

# Journal of EMERGENCY NURSING

OFFICIAL PUBLICATION OF THE EMERGENCY NURSES ASSOCIATION

- Nursing Skills Fair in an Austere Military Environment
- The Deadly Trio: Heroin, FentaNYL, and Carfentanil
- Development and Validation of the Ambulance Nurse Competence Scale
- Advanced Placement Paramedic Education for Health Care Professionals: A Descriptive Evaluation
- Experiences of Care in the Emergency Department Among a Sample of Homeless Male Veterans: A Qualitative Study
- Serum Magnesium Levels and Neurological Outcomes in Patients Undergoing Targeted Temperature Management After Cardiac Arrest
- Workplace Violence Against Emergency Nurses in Taiwan: A Cross-Sectional Study
- Evaluating the Use of a Modified Early Warning Score in Predicting Serious Adverse Events in Iranian Hospitalized Patients: A Prognostic Study
- Personalized Care Plans: Are They Effective in Decreasing ED Visits and Health Care Expenditure Among Adult Super-Utilizers?
- An Interdisciplinary Code Sepsis Team to Improve Sepsis-Bundle Compliance: A Quality Improvement Project





---

# Report Information from ProQuest

27 September 2023 07:50

---

## TABLE OF CONTENTS

---

Search Strategy.....	v
1. The Power of Self-Compassion: JEN.....	1
2. Retention of Tourniquet Application Skills Following Participation in a Bleeding Control Course: JEN.....	3
3. Esophageal Perforation After Cervical Spine Fusion Presenting With Dysphagia and a Burning Sensation: JEN.....	11
4. Tailoring a Comprehensive Bundled Intervention for ED Fall Prevention: JEN.....	16
5. Customizing Physiologic Alarms in the Emergency Department: A Regression Discontinuity, Quality Improvement Study: JEN.....	26
6. Code Critical: Improving Care Delivery for Critically Ill Patients in the Emergency Department: JEN.....	36
7. Complexities of Identifying Posterior Cerebral Artery Cerebrovascular Stroke: JEN.....	43
8. Advanced Practice Registered Nurses in the Emergency Care Setting: JEN.....	48
9. Traffic Safety and Older Drivers: JEN.....	53
10. Table of Contents: JEN.....	59
11. Emergency Nursing Review Questions: March 2020: JEN.....	61
12. One Stop: Examining the Reasons Patients Use the Emergency Department for Nonurgent Care and the Barriers They Face: JEN.....	64
13. Retrospective Diagnosis of Congenital Long QT Syndrome in a Patient With Febrile Syncope: JEN.....	73
14. Instrucciones de Alta por Video: Effectiveness of Video Discharge Instructions for Spanish-Speaking Caregivers in the Pediatric Emergency Department: JEN.....	80
15. Finding Funding Support for Your Dissertation Research or Clinical Practice Project: JEN.....	89
16. CE Earn Up to 7.5 Contact Hours: JEN.....	94
17. Development of the National Early Warning Score-Calcium Model for Predicting Adverse Outcomes in Patients With Acute Pancreatitis: JEN.....	95
18. Call to Action: The Need for Best Practices for Boarding the Pediatric Intensive Care Patient in the Emergency Department: JEN.....	97
19. Optimizing Patient Outcomes in Emergency Cardiac Care Through Advances in Technology: Nurse Scientists in Action: JEN.....	103
20. Creating the Future: Collaborative Practice Between Emergency and Critical Care Nurses: JEN.....	106
21. Editorial Board: JEN.....	111
22. Knowledge Translation of Science Advances Into Emergency Nursing Practice With the Reach, Effectiveness, Adoption, Implementation, and Maintenance Framework: JEN.....	112
23. Commentary on Emergency Nurses Association's 2019 "Position Statement: Advanced Practice Registered Nurses in the Emergency Care Setting": JEN.....	119
24. Information for Readers: JEN.....	122
25. Thank you to JEN 2019 Reviewers: JEN.....	123
26. Assessing the Impact of ED Triage Directives on Febrile Oncology Patient Wait Times: JEN.....	124
27. Transcultural Health Practices of Emergency Nurses Working With Indigenous Peoples: A Descriptive Study: JEN.....	126

## TABLE OF CONTENTS

---

28. Improving Appropriate Dosing of Intravenous diTIAZem in Patients With Atrial Fibrillation or Flutter With Rapid Ventricular Response in the Emergency Department: JEN.....	136
29. A 55-Year-Old Man With Cold Agglutinin Disease: JEN.....	138
30. Table of Contents: JEN.....	142
31. One Person Can Make a Difference: JEN.....	143
32. Serum Magnesium Levels and Neurological Outcomes in Patients Undergoing Targeted Temperature Management After Cardiac Arrest: JEN.....	145
33. On Evolutions and Revolutions in Emergency Care: Commemorating the Emergency Nurses Association's 50th Anniversary: JEN.....	153
34. Experiences of Care in the Emergency Department Among a Sample of Homeless Male Veterans: A Qualitative Study: JEN.....	158
35. An Interdisciplinary Code Sepsis Team to Improve Sepsis-Bundle Compliance: A Quality Improvement Project: JEN.....	167
36. Workplace Violence Against Emergency Nurses in Taiwan: A Cross-Sectional Study: JEN.....	177
37. Personalized Care Plans: Are They Effective in Decreasing ED Visits and Health Care Expenditure Among Adult Super-Utilizers?: JEN.....	179
38. Winds of Change: Anita N. Dorr Memorial Lecture: JEN.....	187
39. Blast Incidents and Their Sequela: JEN.....	193
40. Advanced Placement Paramedic Education for Health Care Professionals: A Descriptive Evaluation: JEN.....	199
41. Emergency Rabies Exposure Plan of Care: JEN.....	207
42. Nursing Skills Fair in an Austere Military Environment: JEN.....	212
43. Thinking Outside the Box in Rural Trauma Transport: JEN.....	217
44. Evaluating the Use of a Modified Early Warning Score in Predicting Serious Adverse Events in Iranian Hospitalized Patients: A Prognostic Study: JEN.....	221
45. Logic Models for Program Evaluation in Emergency Nursing: JEN.....	236
46. Development and Validation of the Ambulance Nurse Competence Scale: JEN.....	240
47. Making Ends Meet...When They Shouldn't: Accidental Misconnections Involving Endotracheal and Tracheostomy Cuff Ports: JEN.....	287
48. Can Sudden Cardiac Death Risk in the Young be Identified in the Emergency Department?: JEN.....	292
49. Physostigmine for Antimuscarinic Toxicity: JEN.....	297
50. Top 10 Pitfalls to Avoid When Caring for the Older Adult: Part II: JEN.....	301
51. CE Earn Up to 8.0 Contact Hours: JEN.....	306
52. The Deadly Trio: Heroin, FentaNYL, and Carfentanil: JEN.....	307
53. Editorial Board: JEN.....	316
54. Information for Readers: JEN.....	317
55. Prehospital and Transport Nursing: The Next 50 Years: JEN.....	318

## TABLE OF CONTENTS

---

Bibliography.....	323
-------------------	-----

## SEARCH STRATEGY

Set No.	Searched for	Databases	Results
S1	Journal of Emergency Nursing	Ebook Central, Public Health Database, Publicly Available Content Database	76792*

\* Duplicates are removed from your search, but included in your result count.

# The Power of Self-Compassion: JEN

[ProQuest document link](#)

---

## ABSTRACT (ENGLISH)

In the emergency department or other emergency care settings, there is very little downtime. Contrary to inferences made by my state representatives that nurses relax and play cards during shifts, we all know the reality of our care settings. Or this moment can take place at unexpected times, such as when we are logging into our electronic medical record, and instead of experiencing frustration that the program is not moving quickly enough, we use that moment to contemplate.

## FULL TEXT

In the emergency department or other emergency care settings, there is very little downtime. Contrary to inferences made by my state representatives that nurses relax and play cards during shifts, we all know the reality of our care settings. We are required to work hard with limited resources every day. We are the safety net for our communities, and we address all patients that present to us, whatever the circumstances, because, unlike other hospital units, the emergency department has no cap for census.

We know that emergency nurses face a high rate of burnout.<sup>1,2</sup> The struggles of increased workload and situations such as workplace violence are often cited as reasons for this. And let's face it, how many times have you taken care of a critically ill patient or had a patient who has just passed away and you walk out of the patient's room to go directly into another room to care for another patient?

Recently, I attended a meeting with other leaders from my hospital. We talked about compassion, specifically discussing the idea that if you cannot practice self-compassion, then you cannot express compassion to others. A presenter at the meeting described a useful technique we can all use to exercise more self-compassion. He talked about the importance of taking the time to stop and reflect throughout the busy day: to simply be still in the moment and breathe.

This led me to reflect back on a practice we followed in an emergency department where I had previously worked. Anytime we had a patient who passed away, we all would take a few moments before we left the room: just a bit of time to think about the event and realize we had just cared for someone's loved one. If the patient did not have loved ones present at the time, we would recognize that the person we had just cared for was loved by someone, and they would be mourning the loss. This gave us time to stop and reflect before moving on to care for our other patients.

We are just beginning to see the end of winter. As we know, this time of year, in addition to the seasonal holidays, increases stress for many people. We also faced another stressful flu season. Our lives are busy with day-to-day nursing operations; however, adding these extra stressors takes an additional toll on us, no matter how experienced we are or how "strong" we believe we are.

I challenge us all to take a moment to consciously "Pause"<sup>3</sup> and take a breath throughout our days, especially after facing a critical situation or the death of a patient. I also ask you to encourage your coworkers to engage in this practice, and when you notice they're under stress, remind them to take a moment to reflect and take a deep breath. This moment can be as simple as when we have walked out of a room and are gelling with hand sanitizer, and we simply stand and take that deep breath as we rub in the gel. Or this moment can take place at unexpected times, such as when we are logging into our electronic medical record, and instead of experiencing frustration that the program is not moving quickly enough, we use that moment to contemplate.

As we know, One Person Can Make a Difference, so consider the power of a moment of self-compassion, take that

moment to be still and reflect and encourage others to do the same.

## DETAILS

<b>Subject:</b>	Emergency medical care; Nurses; Emergency services; Sympathy; Frustration; Mental health; Occupational health
<b>Business indexing term:</b>	Subject: Occupational health
<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	2
<b>First page:</b>	135
<b>Publication year:</b>	2020
<b>Publication date:</b>	Mar 2020
<b>Section:</b>	President's Message
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English
<b>Document type:</b>	Commentary
<b>DOI:</b>	<a href="https://doi.org/10.1016/j.jen.2020.01.002">https://doi.org/10.1016/j.jen.2020.01.002</a>
<b>ProQuest document ID:</b>	2487205967
<b>Document URL:</b>	<a href="https://www.proquest.com/scholarly-journals/power-self-compassion/docview/2487205967/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/power-self-compassion/docview/2487205967/se-2?accountid=211160</a>
<b>Copyright:</b>	©2020. Emergency Nurses Association



Last updated: 2021-04-09

Database: Public Health Database

Document 2 of 55

# Retention of Tourniquet Application Skills Following Participation in a Bleeding Control Course: JEN

[ProQuest document link](#)

## ABSTRACT (ENGLISH)

### Introduction

The American College of Surgeons' Stop the Bleed program has trained more than 1 million individuals to recognize and treat external hemorrhage. Central to this training is tourniquet application. No published studies review the retention of this skill after initial class participation.

### Methods

One hundred fourteen volunteers agreed to participate. A random sample of 57 was selected and 46 participated. Upon return 6 months later, each participant demonstrated tourniquet application. An observer compared the application process with steps on a checklist. Each step completed correctly was tallied, and the total score for all 10 steps was computed as a percentage correct between 0% and 100%.

### Results

The baseline score on the tourniquet skill test was 100% following initial training. At 6 months, mean scores were lower, 69% (SD = 31%) ( $\chi^2 = 52.09$ ,  $df = 1$ ,  $P < 0.001$ ). Fourteen volunteers (30%) attained a score of 100%, and 28 volunteers (61%) achieved a passing score. Bleeding was stopped or reduced to non-life-threatening levels by 34 participants (74%). Participants with passing scores were more likely to stop or reduce the bleeding than those with failing scores (97% vs 35%;  $\chi^2 = 20.99$ ,  $df = 1$ ,  $P < 0.001$ ). Of the 17 volunteers who failed, 18% stopped the bleeding, 18% slowed bleeding to a non-life-threatening level, and 64% were unable to control bleeding.

### Discussion

At 6 months, 39% of participants were unable to successfully apply a tourniquet, and 26% were unable to control life-threatening bleeding. This study demonstrates that refresher training is needed within 6 months of initial training.

## FULL TEXT

### Contribution to Emergency Nursing Practice

- The current literature on the skill retention of tourniquet application following participation in a bleeding control course indicates a lack of data supporting appropriate recommendation for refresher training.
- This article contributes to the knowledge that there is a considerable skill decay 6 months after participating in a bleeding control course.
- Key implication for emergency nursing practice found in this article is that all nurses teaching tourniquet application skills as part of the bleeding control class offer refresher training within 6 months of initial course completion.

## **Introduction**

In the United States, traumatic injury is the leading cause of death among individuals aged between 1 and 44 years and is among the most common causes of death among individuals aged 45 to 64 years.<sup>1</sup> Twenty percent of all civilian trauma deaths are considered preventable, and within this population, uncontrolled hemorrhage accounts for 64% of deaths.<sup>2-4</sup> External hemorrhage has been increasingly recognized as a major cause of potentially preventable death following severe injury. A comprehensive review of preventable deaths within the US military by the Tactical Combat Casualty Care Committee led to the establishment of evidence-based guidelines that resulted in major decreases in mortalities from combat casualties.<sup>5</sup> A related civilian guide for mass shootings was subsequently developed, named the Hartford Consensus.<sup>6</sup> The Hartford Consensus deliberations meetings were led by the American College of Surgeons. The consensus guidelines were developed by representatives from several first responder, professional medical, and government organizations following the US 2012 Sandy Hook Elementary School active shooter incident and deaths in 2012. The overriding goal of this consensus was maximizing survival during a mass casualty incident using the principles described in the acronym THREAT: threat suppression, hemorrhage control, rapid extrication of victims, assessment by medical professionals, and transport to definitive care.<sup>6</sup>

Following the release of the Hartford Consensus in October 2015,<sup>6</sup> the American College of Surgeons Committee on Trauma in collaboration with several professional stakeholder groups developed a training curriculum and initiated the national Stop the Bleed (STB) campaign with the support of the Obama Administration.<sup>7</sup> Among several proactive recommendations was to encourage first responders and the lay public to become trained, equipped, and empowered to step forward and intervene in a bleeding emergency. The program purports to consider bystanders at the scene of an incident as it occurs and empowers them to act as immediate responders, thus providing initial bleeding assessment and intervention until first responders arrive.<sup>7</sup> One of the key components of the STB initiative is baseline education and training in the use of the commercial tourniquet (CTQ) to stop extremity hemorrhage when pressure alone does not work. Although the program has progressively provided education and training to more than 1,076,000 individuals worldwide,<sup>8</sup> there are no recommendations regarding time intervals for refresher training to maintain confidence and competence in CTQ application. The rationale for this study was to ascertain whether CTQ application skills were sufficiently maintained 6 months after participation in an STB course and to provide recommendations for refresher training on the basis of results.

The goal of this study was to determine to what degree the skill of CTQ application was retained 6 months after participation in an STB class. The research question was, how many STB participants have retained tourniquet application skills after 6 months? It was hypothesized that tourniquet application skills would deteriorate within 6 months of completing an STB course.

## **Methods Design and ethical considerations**

This study was a single group, prospective direct observational study. The protocol was approved by the Queen Mary University of London's Ethics Review Committee (reference number: QMREC2206a). In addition, this project was reviewed and approved by the legal counsels of Somerset County, New Jersey, and the Borough of Somerville, New Jersey. Informed consent for study participation was obtained for all participants.

## **Study Site**

This study took place at 2 locations, the headquarters of the Somerville Emergency Medical Services in Somerville, New Jersey, and the Somerset County Emergency Services Training Academy in Hillsborough, New Jersey.

## **Sampling and Inclusion and Exclusion Criteria**

All participants volunteering for inclusion in this study completed the American College of Surgeons-sponsored STB

program and were able to successfully complete all skill steps in sequence on a tourniquet simulator, resulting in the cessation of extremity hemorrhage. Participants were adult volunteers (aged 18 years or older) who successfully completed an STB class presented by the principal investigator.

A total of 157 STB class participants were solicited to volunteer. One hundred fourteen agreed to volunteer after their respective classes. A random sample of 57 (50%) was selected, and all volunteers agreed to participate in the study. Volunteers agreeing to participating in the 6 month follow up were added to an Excel spreadsheet and then 57 numbers were selected by a random number generator. None of the volunteers knew that their CTQ skills were going to be observed. At the time of the class, all agreed to return in 6 months for STB refresher training. Exclusion criteria for participation included younger than 18 years (0 participants), participation in another STB-like program (1 participant), and refusal to consent for inclusion in the study (0 participants).

### **Primary Outcome**

The primary outcome of this study was the determination of CTQ application skill retention 6 months after attending an STB course.

### **Data Collection**

A standardized checkbox data collection checklist was developed and reviewed by 2 other bleeding control instructors (Figure 1). The data to be collected paralleled the procedure for CTQ application as outlined in the American College of Surgeons Committee on Trauma's STB curriculum.<sup>7</sup> Participant number was assigned to each volunteer to maintain anonymity and for accounting purposes.

Study participants presented for refresher training 6 months ( $\pm 1$  week) after completing their initial program.

Following informed consent, each participant was isolated and observed by the investigator during an attempt to apply a CTQ (Combat Application Tourniquet, CAT Resources, LLC, Rock Hill, SC) to a tourniquet simulator (BCon Trainer, Techline Technologies, Willow Grove, PA). As the participant proceeded with the application of the tourniquet, the observer compared the steps in the CTQ application process with the steps on a data collection form.

### **VARIABLE SCORING**

Each step of the observation that was completed correctly was tallied, and the total score for all 10 steps computed as a percentage correct between 0% and 100% and transferred to a master spreadsheet for ease of data analysis. During the initial training session, all steps had to be successfully demonstrated to complete the training. At 6 months, the scores of 0% to 60% were considered failures, and scores of 70% and higher were considered successes. This scoring system was selected as it paralleled the common academic scoring system used in the US. Minimal deviation was defined as the volunteer's ability to demonstrate at least 70% of the skill procedure steps and stop the bleed on the tourniquet simulator. The control of bleeding was scored as a dichotomous variable: bleeding controlled or bleeding not controlled. If bleeding was not controlled, ongoing bleeding was rated life threatening or non-life threatening. Catastrophic failure was defined as the failure to stop or slow considerable bleeding on the tourniquet simulator. Specific errors were recorded as comments.

### **Data Analysis**

Data collection checklists were transcribed into Microsoft Excel. Tourniquet skill scores were treated as continuous data; descriptive statistics were calculated as means, SDs, medians, interquartile range (IQR), and percentages. Bleeding control ratings were used to stratify the skill test scores for chi-square analysis, and the proportions of participants succeeding in controlling bleeding were calculated as percentages. Specific errors that had been recorded as comments were analyzed thematically.

### **Results**

Of the 57 volunteers agreeing to participate, 46 presented on the specified date and time assigned for the refresher

session. All 46 volunteers consented to data collection, and a complete dataset was obtained for each volunteer.

Figure 2 shows age distribution, and Figure 3 shows the sex demographics of STB participants. The age and sex of study volunteers was similar to those of the STB participants (age:  $\chi^2 = 0.379$ ,  $df = 5$ ,  $P = 0.99$ ; sex:  $\chi^2 = 0.028$ ,  $df = 1$ ,  $P = 0.87$ ).

Table 1 summarizes the CTQ application skill steps, which were identical to those taught in the STB curriculum completed 6 months earlier.<sup>7</sup> Of the 46 volunteers participating in this study, the baseline score on the CTQ skill test was 100%, but at 6 months, the mean test score was significantly lower at 69% (SD = 31%) ( $\chi^2 = 52.09$ ,  $df = 1$ ,  $P$  Figure 3).

Table 2 stratifies participants' skill scores by bleeding control. Bleeding was stopped or reduced to non-life-threatening levels by 34 participants (74%), and those with passing scores were more likely to stop or reduce the bleeding than those with failing scores (97% vs 35%;  $\chi^2 = 20.99$ ,  $df = 1$ ,  $P$  Figure 4 shows the distribution of test scores at the 6-month follow up.

Table 3 provides the frequency of 8 critical errors that occurred when attempting to place the CTQ ( $n = 62$ ; mean errors per participant: 4.4 [range, 0-10]). The most common error was placing the CTQ too low (32%), followed by applying the strap too loose (18%).

## Discussion

A reduction in CTQ application skill occurred within 6 months after the successful completion of the American College of Surgeons' STB program. Although 61% of the participants successfully applied at least 70% of the CTQ skill steps, 26% showed catastrophic failure. Fundamental errors in CTQ application observed in this study were placing the CTQ too low on the extremity, applying the strap too loose, failing to thread the strap through the CTQ buckle, lack of physical strength to turn the windlass sufficiently, and not assessing to see whether bleeding stopped when finishing the application process. All participants had previously been taught and successfully demonstrated all 10 skills steps in CTQ application. In addition to 11 of the 17 participants with failing scores (65%), 1 of the 29 participants (3%) with a passing score on the CTQ application portion of the evaluation permitted life-threatening bleeding to continue. In the case of the participant who passed the skill process but failed to stop life-threatening bleeding, the participant had placed the CTQ too low on the extremity and did not have the strength to turn the windlass more than 3 revolutions. In addition, 4 other participants had trouble turning the windlass to completely stop the flow of blood although they did not have this issue when demonstrating this skill during the STB class. In none of these instances did the study participant follow the skill step of stating that they would apply a second CTQ proximal to the first. More emphasis on this skill step should be integrated into future STB classes.

A scoring checklist was developed for this study (Figure 3). The steps in this checklist parallel the procedure for CTQ application as outlined in the American College of Surgeons Committee on Trauma's STB curriculum.<sup>7</sup> In this study, each step on the checklist was weighted equally; however, after data analysis, 1 individual was able to achieve a score of 70 (indicating successful skill step completion) without achieving satisfactory bleeding control. Further investigation revealed that the participant was able to matriculate most of the application skills but did not have the strength to turn the windlass to stop severe bleeding.

The results of this study parallel those of similar trials regarding medical skill retention. Several of the critical errors observed in this study were similar to those reported by Baruch et al.<sup>9</sup> In their study of 179 untrained layperson applications using the CAT, Baruch et al.<sup>9</sup> found that of the 134 errors observed in tourniquet application, too much slack was noted 54% of the time, followed by too few turns of the windlass (22%), misunderstanding of the strap and buckle mechanisms (11%), and incorrect tourniquet placement (11%). The present data are consistent with those reported by Goralnick et al.<sup>10</sup> Goralnick et al.<sup>10</sup> compared the outcomes of 4 different in-person hemorrhage-control

training programs with 303 participants and found that although all 4 programs provided adequate bleeding control training, on retesting at 3 to 9 months later, only 54.5% of the participants retained enough skills to successfully demonstrate competence in CTQ application.

Adding to the notion of skill retention, a number of studies cite similar retention loss for several psychomotor and knowledge skill courses. In a study of the retention of knowledge and skills in first aid and resuscitation by airline cabin crews, Mahony et al<sup>11</sup> found a marked decay in skill retention in 35 subjects at 12 months following recurrent first-aid and resuscitation training. Another study assessed cardiopulmonary resuscitation skill retention and self-confidence in preclinical medical students.<sup>12</sup> These investigators concluded that both confidence and skills deteriorate considerably within 1 year of training, reaching unacceptable levels.

In addition, skill retention among medical professionals demonstrates a marked reduction in competence within 1 year of initial or recurrent training. In a study by Gass and Curry,<sup>13</sup> 39 medical professionals (19 nurses and 20 physicians) were pre- and posttested in basic cardiopulmonary resuscitation and then retested at 6 months (12 nurses and 13 physicians) and 12 months (12 nurses and 6 physicians). Both knowledge and skills showed considerable decay at the 6-month assessment and had essentially reverted to pretraining levels at the 1-year mark. Similarly, Binkhorst et al<sup>14</sup> assessed the retention of knowledge and skills in pediatric, basic life support within a group of pediatricians. In this study, 58 pediatricians and pediatric residents were assessed between 3 months and 2 years after the completion of a standard, pediatric basic life support training. As time from the training advanced, knowledge and, in particular, skill retention deteriorated, reaching the highest level 2 years or more following the last participatory training session. Although the deterioration in knowledge and skills demonstrated a linear increase from 3 months to 2 years, there was marked decay in skill competence at the 6- to 12-month time interval. In another analysis, by de Rujter et al,<sup>15</sup> data were collected on the retention of first-aid and basic life support skills in undergraduate medical students in the Netherlands at 1 and 2 years after participating in first-aid and basic life support trainings, respectively. There were 2 cohorts in this study, the first was retested 1 year after the completion of the course, and the second cohort was evaluated 2 years after training. Ninety-four students participated in the 1-year cohort, whereas 66 students were available for the 2-year cohort. Results demonstrated a marked decrease in skills for both first aid (100% failure) and basic life support (100% failure).

Regardless of training (layperson or professional), the literature shows that skill retention drops substantially at 6 to 12 months following the initial teaching session. If asked, will participants return for refresher training? In this study, 46 of 57 individuals did return for 6-month refresher training when asked. On the basis of the requests I made to my learner population during the span of this study (n = 157), 72% were willing to return for a refresher, and of this, 81% returned. Although there is no requirement for the lay population to refresh their skills, I continue to offer all the participants of my STB program the opportunity to attend a 20-minute, hands-on refresher session every 6 months. To date, 58% of all participants have attended at least 1 refresher in the 16 months I have been offering such an opportunity. There are no data in the literature to compare this rate of return to other volunteer-oriented first aid-related courses. A 57% rate of return demonstrates the perceived importance of maintaining the skills taught as part of the STB curriculum.

### **Limitations**

There are several limitations to this study. The sample size was small, limited to 2 testing sites at a single time point, and the STB course instructor was the principal investigator of the study and performed all the follow-up testing. To better characterize the rate of skill degradation, the study should be replicated with a larger sample size by other trainers, preferably at 3-, 6-, and 12-month follow-ups. In particular, it would be of interest to learn whether both a 100% score on the skill test predicts the ability to stop simulated, life-threatening bleeding as it did in this study and

the characteristics associated with perfect test scores. This study was conducted in a low-stress environment. The successful completion of CTQ application might be reduced if studied under conditions more typical of the stressful, chaotic conditions encountered in real life. Replicating this environment and studying CTQ application success could give better insight as to how participants would perform during a real incident. In this study, I did not assess whether the participants remembered that there are other means to mitigate bleeding control if a CTQ is not available. In addition, it does not assess the ability of the participant to apply an improvised tourniquet if a CTQ is not available. Although most participants in this study (73%) did purchase or have access to a CTQ, it may not be readily available, and other methods of bleeding control would be required. STB does discuss alternative means for hemorrhage control, and future research should include the evaluation of the retention of these skills. Another limitation was the time interval used to reevaluate CTQ application skills: refresher training at 12 months may be more realistic. However, the results showed a significant degradation in CTQ application skills within 6 months. More than one third (39%) of the volunteers did not adequately apply the CTQ to stop severe hemorrhage completely and 26% did not stop or slow life-threatening hemorrhage.

This prospective, observational study is the first to assess CTQ retention skills following participation in an STB program. As such, replication is needed using a larger cohort of participants and recruitment of participants completing other STB programs.

### **Implications for Emergency Nurses**

This study demonstrates that 6 months after training, 26% of participants who showed competence in CTQ application were no longer able to apply this device to stop catastrophic bleeding. These data have implications for emergency nurses teaching bleeding control courses as refresher training must be arranged at regular intervals to assure ongoing competence. Although this study did not specifically address health care professional competence in CTQ application, on the basis of the skills retention literature,<sup>9-15</sup> I feel it is reasonable to assume that health care professionals should regularly practice CTQ application.

### **Conclusions**

This study demonstrates that 6 months after training, 30% of participants taking part in the STB program had a perfect recall of the CTQ skill test, and 74% were able to control bleeding to a non-life-threatening level; however, 39% of participants were unable to pass the CTQ skill test, and 26% of the participants were unable to control life-threatening bleeding. Given the fact that these data are consistent with the outcomes of other medical-skill retention studies, I recommend that the American College of Surgeons develop a refresher training curriculum and recommend refresher training sessions at least 6 months following initial training, as annual training may be insufficient to maintain CTQ application skills.

### **Author Disclosures**

Conflicts of interest: none to report.

### **Acknowledgments**

I thank Mike Halperin, EMT, and Scott Skrivanek, MA, MICP, for their assistance in teaching STB to more than 1,200 residents of Somerset County, New Jersey, since the program's inception. In addition, I thank Margery Tamas, HBSE, MPH, for her statistical insight, and Doug Vornlocker for supporting the STB program through the Somerset County Office of Emergency Management.

Tourniquet application steps	Correct	Incorrect
Identified uncontrollable external bleeding	46	0
Applies the tourniquet to the extremity (inserts through loop or fastens around extremity)	39	7
Positions the tourniquet at a proper location	26	20
Pulls the self-adhering back tight and securely fastens back on itself as tight as possible	27	19
Secures strap so as not adhere the band past the windlass clip	30	16
Twists the windlass rod until bleeding stopped	28	18
Secures or locks windlass in windlass clip	35	11
Secures the strap through windlass clip and around as far as it will go	27	19
Secures the windlass time tag across the clip	34	12
Verbalized need to note the time of application of tourniquet	26	20

Tourniquet skill mastery score	Bleeding control			
	Bleeding no longer life-threatening	Life-threatening bleeding continues	Total	Fail
3	3	11	17	Pass
25	3	1	29	Total

Common critical errors in tourniquet application	Number
Strap applied too loose	11
Tourniquet placed too low ("high and tight")	20

Tourniquet placed directly over wound	3
Strap not secured back against itself	6
Not enough strength to turn the windlass to completely stop bleeding	5
Did not thread strap through buckle	6
Did not tighten the windlass till bleeding stopped	6
Did not clip windlass into windlass clip	5

## DETAILS

**Subject:** Emergency medical care; Retention; Life threatening; Application; Trauma; Curricula; Training; Volunteers; Participation; Hemorrhage; Life control; Bleeding; Data collection; Data analysis; Mass murders; Casualties; Skills; Health education; First aid

**Business indexing term:** Subject: Training

**Location:** New Jersey

**Identifier / keyword:** Stop the Bleed; Tourniquet; Skill; Application

**Publication title:** Journal of Emergency Nursing;; JEN; Philadelphia

**Volume:** 46

**Issue:** 2

**Pages:** 154-162

**Publication year:** 2020

**Publication date:** Mar 2020

**Section:** Research

**Publisher:** Elsevier Limited

**Place of publication:** Philadelphia

**Country of publication:** United Kingdom, Philadelphia

**Publication subject:** Medical Sciences--Nurses And Nursing

**ISSN:** 00991767



e-ISSN:	15272966
Source type:	Scholarly Journal
Language of publication:	English
Document type:	Journal Article
DOI:	<a href="https://doi.org/10.1016/j.jen.2019.10.020">https://doi.org/10.1016/j.jen.2019.10.020</a>
ProQuest document ID:	2487205953
Document URL:	<a href="https://www.proquest.com/scholarly-journals/retention-tourniquet-application-skills-following/docview/2487205953/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/retention-tourniquet-application-skills-following/docview/2487205953/se-2?accountid=211160</a>
Copyright:	©2019. Emergency Nurses Association
Last updated:	2021-03-01
Database:	Public Health Database

Document 3 of 55

# Esophageal Perforation After Cervical Spine Fusion Presenting With Dysphagia and a Burning Sensation: JEN

[ProQuest document link](#)

## ABSTRACT (ENGLISH)

Anterior cervical spinal surgery is, at present, one of the most effective clinical methods of treating cervical spinal stenosis.<sup>1</sup> Dysphagia occurs in 71% of patients during the first 2 weeks after surgery and gradually decreases with time; the use of steroid medications can significantly reduce the incidence and severity of postoperative dysphagia.<sup>2,3</sup> When a patient who has been taking steroids continues to experience dysphagia or burning throat pain, strong consideration must be given to other rare postoperative complications. [...]of triage, the patient appeared in no distress and was classified as category III according to the Taiwan Triage and Acuity Scale (a 5-level triage scale modified from the Canadian Triage and Acuity Scale [CTAS], had a Glasgow Coma Scale score of 15, and the following vital signs: temperature of 38.2°C (100.8°F), respirations of 18/min, pulse of 108/min, and blood pressure of 108/62 mm Hg. Laboratory tests showed an increased white blood cell count of 10.66/mm<sup>3</sup> with 79.0% of segmented neutrophils, elevated C-reactive protein (CRP) of 24.52 mg/dL, and erythrocyte sedimentation rate (ESR) of 34 mm/h. The patient was subsequently discharged from the hospital 42 days after readmission. Discussion Anterior cervical spine surgery is a common procedure for treatment of cervical spondylosis with spinal stenosis, and it has a high rate of success with long-term effectiveness.<sup>1</sup> Possible complications of the procedure include vocal-cord paralysis (incidence: 0.07%), postoperative hematoma (incidence: 0.1 to 0.5%), wound infections (incidence: 0.1% to 1.6%), esophageal perforation (incidence: 0.2% to 1.15%), dural tear and cerebrospinal fluid leakage

(incidence: 0.3% to 13%), and dysphagia (incidence: 71%).<sup>1,2</sup> One of the most notable aspects of this case was that although the patient presented with the common complication of dysphagia, his problem turned out to be the rare and potentially fatal complication of esophageal perforation.

## FULL TEXT

### Contribution to Emergency Nursing Practice

- Esophageal rupture is an uncommon but potentially lethal complication following anterior cervical spine fusion. Recognition of this complication may be difficult, as dysphagia and a burning sensation in the throat are common following this surgery, and the symptoms may be dismissed as part of the normal postoperative course.
- This article presents an actual case of a patient with this complication after anterior cervical spine fusion and a discussion of subsequent treatment.
- Key implications for emergency nursing practice are to inform emergency nurses of the symptoms and signs of life-threatening esophageal perforation, which may be masked by administration of steroids.

Anterior cervical spinal surgery is, at present, one of the most effective clinical methods of treating cervical spinal stenosis.<sup>1</sup> Dysphagia occurs in 71% of patients during the first 2 weeks after surgery and gradually decreases with time; the use of steroid medications can significantly reduce the incidence and severity of postoperative dysphagia.<sup>2,3</sup> When a patient who has been taking steroids continues to experience dysphagia or burning throat pain, strong consideration must be given to other rare postoperative complications. If such complications are not identified and treated promptly, the patient may face a life-threatening condition. The authors present a case in which the focus of pathology was determined by relying on medical history queries, physical examination, laboratory tests, and radiologic imaging.

The patient in this case developed burning throat pain and dysphagia less than 4 hours after discharge from the hospital following anterior cervical fusion. He was readmitted after returning to the emergency department of that hospital and was hospitalized for 42 days until recovery. This case study provides a description of the patient's clinical manifestations, diagnosis, and treatment process. We hope that this case presentation will provide emergency nurses with a better understanding of the possible postoperative complications and the care needed for patients receiving this type of surgery, thus facilitating early recognition and prompt treatment of the problems.

### Case Report

A 57-year-old man underwent anterior cervical discectomy and C3-C7 spinal fusion because of spondylosis with stenosis. The patient exhibited gagging and dysphagia while receiving liquid food on the third postoperative day. Although the patient's symptoms were relieved with oral steroids (prednisone 10 mg every 12 hours), he still experienced occasional gagging while ingesting a large mouthful of food. Nine days after surgery he was able to eat small amounts of liquid food without gagging and was discharged from the hospital after re-evaluation by the physician. However, he returned to the same hospital's emergency department less than 4 hours after arriving home because of dysphagia and burning throat pain. The pain was localized over the left side of his neck and was accompanied with a sensation of swelling and slight reddening of the skin. The patient also reported gagging and severe pain during swallowing, especially when ingesting liquid food. The burning pain was unlike his earlier symptoms, was not relieved by analgesics, and his appetite had worsened.

In addition to the cervical spinal stenosis, the patient's medical history included open surgery for a bleeding duodenal ulcer at age of 17 and hypertension without regular medical control; he was a long-term smoker (1.5 pack of cigarettes per week for 40 years) and had been a long-term consumer of alcohol, which he stopped 2 years ago.

He had no travel history during the 3 months before hospitalization, and there was no family history of any congenital anomaly. The patient had not been taking any regular medication.

At the time of triage, the patient appeared in no distress and was classified as category III according to the Taiwan Triage and Acuity Scale (a 5-level triage scale modified from the Canadian Triage and Acuity Scale [CTAS]), had a Glasgow Coma Scale score of 15, and the following vital signs: temperature of 38.2°C (100.8°F), respirations of 18/min, pulse of 108/min, and blood pressure of 108/62 mm Hg. The 6-cm surgical wound on the left side of the patient's neck appeared slightly red and swollen; there was marked local tenderness with a pain score of 5/10 on visual analogue scale, but no fluid or purulent discharge was noted. The skin on the right side of the neck was intact without swelling, the jugular veins were not engorged, and the neck was protected with a cervical collar. There was no hoarseness or tonsil swelling, and the trachea was slightly deviated to the right. The respirations were smooth and regular, with clear breath sounds bilaterally. The exterior of the thoracic cage appeared normal, without subcutaneous emphysema. An old surgical scar approximately 13 cm in length was located near the midline of the abdomen above the navel. There were no focal neurologic deficits or sensory loss. No other abnormal physical findings were noted.

Laboratory tests showed an increased white blood cell count of 10.66/mm<sup>3</sup> with 79.0% of segmented neutrophils, elevated C-reactive protein (CRP) of 24.52 mg/dL, and erythrocyte sedimentation rate (ESR) of 34 mm/h. Procalcitonin (PCT) was found to be 5.45 ng/mL (normal is less than 2 ng/mL); thus, sepsis was highly suspected. An anteroposterior cervical spine x-ray film revealed locally swollen soft tissue with an air shadow over the left side of his neck; the lateral view confirmed that there was no loosening of the fixating implants (<sup>Figure 1</sup> [indicated by arrows]). The chest x-ray film revealed no active lung pathology or abnormal heart size, but the trachea was slightly displaced to the right side. Electrocardiographic examination revealed normal sinus rhythm and right bundle-branch block. A computed tomography (CT) scan of the neck revealed extensive abscess formation involving the lower esophageal area, extending to the cervical spine and bilateral axilla (<sup>Figure 2</sup> [indicated by arrows]), with air collection in front of the fixating implants.

Based on the above-mentioned medical history, physical examination, and laboratory results, a preliminary diagnosis of wound and deep neck infection with sepsis was made—possibly due to esophageal rupture—and the patient was readmitted immediately after placement of a nasogastric (NG) tube for gastric decompression. Oral intake and NG feeding were restricted except for medications. Hydration was supported intravenously with 1,000 mL of normal saline and 1,500 mL of Taita No. 5 (a glucose and electrolyte solution) per day. Empirical antibiotics were initiated with amoxicillin sodium 500 mg/clavulanic acid 100 mg, 1,200 mg immediately and every 8 hours, and gentamicin 160 mg immediately and once a day by intravenous (IV) drip. A pain score of 3/10 to 5/10 was controlled with lysine acetylsalicylate (a form of IV aspirin) 500 mg IV every 6 hours.

Surgery was performed urgently on the day of hospitalization, and intraoperative flexible laryngovideoscopy revealed a 5-mm perforation in the cervical esophagus. The abscess was debrided, and the esophageal perforation was sutured. Wound and blood cultures revealed *Viridans streptococci*, and the antibiotic regimen was changed to meropenem 1,000 mg IV every 8 hours and vancomycin 1,000 mg every 12 hours. Parenteral nutrition (PPN) consisting of Clinimix N9G15E 1,500 mL was administered. The patient developed a fever of 38.3°C (100.9°F) 7 days postoperatively, and turbid content with some air was found in the wound drainage tube. An oral methylene blue test was performed, suggesting a leakage at the site of repair.

The operative site was debrided again 11 days after admission, during which the implants were removed, and a sternocleidomastoid rotational muscle flap reconstruction was performed. Further wound cultures identified *Pseudomonas aeruginosa* and *Burkholderia cepacia*; however, no anaerobic species were found. Antibiotics were

subsequently changed to moxifloxacin 400 mg by IV drip once daily and cefoperazone sodium 500 mg/sulbactam 500 mg) 4 gm by IV drip every 12 hours. The patient's condition improved after the second surgery, and he was transferred to a general ward 1 week later, after endotracheal tube extubation. A repeat oral methylene blue test was negative for leakage, and the drainage tube was removed 2 days later. Oral intake was begun, and the nasoduodenal tube was then removed. The patient was subsequently discharged from the hospital 42 days after readmission.

## Discussion

Anterior cervical spine surgery is a common procedure for treatment of cervical spondylosis with spinal stenosis, and it has a high rate of success with long-term effectiveness.<sup>1</sup> Possible complications of the procedure include vocal-cord paralysis (incidence: 0.07%), postoperative hematoma (incidence: 0.1 to 0.5%), wound infections (incidence: 0.1% to 1.6%), esophageal perforation (incidence: 0.2% to 1.15%), dural tear and cerebrospinal fluid leakage (incidence: 0.3% to 13%), and dysphagia (incidence: 71%).<sup>1,2</sup> One of the most notable aspects of this case was that although the patient presented with the common complication of dysphagia, his problem turned out to be the rare and potentially fatal complication of esophageal perforation.

The 4 main causes of esophageal perforation are iatrogenic, spontaneous, chemical, and traumatic. Iatrogenic injury is the most common cause, accounting for 44% of all cases and has a mortality rate of 3.92%.<sup>4,5</sup> Esophageal perforation following anterior cervical spinal surgery may be caused by erosion due to implant impingement, and the most common location is at the cervical esophagus in the throat.<sup>5</sup>

Early diagnosis of esophageal perforation after cervical spine surgery must rely on a high level of clinical suspicion and appropriate physical examination. A confirmative diagnosis depends on lateral x-ray image of the cervical spine, which may reveal subcutaneous emphysema, soft-tissue swelling, enlargement of the retropharyngeal space, or displacement of implants. Flexible laryngovideoscopic examination enables direct visualization of the site of perforation, and contrast CT scan can help to detect accumulation of abscess or dislocation of implants.<sup>6</sup>

Early or tiny esophageal perforations can generally be treated conservatively with antibiotics and fasting; however, surgical treatment may be required in the case of relatively large perforations.<sup>7</sup> Different types of surgical treatments—including direct suture repair or flap reconstruction—should be considered, depending on the size of perforation, severity of infection, and time of injury. Methylene blue can be injected into the throat during debridement to detect any perforation.<sup>8</sup> Studies show that direct repair has a 70% success rate, and further surgeries will be necessary if initial treatment fails;<sup>7</sup> on the other hand, flap reconstructive surgery has a higher success rate of 83%.<sup>9</sup> Secondary complications of esophageal perforation include wound dehiscence, malnutrition, mediastinitis, esophageal stenosis, osteomyelitis, and tracheoesophageal fistula. According to Kang et al, delayed treatment of esophageal perforation may increase the mortality rate to as high as 60%.<sup>9</sup>

Dysphagia is common following anterior cervical spinal surgery during the first 2 weeks after surgery but usually resolves slowly in a few months.<sup>1</sup> The most common cause of dysphagia is overstretching of the esophagus during surgery, which often causes local ischemia in the wall of the pharynx and esophagus. Other possible causes include edema, hematoma, and infection.<sup>10</sup> The use of steroids can significantly reduce the incidence and severity of postoperative dysphagia.<sup>3</sup> The patient in this case experienced dysphagia on the third day after his initial surgery and tended to gag when consuming liquid food; this may have been caused by local ischemia or edema. His symptoms were eased after steroid treatment, which might have masked the underlying problem.

The most notable features of this case were the warning signs of dysphagia and burning throat pain. Steroid therapy was effective in relieving his symptoms but might have also decreased the alertness for esophageal perforation. Accordingly, we recommend that when a patient experiences dysphagia, fever, or abnormal throat pain after anterior

cervical spinal surgery, clinical signs and symptoms should be assessed carefully, and the possibility of esophageal perforation must always be kept in mind to reduce morbidity and mortality.

In summary, emergency nurses must have full knowledge and awareness of postoperative complications, quickly identify abnormal clinical symptoms, and facilitate timely treatment. We hope that this case provides emergency nurses with a better understanding of complications that may occur in a patient who has had an anterior cervical spine procedure and also enable them to fully employ their professional care and coordination skills to ensure the highest quality in clinical care.

### Acknowledgment

The authors would like to thank Dr. Yu Tzai-Chiu for providing this case. This research was partially supported by a grant from Taipei Tzu Chi Hospital (grant no. TCRD-TPE-105-29).

## DETAILS

<b>Subject:</b>	Laboratories; Emergency medical care; Pain; Transplants & implants; Food; Neck; Dysphagia; Sepsis; Abscesses; Postoperative morbidity; Esophagus; C-reactive protein; Blood; Burning; Steroids; Complications; Cerebrospinal fluid; Blood pressure; Hospital discharged; Antibiotics; Readmission; Surgery; Triage; Coma; Back surgery; Paralysis; Psychological distress; Spinal stenosis; Long term
<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	2
<b>Pages:</b>	220-224
<b>Publication year:</b>	2020
<b>Publication date:</b>	Mar 2020
<b>Section:</b>	Case Review
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English

Document type:	Journal Article
DOI:	<a href="https://doi.org/10.1016/j.jen.2018.12.019">https://doi.org/10.1016/j.jen.2018.12.019</a>
ProQuest document ID:	2487205944
Document URL:	<a href="https://www.proquest.com/scholarly-journals/esophageal-perforation-after-cervical-spine/docview/2487205944/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/esophageal-perforation-after-cervical-spine/docview/2487205944/se-2?accountid=211160</a>
Copyright:	©2019. Emergency Nurses Association
Last updated:	2023-01-26
Database:	Public Health Database

---

Document 4 of 55

# Tailoring a Comprehensive Bundled Intervention for ED Fall Prevention: JEN

[ProQuest document link](#)

---

## ABSTRACT (ENGLISH)

### Introduction

Falls in the emergency department pose an important challenge for patient safety. Multifactorial fall prevention bundles have been associated with a reduction in patient falls in the inpatient setting. The purpose of this project was to tailor and implement a comprehensive fall prevention bundle in our emergency department.

### Methods

Fall bundle components for this intervention were selected on the basis of a review of fall prevention research and included fall risk assessment, safe ambulation, safe toileting, staff communication, early warning, and patient education. The fall risk assessment was tailored to the emergency department through an appraisal of select inpatient fall risk assessments, literature search for ED-specific fall risk factors, and a site-specific chart review, after which pertinent fall risk factors were integrated into a modified screening. Fall prevention materials that were both practical and applicable to the emergency department and facilitated patient safety along each bundle domain were selected for implementation at our site.

### Results

The tailored fall prevention bundle was championed by the interdisciplinary ED Fall Prevention Team and implemented over the course of 5 months in 1 emergency department. Education on fall prevention equipment was delivered in a peer-to-peer format, and an online module was designed to guide staff through the new fall risk assessment. The fall prevention bundle was adopted into clinical practice after staff education was completed, and the fall risk screening was merged into the electronic medical record.

### Discussion

ED fall prevention requires a comprehensive bundled approach, which includes a fall risk screening and multifactorial interventions that are tailored to the ED setting. Successful implementation relies on the involvement of front-line staff from the design through the delivery of the bundled fall prevention measures. Continued inquiry and innovation in ED fall prevention will help provide a safer health care environment and improve patient outcomes.

## FULL TEXT

### Contribution to Emergency Nursing Practice

- The current literature on fall prevention indicates that multifactorial bundles are effective in reducing patient falls in the acute care setting.
- This article contributes a detailed description of the process to tailor a fall prevention bundle to emergency department clinical practice.
- Key implications for emergency nursing practice found in this article include how comprehensive fall prevention measures in the emergency department can be successfully implemented with a bundled approach through the engagement of front-line staff.

### Introduction

Falls in the emergency department account for 6% of hospital-wide falls and often result in use of additional resources, unplanned hospitalization, and poor patient outcomes.<sup>1,2</sup> When compared with other areas of the hospital, a fall in the emergency department is more likely to result in injury or death.<sup>1</sup> Multicomponent fall prevention bundles have been associated with a reduction in falls and fall-related injuries in the acute care setting.<sup>3,4</sup> The purpose of this project was to describe how we tailored and initially implemented a comprehensive fall prevention bundle in our emergency department.

### Rationale and Essential Elements of the Tailored Fall Prevention Bundle

Combining fall prevention measures into a multicomponent bundle has been associated with a reduction in fall risk by up to 30% in the acute care setting.<sup>3,4</sup> Evidence-based components of fall prevention bundles include (1) assessment of fall risk, (2) application of multifactorial interventions, and (3) embedding fall prevention into unit culture.<sup>3,4</sup> Use of an appropriate tool to assess fall risk is a fundamental component of a fall bundle.<sup>3,4</sup> Fall risk factors found on inpatient tools include a history of falls, mental status, mobility, medications, continence, and use of intravenous (IV) therapy or tethering equipment.<sup>5</sup> Some risk factors are impractical to assess in triage, such as toileting ability, and others are not applicable on arrival, such as an IV or tethered equipment. Furthermore, fall risk factors unique to the emergency department, such as intoxication, are lacking from inpatient tools and may account for up to 20% of ED falls.<sup>2,6</sup> Addition of ED-specific risk factors to a fall risk assessment may improve the detection of at-risk patients in the emergency department.<sup>2</sup> Two ED fall risk assessments adapted from inpatient tools have been published, and further work is needed to establish their validity and reliability.<sup>14-17</sup>

Multifactorial interventions aimed to improve staff communication, facilitate safe ambulation and toileting, educate patients, provide early warning, and prevent injury are the second key aspect of fall prevention bundles.<sup>3,4</sup> Use of fall wrist bands, fall door signage, electronic medical record alerts, bedside commodes, gait belts, and nonskid socks are shown to reduce a patient's risk of falling in the inpatient setting.<sup>3,4,18,19</sup> When these measures have been implemented in the emergency department, a reduction in patient falls has resulted.<sup>14,20</sup>

The third key aspect of a fall prevention bundle is embedding fall prevention into unit culture, which begins with an accurate assessment of departmental readiness for change.<sup>5</sup> Involvement of ED leadership and the use of front-line staff from the design to the delivery of a fall prevention bundle is key in creating positive change.<sup>14,20</sup> Performance auditing and dissemination of fall prevention data helps to sustain a culture of patient safety.<sup>14</sup>

Thus, a comprehensive approach to fall prevention necessitates the use of fall risk assessment, multifactorial interventions, and a culture of fall prevention. Failure to incorporate all 3 aspects or overemphasis on 1 area of fall

prevention may lead to varying results.<sup>16,20</sup> Bundling these aspects into a fall prevention intervention provides a balanced approach, which may provide the best outcomes.

### **Our Process**

We conducted a literature review with quality appraisal of select existing falls risk assessments, integrated findings from a previously conducted site-specific chart review, reviewed the ED-specific risk factors from available inpatient fall risk assessment tools, adopted a modified and tailored bundled intervention for our site, delivered a staff education on the bundle, and implemented the initial intervention in 1 emergency department. This report focuses on describing the process to tailor a falls bundle intervention for our site. This project was considered exempt by Rush University Medical Center's Institutional Review Board.

### **Intervention Site and Context**

The project was implemented at a 676-bed Midwestern urban academic medical center over the course of 5 months, from August to December, 2017. This academic medical center holds Magnet designation and is a comprehensive stroke center that specializes in the treatment of neurological disorders. The emergency department within this medical center is a 60-bed unit with 74,000 patient visits per year and serves both adult and pediatric populations.

### **The Intervention Team**

The interdisciplinary ED Fall Prevention Team was appointed to implement the fall prevention bundle and comprised of 5 bachelor's-prepared nurses with 1 to 12 years of ED experience and 4 nurse aides with 1 to 3 years of ED experience. This intervention was coordinated by 1 of the nurses as a doctoral project and facilitated by the master's-prepared Unit Director with the oversight of 2 doctoral-prepared faculty members from Rush University's College of Nursing.

### **Tailoring Fall Bundle Interventions To The Emergency Department**

The ED Fall Prevention Bundle infographic was created to visually depict the domains of the bundle (<sup>Figure 1</sup>). These domains were selected from evidence-based inpatient multifactorial interventions and approved by the ED Fall Prevention Team as both practical and adaptable to the emergency department.<sup>3,4</sup> Staff communication was improved with fall risk wristbands and door signage. Safe ambulation was promoted through nonskid socks, gait belts, and individualized staff assistance. Safe toileting was encouraged with bedside commodes and early warning with bed-exit alarms. Patient education was provided by placing "Call, Don't Fall" signage in every room and with patient teach-back to reinforce understanding.

To facilitate the use of multifactorial interventions, the ED Fall Prevention Team identified the most central and convenient area to place fall prevention materials within the department. Wristbands were placed in triage and nonskid socks and door signage were placed in each patient's room. Commodes were placed in strategic areas throughout the department. Bed-exit alarms and gait belts were placed in the medication room, which is in a central location.

### **Tailoring The Fall Risk Assessment To The Emergency Department**

To improve the identification of at-risk patients and to make the fall risk assessment more applicable to the emergency department, selected modifications were made. Before this intervention, the emergency department used an adapted version of the Schmid fall risk screening.<sup>11</sup> To best inform the needed changes, appraisal of select existing fall risk assessments and a review of literature focusing on ED-specific fall risk factors was conducted (<sup>Table 1</sup>).<sup>2,6-15</sup> A review of ED falls in the last fiscal year yielded additional fall risk factors, such as weakness and impulsivity, which accounted for 10% and 2% of falls, respectively. A comprehensive list of ED fall risk factors was generated and agreed upon using a nominal process with the ED Fall Prevention Team, departmental, and organizational nursing leadership (<sup>Table 2</sup>).



Intoxication is an ED-specific fall risk factor found both in clinical practice and research and was marked for inclusion.<sup>2,6</sup> Age alone was not considered a strong enough predictor and was not substantiated in the chart review. Disagreement on the definition and ability to assess alterations in elimination in triage excluded this risk factor. As a center for neurological care, presence of diagnosis affecting comprehension and coordination was a common site-specific risk factor. Thus, the new ED fall risk screening included the following factors: history of falls in the past 3 months including today, confusion/disorientation, intoxication/sedation, dizziness/weakness, history of neurological diagnosis, use of assistive gait device, and unsteady gait (Figure 2). The presence of any 1 risk factor qualified the patient as having fall risk. A positive triage screening then prompted additional documentation by the primary RN for application of individualized fall precaution interventions. Interrater agreement for the new fall risk assessment was conducted by 2 members of the ED Fall Prevention Team using 10 real-time triage patients and was measured at 98.3%.

### **Education And Communication On The Fall Bundle**

In preparation for the upcoming change a month-long communication campaign was launched, and the ED Fall Prevention Bundle infographic was prominently displayed in e-mail communications, unit-based poster displays, and buttons worn by staff. The ED Fall Prevention Team took the lead in presenting the change to fellow staff members at shift-change huddles and at nursing shared-governance meetings to demonstrate the peer-lead design and support for this intervention. Additional points to facilitate staff buy-in included highlighting that new fall prevention measures were integrated into standard ED workflows, new documentation was streamlined and required less mouse strokes to complete, and new fall prevention materials were conveniently placed. To create a sense of urgency for this intervention, benchmark data of our emergency department's unsatisfactory performance were disseminated to staff.

After the completion of the communication campaign, staff education on fall prevention equipment began and consisted of short lessons on different aspects of the fall bundle, including fall precaution application, gait belt training, bed alarm utilization, and postfall patient management. Each month focused on a different topic and the lessons were delivered in a peer-to-peer format with return demonstration when necessary. To promote participation, each member of the ED Fall Prevention Team was assigned a list of specific ED staff members to educate during that month. By the end of implementation, 92% (n = 114) of staff participated in equipment education. Competency was assessed using equipment checklists provided by the manufacturer, and staff scored an average of 98%.

For fall risk assessment education, a different educational modality was used, namely, an online learning module, which was designed to visually guide staff through the new screening. A posttest consisting of 10 different patient-based triage scenarios was placed at the end to assess competency. The module was completed by 82% (n = 70) of nursing staff with a 97% posttest average.

The ED Fall Prevention Bundle was incorporated into clinical practice after education was complete and the new fall risk assessment was merged into triage documentation. To celebrate the bundle implementation, a 3-day "ED Fall Fair" was held to showcase the positive changes and recognize the ED Fall Prevention Team who spearheaded this initiative.

### **Discussion**

We have detailed our process for tailoring a fall prevention bundle from evidence-based research findings and implemented those elements that were practical for our emergency department. Furthermore, we adapted our fall risk assessment through appraisal of research literature and select existing falls risk assessments as well as from chart review data into a screening that is more applicable to our practice setting.

Use of the interdisciplinary ED Fall Prevention Team in the design and delivery of the fall prevention bundle was instrumental in the success of this initiative. The peer-to-peer interaction between the ED Fall Prevention Team and staff was both educational and promoted buy-in through role modeling the new standard of care. Fall prevention screening and fall precaution application are now considered standard practice and part of the annual employee performance appraisal. Additional measures to maintain the culture of fall prevention created by this intervention include public recognition for staff excelling in fall prevention measures and dedicated fall prevention education for new hires.

### **Intervention Effectiveness and Recommendations for Quality Improvement Research**

Evaluation of the ED Fall Prevention Bundle is ongoing at our site and includes analysis of bundle metrics, such as the extent of fall risk screening, fall precaution application, and the rate and type of patient falls. Early results at the end of 6 months of evaluation were promising with 96% of ED arrivals screened in triage, 86% of at-risk patients with fall precautions applied, and a quarterly fall rate reduced to 0.27 falls per 1,000 visits with no fall-related injuries ( Supplementary Material ). Long-term outcomes are yet to be determined. The continued involvement of the ED Fall Prevention Team in matters related to patient safety and dissemination of individual and unit-wide performance measures maintains the fidelity of this intervention. Validation of the bundle through a rigorous single-site or initial multisite design is the next step in determining the impact of this quality improvement initiative.

The most immediate cost savings from improved fall prevention can be measured by the decreased diagnostics and procedures ordered after a fall.<sup>2,6</sup> In the 6 months before implementation, 19 different diagnostics tests (8 head computed tomographies [CTs], 3 C-spine CTs, 1 L-spine CT, 4 upper extremity radiographs, 1 pelvis radiograph, and 2 electrocardiograms) were ordered by providers after a fall. In the 6 months postimplementation, 3 postfall head CTs were ordered. Using the fair price value for these diagnostics, this represents a cost saving of \$6,840. A cost-savings projection is provided and can be individualized to other sites by applying local data (Table 3).

### **Limitations**

Use of a more integrative process to ascertain fall risk factors for inclusion, such as the Delphi method, would have been a more structured way to obtain group consensus on which items to include on our ED falls risk assessment tool.<sup>21</sup> We assessed content validity by utilizing the input of departmental and organizational nursing leadership, and a formal determination with content validity index should be made, along with establishing the sensitivity, specificity, and positive predictive value of the tool.<sup>22</sup>

### **Conclusion**

Fall prevention in the emergency department can be accomplished through a bundled approach that includes fall risk assessment and multifactorial interventions aimed to improve staff communication, promote safe ambulation and toileting, and provide early warning for unsafe actions. Involvement of bedside staff in the design and delivery of fall prevention measures is instrumental to successful implementation and creating a culture of safety. We provided our process to tailor a fall prevention bundle to our emergency department. Continued emphasis on fall prevention in the emergency department in research and clinical practice will help provide a safer health care environment.

### **Author disclosures**

Conflicts of interest: none to report.

### **Acknowledgments**

The authors would like to acknowledge Rush University Medical Center for support of this project as well as ED Fall Prevention Team members Lisa DAmico, Kevin Hsu, Brittany Kepler, Stacey Kratky, Nikolus Lima, and Kyle Wright along with Kevin Thomas, Coether Yusuf, Marites Gonzaga-Reardon, Emily Sermersheim, and Shirley Ambutas for their help with this quality improvement initiative.

Supplementary Material

Supplementary Material

Supplementary material related to this article can be found at <https://doi.org/10.1016/j.jen.2019.11.010>.

Tool/source	Level of evidence	Design	Fall risk factors	Tool metrics
Inpatient fall risk assessments				
Hendrich falls risk model II <sup>7</sup>	Level IV	Random enrollment of 355 cases and 780 controls were assessed intrinsic and extrinsic fall risk factors	Confusion/disorientation/impulsivity Symptomatic depression Altered elimination Dizziness/vertigo Gender Antiepileptic/benzodiazepine use Timed get-up-and-go score	Sensitivity: 75% Specificity: 74% Reliability: 0.98
Hester Davis scale (HDS) <sup>8</sup>	Level III	Prospective study of 1,904 patients on a neuroscience unit	Age Date of last known fall Mobility Mental status Medications Toileting needs Volume/electrolyte status Communication/sensory Behavior	Sensitivity: 90.0% Specificity: 47.1% Reliability: 0.90
Morse falls risk assessment tool <sup>9,10</sup>	Level IV	Retrospective review of 100 patients who fell compared with 100 randomly selected patients who had not fallen	History of falls Secondary diagnosis Use of ambulatory aid Intravenous therapy Altered mobility Overestimates own ability/forgets limitations	Sensitivity: 78%-83% Specificity: 29%-83% Reliability: 0.96

Schmid fall risk assessment <sup>11</sup>	Level IV	Retrospective review of 102 patients who fell was compared with 102 patients who did not fall	History of falls Altered mobility Altered mentation Frequency, diarrhea, or needs assistance with toileting Use of anticonvulsants/sedatives or psychotropics/hypnotics	Sensitivity: 95% Specificity: 66% Reliability: 0.88
STRATIFY falls prediction <sup>12,13</sup>	Level IV	Retrospective case-control study of 116 patient falls compared with control patients who had not fallen	History of falls Agitation Visually impaired Need of frequent toileting Impaired mobility/transfer ability	Sensitivity: 66% Specificity: 57% Reliability: n/a
ED fall risk tools				
KINDER1 fall risk assessment tool <sup>14,17</sup>	Level III	Adapted from unknown inpatient fall risk assessment implemented at single-site, evaluated over 1 year	History of falls Age Altered mentation Impaired mobility Nursing judgment	Sensitivity: 73% Specificity: n/a Reliability: n/a
Memorial ED fall risk assessment tool (MEDFRAT) <sup>15-17</sup>	Level III	Adapted from the Conley Fall Risk Assessment implemented at single-site, evaluated over 1 year	History of falls Confused or disoriented Intoxicated or sedated Impaired gait Mobility assisted device used Altered elimination	Sensitivity: 52% Specificity: n/a Reliability: 0.7

Category	Fall risk factor	Marked for inclusion
Fall history	Fallen within past 3 months <sup>+,†</sup>	Yes
Fallen today <sup>+,†,‡</sup>	Yes	Review of systems
Dizziness <sup>+,§</sup>	Yes	Weakness <sup>†</sup>
Yes	Medical history	Age >70 <sup>‡</sup>
No	Depression <sup>§</sup>	No

Neurological diagnosis (ie, seizure, CVA) <sup>†,§</sup>	Yes	Syncope <sup>§</sup>
No	Altered elimination <sup>*§</sup>	No
Mental status and behavior	Confused/disoriented <sup>*,†,‡,§</sup>	Yes
Intoxicated/illicit substances <sup>*,†,‡,§,¶</sup>	Yes	Sedated/sedating medications <sup>*,†,§,¶</sup>
Yes	Impulsive <sup>†</sup>	No
Ambulation	Use of assistive gait devices <sup>*,†,‡</sup>	Yes

		ED falls (%)	Cost estimates <sup>*</sup>
Diagnostic imaging and testing	Radiograph upper extremity	21.0 <sup>†</sup>	\$70-\$170
Radiograph hip/pelvis	2.7 <sup>‡</sup> -5.2 <sup>†</sup>	\$90-\$230	CT Brain (noncontrast)
5.5 <sup>‡</sup> -42.1 <sup>†</sup>	\$360-\$950	CT C-Spine (noncontrast)	15.7 <sup>†</sup>
\$440-\$1,150	CT L-spine (noncontrast)	5.2 <sup>†</sup>	\$450-\$1,200
EKG	2.8 <sup>‡</sup> -10.5 <sup>†</sup>	\$420-\$1,100	Procedures
Wound care	3.6 <sup>‡</sup> -16.8 <sup>§</sup>	Variable, depending on size and depth	Laceration repair

Month	ED fall risk screening		
Total ED visits	Total screened	Percent screened for fall risk (%)	January
6,853	6,096	89.0	February
5,883	5,510	93.7	March

6,460	6,165	95.4	April
6,154	5,882	95.6	May
6,245	6,005	96.2	June
5,873	5,664	96.4	July

ED fall precaution application data								
Month	Patients audited	Fall band	Cart in low position	Side rails up	Call bell in reach	Nonskid footwear	Sign on door	Fall precaution rate (%)
February	105	97	102	92	94	64	50	79
March	100	91	100	95	90	67	63	84
April	100	93	100	100	97	81	66	90
May	100	97	99	95	96	78	61	88
June	100	94	99	93	88	86	50	85
July	110	102	109	96	99	98	66	86

Quarter	Total visits	Number of falls	Fall rate	Number falls with injury	Falls with injury rate
Q1	18,459	9	0.49	3	0.16
Q2	18,191	10	0.55	1	0.05
Q3	19,196	9	0.47	0	0.00
Q4	18,272	5	0.27	0	0.00

## DETAILS

<b>Subject:</b>	Emergency medical care; Patient education; Intervention; Falls; Prevention programs; Clinical medicine; Risk factors; Communication; Patients; Risk assessment; Equipment; Chart reviews; Gait; Clinical outcomes; Prevention; Innovations; Health education; Interdisciplinary aspects; Nursing; Education; Inpatient care; Clinical assessment; Emergency services; Medical screening
<b>Business indexing term:</b>	Subject: Risk assessment
<b>Identifier / keyword:</b>	Fall risk screening; Fall prevention bundle; Emergency department; Patient safety
<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	2
<b>Pages:</b>	225-232.e3
<b>Publication year:</b>	2020
<b>Publication date:</b>	Mar 2020
<b>Section:</b>	Clinical Nurses Forum
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English
<b>Document type:</b>	Journal Article
<b>DOI:</b>	<a href="https://doi.org/10.1016/j.jen.2019.11.010">https://doi.org/10.1016/j.jen.2019.11.010</a>
<b>ProQuest document ID:</b>	2487205933
<b>Document URL:</b>	<a href="https://www.proquest.com/scholarly-journals/tailoring-comprehensive-bundled-intervention-ed/docview/2487205933/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/tailoring-comprehensive-bundled-intervention-ed/docview/2487205933/se-2?accountid=211160</a>

Copyright: ©2019. Emergency Nurses Association

Last updated: 2023-08-01

Database: Public Health Database

Document 5 of 55

# Customizing Physiologic Alarms in the Emergency Department: A Regression Discontinuity, Quality Improvement Study: JEN

[ProQuest document link](#)

## ABSTRACT (ENGLISH)

### Introduction

Clinical alarms promote patient safety by alerting clinicians when there is an indication or change in a condition requiring a response. An excessive volume of alarm fires, however, contributes to sensory overload and desensitization, referred to as alarm fatigue, which has significant implications when alarms are missed. This evidence-based, practice project aimed to implement and evaluate a program that reduces the number of clinically nonactionable, physiologic alarms in an emergency department. Although alarm fatigue is an important negative consequence, the focus of this project is not on alarm fatigue but on measures to reduce the volume of clinically nonactionable alarms that lead to alarm fatigue. The Iowa Model was used as a conceptual framework.

### Methods

This project involved adjusting default alarm settings and implementing an education plan on the safe use of alarms. The sample population included all patients on physiologic monitors at an emergency department. Retrospective data were collected, and regression discontinuity design was applied to compare the rate of alarm fires triggered by the physiologic monitor between pre- and postimplementation of an alarm protocol.

### Results

A significant change in the rate of alarm fires occurred with an estimated reduction of 14.96 ( $P = 0.003$ ). There were no reports of adverse outcomes such as a delay in responding to a change in patient condition or delay leading to cardiopulmonary arrest.

### Discussion

A reduction in nonactionable, physiologic alarms was attained after implementing multimodal strategies inclusive of adjusting default settings, staff education on managing alarms, and emphasis on staff accountability.

## FULL TEXT

### Contribution to Emergency Nursing Practice

- The purpose of this practice improvement project was to implement interventions that tailor monitor default settings for the emergency department and empower staff to customize alarm settings.
- This article contributes to reducing the rate of physiologic alarms, which we assumed were nonactionable alarms because of the nature of our intervention.



••Key implications for emergency nursing practice found in this article are the importance of customizing alarms on the basis of the unique needs of individual patients, educating staff on alarms, adjusting default settings, and integrating shared governance to reduce potentially nonactionable alarms.

## Introduction

The excessive number of physiologic alarms resulting in alarm fatigue and resulting patient safety concerns have gained national attention. The Joint Commission (TJC)<sup>1</sup> estimates that approximately 85% to 99% of alarms are nonactionable, meaning they do not require clinical intervention or actions by a clinician. Nonactionable and/or false alarms have been linked to a decrease in overall clinician response time.<sup>2</sup> Previous exposure of clinicians to repeated alarms that do not require attention leads to a psychological mechanism linked to delayed response time to subsequent alarms.<sup>2</sup>

Between March 1, 2010, and June 30, 2010, there were 33 alarm-related deaths attributed to physiologic monitors in the United States Food and Drug Administration Manufacturer and User Facility Device Experience database.<sup>3</sup> TJC<sup>1</sup> reported 98 alarm-related events in their Sentinel Event database between January 2009 and June 2012. Of these 98 events, 80 resulted in death, 13 in permanent loss of function, and 5 in additional length of stay or added care. Ninety-four of these events occurred in hospital areas such as telemetry, intensive care, general medicine, and the emergency department.<sup>1</sup> Subsequently, TJC<sup>4</sup> reported the following medical equipment-related sentinel events: 9 in 2014; 14 in 2015; 10 in 2016; and 9 in 2017. Reporting of sentinel events is voluntary and, therefore, likely underrepresents the proportion of actual events.<sup>1,4</sup> These sentinel events may be preventable harms that are inflicted, without intent, by clinicians who acclimate to an environment with perpetual alarm noise pollution. Consequently, in January 2014, clinical alarm safety became a national patient safety goal<sup>5</sup> and remained an annual goal.<sup>6-8</sup>

In 2015, the medical center for this project site purchased new monitors equipped with technology to extract data from the server. In January 2017, the first data analysis was completed for December 2016 and continued to be completed monthly. The emergency department had the highest volume of all physiologic alarms triggered from the bedside monitor for 13 of 15 months, among 18 reported units from December 2016 to February 2018; for the other 2 months, they were the second highest. Patients are at risk of adverse events when clinicians work in a caring environment polluted with noise from frequent, nonactionable alarms.<sup>3</sup> Therefore, addressing the safe use of alarms aligns with the medical center's goal 1: to keep patients safe.<sup>9</sup>

## Available Knowledge

Supplemental Figures 1-3 present details of the literature search methods and analysis of literature findings using Mosby's Level of Evidence.<sup>10,11</sup> Most previously published articles address alarms management in inpatient settings; only a few articles specifically address the emergency department. An integrative review<sup>12</sup> found that few alarms (5%-13%) require clinician response and emphasized the need to focus on reducing clinically irrelevant alarms to address alarm fatigue. Because of limited randomized controlled research studies on this topic, most evidence originates from single descriptive case studies, systematic reviews of descriptive studies or qualitative surveys, expert committee reports or the opinion of authorities, and other reviews of the literature.

The volume of nonactionable alarms in an already heavily distracted environment can result in the staff becoming desensitized to alarms. The emergency department is most vulnerable to alarm desensitization, given its unique and generally chaotic environment.<sup>13</sup> Furthermore, patients in the emergency department are thought to be monitored for a longer duration than clinically indicated in this setting, contributing to the additional volume of noise.<sup>13,14</sup>

Various approaches were identified in the current literature to address alarm overload (Table 1). A common recurring

strategy to reduce alarm fatigue is to empower staff to customize alarms according to the patient's condition, regardless of the type of patient-care setting,<sup>14-17</sup> so alarms become actionable<sup>17,18</sup> and clinically relevant.<sup>12</sup> Drew et al<sup>19</sup> described alarm overload and justified customizing alarms, as there were an average of 211 alarms per hour for an intensive care patient with atrial fibrillation and rapid ventricular response with a 6-day stay. For example, if a patient presents to the emergency department with atrial fibrillation and a rapid ventricular response of 140 beats per minute, the upper heart rate limit can be adjusted to 145 and returned to the baseline default once controlled with treatment. Otherwise, upper heart rate limit alarms will repeatedly sound, resulting in desensitization to alarm fires. These alarms are considered nonactionable as the clinician is already aware of the patient's condition. Subsequently, if the heart rate increases to 150 beats per minute, beyond the customized upper-high-limit threshold, the alarm becomes actionable and alerts the staff that the heart rate is increasing and the patient may not be responding to treatment.

Another strategy is to change preset default settings to fit the needs of the patient population.<sup>13,14,16,17</sup> An appropriate default setting for the intensive care unit (ICU) will differ from the emergency department owing to the differences in patient population needs and workflow. The emphasis in the emergency department is to prioritize, stabilize, and determine patient disposition in a short time frame. Therefore, priority alarms are those requiring immediate attention. Drew et al<sup>19</sup> completed an observational study involving 461 ICU patients and found that 88.8% of 12,671 alarms were false positive and 93% of 168 were true ventricular alarms that did not necessitate treatment. Modifications to the default settings were subsequently completed to minimize audible messages or alarms. Forming an Alarm Committee that includes frontline caregivers and makes evidence-based practice (EBP) decisions is another strategy to reduce nonactionable alarms.<sup>15,18</sup> A multidisciplinary team approach provides a method to analyze and address cardiac telemetry alarm fatigue.<sup>20</sup> Another endorsed strategy is reducing the number of patients who are on monitors by assessing the clinical indication for ongoing monitoring.<sup>13-15</sup> A final recommended strategy is to provide education about alarm devices,<sup>15</sup> specifically on how to adjust alarm parameters, alternatively referred to as customization.<sup>21</sup> Training on proper lead placement is likewise necessary<sup>21</sup> to avoid false alarms influenced by lead placement such as apnea in a patient who is breathing.<sup>14</sup> Education on skin preparation and daily replacement of fresh, gel-containing electrodes to obtain maximum accuracy in electric signal, is vital.<sup>15</sup>

### **Conceptual Framework**

A conceptual framework that focuses on the application of EBP is the Iowa Model,<sup>22</sup> as shown in [Figure 1](#). A key feature of this model is the use of existing organizational committees to facilitate EBP, which aligns with the current project. At the study setting, an existing, system-wide, multidisciplinary Alarms Management Committee chaired by the Advanced Practice Register Nurse (APRN) investigator provided project oversight. In addition, project activities were reported to the Critical Care Shared Governance Committees whose responsibilities were to review and approve practice recommendations before implementation.

The model follows an algorithm that starts with an assessment of triggers on the basis of clinical inquiries for seeking knowledge or evidence to reach conclusions. Such triggers have been categorized by Titler et al<sup>22</sup> as problem-focused or knowledge-focused triggers. The high volume of physiologic alarms at the emergency department represented an example of a problem-focused trigger. Our knowledge-focused trigger was identifying alarm management as a national patient safety goal<sup>5</sup> owing to documented, unsafe situations.

Another aspect of the Iowa Model includes the formation of a team. Input from nursing and medicine ED stakeholders is vital for decision making and to facilitate change by positively influencing others. In addition, the Iowa Model<sup>22</sup> describes piloting the change in practice. It was only feasible for us to implement the change in the entire unit.

## **Population, Intervention, Comparison, and Outcome**

The following Population, Intervention, Comparison, and Outcome questions were created to guide the practice change for this project. Among patients with physiologic monitors in the emergency department (P), will our unit intervention to customize physiologic monitor alarms and adjust default settings (I), compared with current practice (C), result in a reduction in the total number of physiologic monitor alarms (O)? Because of the nature of our intervention, our project team assumed that the reduction of overall alarms would represent a reduction in clinically nonactionable, physiologic alarms.

## **Specific Aims**

The purpose of this EBP project was to implement and evaluate a protocol to reduce the number of clinically nonactionable, physiologic alarms in the emergency department. The objective was to compare the rate of overall, physiologic monitor alarms from the baseline, hospital-wide, default setting used in the emergency department to a postintervention adjustment of default monitor settings specifically for the ED population. The aim was to test the rate of overall, physiologic monitor alarms before and after an intervention to educate nursing staff to customize physiologic monitor alarms.

## **Methods Project Design**

The project design was a single-unit, quality improvement intervention with preintervention and postintervention measurements that compared postintervention data with data of a historic control period, using weekly benchmarks as the unit of analysis. This project was granted exempt status by the medical center's institutional review board. The target patient population meeting inclusion criteria were all patients placed on a physiologic monitor regardless of diagnosis. The exclusion criterion was no monitoring in patients. The staff meeting inclusion criteria were all bedside nurses employed in the emergency department. The staff meeting exclusion criterion included all nonbedside nursing staff in the emergency department.

## **Context**

The emergency department was a 36-bed, level I, trauma-designated unit within a 505-bed, tertiary-care medical center located in Honolulu, Hawaii. The medical center is TJC accredited and is the only magnet facility in Hawaii, which is an institutional recognition of excellence from the American Nurses Credentialing Center. Approximately 104 nursing staff are employed in the emergency department, and there are roughly 180 patient encounters per day. The unit is led by a nurse manager and 2 operational managers. There is 1 charge nurse and a minimum of 2 physicians on duty.

## **Interventions**

The interventions for this quality improvement project included (1) changing physiologic monitor default settings from the hospital-wide preset to new ED-specific settings and (2) educating and empowering staff to customize alarms. All phases of the interventions and intervention planning were integrated with shared governance committees to include frontline emergency nurse representation. Our intervention was tailored to address meaningful and realistic strategies for the fast-paced and unpredictable workflow.

The project team consisted of a core group of bedside nurses, a clinical-ladder nurse stakeholder (a nurse with clinical bedside career advancement), emergency nursing and physician leaders, biomed staff, and the APRN investigator. This core group identified proposed changes, which required approval by the shared governance committee. The educational intervention implementation was led by the clinical-ladder nurse and reinforced by a group of super users. Super users are bedside nurses who have received more in-depth training on how to manage alarms.

Staff engagement was critical to the success and leveraged existing marketing strategies to maintain transparent

communication with staff through their ED Unit Council (UC). Baseline alarm data were shared with the UC members who evaluated the high-volume, problematic, recurring alarms. Recommendations from the literature, specifically on nonactionable alarms, were the focus of discussions. The ED UC was involved in decision making on all proposed default changes before obtaining final approval (<sup>Table 2</sup>).

<sup>Table 2</sup> summarizes the default settings that were changed in the emergency department. The ED UC identified that low-priority premature ventricular contraction (PVC) alarms were a major source of nonactionable alarms within the medical center and the emergency department. The ED UC's problem identification was similar to the findings of the study by Drew et al.<sup>19</sup> Therefore, several low-priority, nonactionable PVC alarms were targeted and turned off as a default alarm. Ventricular rhythms requiring a clinician's response would be triggered by the actionable, high-priority ventricular tachycardia alarm and/or PVCs per minute alarm that is defaulted at 10 per minute.

Persistent atrial fibrillation was the second-highest recurring alarm identified by Drew et al.<sup>19</sup> Therefore, irregular rhythm and atrial fibrillation were turned off as default alarms because actionable alarms would be triggered by the heart rate alarm. However, staff were taught to turn on the atrial fibrillation alarm for anyone presenting with sinus rhythm with transient ischemic attack or signs of a stroke.

ST segment settings for leads V and modified chest lead set at  $\pm 2$  mm were not changed for this project, but the default threshold for the limb leads was changed by  $\pm 1.0$  mm to  $\pm 2$  mm, and the staff were taught how to customize ST segment alarms according to patient condition. This decision was justified by the findings of our literature review. Majority of ST segment alarms (91%) were estimated to be nonactionable in a 16-bed ICU that averaged 200 ST alarms per day despite having a  $\pm 2$ -mm alarm threshold,<sup>19</sup> which reflected the importance of addressing ST segment alarms. Moreover, the pause threshold was changed from 2.0 to 2.5 seconds.

The next intervention stage for this quality improvement project was to educate and empower emergency nurses to customize monitor settings for each patient. Nurses at the medical center are empowered to customize alarms per policy. Quick reference tools were created by the clinical-ladder nurse and the APRN investigator to support staff in troubleshooting nonactionable alarms. The ED UC members provided feedback on all quick reference materials (<sup>Figures 2 and 3</sup>) developed for staff education before the clinical-ladder nurse stakeholder and super users commenced training. This document included how to troubleshoot repeated false apnea alarms by customizing the default apnea time and/or switching from the automatic to manual detection mode to adjust the detection line. The project team relied on the clinical-ladder staff-nurse stakeholder to implement education. The clinical-ladder staff-nurse stakeholder was selected by the project team that subjectively evaluated this individual and informal leaders of the unit. This stakeholder worked individually with the super users using a train-the-trainer model. Collectively, these individuals trained their peers during available downtime or real time as the opportunity arose during clinical care staff time. Staff members were asked to document that they had received the education content and acknowledge their role in the safe use of alarms. This staff accountability step was supported by the ED leadership. To assure sustainability and integration among new ED staff, the ED clinical educator created a process of incorporating the content as a core topic for training new-to-specialty nursing staff.

With regard to managing the number of alarms, we included a vital signs (VS) mode strategy. We educated the staff to evaluate patient criteria for monitoring and to use the VS mode instead of the arrhythmia-monitoring feature. The VS mode provides the capability for the monitor to obtain blood pressure, heart rate, and oxygen saturation values that, similar to arrhythmia monitoring, populates into the electronic medical record through device integration. We anticipated that using the VS mode to collect such information instead of placing the patient on the arrhythmia-monitoring feature would decrease the number of potential arrhythmia alarms.

Furthermore, to minimize false pulse oximetry readings, the ear clip sensor or a specialized sensor that minimizes

false alarms was made available to improve readings in patients with low-perfusion states. Alarm trends were posted in the emergency department to provide staff with ongoing feedback.

### **Measures**

We measured the daily rate of all physiologic alarm events (alternatively known as fires) in the emergency department. Alarms triggered by the physiologic monitor were defined according to priority. Red alarms were high-priority alarms, representing potentially life-threatening situations such as asystoles. Yellow alarms indicated low-priority alarms, such as missed beats. Inoperative alarms were technical alarms that indicated the monitor is unable to reliably detect alarm conditions. Raw alarm data were not identifiable by patient name or medical record number and were retrieved monthly from the server by biomedical staff. For this project, data consisted of the number of alarm fires for all 36 monitored ED beds for 28 days of each month. Twenty-eight days were selected to standardize the number of days per calendar month. The retrieved data were categorized by weeks and included the number of total alarm fires during the week and the number of average daily patient visits. The start of the baseline period was selected in relation to a house-wide-education self-learning module that was implemented in July 2017 and vendor education starting in November 2017. Therefore, the start of the baseline data collection period was 6 months before initial training or December 2016. Combined with the 6 months of postimplementation data, the study period was defined as December 2016 to March 2019.

The implementation period was delayed from the planned project timeline, as described in the limitations. After receiving input from all stakeholders, specific, default alarm settings to modify were identified and presented to the Critical Care Committee for approval on September 20, 2018. The default changes were completed by the biomedical staff on October 4, 2018, providing 6 months of postimplementation data by the end of the study period. Ongoing communication with the ED managers was maintained throughout the postimplementation period to ensure there were no adverse events reported related to physiologic monitoring. Lessons learned were evaluated through the existing UC shared governance structure. UC members have a communication tree with assigned peers that they use for dissemination and feedback of information.

### **Statistical Analyses**

Exploratory data analysis was performed by the Biostatistical Analyst investigator using descriptive statistics, including frequencies, means, and SDs. Default alarm setting changes were completed in October 2018. To assess changes in the number of alarm fires in the emergency department since the implementation of the default settings, a regression discontinuity design was applied to the weekly report of the number of alarm fires divided by the average monitor-patient encounters in the emergency department to account for the variability in patient encounters. The significance level was set at 0.05. All analyses were performed using the R version 3.6.0 (R Core Team, 2019).

### **Results**

During the study period from December 2016 to March 2019, the average rate of alarm fires was 174.93 (SD = 12.89). The average rate of alarm fires before the interventions began was 178.39 (SD = 11.55), whereas the average rate of alarm fires after the interventions were implemented was 161.54 (SD = 8.03) (Figure 4), which depicted the regression discontinuity analysis. There was a significant change in the rate of alarm fires after the completion of the interventions with the estimated effect of -14.96 in the rate of alarm fires ( $P = 0.001$ ). There was an upward trend in the rate of alarm fires postintervention; however, it was not significant ( $P = 0.106$ ). To date, as of 7 months postintervention, there were no patient safety reports related to physiologic alarms. A total of 82% of the nurses documented the completion of training.

### **Lessons Learned**

Staff continued to refer to the quick reference guides introduced during the education roll-out, which remain posted

in the department for easy access. Through their UC, ED staff nurses reported that they had identified more potentially serious and meaningful alarms requiring action since the elimination of nonactionable and nuisance alarms.

The importance of staff commitment and accountability, which become barriers if lacking, was emphasized in project implementation. Having a strong group of committed stakeholders was a substantial facilitator for the project. The collaboration and communication among all team members were critical to this project's success. Each team member contributed to this project by openly sharing their ideas from the perspective of their individual roles. Each discipline was well represented at each meeting, and all members collectively worked toward a common goal. The clinical-ladder staff stakeholder acted as a project champion by introducing and facilitating the intervention. The super users and train-the-trainer model became a barrier or challenge to take advantage of, at times, owing to the sustained, fast-paced setting in the emergency department.

## **Discussion**

Our project demonstrated a reduction in alarm fires following the implementation of a protocol to reduce the rate of physiologic alarms, which we assumed were clinically nonactionable because of the nature of our interventions. The reduction in alarm fires before the implementation of default changes and interventions reached significance and may be attributed to previous, isolated, education-only attempts in July 2017 and November 2017. Following staff education and completion of default changes and other interventions in October 2018, the reduction in alarm fires was substantial and significant. Although there was an upward, linear line postproject intervention, this change did not reach significance. ED staff maintained the improved reduction of nonactionable alarms that was observed following the implementation of interventions for 6 months. However, this does raise concerns that the intervention may not have sustainability over time without additional reinforcement or sustained re-education.

Education alone was not sufficient to sustain a practice change. Therefore, it was imperative to implement and hardwire other strategies from the literature, including systems and workflow practices. Customizing alarms to the needs of patients was a common, recurring theme mentioned in the literature to address nonactionable alarms. However, concerning the emergency department's uniquely different patient-care focus and workflow compared with inpatient units, it was essential to address default settings to reduce nonactionable alarms. Numerous references in the literature emphasized the relevance of modifying default settings so that alarms become more actionable according to the needs of the patient care setting.<sup>13,14,16,17,19</sup> Before this project, default settings at the medical center were standardized regardless of the unit's setting. Patients in the emergency department placed on monitors had identical, default alarm settings as those in the inpatient areas, resulting in alarms that may not necessitate a clinician's response given the uniquely different patient-care setting. Therefore, adjusting default settings in the emergency department was a high-priority intervention to reduce nonactionable alarms.

Staff, through the ED UC feedback structure, expressed that alarms were more clinically relevant. This concern was a reflection that staff members were being resensitized to alarms, an awareness that was lost as a result of the high volume of nuisance alarms before project implementation, which places patients at risk for harm when alarms are missed.

Creating a renewed culture was vital for project sustainability. Strategies to enhance sustainability included ongoing unit-based activities to support the goal of house-wide alarm reduction established by the Critical Care Nursing Committee. Monthly data and adverse patient outcomes related to alarms continued to be reviewed vigilantly by the UC and could lead to further adjustment of default parameters. Staff accountability and support continued to be emphasized via nursing leadership and super users.

The importance of approaching the problem of multiple nonactionable alarm fires using multimodal strategies and

through an interprofessional, collaborative manner, cannot be overemphasized. Having a respected ED clinical-ladder nurse representing the bedside nurses, along with physician and nursing leaderships, contributed to successfully creating a renewed standardized culture for the safe use of alarms by collectively incorporating several innovative practice changes. A particular strength of our project is its novel contribution to the literature through the application of regression discontinuity analysis.

### **Limitations**

A limitation of this EBP project was the short postintervention period despite an effort to adhere to a timeline. This time period was shorter than that planned as a natural disaster resulted in delayed approval from the Critical Care Committee for the default changes because the committee's meeting was cancelled. Additional analysis using a longer period of postintervention data is needed to confirm the sustainability of the intervention's impact.

There was no strategy to purposefully schedule at least 1 super user for each shift during and immediately following the implementation period. The outcome data, therefore, reflect total alarm fires for the month regardless of the presence or absence of a super user on duty. Finding the opportune time for super users to reinforce training among their peers is another limitation of this project design. The inability to assess the appropriateness of the practice change before adopting it to the entire unit was another limitation. Furthermore, this project was conducted at 1 specialty unit, and therefore, results may not be generalizable to other units.

Finally, this study was conducted using 1 physiologic monitoring system, which may have alarm features that differ from other systems. We measured the total number of physiologic alarms and assumed that a reduction in the total number meant that the nonactionable alarms were decreasing. Future study is warranted to directly measure nonactionable alarms.

### **Implications for Emergency Nurses**

Nurses working in fast-paced emergency departments are inundated with noise from multiple devices with alarms that contribute to distraction and alarm overload and fatigue. Such conditions may lead to a delayed or no response to alarms, placing patients at risk of an unsafe event. It is, therefore, imperative to implement strategies to control nonactionable, physiologic alarms so that alarms can become more meaningful and clinically relevant.

In addition to the customization of alarms, 2 key points for emergency nurses are to (1) assess for the appropriateness of physiologic monitoring for each patient and (2) review criteria for the discontinuation of monitors. Being proactive in such activities can influence the number of patients being placed on monitors and ultimately the total number of alarm fires, which could improve patient safety in emergency departments.

### **Conclusions**

This project demonstrated success in the reduction of total physiologic alarms specific to an ED setting. Our intervention was designed to reduce nonactionable, physiologic alarms, which is not covered extensively in the literature. In addition to the basic universal strategy of customizing alarms by nurses, the success of this EBP project was attributed to the concurrent implementation of other evidence-based, recommended interventions as mentioned in the literature. This intervention included staff education on troubleshooting alarms and the adjustment of default settings that align with the unique needs of the heavily distracted ED milieu. Other contributing factors to the success of this project were leadership support in emphasizing professional accountability and the involvement of bedside staff nurses through their UC.

### **Acknowledgments**

We thank the staff nurses, particularly Aaron Lau, BSN, RN, CEN, TCRN, CN IV, and the nursing and physician leadership team of the emergency department for their contribution and participation in this project. In addition, we thank Christopher Batacan for providing data analysis support.

### Author Disclosures

So Yung Choi was partially supported by the National Institutes of Health (no. U54MD007601, U54MD007584). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

### Author Disclosures

Conflicts of interest: none to report.

### Appendix

#### Supplementary Data

To access the supplementary material accompanying this article, visit the online version of the *Journal of Emergency Nursing* at [www.jenonline.org](http://www.jenonline.org).

Intervention	Description
Customize alarms	Adjust alarms according to patient's condition, so alarms are actionable
Default settings	Adjust unit default settings according to the needs of the patient population
Alarms committee	Have a multidisciplinary system-wide team to provide oversight and make evidence-based practice decisions
Criteria for monitoring	Monitor patients on the basis of clinical indications; discontinue when appropriate
Staff education	Provide staff education on alarm customization, troubleshooting, electrode placement, and skin preparation

Parameter	Original default	Changed to
Heart rate	60	50
Atrial fibrillation*	On	Off
Irregular rhythm	On	Off
ST alarms (mm)		
Leads I, II, III, aVR, aVL, and aVF	± 1.0	± 2.0
Leads V and MCL	± 2.0	No change



Pause (seconds)	2.0	2.5
PVC <sup>†</sup>		
Nonsustained	On	Off
Ventricular rhythm <sup>†</sup>	On	Off
Run PVCs	On	Off
R on T PVCs	On	Off
Ventricular bigeminy	On	Off
Ventricular trigeminy	On	Off

## DETAILS

**Subject:** Desensitization; Emergency medical care; Quality management; Patient safety; Fatigue; Discontinuity; Accountability; Cardiac arrhythmia; Intervention; Empowerment; Evidence-based nursing; Noise; Alarms; False alarms; Intensive care; Heart rate; Emergency services; Quality control; Quality improvement

**Business indexing term:** Subject: Quality control Quality improvement

**Location:** Iowa; United States--US

**Identifier / keyword:** Monitoring; Physiologic; Clinical alarms; Alarm fatigue; Emergency department; Emergency nursing

**Publication title:** Journal of Emergency Nursing;; JEN; Philadelphia

**Volume:** 46

**Issue:** 2

**Pages:** 188-198.e2

**Publication year:** 2020

**Publication date:** Mar 2020

**Section:** Practice Improvement

**Publisher:** Elsevier Limited

**Place of publication:** Philadelphia

Country of publication:	United Kingdom, Philadelphia
Publication subject:	Medical Sciences--Nurses And Nursing
ISSN:	00991767
e-ISSN:	15272966
Source type:	Scholarly Journal
Language of publication:	English
Document type:	Journal Article
DOI:	<a href="https://doi.org/10.1016/j.jen.2019.10.017">https://doi.org/10.1016/j.jen.2019.10.017</a>
ProQuest document ID:	2487205926
Document URL:	<a href="https://www.proquest.com/scholarly-journals/customizing-physiologic-alarms-emergency/docview/2487205926/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/customizing-physiologic-alarms-emergency/docview/2487205926/se-2?accountid=211160</a>
Copyright:	©2019. Emergency Nurses Association
Last updated:	2023-08-01
Database:	Public Health Database

Document 6 of 55

# Code Critical: Improving Care Delivery for Critically Ill Patients in the Emergency Department: JEN

[ProQuest document link](#)

## ABSTRACT (ENGLISH)

### Problem

Although certain critically ill patients in emergency departments—such as those experiencing trauma, stroke, and myocardial infarction—often receive care through coordinated team responses, resource allocation and care delivery can vary widely for other high-acuity patients. The absence of a well-defined response process for these patients may result in delays in care, suboptimal outcomes, and staff dissatisfaction. The purpose of this quality improvement project was to develop, implement, and evaluate an ED-specific alert team response for critically ill medical adult and pediatric patients not meeting criteria for other medical alerts.

### Methods

Lean (Lean Enterprise Institute, Boston, MA) principles and processes were used to develop, implement, and evaluate an ED-specific response team and process for critically ill medical patients. Approximately 300 emergency nurses, providers, technicians, unit secretaries/nursing assistants, and ancillary team members were trained on the

code critical process. Turnaround and throughput data was collected during the first 12 weeks of code critical activations (n = 153) and compared with historical controls (n = 168).

### **Results**

After implementing the code critical process, the door-to-provider time decreased by 62%, door to laboratory draw by 76%, door-to-diagnostic imaging by 46%, and door-to-admission by 19%. A year later, data comparison demonstrated sustained improvement in all measures.

### **Discussion**

Emergency nurses and providers see the value of coordinated team response in the delivery of patient care. Team responses to critical medical alerts can improve care delivery substantially and sustainably.

## **FULL TEXT**

### **Contribution to Emergency Nursing Practice**

- The current literature on care coordination and resource allocation for critically ill medical patients indicates that this area is in need of improvement.
- This article contributes recommendations for improved timeliness and communication during care of critically ill medical patients.
- Key implications for emergency nursing practice found in this article are that the ED-specific alert models used for trauma, stroke, and other disease processes can improve the efficiency of care delivery and resource utilization for other critically ill patients.

### **Introduction**

Emergency departments are in constant states of triage. The unrelenting influx of patients requires nurses and providers to assess and reassess frequently so that patients who cannot wait to be seen are prioritized. In 2015, 136.9 million ED visits occurred nationwide; 1.5 million of those visits resulted in critical care admission.<sup>1</sup> Although ED visit trends are on the rise and well documented, data regarding changes in acuity are sparse. California ED visits from 2002 to 2009 increased approximately 25%, and high-intensity visits increased 87%, despite an increase in the state's population of only 6%.<sup>2</sup>

Increases in patient volume and severity of illness, combined with the crowding and staffing issues many emergency departments experience, greatly increase the risk of medical errors and delays in care. Many hospitals have medical alert systems in place that enable a quickly activated multidisciplinary team to respond and stabilize patients experiencing a time-sensitive deterioration in health status. In addition to bringing care to the patient quickly, the establishment of team responses allows an organization to dedicate staff to such processes. Such efforts have been shown to improve delivery of care, including decreased door-to-computed tomography (CT) time for acute stroke, door-to-intervention time for ST-elevation myocardial infarction (STEMI), and improved outcomes for trauma patients.<sup>3-5</sup>

### **Problem**

Although stroke, STEMI, and trauma alerts were used frequently at our facility, ED staff expressed concern that critically ill patients not meeting existing team alert criteria were not afforded the same level of response or priority of care. Data analysis validated this concern. In the year before project implementation, existing team alerts, such as trauma, sepsis, stroke, and STEMI, represented 2.1% of total patient volume (1,688 alerts and 80,555 visits). However, high-acuity patients (Emergency Severity Index [ESI] 1 and 2) accounted for 18.7% (15,069 patients) of the total yearly patient volume. Retrospective chart review from the 3 months preceding implementation was performed on 168 patients who were critically ill upon ED arrival but did not fall into the other alert categories. The

review evaluated multiple criteria: care delivery location, door-to-medical screening examination, door to laboratory draw and result, door-to-diagnostic imaging (DI) order and completion, door-to-intubation, and door-to-admission order and transfer to inpatient bed. Comparison with similar data points on patients with activated medical alerts revealed some dramatic findings. For example, the door-to-DI order and result for stroke-alert patients' median times were 10 minutes and 32 minutes, respectively; the critically ill patient sample averaged 17 and 78 minutes. In addition, patients with STEMI and trauma alerts were roomed in resuscitation rooms 98% of the time, whereas only 29% of critically ill medical patients received care there.

### **Available Knowledge**

Our literature review, using search terms *critical alert*, *stroke alert*, *STEMI alert*, *trauma alert*, *medical alert*, *team response*, and *emergency department alert* resulted in 1 identified study that detailed an emergency response team for ED patients presenting with airway, breathing, circulation, or disability problems.<sup>6</sup> Although this study focused on intensive care unit (ICU) admissions and mortality rate, it sparked the idea that an ED-specific medical alert-response process could be created.

### **Purpose**

The purpose of this quality improvement project was to develop, implement, and evaluate an ED-specific alert team response for critically ill adult and pediatric medical patients not meeting criteria for other medical alerts.

### **Methods Context**

This practice improvement project occurred in a suburban 34-bed adult and pediatric emergency department experiencing 83,000 visits annually. The facility is a designated level II trauma center, a primary stroke center, and a STEMI-receiving center. Because it was part of a continuous improvement process, hospital policy allowed for the project to be exempt from Institutional Review Board approval.

### **Intervention**

A rapid cycle improvement project was planned using Lean (Lean Enterprise Institute, Boston, MA) methodologies; the goal of the Lean approach is to optimize flow and eliminate waste.<sup>7</sup> A *kaizen* workshop was deemed to be the most appropriate strategy for this project. A *kaizen* workshop is an expert-facilitated intense 5-day session during which key stakeholders (*kaizen* team) identify and implement significant process improvements for a specific problem. After testing the process, potential improvements are identified, and the process is standardized.<sup>7</sup> Our *kaizen* team was composed of emergency and critical care RNs, respiratory therapists, and nursing administration. High performing staff were recommended by their supervisors for participation in the project. Participant work schedules were adjusted to enable participation, and participants were compensated for their time. The *kaizen* team was charged with developing and implementing an improved process for the care of critically ill/high-risk patients with medical problems presenting to the emergency department. The term *code critical* was used to describe the health care team response. The *kaizen* team activities included reviewing data, flow charting existing care processes, observing ED flow, and designing the code critical experiment. Based on data analysis, the scope of the Lean *kaizen* was initially limited to patients with respiratory distress, unresponsiveness, or shock.

Team decisions included designated bedding, levels of alerts, patient criteria for the alert, composition of the response team, and evaluation metrics. It was determined that all patients meeting existing team response criteria (STEMI, stroke, sepsis), as well as the code critical patients, would receive care in the trauma/resuscitation bay. Two levels of alerts would be called: Code Critical Level 1 included conditions rated ESI 1, such as cardiac arrest, unprotected airway, or near drowning; Code Critical Level 2 included conditions more likely to be ESI level 2, such as respiratory distress and symptomatic arrhythmias. The response team would consist of immediately available ED staff including the technician, nurse, provider, and the phlebotomist and respiratory therapist assigned to emergency

department. Code Critical Level 1 response also included a “standby” notification to alert services such as pharmacy, DI, chaplain, and the rapid response team (RRT) that may be needed. The alerts would be called overhead in the emergency department and paged out by the operator to staff members not physically located in the emergency department.

Once the criteria and response were established, the team performed an experiment on the final day of the *kaizen*. One-on-one education was provided for staff members working that day, and they were then observed during a code critical alert. Although the alert appeared promising, this observation identified that additional work was necessary to create a sustainable alert.

### **Intervention Finalization Stage**

ED leadership reviewed the code critical criteria developed by the group and determined that the dual-level alert added complications and confusion, both with alert activation and desired team response. It was decided to have only 1 level of activation and a standard response team based on the most likely initial patient needs. <sup>Table 1</sup> lists the code critical alert team members. <sup>Table 2</sup> identifies the criteria for code critical activation.

Successful project implementation necessitated involvement of ancillary departments in the finalization of the code critical process. Collaborative meetings ensured that the alert and expected response was feasible and that staff education would occur before the established go-live date. Laboratory, respiratory therapy, and DI already had designated staff assigned to ED code response 24 hours a day; code critical was simply added to their list of alerts. ED technician work assignments already included code response. ED provider response was similar to response to other alerts and based on shift start time and provider availability. Using projected volume of medical and trauma alerts, the ED leadership team received approval for additional RN staffing, allowing a designated nurse on each shift to respond to medical alerts. This position was in addition to the assigned trauma nurse so that resources were not diverted from other areas. If multiple alerts were activated at the same time, additional resources would be obtained from wherever possible—ED floats, leadership, and inpatient ancillary services—and care delivery prioritized by level of patient need.

Team members receiving a page only, such as intravenous therapy, were expected to be aware of patient arrival and potential resource needs. If available, they could respond to the bedside and assess if services were needed. Otherwise, they would be contacted as needed. Chaplain services and social work notifications were unique, as these departments do not have 24-hour in-house coverage. Chaplain services preferred to receive the page around the clock as a “heads up,” so they might be called in for support. Social Work wished to be alerted, as well, for potential patient follow-up during working hours.

ED staff and physicians were educated to the new process through staff meetings, daily huddles, and 1-on-1 interactions. Alert activation, patient placement, and expected team roles were all discussed. During go-live, ED leadership was on site to support staff and encourage alert activation. Staff rounding was performed daily to determine effectiveness of alert activation and staff satisfaction with the process.

### **Study of the Intervention**

We used a single-site quality improvement intervention design, comparing postintervention patients with preintervention historical controls. Outcomes were measured for 1 calendar quarter before intervention, 1 calendar quarter postintervention, and a 1-month duration at 1-year postimplementation for follow-up.

### **Measures**

Evaluation metrics included care-delivery location, door-to-medical screening examination, door-to-laboratory draw and result, door-to-DI order and completion, door-to-intubation, and door-to-admission order and transfer to inpatient bed. Number of alerts per day were also tracked to justify continued staffing of the designated alert RN. Descriptive

statistics were used to analyze the results.

## Results

All code critical activations (n = 153) were tracked for the first 12 weeks of use. Room assignments and turnaround times were compared with patients who met similar criteria in the same quarter 1 year before implementation (n = 168). Significant improvements were made in all areas. Before implementation, only 29% of patients received care in the resuscitation bay; postimplementation, this was 92.8%. Door-to-medical screening examination time decreased 62%, from 13 to 5 minutes. Door-to-laboratory draw time dropped 76% from 29 to 7 minutes, and door-to-laboratory result time decreased 45%, from 51 to 28 minutes. Door-to-DI time decreased 59%, from 17 to 7 minutes; and door-to-imaging result time decreased 46%, from 78 to 42 minutes. Also important for ED throughput, admission order time and time to inpatient bed improved. Door-to-admission order entry decreased 9%, from 176 to 160 minutes. Before implementation, the median time-to-ICU bed for this group of patients was 313 minutes. In the first quarter postimplementation, this dropped 19% to 252 minutes. ED throughput is a multifaceted issue, but this substantial effect from 1 intervention was well appreciated.

As staff became more comfortable with the code critical criteria and realized the benefits of activation, average monthly activations rose from 45 to 80. Given the possibility of drift after implementation of a new process, data were collected for 10 months postimplementation to determine if improvements had been sustained. The <sup>Figure</sup> shows median times for care delivery, comparing pre-code critical implementation with the first-quarter postimplementation and the same categories 1 year later. Most improvements were sustained. Door-to-departure to admission bed times increased slightly to 271 minutes; however, that was still lower than the preintervention numbers. This was not unexpected, as data were evaluated during winter surge, when patient volumes and acuities were both higher. Although ED and hospital patient volume affected throughput times, code critical remained effective at getting resources to the bedside in a timely fashion.

## Discussion

Although there is little existing literature regarding alerts such as code critical, there is substantial evidence that team responses improve care delivery. Stroke-alert activation leads to decreased door-to-CT and door-to-thrombolysis times.<sup>3</sup> STEMI alert activation improves door-to-electrocardiogram and intervention time.<sup>4</sup> Although this project used different metrics to evaluate effectiveness, it reflected the same findings: that focused team responses improve the efficiency of care delivery. The outcomes observed were consistent with what was expected by the team, although the extent of improvement exceeded expectations. One opportunity cost anticipated by the ED leadership team was diversion of RN resources, as the trauma RN, float RN, or fast-track RN was initially expected to respond to code critical. Tracking data related to patient volume allowed the team to receive approval for additional positions to have a dedicated resource nurse for critical alerts who would float until needed.

Collaboration was essential to the success of this project. By involving key stakeholders in ancillary departments from the outset, the team was able to ensure that the resulting process and policy met the needs of all parties. This ownership also resulted in a go-live that required little administrative or bedside support. The success is also reflected in sustainability as demonstrated by the increased number of alerts called per month and maintenance of improved response times. Further studies are needed to determine if there is any impact on length of stay or mortality.

## Limitations

One limitation to this process is that chart review occurred retrospectively. There was opportunity for provider variation regarding alert activation; there may have been other cases where code critical activation could have been appropriate, but resources were not available to review the charts of all patients admitted to the ICU from the

emergency department. Our code critical process would also benefit from evaluation by additional emergency departments to identify feasibility in the face of varying conditions and resource allocation.

### **Implications for Emergency Nursing**

Process improvement is much more likely to be successful if clinical staff members are engaged in the process. ED staff can provide valuable insight and innovative solutions for streamlining patient care and improving efficiency. By engaging staff in the development process and allowing them to identify barriers to care delivery, ED leadership can ensure that the final product is one that staff supports and owns. Engaging ancillary team members increases that ownership and facilitates identifying additional issues that may have been missed. When developing new processes, it is important to use a structured approach. Barrier identification, care-delivery mapping, and resource-availability determination can allow teams to design processes more likely to be successful and sustainable. Using a rapid-cycle improvement design can provide timely feedback and adaptation, allowing optimization of the new process.

### **Conclusions**

As ED volumes and acuity increase, more innovative solutions will become necessary to deliver efficient, high-quality patient care. Although resource availability and staffing might vary among emergency departments, optimizing responses is possible in all. Early collaboration with ancillary departments and bedside staff can clarify the need. Applying the principles of medical alerts—such as stroke, STEMI, and trauma—to other patients requiring immediate intervention can improve turnaround times, expedite medical decision making, and decrease ED length of stay. This project resulted in significant and sustained improvements in all metrics, having a positive effect on patient care. Metric analysis can assist ED leadership in substantiating the business case for additional resources.

Engaging end users in process-improvement efforts can enhance both the likelihood of success as well as staff satisfaction with—and ownership of—the outcomes.

### **Acknowledgments**

The author would like to thank the ED staff at Sutter Roseville Medical Center for their dedication to their department and patients and their willingness to participate in experiments to improve both. Special thanks to Nathaniel Shye for his commitment to putting forth a quality intervention that would improve patient and staff experience.

### **Author Disclosures**

Conflicts of interest: none to report.

ED Provider
Laboratory
Respiratory therapist
Emergency nurse x 2
ED technician
Chaplain

X-ray technician
IV therapy (page only)
Social worker (page only)
Pharmacist (page only)
Nursing supervisor (page only)
Rapid response team RN (page only)

Code critical criteria include but are not limited to the following:•Cardiac arrest/postarrest return of spontaneous circulation•Acutely altered mental status/ Glasgow Coma Scale <13 or drop >2•Unstable vital signs•Shock presentationoSystolic blood pressure <80 mm Hg, mean arterial pressure <65 mm Hg, heart rate <50 or >130 (adult parameters)oActive profound bleeding, signs of poor perfusion (altered mental status, delayed capillary refill, weak pulses)•Unprotected airway•Severe respiratory distress/impending arrestoBradypnea or tachypnea (age dependent)oContinuous positive airway pressure en routeoIntubated en routeoOxygen saturation <90% with high-flow oxygenoSevere accessory muscle use/increased work of breathing•Drowning/near drowning•Symptomatic arrhythmia (supraventricular tachycardia, atrial fibrillation, bradycardia)•Severe allergic reaction•Active seizure

## DETAILS

<b>Subject:</b>	Laboratories; Workforce planning; Patients; Emergency medical care; Quality management; Stroke; Resource allocation; Sepsis; In care; Nursing administration; Data analysis; Nurses; Myocardial infarction; Teams; Quality of care; Medical screening; Departments; Technicians; Pediatrics; Critical care; Secretaries; Emergency services
<b>Business indexing term:</b>	Subject: Workforce planning
<b>Identifier / keyword:</b>	Emergency nurse manager; Critical care; Emergency nursing
<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	2
<b>Pages:</b>	199-204
<b>Publication year:</b>	2020



<b>Publication date:</b>	Mar 2020
<b>Section:</b>	Practice Improvement
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English
<b>Document type:</b>	Journal Article
<b>DOI:</b>	<a href="https://doi.org/10.1016/j.jen.2019.04.001">https://doi.org/10.1016/j.jen.2019.04.001</a>
<b>ProQuest document ID:</b>	2487205922
<b>Document URL:</b>	<a href="https://www.proquest.com/scholarly-journals/code-critical-improving-care-delivery-critically/docview/2487205922/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/code-critical-improving-care-delivery-critically/docview/2487205922/se-2?accountid=211160</a>
<b>Copyright:</b>	©2019. Emergency Nurses Association
<b>Last updated:</b>	2021-07-15
<b>Database:</b>	Public Health Database

Document 7 of 55

# Complexities of Identifying Posterior Cerebral Artery Cerebrovascular Stroke: JEN

[ProQuest document link](#)

## ABSTRACT (ENGLISH)

Delays in treatment are associated with long-term disability as well as substantial financial burdens.<sup>3</sup> On average, patients will incur \$21,500 in acute-care hospital bills alone.<sup>4</sup> The most recent estimate of financial burden from 2012 reports that the United States spends 34 billion dollars in indirect and direct costs related to care of patients

with stroke. According to the National Health Interview Survey, more than 73% to 90% of people were able to identify the most 5 common cardiovascular-related signs and symptoms and “would call 9-1-1 right away if someone was having a stroke.” According to the American Heart Association (AHA), best-practice stroke guidelines include having a stroke protocol in place for pre-hospital and hospital providers. Hospitals should have a goal of door-to-CT scan within 20 minutes and a door-to-needle time of less than 60 minutes if the patient is eligible for tissue plasminogen activator (t-PA) intravenous therapy (IV-tPA).<sup>13</sup> Care should be taken to obtain a blood glucose reading as well to ensure that hypoglycemia is not imitating a stroke.

## FULL TEXT

### Contribution to Emergency Nursing Practice

- The current literature on identification of posterior cerebrovascular arterial (PCA) strokes indicates that, because of their infrequent presentation, these strokes often are misdiagnosed.
- This article contributes a succinct presentation of a PCA stroke and key clinical manifestations for which the ED nurse should maintain a high suspicion of PCA stroke.
- Key implications for emergency nursing practice found in this article are the timely identification of PCA stroke-like symptoms to identify and treat these patients efficiently.

Posterior cerebral artery (PCA) strokes can result in devastating permanent disabilities for patients. Although the mortality rate from stroke dropped from the fourth to the fifth leading cause of death, especially for people above age 65,<sup>1</sup> 795,000 Americans will still experience a new or a recurrent stroke each year. The most recent statistics estimate that stroke will account for 130,000 deaths per year, and someone will die of a stroke every 4 minutes.<sup>1,2</sup> Regardless of the type of stroke—hemorrhagic or ischemic—the consequence of delay in treatment can lead to serious long-term disability as well as substantial financial costs associated with hospitalization and long-term rehabilitation.<sup>3</sup> Early identification and treatment are critical for these patients. Delays in treatment are associated with long-term disability as well as substantial financial burdens.<sup>3</sup> On average, patients will incur \$21,500 in acute-care hospital bills alone.<sup>4</sup> The most recent estimate of financial burden from 2012 reports that the United States spends 34 billion dollars in indirect and direct costs related to care of patients with stroke. Timely identification and initiation of therapeutic treatment is vital for reducing the financial burden but, more importantly, lessening the life-long debilitating health outcomes associated with stroke events.

Most strokes occur outside a hospital setting, making public awareness of stroke signs and symptoms paramount for early identification and intervention. According to the National Health Interview Survey, more than 73% to 90% of people were able to identify the most 5 common cardiovascular-related signs and symptoms and “would call 9-1-1 right away if someone was having a stroke.”<sup>5</sup> The 5 most common symptoms are sudden numbness on the face, leg, or arm; sudden confusion and difficulty speaking; sudden vision loss or vision impairment; sudden dizziness or loss of coordination; and sudden headache with no apparent cause.<sup>5</sup> These common signs and symptoms are helpful when used to identify a more common stroke involving anterior circulation. However, strokes that affect the posterior circulation may present with more subtle symptoms such as dizziness, nausea or vomiting, and sight disturbances. These symptom subtleties and commonalities with other disease processes add to the challenge in early identification of a posterior stroke.<sup>6-8</sup>

Identification of posterior circulation stroke (PCS) can be delayed when compared with the more common stroke involving the anterior circulation (ACS) because of the difference in clinical presentation. Only 12% to 25% of ischemic strokes affect the posterior cerebral circulation. The posterior cerebral circulation consists of vasculature

that supplies the brainstem (medulla, pons, and midbrain), the thalamus, the hippocampus, the cerebellum, and parts of the occipital and temporal lobes (including the visual cortex).<sup>7,9-12</sup> This case study will present and discuss a patient with atypical signs and symptoms of stroke who was later diagnosed with a PCS via a magnetic resonance imaging (MRI) scan.

### **Case Study**

A 63-year-old woman presented in the emergency department with a chief complaint of upper right quadrant abdominal pain. The patient had a past medical history of end stage renal disease (ESRD) secondary to unclear etiology, 2 renal transplants, type 2 diabetes mellitus (on insulin), and recurrent urinary tract infections. On initial assessment in the emergency department, the patient appeared pale and hypertensive with an initial blood pressure reading of 219/60 mm Hg. The patient was also complaining of pain at the surgical incision site of her recent kidney transplant several days before her ED presentation. She also complained of nausea and vomiting since her discharge from the hospital after transplant. The patient had 1 episode of vomiting while waiting in triage before she was assigned to a room in the emergency department. While in the emergency department, the patient had become increasingly drowsy and complained of not being able to see the nurse or gurney and requiring significant assistance from the wheelchair to the gurney. Further assessment and evaluation were conducted, including a blood glucose check, which registered at 275 mg/dL. The patient also began hallucinating objects that were not in the room. Additional assessment findings included no facial asymmetry, intact speech, and strong equal grip with equal foot flexion and extension. Within 30 minutes of being evaluated by an ED physician, the patient became increasingly unresponsive, with decreasing pulse oximetry of 89% to 90% on room air. Additional changes to the patient while in emergency department included speech impairment, decline in mental status, and deviated left gaze. No evidence of hemorrhage or infarction was noted in the head computed tomography (CT) scan while the patient was in the emergency department, which meant that a lumbar puncture (LP) could be performed to rule out meningitis. At the time of this patient's visit, MRI was not readily available for ED use.

Continued assessment and evaluation of the patient performed by the medical staff included an LP, which was negative for meningitis. The patient's blood pressure remained hypertensive but did improve with medication. She remained tachycardic with a heart rate between 110 and 120. Blood cultures were obtained and antibiotics administered prophylactically. A general overview of basic laboratory studies included a slightly elevated white blood cell count at  $12.2 \times 10^9/L$  and a hemoglobin and hematocrit within normal limits (WNL). The metabolic panel was WNL except for the elevated glucose at 287 mg/dL. Troponin was slightly elevated at 0.03 ng/mL. Urine analysis showed the following: yeast 2+, bacteria 1+, WBCs 10 (high power field [HPF]) and red blood cells 140 (HPF). The patient's ammonia level was slightly elevated at 52  $\mu\text{mol/L}$ . Arterial blood gas results demonstrated an uncompensated metabolic acidosis with a pH of 7.13, pCO<sub>2</sub> of 64, a pO<sub>2</sub> of 96, and a bicarbonate level of 21.1. The patient was admitted to the intensive care unit (ICU) after spending a little over 8 hours in the emergency department. During the patient's ICU stay, an MRI of the brain was obtained with results indicating "an acute infarct within the right occipital lobe," which would indicate a PCS.

The patient spent 17 days hospitalized as an inpatient and then was sent to an outpatient rehabilitation facility for approximately 2 weeks. The patient is now recovering at home, her visual loss is resolved, and her short-term memory is improving.

### **Literature Review**

Time is critical when it comes to treating patients with stroke and stroke-like symptoms. According to the American Heart Association (AHA), best-practice stroke guidelines include having a stroke protocol in place for pre-hospital and hospital providers. The time a patient presents at a hospital setting until the start time of the thrombolytic agent

is often referred to as door-to-needle-time. Hospitals should have a goal of door-to-CT scan within 20 minutes and a door-to-needle time of less than 60 minutes if the patient is eligible for tissue plasminogen activator (t-PA) intravenous therapy (IV-tPA).<sup>13</sup> Care should be taken to obtain a blood glucose reading as well to ensure that hypoglycemia is not imitating a stroke.

Patients who are presenting with symptoms of PCA ischemic stroke may fall outside the accepted door-to-needle time for administration t-PA. This may be attributed partially to the rarer clinical manifestations of PCS versus the signs and symptoms of more common ACS (Table). One emergency department found that, of the 252 patients treated with t-PA, there was a significant treatment time delay for those patients with PCS compared with ACS.<sup>11</sup> The time delay was specific to the minutes between when the ED physician evaluated the patient and the time the physician initiated a neurology consult. There was no treatment time difference between the 2 groups from the time the neurologist was consulted and the t-PA therapy was initiated.<sup>11</sup>

Another possible reason for the delay is that patients with PCS have atypical symptoms and a significantly lower National Institutes of Health and Stroke Scale (NIHSS) median score than patients with ACS.<sup>11</sup> The lower NIHSS score in patients with PCS may be because these patients sometimes indicate symptoms of nausea and vomiting, which are not captured effectively in the NIHSS. One study found a significant difference in NIHSS scores between ACS and PCS, with a mean score of 8.2 and 3.8, respectively.<sup>6</sup>

In addition, studies have shown that CT scans may be inadequate when it comes to detecting strokes of posterior circulation.<sup>14-16</sup> This study reported a sensitivity of 83% (181 of 217; 78% to 88%) for MRI compared with CT sensitivity of 26% (56 of 217) for the diagnosis of any acute ischemic stroke.<sup>17</sup> Other studies document similar results regarding the inefficiency of noncontrast-agent CT in the detection of strokes originating specifically in the posterior cerebral circulation.<sup>16-20</sup>

## Discussion

For the patient in this case study, the care provided did not meet all stroke-management recommendations, which was almost entirely due to the failure of staff to maintain a high index of suspicion for stroke. The patient spent more than 20 minutes in the waiting room, and, by the time she was assessed by an ED physician, she had significantly fallen out of the 20-minute door-to-imaging (CT or MRI) window. The patient's symptoms of nausea and vomiting, coupled with a current elevated blood pressure (219/60 mm Hg) should have alerted the triage nurse to maintain a high index of suspicion for PCS. Because MRI was not readily available for ED use at the time of this patient's treatment, that could have caused a delay in treatment. Future patients who may present similarly may benefit from advocating for an MRI even if the CT scan is negative for stroke.

## Conclusions

As demonstrated in the literature review and in the case study, improvements are needed to ensure that patients with PCS are identified promptly and receive thrombolytics if warranted. Besides the initial physical assessment by the evaluating health care provider, tools—such as the NIHSS and CT scan—are used to quantify the severity of the stroke as well as assessment by the neurologist. Although NIHSS is a reliable and well-validated stroke scale, the 15 items in the scale may favor the symptoms associated with strokes in the anterior circulation, making it more challenging for the evaluating physician to confer a proper diagnosis of stroke.<sup>21</sup> The NHISS may not be sensitive enough to capture the most common symptoms associated with PCS, which are ataxia, dizziness, nausea or vomiting, and sight impairment.<sup>6-8,10,15,22</sup> Although the NIHSS is the most widely used scale for patients suspected of having acute stroke events, and the preferred instrument by the American Stroke Association (ASA), patients with PCA tend to score lower on the NIHSS, possibly contributing to delay in therapeutic treatment.<sup>11,13,16,21,23,24</sup>

The current stroke guidelines published by the AHA and the ASA for the management and treatment of acute

ischemic stroke recommend either a noncontrast-agent CT scan of the brain or an MRI scan of the brain before administration of thrombolytic therapy.<sup>13,14</sup> Although a brain MRI scan may be more sensitive in detecting acute ischemic stroke, most hospitals continue to use noncontrast-agent CT scans for patients for whom stroke is suspected, as CT scan time is much shorter than an MRI scan time. However, 1 study found an MRI protocol that can provide detail image of the brain in 6 minutes.<sup>25</sup>

With the differences in clinical presentations, PCS is more likely to be misdiagnosed or delayed compared with ACS. Differences in clinical manifestations can erroneously influence the initial assessment and triage and can skew the confidence of the provider in the instrument used to quantify the presence, absence, or severity of the stroke. There are limitations to the diagnostic tools available as well, including that of a CT being more likely to miss the diagnosis of PCS. Although the prevalence of PCS is much less than anterior posterior circulation stroke, health care providers can do better to ensure that posterior circulation strokes are identified quicker by maintaining a high index of suspicion for patients who are reporting symptoms of PCS such as dizziness, visual changes, difficulty walking, nausea, and vomiting,<sup>6-8</sup> especially when these symptoms are accompanied with a history of hypertension or elevated blood pressure.<sup>1</sup> Revising existing tools and examining and implementing MRI protocols to better detect the elusive PCS may also aid in the earlier diagnosis and treatment of PCS.

## Supplementary Data

### Data Profile

Selected anterior circulation stroke symptoms	Selected posterior circulation stroke symptoms
Confusion	Nausea
Deficits in movement	Vomiting
Decreased auditory comprehension	Dizziness Trouble with vision

## DETAILS

<b>Subject:</b>	Vomiting; Patients; Emergency medical care; Hospitals; Nausea; Stroke; Transplants & implants; Intravenous therapy; Health care expenditures; Identification; Blood pressure; Magnetic resonance imaging; Hypertension; Glucose; Meningitis; Metabolism; Acute services; Disability
<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	2
<b>Pages:</b>	210-213

Publication year:	2020
Publication date:	Mar 2020
Section:	Case Review
Publisher:	Elsevier Limited
Place of publication:	Philadelphia
Country of publication:	United Kingdom, Philadelphia
Publication subject:	Medical Sciences--Nurses And Nursing
ISSN:	00991767
e-ISSN:	15272966
Source type:	Scholarly Journal
Language of publication:	English
Document type:	Journal Article
DOI:	<a href="https://doi.org/10.1016/j.jen.2019.02.001">https://doi.org/10.1016/j.jen.2019.02.001</a>
ProQuest document ID:	2487205913
Document URL:	<a href="https://www.proquest.com/scholarly-journals/complexities-identifying-posterior-cerebral/docview/2487205913/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/complexities-identifying-posterior-cerebral/docview/2487205913/se-2?accountid=211160</a>
Copyright:	©2019. Emergency Nurses Association
Last updated:	2021-02-16
Database:	Public Health Database

---

Document 8 of 55

# Advanced Practice Registered Nurses in the Emergency Care Setting: JEN

[ProQuest document link](#)

---

## ABSTRACT (ENGLISH)

APRNs have existed for more than 50 years and are established members of emergency care teams throughout the United States (US) and in many countries worldwide.<sup>2-6</sup> Nearly a decade ago, the Institute of Medicine identified APRNs as necessary for the future of health care delivery in the US.<sup>7,8</sup> Since then emergency departments (EDs) in the US and abroad have become increasingly overcrowded, in part due to their status as a health care safety net for those who cannot access a primary care provider.<sup>9,10</sup> It is estimated that EDs provide more than 47% of all hospital-associated health care in the US.<sup>9</sup> As a result, there is currently a substantial mismatch between the need for emergency services and the available resources to provide that care.<sup>10</sup> APRNs have been identified as particularly important for bridging this gap in both urban and rural settings.<sup>11-14</sup> The regulatory landscape for APRNs in the US continues to evolve, and APRNs who work in the emergency care setting face a few unique licensing and certification challenges. The Consensus Model's licensing paradigm could create barriers to APRN practice in the emergency care setting because it would require APRNs who treat the full population of the emergency care setting to complete three courses of graduate study and to obtain and maintain three certifications (eg, Family Nurse Practitioner, Adult-Gerontological Acute Care Nurse Practitioner, and Pediatric Acute Care Nurse Practitioner).<sup>1,17</sup> CNSs, for whom there are fewer courses of study than for NPs, would be required to have and maintain 2 licenses (Adult-Gerontology CNS and Pediatric CNS), but they would be restricted to either primary or acute care.<sup>18</sup> ENA Position The following are the positions of the Emergency Nurses Association (ENA): APRNs are established members of the emergency care team and are critical to the future of quality health care across the US and worldwide. Background The emergency care setting is unique when compared to most other practice settings in that its patient population consists of all ages and all combinations of medical history and chief complaint, rather than a narrow subset of them, as is the case with most other specialties (eg, pediatric oncology, adult cardiology, etc).<sup>19</sup> Although some APRNs only treat a subset of the patients in the emergency care setting, for example, only pediatric patients or only adults with urgent or chronic needs, other APRNs are called upon to treat all patients and conditions, from nonemergent, episodic chronic care to acute, complex, life-threatening traumatic and medical conditions.<sup>2,20-23</sup> APRNs are licensed and regulated by state law, and reciprocity across state lines is determined by each state. The Consensus Model's proposal that US states license APRNs as "primary care" or "acute care" APRNs, along with its stipulation that an APRN only be allowed to expand his or her scope of practice by completing another graduate program of study, stands in contrast to how APRNs are currently licensed and regulated today.<sup>24-29</sup> In nearly all states, APRNs are licensed at the role level, and the scope of practice is determined not only by formal education and national certification but by clinical experience as well.<sup>30</sup> Degree-granting programs are designed to prepare APRNs for entry-level competency, and postgraduate training after one's formal course of education confers clinical expertise.<sup>6,29,31-34</sup> It is, therefore, no surprise that APRNs who are currently providing safe and effective primary and acute care across the country are certified as family nurse practitioners (FNPs), acute care nurse practitioners (ACNPs), Adult NPs, Pediatric NPs, Adult-Gerontological NPs, Adult-Gerontological CNSs, and Pediatric CNSs, among others.<sup>15,21,35,36</sup> The Consensus Model has been a powerful force for raising the quality of APRN education and training in the US and has successfully championed full practice authority for APRNs in all states.<sup>15</sup> Regardless of the outcome of these and future discussions over whether and how to implement the Consensus Model's definitions of primary care, acute care, and scope of practice, APRNs will continue their long tradition of providing safe, effective care in the emergency care setting, and ENA will remain committed to interprofessional collaboration and advocacy on their behalf. Resources Advanced Practice Registered Nursing Consensus Work Group, The National Council of State Boards of Nursing APRN Advisory Committee.

## FULL TEXT

### Description

Advanced practice registered nurses (APRNs) are clinicians licensed as nurse practitioners (NPs), clinical nurse specialists (CNSs), certified registered nurse anesthetists (CRNAs), or certified nurse-midwives (CNMs).<sup>1</sup> All are educated and trained at the postgraduate level to diagnose, treat, and prescribe medications for complex medical conditions. Nearly all APRNs who practice in the emergency care setting, which includes both in-hospital and out-of-hospital environments, are NPs or CNSs. APRNs have existed for more than 50 years and are established members of emergency care teams throughout the United States (US) and in many countries worldwide.<sup>2-6</sup>

Nearly a decade ago, the Institute of Medicine identified APRNs as necessary for the future of health care delivery in the US.<sup>7,8</sup> Since then emergency departments (EDs) in the US and abroad have become increasingly overcrowded, in part due to their status as a health care safety net for those who cannot access a primary care provider.<sup>9,10</sup> It is estimated that EDs provide more than 47% of all hospital-associated health care in the US.<sup>9</sup> As a result, there is currently a substantial mismatch between the need for emergency services and the available resources to provide that care.<sup>10</sup> APRNs have been identified as particularly important for bridging this gap in both urban and rural settings.<sup>11-14</sup>

The regulatory landscape for APRNs in the US continues to evolve, and APRNs who work in the emergency care setting face a few unique licensing and certification challenges. First, all APRNs in the US are licensed at the state level, and their scope of practice differs from state to state. In many states, APRNs are restricted from practicing to the full extent of their education and training.<sup>15,16</sup> The Consensus Model for APRN Regulation is a proposed solution to this problem in the form of standardized education, certification, licensure, and accreditation of all APRNs and APRN programs in the US.<sup>1,7</sup> However, the Consensus Model has also proposed that states license APRNs in a way that enforces a scope of practice definition of “primary care” and “acute care” that is not currently practiced today. The emergency care setting is unlike nearly all other practice settings in that its patients are all ages with all combinations of medical history and chief complaint. The Consensus Model’s licensing paradigm could create barriers to APRN practice in the emergency care setting because it would require APRNs who treat the full population of the emergency care setting to complete three courses of graduate study and to obtain and maintain three certifications (eg, Family Nurse Practitioner, Adult-Gerontological Acute Care Nurse Practitioner, and Pediatric Acute Care Nurse Practitioner).<sup>1,17</sup> CNSs, for whom there are fewer courses of study than for NPs, would be required to have and maintain 2 licenses (Adult-Gerontology CNS and Pediatric CNS), but they would be restricted to either primary or acute care.<sup>18</sup>

### **ENA Position**

The following are the positions of the Emergency Nurses Association (ENA):

1. APRNs are established members of the emergency care team and are critical to the future of quality health care across the US and worldwide.
2. Advanced practice emergency nursing is a unique specialty that requires many of its practitioners to treat the episodic primary and acute care needs of all patient populations.
3. There is a need for a single population focus that will educate and license APRNs to treat the episodic acute care needs of patients across the lifespan within the framework of the Consensus Model.
4. ENA is a stakeholder in the Consensus Model for APRN Regulation and is committed to working collaboratively with others to ensure the future of APRNs in emergency care settings.
5. ENA, in collaboration with other key stakeholders, will continue to develop and update scopes of practice, standards of practice, and core competencies for APRNs practicing in the emergency care setting.
6. There is a need for more specialty education for APRNs as such, ENA can focus on efforts to provide educational offerings and serve as content experts for education programs that educate and train APRNs for roles in the emergency care setting.

### **Background**

The emergency care setting is unique when compared to most other practice settings in that its patient population consists of all ages and all combinations of medical history and chief complaint, rather than a narrow subset of them, as is the case with most other specialties (eg, pediatric oncology, adult cardiology, etc).<sup>19</sup> Although some APRNs



only treat a subset of the patients in the emergency care setting, for example, only pediatric patients or only adults with urgent or chronic needs, other APRNs are called upon to treat all patients and conditions, from nonemergent, episodic chronic care to acute, complex, life-threatening traumatic and medical conditions.<sup>2,20-23</sup>

APRNs are licensed and regulated by state law, and reciprocity across state lines is determined by each state.

There is no nationally standardized scope of practice, with the result that many states restrict APRNs from practicing to the full extent of their education and training. The Consensus Model for APRN Regulation has proposed to standardize the accreditation, education, certification, and licensure of APRNs and APRN programs throughout the US with the goal of achieving full practice authority for APRNs in all states. It has proposed that APRNs be certified in 1 of 4 roles (NP, CNS, CRNA, or CNM) and 1 of 6 population foci (family/individual across the lifespan, adult-gerontology, pediatrics, neonatal, women's health/gender-related, or psychiatric/mental health).<sup>1</sup> Under the Consensus Model, APRNs must (and may only) be licensed in a role and a population focus. Although they may also validate expertise by becoming certified in a specialty area (eg, as an emergency nurse practitioner), specialty certification cannot expand an APRN's scope of practice past that designated by the role and population focus.<sup>1</sup> Within the Consensus Model's framework, the family/individual-across-the-lifespan population focus would allow APRNs to treat patients of all ages, but their scope of practice would be restricted to primary care, defined as "...comprehensive, chronic, continuous care that is characterized by a long term relationship between the patient and primary care [NP]."<sup>17(p3)</sup> This "...includes continuous care for patients with stable acute and/or chronic conditions."<sup>17(p3)</sup> Acute care certification can be obtained only in the adult gerontology or pediatrics foci ("Acute care," as envisioned by the Consensus Model, is "...care that is characterized by rapidly changing clinical conditions"—that is, "...care for patients with unstable chronic, complex acute, and critical conditions.")<sup>17(p3)</sup> As a result, the Consensus Model requires an APRN treating the whole patient population of the emergency care setting to have and maintain 3 certifications (Family, Pediatric Acute Care, and Adult-Gerontological Acute Care). CNSs would be required to have and maintain 2 certifications (Adult and Pediatric), as there is no family population focus for CNSs,<sup>18</sup> and they would have to choose primary or acute care. An acute-care-across-the-lifespan population focus would go a long way toward solving this problem, and the Consensus Model contains within itself a pathway to creating a new population focus.

The Consensus Model's proposal that US states license APRNs as "primary care" or "acute care" APRNs, along with its stipulation that an APRN only be allowed to expand his or her scope of practice by completing another graduate program of study, stands in contrast to how APRNs are currently licensed and regulated today.<sup>24-29</sup> In nearly all states, APRNs are licensed at the role level, and the scope of practice is determined not only by formal education and national certification but by clinical experience as well.<sup>30</sup> Degree-granting programs are designed to prepare APRNs for entry-level competency, and postgraduate training after one's formal course of education confers clinical expertise.<sup>6,29,31-34</sup> It is, therefore, no surprise that APRNs who are currently providing safe and effective primary and acute care across the country are certified as family nurse practitioners (FNPs), acute care nurse practitioners (ACNPs), Adult NPs, Pediatric NPs, Adult-Gerontological NPs, Adult-Gerontological CNSs, and Pediatric CNSs, among others.<sup>15,21,35,36</sup>

The Consensus Model has been a powerful force for raising the quality of APRN education and training in the US and has successfully championed full practice authority for APRNs in all states.<sup>15</sup> Regardless of the outcome of these and future discussions over whether and how to implement the Consensus Model's definitions of primary care, acute care, and scope of practice, APRNs will continue their long tradition of providing safe, effective care in the emergency care setting, and ENA will remain committed to interprofessional collaboration and advocacy on their behalf.

## Resources

- Advanced Practice Registered Nursing Consensus Work Group, The National Council of State Boards of Nursing APRN Advisory Committee. Consensus Model for APRN regulation: licensure, accreditation, certification, & education. [https://www.ncsbn.org/Consensus\\_Model\\_Report.pdf](https://www.ncsbn.org/Consensus_Model_Report.pdf). Published July 2008. Accessed February 5, 2020.
- American Academy of Emergency Nurse Practitioners. Scope and standards for emergency nurse practitioner practice. [https://www.aaenp-natl.org/assets/docs/aaenp\\_scope\\_and\\_standards.pdf](https://www.aaenp-natl.org/assets/docs/aaenp_scope_and_standards.pdf). Published 2016. Accessed February 5, 2020.
- American Association of Critical-Care Nurses. AACN scope and standards of practice for acute care nurse practitioner practice. <https://www.aacn.org/nursing-excellence/standards/aacn-scope-and-standards-for-acute-care-nurse-practitioner-practice>. Accessed February 5, 2020.
- Emergency Nurses Association. Competencies for nurse practitioners in emergency care. [https://www.aaenp-natl.org/assets/docs/compsfornpinemergencycarefinal\\_ena.pdf](https://www.aaenp-natl.org/assets/docs/compsfornpinemergencycarefinal_ena.pdf). Published 2008. Accessed February 5, 2020.
- Emergency Nurses Association. Competencies for clinical nurse specialists in emergency care. [https://www.ena.org/docs/default-source/resource-library/practice-resources/other/competencies-for-clinical-nurse-specialists-in-emergency-care.pdf?sfvrsn=b2348c1c\\_4](https://www.ena.org/docs/default-source/resource-library/practice-resources/other/competencies-for-clinical-nurse-specialists-in-emergency-care.pdf?sfvrsn=b2348c1c_4). Published 2011. Accessed February 5, 2020.
- National Council of State Boards of Nursing. Find your nurse practice act. <https://www.ncsbn.org/npa.htm>. Accessed February 5, 2020.
- National Organization of Nurse Practitioner Faculties. Statement on acute care and primary care certified nurse practitioner practice 2012. [https://www.pncb.org/sites/default/files/2017-02/NONPF\\_AC\\_PC\\_Statement.pdf](https://www.pncb.org/sites/default/files/2017-02/NONPF_AC_PC_Statement.pdf). Published June 2012. Accessed February 5, 2020.
- National Organization of Nurse Practitioner Faculties. Population-focused nurse practitioner competencies. <https://cdn.ymaws.com/www.nonpf.org/resource/resmgr/Competencies/CompilationPopFocusComps2013.pdf>. Published 2013. Accessed February 5, 2020.
- National Organization of Nurse Practitioner Faculties. Adult-gerontology acute care and primary care NP competencies. [https://cdn.ymaws.com/www.nonpf.org/resource/resmgr/competencies/NP\\_Adult\\_Geri\\_competencies\\_4.pdf](https://cdn.ymaws.com/www.nonpf.org/resource/resmgr/competencies/NP_Adult_Geri_competencies_4.pdf). Published 2016. Accessed February 5, 2020.

## DETAILS

**Subject:** Emergency medical care; Standards; Licensure; Collaboration; Life threatening; Oncology; Cardiology; Medical conditions; Accreditation; Chronic illnesses; Hospitals; Health status; Nurse practitioners; Gerontology; Emergency services; Nursing; Primary care; Acute services; Pediatrics; Clinical nursing; Advanced practice nurses; Certification; Graduate studies; Patients; Scope of practice; Advocacy; Adults; Medical personnel; Interdisciplinary aspects; Nurse specialists; Clinical experience; Education; Nursing licensure

**Location:** United States--US

**Publication title:** Journal of Emergency Nursing;; JEN; Philadelphia

Volume:	46
Issue:	2
Pages:	205-209
Publication year:	2020
Publication date:	Mar 2020
Section:	ENA Position Statement
Publisher:	Elsevier Limited
Place of publication:	Philadelphia
Country of publication:	United Kingdom, Philadelphia
Publication subject:	Medical Sciences--Nurses And Nursing
ISSN:	00991767
e-ISSN:	15272966
Source type:	Scholarly Journal
Language of publication:	English
Document type:	Journal Article
DOI:	<a href="https://doi.org/10.1016/j.jen.2019.12.011">https://doi.org/10.1016/j.jen.2019.12.011</a>
ProQuest document ID:	2487205900
Document URL:	<a href="https://www.proquest.com/scholarly-journals/advanced-practice-registered-nurses-emergency/docview/2487205900/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/advanced-practice-registered-nurses-emergency/docview/2487205900/se-2?accountid=211160</a>
Copyright:	Copyright Elsevier Limited Mar 2020
Last updated:	2023-08-01
Database:	Public Health Database

Document 9 of 55

## Traffic Safety and Older Drivers: JEN

[ProQuest document link](https://www.proquest.com/scholarly-journals/advanced-practice-registered-nurses-emergency/docview/2487205900/se-2?accountid=211160)

## ABSTRACT (ENGLISH)

Older adults, defined as individuals aged 65 years and older, comprise the fastest-growing segment of the United States population, with a projected increase to 53 million by 2030.<sup>1</sup> As the older adult population continues to grow, the number of older drivers will increase.<sup>2</sup> It is anticipated that there will be an increase in fatalities and injuries from motor vehicle crashes (MVCs) among older drivers.<sup>3</sup> Currently, MVC is ranked as the second leading cause of injury-related death, after falls, among persons 65 years and older.<sup>4</sup> Common age-related changes that impact functional abilities, in addition to medical conditions and medications, can heighten an older driver's crash risk.<sup>3</sup> A decreased physiologic reserve to respond to injury increases the risk of morbidity and mortality in this population.<sup>3</sup> In addition, these normal age-related changes complicate the assessment of older patients with trauma.<sup>5</sup> Thus, caring for this special population is a clinical challenge for emergency nurses.<sup>5</sup> Age-Related Changes and Impact on Driving Safety Aging is associated with declining functional abilities and increased susceptibility to injury in traffic crashes.<sup>6,7</sup> Age-related changes in the human body, including the deterioration of sight and hearing and the onset of muscle, joint, and skeletal disorders,<sup>5</sup> contribute to an older person's propensity for crash involvement and injury.<sup>6</sup> Changes in strength and cognition, medical conditions and comorbidities, and medication effects, which are especially impairing for older drivers, contribute to the decline in some functional abilities and can interfere with the ability to perform driving tasks and navigate complex roadway situations.<sup>6,7</sup> Driving is a complex task involving visual, motor, and cognitive skills that may be affected by age-related changes, even with healthy aging.<sup>8</sup> These changes may become particularly evident in stressful or complex driving tasks, such as turning left, merging, or changing lanes.<sup>6</sup> However, with large individual differences in the onset and degree of functional impairments, it is a driver's performance rather than chronological age that determines fitness to drive.<sup>6</sup> Cognition and Reaction Times Although older minds can be just as sharp as younger ones, they do react more slowly; moreover, as a person gets older, his or her brain needs more time to process information.<sup>8,9</sup> Cognition is the mental function or process of acquiring knowledge and comprehension associated with thinking, understanding, remembering, judging, problem solving, and information processing.<sup>8</sup> Cognition involves sensory experiences and memories.<sup>8</sup> Furthermore, cognition is the ability to remember information, recognize and respond to traffic signs and pavement markings, or the ability to focus and make sound decisions quickly to avoid a crash.<sup>8</sup> Cognition does not act in isolation.<sup>9</sup> There is a constant interaction between the physiological system and cognitive performance.<sup>9</sup> Declines in physiological performance, such as processing of visual information, exacerbate the effects of aging on cognitive functioning.<sup>9</sup> Perceptually, an older driver may have difficulty seeing and determining the speed and distance of the traffic into which he or she needs to merge.<sup>9</sup> On the motor function level, older adults may have difficulty turning their necks, instead relying on the side and rearview mirrors to perceive the traffic around them.<sup>9</sup> Cognitively, because of declines in attention and working memory, they may have difficulty integrating all the information needed to make a decision on the appropriate time to merge into the traffic flow.<sup>9</sup> When they do respond, the response may be slower than that required by the situation. Visual Impairment With aging, a person experiences visual impairment, including reductions in visual acuity and contrast sensitivity, an increase in glare sensitivity, and reduced peripheral vision.<sup>8</sup> These age-related impairments are important for driving as 80% to 90% of traffic-relevant information is sensed through the eyes.<sup>8</sup> The most frequent error made by older drivers who are involved in crashes is inadequate surveillance.<sup>10</sup> Inadequate surveillance includes looking at but not fully perceiving another vehicle and failing to scan thoroughly at intersections, which could exacerbate problems with information gathering and processing.<sup>10</sup> Injuries Older adults are at a disadvantage compared with younger people when it comes to their ability to tolerate injury in MVCs.<sup>7</sup> Aging results in increased fragility and frailty.<sup>7</sup> Fragility refers to the ability to tolerate a physical insult (eg, the ability to tolerate crash forces).<sup>7</sup> Fragility increases beginning around middle age and continues to progress with age.<sup>6</sup> Frailty is the diminished ability to recover from injuries and resume the level of daily life activity once enjoyed before being injured.<sup>7</sup> Age-related fragility and frailty increase the likelihood that an older, crash-involved driver will sustain a fatal or serious injury.<sup>3</sup> The more fragile a person, the more severe the injury they will sustain, given similar physical crash conditions.<sup>11</sup> In addition, the more frail the driver, the higher the likelihood of death for a given injury.<sup>11</sup> Physiological changes associated with aging increase an older driver's susceptibility to injury and, specifically, predispose this population to chest injuries.<sup>12</sup> Older drivers are more

vulnerable to injury in a crash because skeletal structures are more easily injured, and the consequences of any physical insult are likely to be more serious compared with that in younger drivers in similar crash conditions.<sup>7</sup> This increased vulnerability is because the energy required to cause an injury decreases with age due to a loss of mass, strength, and flexibility.<sup>5</sup> A similar crash load from an airbag or steering wheel to the chest of a young male may result in a chest contusion or fracture, while it may cause a life-threatening aortic rupture if applied to an older adult.<sup>12</sup> Medical conditions, such as osteoporosis, reduce the tolerance of the musculoskeletal system to crash forces and increase the likelihood of sustaining an injury or a more severe injury as a result of MVCs.<sup>7</sup> A study exploring injuries in adults aged 65 years and older involved in MVCs found that this population experienced a high frequency of bony structure injuries, such as rib cage and sternal fractures, accompanied by increases in morbidity and mortality.<sup>12</sup> These findings may be because of age-related geometric changes occurring in the proportion of rib cage structures, such as the cortical bone and rib slope, which inevitably predispose older adult MVC victims to fractures.<sup>11</sup>

**Injury Prevention** The expected increase in the number of older drivers on the road is certain to lead to increased injuries and deaths unless emergency health care professionals successfully intervene to prevent harm and prepare for the unique care needs of older adults.<sup>13</sup> The main goal of traffic safety and injury prevention in the older adult population is to prevent MVCs and injury. Improvements in vehicle technology, such as side impact protection, lane departure warning, and seat belt design, are helping older drivers walk away from crashes that might have killed their parents or grandparents.<sup>3, 14</sup> Seat belt designs found in cars before 2006 were reported to cause rib and other injuries to older drivers.<sup>15</sup> By 2008, all new car models sold in the US were equipped with pretensioners and load limiters, developed with a deeper understanding of biomechanics and human tolerance limits, making seat belts safer and more effective in restricting an occupant's motion within the vehicle to minimize injurious contact with interior vehicle components and other occupants.<sup>15</sup> Seat belt pretensioners retract the seat belt to remove excess seat belt almost instantly on sensing that the vehicle has crashed.<sup>15</sup> When forces on the shoulder belt increase compared with the tension in the seat belt above a predetermined level, corresponding to a relatively low risk of injury, load limiters allow the belt to give in or yield while controlling the tension in the belt. Load limiters especially benefit older occupants who are more vulnerable to high belt loads.<sup>15</sup> A simple form of a load limiter is a fold sewn into the seat belt webbing. The stitching holding the fold is designed to pull apart when a certain amount of force is applied to the seat belt; as the stitches are ripped out, the webbing unfolds, allowing the occupant slightly greater forward motion.<sup>15</sup> Although 3-point seat belts are acknowledged to be highly successful countermeasures for reducing risks of death and injury, seat belt injuries are the primary source of chest injury among elderly occupants.<sup>12</sup> The effect of aging is more severe in seat belt loading than in blunt impact force.<sup>12</sup> Seat belt force is concentrated on the bone, rather than on the soft tissue.<sup>11</sup> As a person ages, the bone deteriorates more rapidly than soft tissue.<sup>11</sup> This change does not imply that seat belt use is harmful to older occupants; it just means that seat belts can be a relatively less effective restraint for older adults compared with that for younger occupants.<sup>11</sup> Side airbags with head and torso protections, as well as inflatable seat belts found in the rear seats in some vehicles, provide a better benefit to the older adult occupant.<sup>16</sup> An inflatable seat belt is a cylindrical bag that stretches from the buckle to approximately the shoulder of an occupant and is designed to provide additional protection to passengers

## FULL TEXT

Older adults, defined as individuals aged 65 years and older, comprise the fastest-growing segment of the United States population, with a projected increase to 53 million by 2030.<sup>1</sup> As the older adult population continues to grow, the number of older drivers will increase.<sup>2</sup> It is anticipated that there will be an increase in fatalities and injuries from motor vehicle crashes (MVCs) among older drivers.<sup>3</sup> Currently, MVC is ranked as the second leading cause of injury-related death, after falls, among persons 65 years and older.<sup>4</sup> Common age-related changes that impact functional abilities, in addition to medical conditions and medications, can heighten an older driver's crash risk.<sup>3</sup> A decreased physiologic reserve to respond to injury increases the risk of morbidity and mortality in this population.<sup>3</sup> In addition, these normal age-related changes complicate the assessment of older patients with trauma.<sup>5</sup> Thus, caring for this special population is a clinical challenge for emergency nurses.<sup>5</sup>

### Age-Related Changes and Impact on Driving Safety

Aging is associated with declining functional abilities and increased susceptibility to injury in traffic crashes.<sup>6,7</sup> Age-related changes in the human body, including the deterioration of sight and hearing and the onset of muscle, joint, and skeletal disorders,<sup>5</sup> contribute to an older person's propensity for crash involvement and injury.<sup>6</sup> Changes in strength and cognition, medical conditions and comorbidities, and medication effects, which are especially impairing for older drivers, contribute to the decline in some functional abilities and can interfere with the ability to perform driving tasks and navigate complex roadway situations.<sup>6,7</sup> Driving is a complex task involving visual, motor, and cognitive skills that may be affected by age-related changes, even with healthy aging.<sup>8</sup> These changes may become particularly evident in stressful or complex driving tasks, such as turning left, merging, or changing lanes.<sup>6</sup> However, with large individual differences in the onset and degree of functional impairments, it is a driver's performance rather than chronological age that determines fitness to drive.<sup>6</sup>

### **Cognition and Reaction Times**

Although older minds can be just as sharp as younger ones, they do react more slowly; moreover, as a person gets older, his or her brain needs more time to process information.<sup>8,9</sup> Cognition is the mental function or process of acquiring knowledge and comprehension associated with thinking, understanding, remembering, judging, problem solving, and information processing.<sup>8</sup> Cognition involves sensory experiences and memories.<sup>8</sup> Furthermore, cognition is the ability to remember information, recognize and respond to traffic signs and pavement markings, or the ability to focus and make sound decisions quickly to avoid a crash.<sup>8</sup> Cognition does not act in isolation.<sup>9</sup> There is a constant interaction between the physiological system and cognitive performance.<sup>9</sup> Declines in physiological performance, such as processing of visual information, exacerbate the effects of aging on cognitive functioning.<sup>9</sup> Perceptually, an older driver may have difficulty seeing and determining the speed and distance of the traffic into which he or she needs to merge.<sup>9</sup> On the motor function level, older adults may have difficulty turning their necks, instead relying on the side and rearview mirrors to perceive the traffic around them.<sup>9</sup> Cognitively, because of declines in attention and working memory, they may have difficulty integrating all the information needed to make a decision on the appropriate time to merge into the traffic flow.<sup>9</sup> When they do respond, the response may be slower than that required by the situation.

### **Visual Impairment**

With aging, a person experiences visual impairment, including reductions in visual acuity and contrast sensitivity, an increase in glare sensitivity, and reduced peripheral vision.<sup>8</sup> These age-related impairments are important for driving as 80% to 90% of traffic-relevant information is sensed through the eyes.<sup>8</sup> The most frequent error made by older drivers who are involved in crashes is inadequate surveillance.<sup>10</sup> Inadequate surveillance includes looking at but not fully perceiving another vehicle and failing to scan thoroughly at intersections, which could exacerbate problems with information gathering and processing.<sup>10</sup>

### **Injuries**

Older adults are at a disadvantage compared with younger people when it comes to their ability to tolerate injury in MVCs.<sup>7</sup> Aging results in increased fragility and frailty.<sup>7</sup> Fragility refers to the ability to tolerate a physical insult (eg, the ability to tolerate crash forces).<sup>7</sup> Fragility increases beginning around middle age and continues to progress with age.<sup>6</sup> Frailty is the diminished ability to recover from injuries and resume the level of daily life activity once enjoyed before being injured.<sup>7</sup> Age-related fragility and frailty increase the likelihood that an older, crash-involved driver will sustain a fatal or serious injury.<sup>3</sup> The more fragile a person, the more severe the injury they will sustain, given similar physical crash conditions.<sup>11</sup> In addition, the more frail the driver, the higher the likelihood of death for a given injury.<sup>11</sup> Physiological changes associated with aging increase an older driver's susceptibility to injury and, specifically, predispose this population to chest injuries.<sup>12</sup> Older drivers are more vulnerable to injury in a crash because skeletal structures are more easily injured, and the consequences of any physical insult are likely to be more serious compared with that in younger drivers in similar crash conditions.<sup>7</sup> This increased vulnerability is because the energy required to cause an injury decreases with age due to a loss of mass, strength, and flexibility.<sup>5</sup> A similar crash load from an airbag or steering wheel to the chest of a young male may result in a chest contusion or fracture, while it may cause a life-threatening aortic rupture if applied to an older adult.<sup>12</sup>

Medical conditions, such as osteoporosis, reduce the tolerance of the musculoskeletal system to crash forces and increase the likelihood of sustaining an injury or a more severe injury as a result of MVCs.<sup>7</sup> A study exploring injuries in adults aged 65 years and older involved in MVCs found that this population experienced a high frequency of bony structure injuries, such as rib cage and sternal fractures, accompanied by increases in morbidity and mortality.<sup>12</sup> These findings may be because of age-related geometric changes occurring in the proportion of rib cage structures, such as the cortical bone and rib slope, which inevitably predispose older adult MVC victims to fractures.<sup>11</sup>

### **Injury Prevention**

The expected increase in the number of older drivers on the road is certain to lead to increased injuries and deaths unless emergency health care professionals successfully intervene to prevent harm and prepare for the unique care needs of older adults.<sup>13</sup> The main goal of traffic safety and injury prevention in the older adult population is to prevent MVCs and injury. Improvements in vehicle technology, such as side impact protection, lane departure warning, and seat belt design, are helping older drivers walk away from crashes that might have killed their parents or grandparents.<sup>3,14</sup> Seat belt designs found in cars before 2006 were reported to cause rib and other injuries to older drivers.<sup>15</sup> By 2008, all new car models sold in the US were equipped with pretensioners and load limiters, developed with a deeper understanding of biomechanics and human tolerance limits, making seat belts safer and more effective in restricting an occupant's motion within the vehicle to minimize injurious contact with interior vehicle components and other occupants.<sup>15</sup>

Seat belt pretensioners retract the seat belt to remove excess seat belt almost instantly on sensing that the vehicle has crashed.<sup>15</sup> When forces on the shoulder belt increase compared with the tension in the seat belt above a predetermined level, corresponding to a relatively low risk of injury, load limiters allow the belt to give in or yield while controlling the tension in the belt. This action is typically done by spooling the belt out of the retractor in a controlled manner, maintaining a constant restraining force as it absorbs energy.<sup>15</sup> This action avoids concentrating too much force on the occupant's chest. Load limiters especially benefit older occupants who are more vulnerable to high belt loads.<sup>15</sup> A simple form of a load limiter is a fold sewn into the seat belt webbing. The stitching holding the fold is designed to pull apart when a certain amount of force is applied to the seat belt; as the stitches are ripped out, the webbing unfolds, allowing the occupant slightly greater forward motion.<sup>15</sup>

Although 3-point seat belts are acknowledged to be highly successful countermeasures for reducing risks of death and injury, seat belt injuries are the primary source of chest injury among elderly occupants.<sup>12</sup> The effect of aging is more severe in seat belt loading than in blunt impact force.<sup>12</sup> Seat belt force is concentrated on the bone, rather than on the soft tissue.<sup>11</sup> As a person ages, the bone deteriorates more rapidly than soft tissue.<sup>11</sup> This change does not imply that seat belt use is harmful to older occupants; it just means that seat belts can be a relatively less effective restraint for older adults compared with that for younger occupants.<sup>11</sup> Side airbags with head and torso protections, as well as inflatable seat belts found in the rear seats in some vehicles, provide a better benefit to the older adult occupant.<sup>16</sup> An inflatable seat belt is a cylindrical bag that stretches from the buckle to approximately the shoulder of an occupant and is designed to provide additional protection to passengers seated in the rear seats of certain vehicle models.<sup>17</sup> In a crash, it can cover 5 times the area of a regular seat belt, spreading crash forces over a wider area of the chest and lessening head excursion.<sup>17</sup>

Improvements in the health of older adults, partly due to an emphasis on preventive medicine<sup>5</sup> and physical conditioning, are helping reduce their risk of MVCs and allowing older adults to fare better when they experience crashes.<sup>3</sup> In addition, older adults are benefiting from the new vehicle crashworthiness, enhanced and timely emergency medical services, excellent trauma care, and better access to health care.<sup>3,5</sup> It is of utmost importance to keep older drivers mobile and safe.<sup>5</sup> Being able to drive helps older adults maintain their mobility and independence and thus maintain their cognitive and mental health.<sup>9</sup> Injury prevention education can be essential in preventing MVCs among older adults.<sup>18</sup> The Centers for Disease Control and Prevention has specified recommendations for how older adults can stay safe on roads; these include reviewing their medications with their physicians or pharmacists for side effects and interactions that can inhibit driving abilities to reduce the risk of car crashes.<sup>19</sup>

### **Implications for Emergency Nurses**

Aging is inevitable. Older adults face a number of challenges associated with natural aging, including sensory, perceptual, cognitive, and motor declines that may impact driving. Because of the increase in the elderly population, older drivers represent a substantial proportion of American drivers.<sup>1</sup> However, with preventive medicine and improved health care, older adults are now living longer than earlier generations.<sup>5</sup> Although the outlook for older adults is improved, the fact remains that motor vehicle injuries are the fourth leading cause of injury-related ED visits among older drivers and a reason for the increase of geriatric patients seen in emergency departments and trauma bays.<sup>20,21</sup> The fragility and frailty that accompany aging are major threats when it comes to surviving crashes and are leading contributors to older drivers' fatality rates.<sup>22</sup> This susceptibility to serious injuries can be substantial from even relatively minor mechanisms of injury or trauma.<sup>5</sup> Emergency nurses must understand that preexisting conditions and concomitant diagnoses may minimize the presentation of an injury.<sup>5</sup>

Detection of injuries in older adults involved in MVCs is likely to continue to be a challenge for emergency nurses. The mechanism of injury and vital signs can be misleading triage tools in older adult trauma patients.<sup>5</sup> Physiological changes and comorbidities may increase the severity of injuries, incidence of complications, and mortality rate in this population.<sup>5</sup> The use of medications, such as anticoagulants, may quickly raise the severity of an injury.<sup>5</sup> In addition, older adults may be undertriaged in the field. Underestimation of injury severity by both emergency medical services and emergency nurses could increase the morbidity and mortality among older adults. Injured older adults who may initially appear stable can rapidly decompensate after arriving in the emergency department.

Appropriate triage, early recognition of injury, and early aggressive management of all injured older adults can improve patient outcomes.<sup>5</sup> Older adults who experience MVCs may not be appropriately assessed because instruments, such as the injury severity score (ISS), and some triage protocols have not been modified to capture the higher physiologic consequences to trauma in this population.<sup>23-25</sup> ISS is an anatomical scoring system that provides an overall score for patients with multiple injuries.<sup>26</sup> An abbreviated injury scale score is allocated to 1 of 6 body regions, and the score of the 3 most severely injured regions is squared and added to obtain an ISS score.<sup>26</sup> Triage protocols that rely heavily on physiologic data, such as ISS, may not accurately identify the presence or severity of injuries in elderly victims of MVCs. To avoid missing severe trauma in the older injured adult, a low ISS may need to be used.<sup>5,23</sup> A high index of suspicion for missed, delayed presentation, or occult injury when assessing patients could be beneficial as there could be more to the problem than what the patient initially presented with to the emergency department.<sup>23</sup>

The emergency department plays a critical role in treating acute medical problems in older adults, and injury visits are an important subset of this care. The care of geriatric patients will continue to be a special consideration for emergency nurses.<sup>23</sup> Emergency nurses need to be aware of the unique vulnerabilities seen in the geriatric population, especially related to trauma.<sup>5</sup> Recognizing the interaction between comorbid conditions, physiologic changes associated with aging, medications, and the most common patterns of traumatic injuries will prepare emergency nurses to anticipate and recognize trauma in geriatric victims of MVCs and improve their outcomes.<sup>5,27</sup>

## DETAILS

**Subject:** Load; Physiology; Cognitive functioning; Population; Aging; Seat belts; Problem solving; Contusions; Cognition; Traffic; Injuries; Information gathering; Biomechanics; Age differences; Older people; Cognitive ability; Human body; Cognition & reasoning; Visual impairment; Fatalities; Flexibility; Ability; Frailty; Drugs; Death & dying; Bones; Age; Prevention; Decision making; Automobile safety; Individual differences; Activities of daily living; Fractures; Design; Automobile driving; Surveillance; Technology; Adults; Airbags; Emergency medical care; Emergency services; Clinical decision making; Auditory processing

**Location:** United States--US



<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	2
<b>Pages:</b>	235-238
<b>Publication year:</b>	2020
<b>Publication date:</b>	Mar 2020
<b>Section:</b>	Injury Prevention
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English
<b>Document type:</b>	Journal Article
<b>DOI:</b>	<a href="https://doi.org/10.1016/j.jen.2019.12.010">https://doi.org/10.1016/j.jen.2019.12.010</a>
<b>ProQuest document ID:</b>	2487205894
<b>Document URL:</b>	<a href="https://www.proquest.com/scholarly-journals/traffic-safety-older-drivers/docview/2487205894/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/traffic-safety-older-drivers/docview/2487205894/se-2?accountid=211160</a>
<b>Copyright:</b>	©2019. Emergency Nurses Association
<b>Last updated:</b>	2022-10-20
<b>Database:</b>	Public Health Database

Document 10 of 55

## Table of Contents: JEN

## FULL TEXT

\_TVM:UNDEFINED\_

## DETAILS

<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	2
<b>First page:</b>	A1
<b>Publication year:</b>	2020
<b>Publication date:</b>	Mar 2020
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English
<b>Document type:</b>	Table Of Contents
<b>DOI:</b>	<a href="https://doi.org/10.1016/S0099-1767(20)30014-3">https://doi.org/10.1016/S0099-1767(20)30014-3</a>
<b>ProQuest document ID:</b>	2487205865
<b>Document URL:</b>	<a href="https://www.proquest.com/scholarly-journals/table-contents/docview/2487205865/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/table-contents/docview/2487205865/se-2?accountid=211160</a>
<b>Copyright:</b>	Copyright Elsevier Limited Mar 2020
<b>Last updated:</b>	2023-05-23

# Emergency Nursing Review Questions: March 2020: JEN

[ProQuest document link](#)

## ABSTRACT (ENGLISH)

The parents state that the baby was doing well at home until experiencing 45-second episodes of lethargy during 2 breast-feeding attempts over the last 4 hours. Correct answer: B Shingles is an acute localized infection caused by the varicella zoster virus. A patient may also have significant coronary artery disease (B) but would not be diagnosed with only the presence of an S4 heart sound.

## FULL TEXT

These review questions are based on the Emergency Nursing Core Curriculum and other pertinent resources to emergency nursing practice. They offer emergency nurses an opportunity to test their knowledge about their practice.

### Questions

1. A patient, 32-weeks pregnant, arrives at the emergency department after a motor vehicle crash. She complains of cramping abdominal pain and dizziness, and her vital signs are within normal limits. Along with fetal monitoring, which of the following tests would be immediately indicated during her assessment?

- A.Kleihauer-Betke test
- B.Internal cardiotocography
- C.Pulmonary function test
- D.Urinary protein assay

2. A patient presents with a rash on the lower back with small vesicular-type lesions in a linear pattern and localized on one side of the back. The patient is tender over the lumbar dermatome region. The patient works as a home health aide with a team specializing in oncology. On discharge, which of the following statements would indicate that the patient understands the care of the rash?

- A.The doctor told me that the rash was not contagious, and I could not transmit it to others.
- B.I am not to work until the blisters are scabbed and crusted over.
- C.There is no medication to help, only cool compresses and over-the-counter lotion.
- D.I should expect to experience chicken pox within the next few weeks.

3. During an initial assessment of an older adult patient, a distinctive atrial gallop or S4 heart sound is heard. You would suspect:

- A.no significant pathology because an S4 sound is normal in the aging process.
- B.significant coronary artery disease.
- C.congestive heart failure.
- D.mitral valve prolapse.

4. A 4-day-old infant, delivered without complications at full term, arrives at the emergency department. The parents state that the baby was doing well at home until experiencing 45-second episodes of lethargy during 2 breast-feeding attempts over the last 4 hours. Your assessment reveals a well-appearing infant, resting quietly. Airway, breathing, circulation, and vital signs are all within normal limits. The infant cries when undressed. What is the most appropriate initial intervention?

- A.Complete blood count with differential
- B.Blood glucose
- C.Urinalysis
- D.Blood culture

#### Answers

##### 1. Correct answer: A

The Kleihauer-Betke test is indicated (A) to detect fetal blood within maternal circulation or transplacental hemorrhage. This blood test should be done on any trauma patient who is pregnant regardless of Rh compatibility. Cardiotocography (B) or fetal monitoring would be indicated but not placement of an internal electrode in a nonlaboring, intact membrane patient in the emergency department. A pulmonary function test (C) would not be indicated with the presenting trauma. A urine protein assay (D) would be useful for evaluation of toxemia with pregnancy.<sup>1</sup>

##### 2. Correct answer: B

Shingles is an acute localized infection caused by the varicella zoster virus. The presenting symptoms would be highly suspicious for shingles. The vesicle fluid would be considered contagious until the lesions are crusted over, and the patient should not work until the blisters are scabbed (B). The vesicle fluid is considered contagious (A), although transmission is considered low. Various medications including antivirals and pain medications can be used (C), especially during the early phases of the virus. There is no association with chicken pox outbreak following shingles (D).<sup>2</sup>

##### 3. Correct answer: C

An atrial gallop or S4 heart sound is an abnormal heart sound resulting from a noncompliant left ventricle, usually caused by fluid overload or diagnostic heart failure (C). An S4 is an abnormal heart sound (A) and is indicative of fluid overload or an incompetent left ventricle. A patient may also have significant coronary artery disease (B) but would not be diagnosed with only the presence of an S4 heart sound. A patient would exhibit a heart murmur if they had significant mitral valve prolapse (D).<sup>3</sup>

##### 4. Correct answer: B

Blood glucose (B) would be indicated initially. The mental status of a newborn is often difficult to accurately assess. When a baby is born, they are neurologically immature. Newborns are prone to hypoglycemia if they are not feeding well, or their metabolic demand is increased owing to illness. Hypoglycemia can manifest in a variety of symptoms including apnea, hypothermia, jitteriness, high-pitched cry, loss of tone, and seizures (usually atypical owing to their immature brain). A complete blood count with differential (A), urinalysis (C), and blood culture (D) are all important components of a septic workup in a newborn, but the glucose would be indicated initially.<sup>4</sup>

## DETAILS

<b>Subject:</b>	Chicken pox; Emergency medical care; Blood tests; Breastfeeding &lactation; Infants; Vital signs; Coronary vessels; Heart failure; Cardiovascular disease; Glucose; Hypoglycemia; Lethargy; Fetal monitoring; Core curriculum; Mitral valve prolapse; Nursing; Shingles; Urinalysis; Babies; Emergency services; Coronary artery disease
<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	2
<b>Pages:</b>	233-234
<b>Publication year:</b>	2020
<b>Publication date:</b>	Mar 2020
<b>Section:</b>	Emergency Nursing Review Questions
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English
<b>Document type:</b>	Journal Article
<b>DOI:</b>	<a href="https://doi.org/10.1016/j.jen.2020.01.001">https://doi.org/10.1016/j.jen.2020.01.001</a>
<b>ProQuest document ID:</b>	2487205854

**Document URL:** <https://www.proquest.com/scholarly-journals/emergency-nursing-review-questions-march-2020/docview/2487205854/se-2?accountid=211160>

**Copyright:** ©2020. Emergency Nurses Association

**Last updated:** 2023-08-31

**Database:** Public Health Database

---

Document 12 of 55

# One Stop: Examining the Reasons Patients Use the Emergency Department for Nonurgent Care and the Barriers They Face: JEN

[ProQuest document link](#)

---

## ABSTRACT (ENGLISH)

### Introduction

Despite the plethora of research on the use of emergency department services for nonurgent primary health care, the vast majority of this research is quantitative in nature. To date, there is little research that reports on the problem from the patients' perspective and/or lived experience, which compromises health care providers' understanding of the essence of the problem as described by the patients. Thus, this study will provide a qualitative description of nonurgent ED visits from the patients' perspective. Specifically, this study answers the following research questions: 1) What are the reasons for patients and/or caregivers visiting the emergency department for nonurgent health conditions? and 2) What are the barriers experienced by patients and/or caregivers when seeking access to health care?

### Methods

A qualitative descriptive design with face-to-face interviews of 33 consenting participants was conducted at 4 emergency departments. All interviewed participants were triaged as nonurgent patients by the ED personnel.

### Results

Three themes surfaced from the data regarding reasons for using the emergency department: 1) Practitioner referral; 2) Efficacy of care; and 3) Time saver. When describing barriers that participants experienced when seeking care outside of the emergency department for their nonurgent conditions, 3 themes that emerged are lack of primary care provider, financial difficulties, and lack of comprehensive care outside the emergency department.

### Discussion

The results of the study can help inform patient-centered care and future policy initiatives that will address the practices and barriers contributing to nonurgent ED visits.

## FULL TEXT

### Contribution to Emergency Nursing Practice

••The current literature on ED use indicates that a substantial proportion of ED visits are for nonurgent health care.

- The main finding of this research is that multiple patient- and system-related factors/barriers contribute to nonurgent ED use.
- Key implications for emergency nursing practice found in this article are the need for better understanding of the problem, advocacy for patient-centered innovative solutions, and future research investigating strategies for decreasing the numbers of ED visits for nonurgent care.

## Introduction

The use of ED services in the province of Ontario has been steadily increasing with nearly 5.5 million visits in 2014/2015 and an increase of 14.4% since 2008/2009.<sup>1</sup> Of the 5.5 million documented ED visits, just over 30% were for low-acuity conditions, which translated into 1.78 million potentially avoidable ED visits in 2014/2015.<sup>1</sup> These statistics are consistent with American and worldwide studies that have reported that between one third<sup>2-4</sup> and one half<sup>5,6</sup> of all ED visits are nonurgent. This is disconcerting because high acuity, life-threatening events require immediate attention, and frequent use of emergency departments for nonurgent medical conditions compromises the efficiency of the emergency departments in providing emergency care.<sup>7</sup> In addition, ED crowding can result in long wait times, treatment delays, diversion of ambulances to other hospitals, poor health outcomes, and increased risk of death.<sup>8-10</sup> Another concern is the financial impact of ED use for nonurgent health care which has been reported as being significant.<sup>11</sup>

A number of studies have reported on the demographics of patients who are triaged as nonurgent ED users. The most recent Canadian study evaluating demographic factors associated with nonurgent visits to the emergency department reported that patients triaged as nonurgent were mostly middle-aged and unemployed.<sup>12</sup> In more recent United States studies, Behr and Diaz<sup>13</sup> reported increased frequency of ED visits among the nonemployed and part-time employees. McCormack et al,<sup>6</sup> reported that females were nearly 41% more likely to visit the emergency department for nonurgent reasons than their male counterparts. They also reported that all age groups were more likely to visit the emergency department than those aged 50-65 years and that urban patients were more likely to visit the emergency department for nonurgent reasons than rural patients.<sup>6</sup> McHale et al,<sup>14</sup> however found that males were slightly more likely to attend than females. Several studies<sup>7,14</sup> found that low urgency visitors to the emergency department most often occurred during business hours when most primary care clinics were open.

While gaining a better understanding of the predictors of ED use for nonurgent visits from a quantitative perspective is critical, understanding the patient's perspective of why they visit the emergency department for nonurgent conditions is equally important for a comprehensive understanding of these factors (ie, triangulation of quantitative and qualitative literature). However, there is scarcity in qualitative research pertaining to the understanding of this phenomenon.<sup>15,16</sup> This manuscript provides qualitative descriptive insights from patients and their families/caregivers regarding the issues of nonurgent ED visits in southwestern Ontario. Specifically, this manuscript focused on participant responses to the following 2 questions: 1) What are the reasons for patients and/or caregivers visiting the emergency department for nonurgent health conditions? and 2) What are the barriers experienced by patients and/or caregivers when seeking access to health care for their health conditions?

## Methods Research Design

A qualitative descriptive design,<sup>17,18</sup> guided by the consolidated criteria for reporting qualitative research,<sup>19</sup> was completed on a sample of 33 participants (ie, 30 patients and 3 caregivers). This design included face-to-face interviews to elicit qualitative information about the participants while they were utilizing the emergency department. Upon written informed consent, participants took part in semi-structured, face-to-face audio-recorded interviews. Participants were asked, "Please share using your own words, what brought you to the emergency department

today?” and “What are the reasons you came to the emergency department for health care?” In addition, participants responded to the question, “What are some of the barriers or challenges you experience when seeking health care outside from the emergency department?” Additional questions included, “What else would you like to share about your health care experience today?” and “Please tell me more...” Eight interviews were conducted at 3 of the 4 emergency departments, and 1 emergency department had 9 participants interviewed. The numbers of interviews completed at the emergency departments were discussed in advance with the research team, by all 4 of the hospital administrations based on time and room space availability, and interview numbers were consistent for all 4 emergency departments. All of the emergency departments were located in our local health district in southwestern Ontario, serving a population of urban and rural communities (1 urban hospital, 2 farming community hospitals, and 1 rural hospital). Institutional research ethics approval was obtained from the respective university and hospital Research Ethics Boards.

### **Data Collection**

Data collection took place during peak times of ED visits (eg, daytime, weekday hours, when primary care offices were open). Using purposive sampling,<sup>20,21</sup> the interviewer invited all eligible patients triaged by the emergency nurse as nonurgent, to participate in the study. Patients were eligible to participate if they spoke and understood the English language, as the interviewer only spoke English and the triage nurse also spoke English. The interviews and written consents were written in English, as the most recent 2011 census data collected for southern Ontario indicated that 98.8% of the population most often spoke English at home.<sup>22</sup> Inclusion criteria were participants of 18 years or older, patients under the age of 18 if they had a caregiver (parent or legal guardian) present with them, and triage by an emergency room nurse as nonurgent. The authors interviewed 2 different caregivers who were parents of minor children. One of these children had both parents present and were therefore simultaneously interviewed as one unit. All nonurgent ED patients who met the above criteria were approached. Three individuals declined participation in the study because they needed to return to work after their lunch hour. Written informed consents were completed by participants prior to the commencement of an interview that lasted approximately 45 minutes. Participants were informed both verbally and in the written consent form that participation was voluntary. If participants chose to stop the interview or only answer some of the interview questions asked of them, their current ED care and subsequent ED care would not be affected. Participants knew that if they chose to stop the interview before the end of the interview, they would still receive a coffee gift card for their time.

The face-to-face semi-structured interviews took place in a private room adjacent to the emergency department. Interviews were conducted after participants were seen by a triage nurse and occurred either while the patient waited to be seen by an emergency room physician and/or nurse practitioner or after being seen and prior to their discharge from the emergency department. The interviews were completed by one of the researchers during the daytime hours of 8:00 am to 5:30 pm. Interviews were conducted over a 4-day period; one day in each emergency department until saturation of data was achieved. Interviews were digitally recorded, with patient knowledge and consent. Each participant was given a \$15 gift card at the end of the interview in appreciation for their participation. Interviews continued until saturation of data was achieved. Participants gave detailed rich descriptions<sup>17,23</sup> (ie, detailed contextual account of experiences) during each interview. The interviews were transcribed by a skilled transcriptionist, and once the transcripts had been reviewed for accuracy, and thematic analysis completed, the digital recordings of the interviews were deleted.

### **Data Analysis**

Data were analyzed by hand and grouped for patterns in meaning and overall themes.<sup>17,18,23</sup> Three research team members reviewed the transcriptions independently for coding similarities and met together several times each week



to discuss patterns and themes from the data. Overall themes were grouped together according to meaningful patterns and several themes emerged that were common among patients.<sup>23</sup> Coding discrepancies were discussed among team members for consensus. The transcribed interviews and other observational field notes were triangulated and coded according to their patterns of similarity, relationships to each other, and relationships to the study.

Trustworthiness maintains research rigor, establishing the quality of research findings. Peer review by research team members, triangulation of data, and member checks (during the normal course of the observation and interviews)<sup>24</sup> examined patterns of meaning among participants and provided credibility.<sup>24</sup> Rich description from the interviews showed transferability and wider applicability of the findings to other contexts. Details provided in the data collection strategies, analysis, and audit trail were part of dependability. Peer debriefing with all team meetings reduced bias potential and added confirmability to the study findings.<sup>24</sup>

### **Results Sample Characteristics**

Thirty-three adults participated (12 men and 21 women) and their ages ranged between 19 and 72 years, (M = 40.3 years; SD = 17.3). Among the 21 women, 2 were caregivers who brought their children to the emergency department for nonurgent visits. One of these women was accompanied by her husband.

### **Reasons for Using the Emergency Department to Receive Nonurgent Health Care**

In describing the participants' *reasons for using the emergency department to receive nonurgent health care*, 3 themes surfaced and were grouped together according to patterns in meaning: 1) Practitioner referral, 2) Efficacy of care, and 3) Time saver.

#### **Practitioner Referral**

Twelve participants described how they had called their primary care provider (PCP) for an appointment but were instead referred to the emergency department for care. One participant with a wrist injury called her physician's office to get an appointment. "To speed the process along, he [the physician] directed me to go to the Emerg [emergency department]..." (P-4). Four of the 12 participants said that they had tried to seek care at their physician's office but after a quick assessment, they were sent directly to the emergency department for additional assessments. One participant stated that she asked the triage nurse if her family physician had called ahead to let the emergency triage nurse know that she was being sent by the physician for additional assessment and the participant was told no (P-31). Another participant described waiting to see their PCP only to be directed to the emergency department, "so we went to the doctor's at 1 PM, we were told to come back at 3:30 PM and we waited until 4 and we were told [by the PCP] we couldn't be seen today, and we needed to go to the emergency" (P-16).

#### **Efficacy of Care**

Almost half (16 of 33) of the participants referred to the efficacy of the emergency department. One participant said, "I went to a walk-in clinic and I didn't quite get everything I needed...I got worried and scared, so that's why I came to the hospital" (P-1). Another participant stated, "...everything is here [in the emergency department], the x-ray is here, the blood work is here, the everything is here, the casts, so you don't gotta go to 3 different spots to get this done, and that done, and this done, that's what makes it way more convenient" (P-29). Another participant said that "sometimes you walk out of the clinic and you still don't know what's wrong, and sometimes after the walk-in clinic visit, we end up having to come in here [to the emergency department], so maybe we could have come here first" (P-23). One participant stated, "But the antibiotics aren't working, and my husband said, 'go to the clinic,' but I said, I don't think the clinic can do for me what the hospital can..." She continued, "...I thought it was easier just to come here [to the emergency department]. And they're here [specialists]" (P-5).

#### **Time Saver**

Twenty-six (79%) of participants described needing to wait several days or weeks for an appointment to see their PCP and so going to the emergency department saved time. "If I call my doctor, I have to wait a week to even get in to go see him, and I might have to wait here 2-3 hours [in the emergency department], but it's still better than waiting a week" (P-13). Twelve participants said they were at the emergency department to receive their tests all in one day, as it was more efficient and convenient to receive health care in this way, "I just killed two birds with one stone by coming to the emerg [emergency department]...I would have had to go back and forth, back and forth" (P-25). Another participant stated, "they dealt with the problem instead of having to, you know, book an appointment and having to come back, like in 3 or 4 days. They try to do it that day and get it over with, so you don't have to keep coming back" (P-13). A patient's father said, "I know a nurse in this emergency department so I called ahead to see what the wait was like before bringing him [his son] in [to the emergency department]" (P-10). Another said, "I came here knowing it was quicker, knowing I would get this checked today as opposed to making an appointment" (P-14). Ten participants reported using the emergency department because they "want to get looked at right away" (P-32). Four other participants voluntarily shared they would drive an additional 30 minutes to receive care if it meant faster care once they arrived at that emergency department.

### **Barriers they Have Experienced When Trying to Obtain Health Care**

Participants described at length their reasons for seeking *one stop* health care and the barriers they experienced when seeking care outside of the emergency department for their nonurgent conditions; and 3 themes emerged from these descriptions: 1) Lack of PCP; 2) Financial difficulties; and 3) Lack of comprehensive care outside the emergency department.

#### **Lack of PCP**

Statements by 7 of the 33 participants identified that lack of a PCP was a barrier to obtaining health care outside of the emergency department. These participants explained that they visited the emergency department because they had a "bandage that fell off" and needed to be replaced, a "pain in both legs," "stomach cramps, but no vomiting," "coughing and sneezing," and "pain in their back for five days." They explained that without a family doctor, when they needed health care they would "go from hospital to hospital" (P-27). One participant explained the reason he presented to the emergency department was because "I don't have a family doctor but I want one" (P-30). Two college students required doctors' notes to return to school after missing classes and an exam for having the flu. They shared their frustrations because they knew they did not require a bed in the emergency department, but without a local health care provider, their school required a note before they could return. All of these 7 participants expressed frustration with not having a PCP and needing to use the emergency department. One participant had been waiting for 2 years for a new doctor as his PCP had retired a few years ago, so he uses the emergency department for health care (P-15). Another shared that he uses the emergency department because his physician had closed his practice and there was no one to take his place. He said, "I don't get sick very often, but when you're sick, you need to be seen right away...when I did have a family doctor it used to take months and months to be seen...you need to be seen right away, not later down the road" (P-18).

#### **Financial Difficulties**

A recurrent theme described by participants was financial difficulties. One participant explained in detail the process of going to see his PCP and then being told by the PCP to return later in the day. He reported that he paid for parking at both locations, took time off work to drive his wife and son to this appointment so that the wife did not have to pay for 3 different cab rides to receive health care, "...so we wasted all day and if we would have come here first [emergency department], like first thing in the morning, we could have been out by lunch, even if there was a little bit of a wait. It's extremely frustrating, extremely" (P-16). Eleven participants said their employers did not have

additional health benefits so if they missed a day of work it was a day without pay and very costly. One participant stated, "if I don't work, I don't get paid so I need to be seen and receive health care right away" (P-18) providing this explanation for why he visited the emergency department instead of seeing his PCP, which might require a couple of visits to get all of the tests done. Another commented on the need to hurry along their care so they could get back to work, because they "punch in and punch out, so they are not getting paid [while getting care]" (P-23). Three caregivers commented that attending the emergency department was not as costly as driving to see their PCP: "...daughter's regular doctor is over an hour away, so this was much more convenient" (P-29).

### **Lack of Comprehensive Care Outside the Emergency Department**

The one problem per visit rule was an issue that 20 participants identified with PCP care. These participants explained that this rule made it difficult for them to decide which problem to discuss during a single visit "cuz they all might be related," (P-26) explained one participant. Twenty-six participants with PCPs described feeling rushed by their physician during their office visits; "...it feels like they are herding cattle" (P-31). Twenty-three of the 33 participants and caregivers interviewed (70%) wanted to obtain care in one place to reduce the back and forth required to complete diagnostics and follow up once reports are sent to their PCP. As one participant stated, going to the emergency department avoids having to go for "lab work one day, then a few days later find out the results, then a few weeks or months later, you're referred to a specialist....everything is here; I can get everything here in one stop" (P-32).

### **Discussion**

When describing the reasons for using the emergency department for nonurgent health care, 3 themes emerged in this study: practitioner referral, efficacy of care, and time saver. Consistent with the literature,<sup>4,25-27</sup> 36% of participants (12 of 33) in this study suggested that they were referred to the emergency department by their PCP. In fact, according to Redstone et al,<sup>28</sup> 50% of patients who attended the emergency department during the weekdays were advised to go there by their PCP. Birmingham et al<sup>29</sup> reported that 28% of frequent ED users reported their regular doctor had advised them to go to the emergency department. Further, there seems to be a consistent pattern across both quantitative and qualitative studies that suggest referral from another care provider influences the decision of patients to present at the emergency department for nonurgent visits. In order to decrease nonurgent visits, further discussions with PCPs and clinicians might help determine the rationale for these referrals and identify solutions to keep patients out of the emergency department.

Participants in this study also stated that they preferred a one stop experience and overwhelmingly explained that their usage of the emergency department was due to the lack of timely and comprehensive primary care in the community. Previous studies have also reported that patients view the emergency department as a convenience.<sup>4,26,30</sup> Similarly, Kraaijvanger et al<sup>31</sup> described that patients went to the emergency department because they preferred not to wait for appointments with their PCP and because the emergency department was always accessible to provide immediate care. Consistent with our findings, Redstone et al<sup>28(p374)</sup> found that patients who attended the emergency department did so because, "they were not able to get an appointment with their PCP quickly enough and that only 23% were offered an appointment at all." These findings are alarming and need to be addressed. Unless timely and quality primary healthcare can be provided in the community, it is unlikely that a decrease in ED visits will occur.

Even though 26 participants indicated they have a PCP, all indicated that they visited the emergency department when most PCP offices were open. However, lack of access to regular primary care was cited as a barrier by those who did not have a PCP. This finding was similarly noted by Usher-Pines et al<sup>4</sup> who conducted a systematic review in which they reported an association between poor access (difficulty obtaining health care, not having a regular

physician) and nonurgent ED use. Furthermore, participants in our study expressed frustration that by waiting for their PCP, they would be missing work time and that this creates a significant financial burden to them. This frustration is consistent with those reported in other studies. For example, in Birmingham et al,<sup>29</sup> participants reported that they had difficulty taking time away from daily responsibilities such as work and family in order to attend medical appointments. Additionally, other studies described that patients reported having to wait too long to see their PCP,<sup>27</sup> or were unable to get an appointment at a clinic.<sup>32</sup>

Participants in this study also believed that the emergency department was the best place to access care for their health concerns because of the long wait time to see a PCP or because of the perceived notion that better care was available in the emergency department compared to what a PCP could provide. The inability to get a same- or next-day appointment with a PCP was reported by Redstone et al.<sup>28</sup> In addition, Birmingham et al<sup>29</sup> noted that 48% of frequent ED users reported that they felt they received better health care quality in the emergency department than from their PCP.

### **Limitations**

The research findings were obtained from a one-time semi-structured, face-to-face audio-recorded interview. As a result of the open-ended nature of the questions, responses from patients are limited to their thoughts at the time of the interview and may not have included all their thoughts about the topic. The stress of being in the emergency department and of being interviewed may have limited the articulation and depth of the participants' thoughts. Conducting the interviews at 4 hospitals provided insights into patients in this region but may limit the variation and transferability of the findings. Since we only had one-time access to the participants (during their emergency department visits), this was a one-time interview with each participant. Multiple follow-up interviews with patients at different dates, and during different months of the year would help to verify the research findings, and longitudinal follow-up would help to determine if these thoughts expressed by participants and themes persist over time. Additionally, health care in Ontario is free of charge and based on a universal health care system, and therefore these themes may not be applicable to different regions with varied fees for health services. Finally, this study did not include a review of medical records to corroborate findings reported in the interview.

### **Implications for Emergency Nurses**

Due to the clinical and financial burden of nonurgent ED visits, gaining a better understanding of the reasons for these visits and the barriers to accessing primary care is important for health care providers. Patients reported that they had been referred to the emergency department by their PCPs. It would be helpful to gain better insights from practitioners and staff in the PCP offices to learn more about their criteria for referring patients to the emergency department versus being seen in the PCP office.<sup>25</sup> An understanding of which patients are referred to the emergency department and the rationale behind why they were instructed to go to the emergency department might help provide opportunities for changing the practice of primary health care providers. In addition, understanding the reasons leading to nonurgent use of the emergency department is important so that nurses may have a better appreciation of this phenomenon. Such appreciation will enable nurses to better assist and understand the needs of these patients as opposed to blaming them.

Two of the themes that arose from our qualitative interviews evolved around the emergency department being more efficacious and that it was a time saver. Exploring the differences between the efficacy and efficiency of primary care versus emergency department care might help to uncover areas in the existing health care models that could be changed to better improve services for patients in the community. In addition, opening more clinics with access to timely medical laboratories and diagnostics, like an emergency department, may alleviate the pressure of ED overuse. In addition, training of PCPs to include emphasis on the importance of patient-centered care that could

increase patients' trust and use of primary care systems may prove beneficial. Offering education to patients such as an emergency nurse help line might alleviate the burden on emergency departments if patients could phone and ask about their health condition and which care facility would best meet their needs –be they urgent or nonurgent. Roth<sup>33</sup> found that 86% of presenting medical problems were resolved without an ED visit by using an integrative telemedicine program.

Exploring which services are underutilized in the community would be helpful as patients could be directed to these facilities instead of the emergency department. Having a greater understanding of the services nonurgent ED users would access in the community would be important for nurses to direct these patients to receive the appropriate care in the community. In addition, emergency nurses could use their knowledge and lived experience to better advocate for evidence-based solutions to help resolve some of these issues.

Emergency nurses have the unique opportunity to be the initial gatekeepers when patients arrive to the emergency department. These emergency nurses provide the assessment and subsequent triage designation, and they listen to the reasons that patients experience barriers when seeking health care. Focus groups of patients and nurses could be created to expand health care providers' understanding of the challenges and solutions associated with seeking, receiving, and providing health care in the emergency department. Future changes to primary healthcare delivery can be informed by the valuable feedback and insights provided by the participants from our study, those patients and caregivers who use the emergency department for nonurgent care. A large-scale follow-up study, using mixed methods and inclusive of nurse practitioners and physicians working in the emergency department, would provide additional perspectives regarding patients seeking nonurgent health care.

## **Conclusions**

This study examined the reasons why patients and their caregivers visited the emergency department for their nonurgent health conditions and the barriers they experienced when seeking primary care. Practitioner referral, efficacy of care, and saving time are 3 driving forces for nonurgent use of the emergency department. Lack of PCP care, financial difficulties as well as lack of comprehensive care outside of the emergency department were identified as barriers to seeking primary care outside the emergency department. The results of the study provide insights that can help future initiatives to address the practices and barriers contributing to nonurgent ED visits. This research highlights important findings to inform patient-centered care.

## **Acknowledgments**

The authors would like to thank the patients for sharing their feedback. We acknowledge the participating hospitals and their ED directors, nurses and staff for sharing their space, and for providing excellent care in the emergency department. We would also like to thank T. Malott and A. Omar for their editorial feedback.

## **Author Disclosures**

This study was funded by the Erie St. Clair - Local Health Integration Network (LHIN). The authors do not have any financial or other relationships that might lead to a conflict of interest.

## **DETAILS**

**Subject:** Patients; Emergency medical care; Barriers; Patient-centered care; Health care; Participation; Primary care; Data collection; Caregivers; Medical personnel; Efficacy; Rural areas; Departments; Interviews; Consent; Emergency services; Health care access; Gift cards &certificates

<b>Business indexing term:</b>	Subject: Gift cards &certificates
<b>Identifier / keyword:</b>	Nonurgent health care; Qualitative; Emergency department; Interview; Barriers
<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	2
<b>Pages:</b>	163-170
<b>Publication year:</b>	2020
<b>Publication date:</b>	Mar 2020
<b>Section:</b>	Research
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English
<b>Document type:</b>	Journal Article
<b>DOI:</b>	<a href="https://doi.org/10.1016/j.jen.2019.08.007">https://doi.org/10.1016/j.jen.2019.08.007</a>
<b>ProQuest document ID:</b>	2487205852
<b>Document URL:</b>	<a href="https://www.proquest.com/scholarly-journals/one-stop-examining-reasons-patients-use-emergency/docview/2487205852/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/one-stop-examining-reasons-patients-use-emergency/docview/2487205852/se-2?accountid=211160</a>
<b>Copyright:</b>	©2019. Emergency Nurses Association
<b>Last updated:</b>	2022-10-25
<b>Database:</b>	Public Health Database

# Retrospective Diagnosis of Congenital Long QT Syndrome in a Patient With Febrile Syncope: JEN

[ProQuest document link](#)

---

## ABSTRACT (ENGLISH)

A brief primary survey revealed the following: orbital ecchymosis bilaterally with swelling of the lower lip and small mucosal laceration without active bleeding, c-collar in place, no chest wall tenderness, lungs clear, no heart murmur, mild suprapubic tenderness, and moving all extremities purposefully. Because of his age and head trauma, the patient was quickly expedited to computed tomography where he had his head, cervical spine, and facial bones examined. Follow-up testing concluded that the patient had an underlying congenital long QT syndrome (c-LQTS). Long QT Syndrome Etiology LQTS is a common genetic disorder that predisposes patients to sudden cardiac death, with a prevalence of 1 in 2,000 live births.<sup>1</sup> The pathognomonic feature is a prolonged QT or corrected QT (QTc) interval on an ECG, >470 ms in men, >480 ms in women, and oftentimes much longer.<sup>2</sup> QT prolongation is associated with a number of important illnesses, such as stroke, myocardial infarction, metabolic derangements, renal failure, and hypothyroidism.<sup>3</sup> This prolongation, which functionally represents an elongation of the ventricular repolarization, is common in critically ill patients and is associated with up to a 300% increase in mortality.<sup>3</sup> The common pathway of sudden cardiac death secondary to LQTS is the following: Examples include diuretics, which can deplete stores of potassium, and medications with anorexia side effects, which can prevent adequate potassium repletion through diet. [...]syncope in the elderly may be due to TdP as a result of the medical and social etiology, rather than a genetic mutation. Assessment and Monitoring The case presented in this article demonstrates clinician vigilance and vigor needed for diagnosing LQTS prior to the sentinel event, which is death or fatal ventricular dysrhythmia 50% of the time. The Schwartz score uses a combination of ECG findings (QTc interval, T-wave alternans, notched T waves, and relative bradycardia) and clinical and family histories.<sup>10</sup> Depending on the level of suspicion, additional clinical testing includes stress ECG testing, provocative drug testing, Holter monitoring, and sometimes genetic testing on the index case.<sup>3</sup> Once a diagnosis is made, molecular genetic testing can be performed to determine the exact abnormality followed by familial cascade screening of first degree relatives. Prevention and Treatment Treatment for LQTS is multimodal and targeted toward both the genotype and phenotype.<sup>11,12</sup> First, there is an emphasis on avoiding known triggers including QT-prolonging medications, electrolyte aberrancies, and extra cautiousness during exercise and illness that increase the risk of fever.<sup>11</sup> Athletes are recommended to seek consultation from an LQTS specialist before returning to sports.<sup>11</sup> Pharmacotherapy includes initiation of a  $\beta$ -blocker, even in most asymptomatic patients, except those with explicit contraindications such as severe asthma, bradycardia, and atrioventricular nodal blockade.<sup>11</sup> The mechanism of  $\beta$ -blocker protection against LQTS is its

## FULL TEXT

### Contribution to Emergency Nursing Practice

- The current literature on congenital long QT syndrome (LQTS) indicates that the diagnosis is often missed in the emergency department and has a wide range of presentations.
- This article contributes information on LQTS for the purpose of increasing awareness of the subtle presentation of LQTS and the implication for familial testing, particularly the unique presentation of a febrile older adult.

••Key implications for emergency nursing practice found in this article are the signs in a patient's history that suggest LQTS as a possible underlying pathology in patients who present with syncope, seizures, and/or sudden cardiac arrest and the recognition of the high-risk features.

### **Patient Case Presentation**

A 72-year-old man presented to a level-1 urban trauma center by ambulance after a witnessed syncopal event. The syncope was sudden and without prodrome, resulting in facial injuries. He was feeling well until the day before when he developed fever and chills. History was obtained from his family who witnessed the event and emergency medical services because the patient did not recall the events preceding the syncope. The patient's medical history included hypertension and prostate cancer with robotic prostatectomy.

Triage and initial physical examination were remarkable for temperature, 38.6°C (101.4°F); blood pressure 137/82 mm Hg; heart rate 88 beats per minute; respiratory rate 18 breaths per minute; and oxygen saturation 98% on room air. On examination, he was febrile, awake, and conversant. A brief primary survey revealed the following: orbital ecchymosis bilaterally with swelling of the lower lip and small mucosal laceration without active bleeding, c-collar in place, no chest wall tenderness, lungs clear, no heart murmur, mild suprapubic tenderness, and moving all extremities purposefully.

Because of his age and head trauma, the patient was quickly expedited to computed tomography where he had his head, cervical spine, and facial bones examined. Routine laboratory tests, including blood and urine cultures for possible sepsis, and a 12-lead electrocardiogram (ECG) were obtained. The ECG at this time was notable for a corrected QT-interval of 538 ms without other prominent derangement. When he returned to the ED resuscitation room after imaging was completed, the nurse noted that the patient was unresponsive. The emergency nurse placed the patient on the cardiac monitor, which demonstrated an undulating wide complex tachycardia consistent with torsades de pointes (TdP). The emergency nurse administered 1 precordial thump and promptly defibrillated the patient with 200 biphasic joules. The patient immediately regained consciousness and returned to a normal sinus rhythm.

The emergency care team administered empiric antibiotic coverage with intravenous (IV) ceftRIAXone, IV crystalloid fluids, and oral acetaminophen. The patient was admitted to the cardiac critical care unit for further monitoring of his dysrhythmia and sepsis. He was ultimately diagnosed with *Escherichia coli* sepsis, based on the results of both urine and blood cultures.

The patient had an uneventful stay in the critical care unit. He was started on an oral  $\beta$ -blocker. His IV antibiotics were transitioned to oral cefdinir. A more comprehensive family history was obtained, which revealed the patient had previously passed out twice with fever. His biological son had died unexpectedly in his sleep at the age of 30. In addition, his biological niece had died in infancy. Her crib death had been previously attributed to sudden infant death syndrome. The patient was referred for genetic testing and cardiology follow-up for possible implantable cardioverter-defibrillator placement. Follow-up testing concluded that the patient had an underlying congenital long QT syndrome (c-LQTS).

### **Long QT Syndrome Etiology**

LQTS is a common genetic disorder that predisposes patients to sudden cardiac death, with a prevalence of 1 in 2,000 live births.<sup>1</sup> The pathognomonic feature is a prolonged QT or corrected QT (QTc) interval on an ECG, >470 ms in men, >480 ms in women, and oftentimes much longer.<sup>2</sup> QT prolongation is associated with a number of important illnesses, such as stroke, myocardial infarction, metabolic derangements, renal failure, and hypothyroidism.<sup>3</sup> This prolongation, which functionally represents an elongation of the ventricular repolarization, is



common in critically ill patients and is associated with up to a 300% increase in mortality.<sup>3</sup> The common pathway of sudden cardiac death secondary to LQTS is the following: TdP, a form of polymorphic ventricular tachycardia that occurs when a prolonged QT interval causes a R-on-T phenomenon in which the subsequent R wave lands on the late T wave, inducing ventricular tachycardia (Figure 1).

c-LQTS is the result of 16 disease-causing mutations associated with 15 separate genes.<sup>4</sup> There are 3 main types of LQTS involving mutations in potassium and sodium channels (Figure 2). The remainder of LQTS constitute  $\leq 1\%$  of the total cases and encompass mutations affecting other electrolyte gating channels, adapter proteins, which link the cell membrane to the overall cytoskeleton, or kinase activity.<sup>4</sup> Most cases are inherited via an autosomal dominant pattern, meaning subsequent generations have up to a 50% risk of inheriting this disease from a parent. There is variable expressivity and incomplete penetrance; those who have the genetic mutation, therefore, may not ever have symptoms or even manifest prolonged QTc on their ECG. LQTS is an elusive diagnosis, in part, because of this variable genetic penetrance, such as in the phenotypic expression across generations of this family. Most patients with LQTS experience diagnosable signs and symptoms in childhood and adolescence, but these cases may be mistaken for benign syncope and seizure.

LQTS is rare in the elderly. Prolonged QTc is still problematic in this age group and is primarily related to polypharmacy and electrolyte derangements, rather than congenital. In addition to the direct effects of medications on the QT interval, many medications exert an indirect effect through potassium depletion. Examples include diuretics, which can deplete stores of potassium, and medications with anorexia side effects, which can prevent adequate potassium repletion through diet. Thus, syncope in the elderly may be due to TdP as a result of the medical and social etiology, rather than a genetic mutation.

### **Assessment and Monitoring**

The case presented in this article demonstrates clinician vigilance and vigor needed for diagnosing LQTS prior to the sentinel event, which is death or fatal ventricular dysrhythmia 50% of the time. Clinician critical thinking and awareness are essential, as LQTS may present as benign syncope or seizure, and the diagnosis is often missed.<sup>5</sup> When preemptory symptoms occur, they are often prompted by medications (Table 1), electrolyte derangements, exercise, fever, and even seeming benign events such as sleep and emotional responses.<sup>4</sup> These triggers depend on the type of LQTS; LQT1 is predominantly triggered by exercise, and LQT2-LQT3, largely by emotions, medications, and sleep.<sup>4</sup>

A commonly cited mnemonic, DOSE, can assist clinicians in determining who may be acutely at risk of developing TdP: Drug (medications that predispose to TdP), Overdose (medications that cause bradycardia or that predispose to TdP), Slow rhythm (slower rhythms have longer repolarization periods and can lead to TdP), and Electrolyte derangement (see Table 1).<sup>5</sup>

The list of medications that can cause prolongation of the QT are many, however, several are worth discussing because of their prevalence in the emergency department (Table 2).<sup>6-8</sup> Electrolyte derangements that prolong QT intervals include hypokalemia, hypomagnesemia, and hypocalcemia. Conditions predisposing patients to these electrolyte abnormalities include malnutrition/dehydration, gastrointestinal illness, diuretic therapy, and disorders of calcium metabolism such as primary and acquired hypoparathyroidism.

Morbidity from TdP is linked to the result of a 2- or 3-hit hypothesis: the congenitally prolonged QT interval is worsened by a combination of electrolyte derangement, medications, exercise, and/or emotional stress. An example would be an athlete with LQTS suffering from dehydration and hypokalemia, in which subsequent exercise may cause TdP and sudden cardiac death. Up to 20% of patients with LQTS will have normal QTc on a standard ECG and suffer sudden cardiac death on the initial presentation of disease.<sup>2</sup> A number of otherwise unexplained

drownings may be explained by the effects of temperature mediated surprise and/or exercise-induced QTc prolongation.<sup>9</sup>

### **Diagnosis**

Diagnosis is rarely made on the first encounter. Once there is suspicion for c-LQTS, the Schwartz score can be used to calculate a risk of having LQTS and the need for further diagnostic testing (Table 3). The Schwartz score uses a combination of ECG findings (QTc interval, T-wave alternans, notched T waves, and relative bradycardia) and clinical and family histories.<sup>10</sup> Depending on the level of suspicion, additional clinical testing includes stress ECG testing, provocative drug testing, Holter monitoring, and sometimes genetic testing on the index case.<sup>3</sup> Once a diagnosis is made, molecular genetic testing can be performed to determine the exact abnormality followed by familial cascade screening of first degree relatives.

### **Prevention and Treatment**

Treatment for LQTS is multimodal and targeted toward both the genotype and phenotype.<sup>11,12</sup> First, there is an emphasis on avoiding known triggers including QT-prolonging medications, electrolyte abnormalities, and extra cautiousness during exercise and illness that increase the risk of fever.<sup>11</sup> Athletes are recommended to seek consultation from an LQTS specialist before returning to sports.<sup>11</sup>

Pharmacotherapy includes initiation of a  $\beta$ -blocker, even in most asymptomatic patients, except those with explicit contraindications such as severe asthma, bradycardia, and atrioventricular nodal blockade.<sup>11</sup> The mechanism of  $\beta$ -blocker protection against LQTS is its antiadrenergic properties, which not only decrease the risk of tachydysrhythmias but also decrease the QT interval. In the largest trial to date comparing  $\beta$ -blockers, none were substantially superior, except in the case of LQT2 in which nadolol would be the drug of choice.<sup>12</sup> Clinical symptoms while on  $\beta$ -blockers connotes an increased risk, and other therapies that can be considered include other medications (such as mexiletine), cardiac sympathetic denervation, and/or placement of an implantable cardioverter-defibrillator.<sup>11</sup>

In acute management, commercial cardiac monitoring equipment to continuously measure QT intervals is available; however, guidelines on its use limit recommendations to those patients started on antiarrhythmic medications, which predispose to TdP, or in those patients with known prolonged QT who are started on other medications, which may prolong the interval.<sup>13</sup> Whereas these represent general guidelines, there are many clinical scenarios in the emergency department in which QT monitoring may be appropriate, including initiation of antiarrhythmic agents or addition of antipsychotics.

### **Patient Case Conclusion**

After hospital discharge, the patient was seen by electrophysiology specialists, and genetic samples for channelopathies testing were sent to a specialized laboratory. He was started on nadolol, and all family members were tested. He eventually received an implantable cardioverter-defibrillator, and his symptomatic family members were diagnosed and treated. His sepsis resolved with appropriate antibiotic treatment and hospital and follow-up care.

### **Emergency Nursing Implications**

LQTS is a complex disease with presentation possible at any point of life. Emergency clinician critical thinking and vigilance for LQTS can save the lives of both patients and their family members. This critical thinking and vigilance should focus on clues in the patient history, ECG and cardiac monitoring, and relevant pharmacotherapy (Table 2). We recommend emergency clinicians use the ASK, MONITOR, TREAT, AND REFER process for LQTS. ASK if any family members passed away suddenly. If the patient has experienced a syncopal event with no prodrome, ASK if they have started any new medications recently. MONITOR the ECG. If the QTc is prolonged, maintain cardiac

monitor and/or consider continuous QTc monitoring if history is highly concerning. TREAT to replace electrolytes, hydrate, and do not administer any medications that could further prolong the QTc interval. REFER the patient to cardiology for consideration of genetic testing when appropriate and provide family resources if the LQTS disease diagnosis is made. In 1 study, only 53% of families were properly informed of an inherited cardiac condition.<sup>14</sup> This highlights the need for family counseling and guidance around this issue. More provider and patient resources about LQTS and other forms of sudden arrhythmia death syndromes can be found at the Sudden Arrhythmia Death Syndrome Foundation website, <http://www.sads.org>.<sup>15</sup>

#### Author Disclosures

Conflicts of interest: none to report.

Mnemonic	Meaning
D	Drug (QTc prolonging drugs)
O	Overdose
S	Slow rhythm
E	Electrolyte disturbance

Class/category	Medication examples
Antiemetics	
5-HT3 antagonists	Ondansetron, granisetron
Dopamine antagonists	Metoclopramide, prochlorperazine
Antipsychotics	
Butyrophenones	Haloperidol, droperidol
Phenothiazines	chlorproMAZINE, fluPHENAZine
Atypicals	OLANZapine, risperiDONE, qUEtiapine, ziprasidone
Antibiotics	

Macrolides	Azithromycin, erythromycin, clarithromycin
Fluoroquinolones	ciprofloxacin, levoFLOXacin, moxifloxacin
Extended spectrum $\beta$ lactams	Piperacillin-tazobactam, ampicillin-sulbactam
Antifungal medications	fluconazole, ketoconazole
Antidepressants	
Tricyclics	Amitriptyline, nortriptyline
Selective serotonin reuptake inhibitors	Citalopram, sertraline
Analgesics	
Mu receptor agonists	Methadone, tramADol
Nonsteroidal anti-inflammatories	Ketorolac, celecoxib
Antiarrhythmics	
Class Ia	Procainamide, quinIDine
Class III	Amiodarone

ECG finding	Score, points
QTc duration* (Bazett formula)	
$\geq 480$ ms	3
460-479 ms	2
450-459 ms (men only)	1
Torsades de pointes	2
T-wave alternans	1
Notched T wave in 3 leads	1

HR <2nd percentile for age	0.5
Clinical history	
Syncope <sup>†</sup>	
With stress/exertion	2
Without stress	1
Congenital deafness	0.5
Family history <sup>‡</sup>	
Family member with definite LQTS	1
Unexplained sudden cardiac death <age 30	0.5

## DETAILS

**Subject:** Asthma; Emergency medical care; Sleep; Long QT syndrome; Medical diagnosis; Sports; Sepsis; Mutation; Hypothyroidism; Electrocardiography; Congenital diseases; Side effects; Bleeding; Fever; Births; Patients; Electrolytes; Trauma; Cardiac arrhythmia; Heart beat; Death & dying; Bones; Athletes; Diet; Chest; Consultation; Older people; Bradycardia; Pharmacology; Myocardial infarction; Adapter proteins; Defibrillators; Etiology; Critical care; Diuretics; Genetic testing; Ultrasonic imaging; Diagnostic tests; Relatives; Anorexia

**Publication title:** Journal of Emergency Nursing;; JEN; Philadelphia

**Volume:** 46

**Issue:** 2

**Pages:** 214-219

**Publication year:** 2020

**Publication date:** Mar 2020

**Section:** Case Review

**Publisher:** Elsevier Limited

**Place of publication:** Philadelphia

**Country of publication:** United Kingdom, Philadelphia

Publication subject:	Medical Sciences--Nurses And Nursing
ISSN:	00991767
e-ISSN:	15272966
Source type:	Scholarly Journal
Language of publication:	English
Document type:	Journal Article
DOI:	<a href="https://doi.org/10.1016/j.jen.2020.01.004">https://doi.org/10.1016/j.jen.2020.01.004</a>
ProQuest document ID:	2487205831
Document URL:	<a href="https://www.proquest.com/scholarly-journals/retrospective-diagnosis-congenital-long-qt/docview/2487205831/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/retrospective-diagnosis-congenital-long-qt/docview/2487205831/se-2?accountid=211160</a>
Copyright:	©2020. Emergency Nurses Association
Last updated:	2023-08-21
Database:	Public Health Database

Document 14 of 55

# Instrucciones de Alta por Video: Effectiveness of Video Discharge Instructions for Spanish-Speaking Caregivers in the Pediatric Emergency Department: JEN

[ProQuest document link](#)

## ABSTRACT (ENGLISH)

### Introduction

Although evidence supports the addition of video discharge instructions to improve caregiver knowledge among English-speaking caregivers of children in the pediatric emergency department, there is no evidence about the effectiveness of videos for Spanish-speaking caregivers. The purpose of this study was to test whether Spanish video discharge instructions added to standard written and oral discharge instructions would result in improved knowledge and satisfaction among caregivers compared with written and oral instructions alone.

### Methods

Spanish videos were created for fever, gastroenteritis, and bronchiolitis. A quasi-experimental, consecutive-sample, pre-post-test design was used with an audio computer-assisted survey platform to provide surveys in Spanish. The intervention group received written and oral instructions + video, whereas the comparison group received written

and oral instructions alone.

### **Results**

Data were collected from 150 caregivers. Caregivers who were given written and oral instructions + video showed significant knowledge improvement regarding their child's diagnosis and treatment (+19.3% and +23.6%, respectively, among standard participants;  $P < 0.001$ ). Moreover, videos did not significantly improve caregivers' knowledge regarding illness duration and when to seek further care. Regardless of the discharge instruction format, no significant difference was observed in the helpfulness of the instructions (-1%; pre vs post, 84% vs 80%;  $\chi^2 = 0.35$ ;  $P = 0.58$ ).

### **Discussion**

Study results demonstrate that when tailored to reflect diagnosis-specific education, video discharge instructions can improve Spanish-speaking caregiver knowledge about discharge education compared with written and oral instructions alone. Videos can be integrated to standardize the ED discharge process as an adjunct to nurse-provided written and oral instructions with an interpreter for Spanish-speaking families.

## **FULL TEXT**

### **Contribution to Emergency Nursing Practice**

- The current literature on video discharge instructions indicates that using videos or other technology as an adjunct to standard written and oral discharge instructions improves patient or caregiver understanding and knowledge about emergency department aftercare among English speakers.
- This article contributes to the finding that the use of video discharge instructions shows significant knowledge improvement among Spanish-speaking caregivers about their child's diagnosis and treatment when being discharged from the pediatric emergency department.
- Key implications for emergency nursing practice found in this article are that videos are an effective way to improve knowledge among Spanish-speaking caregivers and that they can be created to reflect diagnosis and facility- and community-specific information.

### **Introduction**

An effective discharge from the pediatric emergency department educates caregivers (parents, family members, and guardians) regarding their child's diagnosis, prognosis, treatment plan, and the expected course of illness.<sup>1,2</sup>

Evidence has shown that standard written and oral discharge instructions (WODIs) from the emergency department may not be equally effective for all caregivers.<sup>2,3</sup> Studies have found limited comprehension of traditional discharge instructions among Spanish-speaking patients, which can lead to poor treatment compliance, inadequate follow-up, and ED readmission.<sup>2,3</sup> Discharge instructions are often not fully understood by patients and caregivers, making it difficult for families to manage aftercare.<sup>3,4</sup> In a busy and sometimes chaotic emergency department, there is often limited time to provide patient-tailored discharge instructions and use a validated teach-back method for assessing comprehension. One study found that on average, providers spent only 4 minutes giving discharge instructions, and there were limited opportunities for patients to ask questions.<sup>5</sup>

Even when standardized written discharge instructions are used, oral discharge instructions may be incomplete or open to the interpretation of the nurse. For example, less experienced pediatric emergency nurses may provide less complete instructions. Although providing a trained interpreter is the best practice for providing discharge instructions, even the most seasoned interpreter or nurse may find providing discharge instructions complicated. In addition, nurses may over- or underestimate the health literacy of caregivers and may not cover information they think the caregiver should already know. In a recent study of caregivers who returned to the emergency department

within 72 hours, approximately 41% reported that they had received incomplete WODIs regarding diagnosis, illness duration, and home care.<sup>6</sup> Moreover, Gutman et al<sup>7</sup> found that among Spanish-speaking caregivers of children being discharged from the pediatric emergency department, even those with whom professional interpreters were used frequently missed topics such as instructions on when to return to the emergency department and follow-up. Recently, there has been a focus on including technology with discharge instructions as both a patient preference and a way to increase patient understanding and improve patient safety.<sup>8</sup> A recent systematic review by Hoek et al<sup>9</sup> determined that standard oral discharge instructions may not be enough to educate patients at discharge and advocated for the addition of written instructions or video to augment instructions for ED aftercare. Although recent evidence has supported the addition of video discharge instructions (VDIs) to improve caregiver knowledge among English-speaking caregivers of children being discharged from the pediatric emergency department,<sup>3,10-13</sup> there is limited evidence demonstrating that VDIs are also effective for Spanish-speaking caregivers. VDIs ensure that the information shared with caregivers during discharge is standard and complete for every person, could potentially reduce errors that develop when a provider or nurse is not experienced at educating patients, and addresses health literacy concerns.

### **Objectives**

The purpose of this study was to test whether Spanish VDIs in addition to WODIs resulted in greater improvement in knowledge than WODIs alone among Spanish-speaking caregivers of children discharged from the emergency department. We hypothesized that caregivers who received VDIs + WODIs would show a significantly greater improvement in pre- versus postintervention knowledge about their child's diagnosis, treatment, illness duration, and when to seek further care than those who received WODIs. The secondary aim was to answer the research question "Do caregivers who receive VDIs + WODIs perceive that their instructions are more helpful than caregivers who receive only WODIs?" We hypothesized that caregivers who received VDIs + WODIs would report significantly higher perceived helpfulness of the instructions than those who received WODIs alone.

### **Methods Study Design**

The study employed a 2-group consecutive-sample, quasi-experimental, pre-post-test design. After triage, but before being seen by the provider, participants completed a diagnosis-specific, 5-question pretest survey that assessed knowledge about their child's diagnosis, treatment, illness duration, and when to seek further care. During their visit, participants in the intervention group received VDIs about their child's specific diagnosis followed by standard WODIs. The comparison group received standard WODIs only. All participants were given WODIs by an in-person staff interpreter or through the hospital's phone interpreting service. After receiving discharge instructions, caregivers completed the same diagnosis-specific, 5-question post-test survey with 1 additional question about their satisfaction with their visit.

### **Sample Size and Setting**

The study was conducted in a medium-sized suburban hospital, with a level III trauma center, which serves approximately 16,000 pediatric patients annually. Sample size estimates were calculated using Stata 12.1<sup>14</sup> (StataCorp LP) with a power of 80% (type II error rate = 20%) and a level of significance of 5% (alpha, type I error rate = 5%). It was estimated that 128 participants were required to determine a statistically significant difference. Recognizing that a Spanish caregiver population may exhibit differences in disease knowledge levels before intervention, data were collected from 150 caregivers (n = 75, standard care group; n = 75, intervention group). The participants were caregivers of children who accessed emergency services for 1 of the 3 most common illnesses seen in the pediatric emergency department: fever, gastroenteritis, and bronchiolitis. Inclusion criteria were as follows: caregivers (1) choosing Spanish as their primary language during triage; (2) with children aged between



1 month and 21 years being treated; (3) with children with an initial complaint of either fever, gastroenteritis, or bronchiolitis; and (4) aged >18 years. Exclusion criteria were caregivers (1) with children triaged at an emergency severity index 2 or above (on a scale of 1-5), indicating that they needed emergent care; (2) unable to provide consent; and (3) leaving before discharge instructions were provided.

### **Data Collection and Management**

The study used the Tufts Audio Computer-Assisted Self-Interview (ACASI) software to collect data.<sup>15</sup> The team chose ACASI primarily because it addresses literacy concerns as questions and response options are displayed as text on computer screens and can simultaneously be read aloud to the participant.

ACASI-based surveys (1) increase data validity for sensitive measures by eliminating social desirability and interviewer bias; (2) increase participant privacy; (3) have functionality for illiterate participants; (4) can be programmed in Spanish; (6) generate less missing data and good nonresponse rates; (7) reduce staff time required for data collection for interviewing; and (8) eliminate costly, time-intensive, and inaccurate data entries.<sup>16</sup> Multiple studies have found that ACASI has good reliability and validity, with a review by Brown et al showing strong evidence that ACASI-administered interviews resulted in lower rates of reporting bias than comparison methods.<sup>17</sup>

Data collection was completed by a team that included a clinical nurse educator, the clinical director, designated staff nurses, and a clinical technician. All team members underwent system institutional review board training and completed online education about the basic principles of research. The team held a kick-off meeting in which research policies and procedures were reviewed and the study protocol was described. The team trialed the ACASI system and consent process several times before beginning data collection to reduce errors in using computer platforms. To improve fidelity of the intervention, data collectors did not enroll their own assigned patients into the study. Instead, they collected data of caregivers with patients assigned to their colleagues.

Three diagnosis-specific surveys were created. The surveys contained 5 questions that assessed knowledge regarding a child's diagnosis (1 question), treatment (2 questions), duration of illness (1 question), and when to seek further care (1 question). The questions were created for a previous quality-improvement project and did not have reliability information available. The questions directly correlated with the information taught in the VDIs. The post-test survey included a sixth question, "How satisfied were you with the discharge education you received today?" and offered answers on a Likert scale with answers ranging from "Not helpful at all" to "Extremely helpful."

### **Procedure**

At the beginning of their ED visit, caregivers who met the inclusion criteria watched a short video in Spanish that described the study and provided information about informed consent. In most cases, a Spanish interpreter who had been trained to be part of the research study was present, and she answered any questions the potential participant had about the study. If the interpreter was not available, after the consent video concluded, the screen of the tablet went to an interactive screen through which the potential participants were able to signal the nurse that they needed to have questions answered before continuing. The data collector would then wait to start data collection until a Spanish interpreter was available before continuing the study protocol. After watching the consent video, the ACASI platform was programmed to welcome the participant to the study, highlight again the purpose of the study, and then confirm that the caregiver understood the study and gave consent to participate in it. If the participants indicated on the screen that they did not understand the purpose of the study or did not give consent, the program stopped and alerted the data collector to call the interpreter to answer questions. The caregivers had full control during data collection to replay questions, navigate forward and backward, and to change their answers multiple times. Skip patterns were automated so that only pertinent questions were asked. At every point in the data collection process, the participant had the opportunity to stop the survey or ask for help.

## Intervention

Spanish VDIs were created for the 3 most commonly seen diagnoses: fever, gastroenteritis, and bronchiolitis.<sup>18</sup> Videos were originally created for a previous English VDI project on the unit through a collaborative interprofessional writing process by nurses, pediatricians, and child life services. Video scripts were created to be readable to a below-fifth-grade reading level. To adapt the original videos, the team engaged hospital translation services. The new videos featured a Spanish-speaking translator who was well known in the local community. Text and visuals were changed as necessary to convey information to the Spanish-speaking population. Each video lasted approximately 5 minutes and included information about the child's diagnosis, treatment, illness duration, and when to seek further care. The videos were loaded on tablet computers that were available in each patient room to help entertain and distract pediatric patients. Tablets were cleaned between patients as a part of room maintenance. Data collection occurred for the intervention group first. When the designated sample size was attained, the videos were removed from the tablets in the patient care rooms, and the control group data were collected. In total, data were collected for 14 months: between July 2017 and September 2018. If caregivers refused the intervention or did not complete both their pre- and post-test surveys, their data were removed from the study. In addition, if caregivers had missing data (for example, if they skipped 1 or more questions on their pre- or post-test survey), their data were dropped from the study. Data collection continued until sample size was met.

## Human Subjects Protection Measures

The research team complied with all human subjects' protection regulations and obtained approval for the study from the Inova Loudoun Hospital Institutional Review Board (IRB#16-2325). The caregiver was given a written Spanish-language copy of the consent and contact information for Spanish-speaking study subjects. In addition, subjects had the opportunity to ask questions, aided by an interpreter, before consenting to the study. On all screens used on the data collection platform, there was a button labeled "Stop" in Spanish. If caregivers used this button at any time during the survey, they had the option of speaking with the data collector and an interpreter or stopping the survey and being removed from the study.

## Data Analysis Procedures

Caregiver knowledge is presented as means, SDs, medians, and percentiles (25th and 75th) for continuous data or as frequencies and percentages for categorical data. Interquartile ranges (25th-75th percentile) were used to evaluate caregiver knowledge by group. Group demographic comparisons were accomplished via the chi-square and *t* tests, where appropriate. Improvements in postinstruction knowledge were evaluated for all caregiver participants using a 2-way analysis of variance (ANOVA) approach. All 2-way ANOVA models contained a group factor (VDIs vs WODI), a time factor (pre vs post), and a group-by-time interaction effect. Caregiver knowledge was compared between the VDI and WODI groups using a similar 2-way ANOVA approach. Our first analyses included the entire cohort, with secondary analyses examining diagnosis groups (ie, gastroenteritis, fever, and bronchiolitis) and question type (ie, diagnosis, treatment, duration, and when to seek further care). All data analyses were performed using SAS 9.4<sup>19</sup> with statistical significance assumed for  $P = 0.05$ , 2 tailed.

## Results

One hundred fifty-five caregivers (51.6% female; 48.4% male) participated in the survey. <sup>Table 1</sup> describes sample characteristics. Eighty caregivers received WODIs, and 75 caregivers received VDI intervention. During the study duration, there were an estimated 925 caregivers who could have been screened for study eligibility. However, data collection only occurred when there was a trained, data collection staff member working and when the unit census was manageable enough for the staff to collect data. Of those approached, 9 caregivers refused to participate in the study. A total of 47 gastroenteritis caregivers (18, WODIs; 29, VDIs), 89 fever caregivers (52, WODIs; 37, VDIs), and

19 bronchiolitis caregivers (10, WODIs; 9, VDIs) were included. Overall, significant improvements in knowledge scores were observed after WODIs or VDIs were provided (preinstructions, 39.3% vs postinstructions, 53.0%;  $F = 32.06$ ;  $P$  Figure presents the overall knowledge level, pre- and postinstructions, by study group. After comparing interquartile ranges (25th-75th percentiles) across timing and the study groups, the narrowest range was observed for pre-VDIs, reflecting the observed improvement in knowledge scores. Within groups, knowledge among VDI participants improved significantly (+19.3%; pre vs post, 38.7% vs 58.1%) compared with that among standard participants (+8.2%; pre vs post, 39.9% vs 48.1%;  $F = 16.7$ ;  $P = 0.01$ ), and bronchiolitis (post vs pre, 61% vs 37%;  $F = 3.67$ ;  $P = 0.05$ ).

### **Knowledge Regarding Child's Treatment**

Both VDI and WODI participants demonstrated increased knowledge regarding their child's treatment. Caregiver knowledge regarding the child's treatment improved significantly (+14.7%; pre vs post, 44.6% vs 59.3%;  $F = 24.51$ ;  $P = 0.01$ ).

### **Knowledge Regarding Child's Illness Duration**

Both VDI and WODI participants demonstrated increased knowledge regarding their child's illness duration. Caregivers' knowledge regarding their child's illness duration improved significantly (+12.9%; pre vs post, 28.0% vs 40.9%;  $F = 24.67$ ;  $P = 0.01$ ).

### **Knowledge Regarding When To Seek Further Medical Care**

Both VDI and WODI participants demonstrated increased knowledge regarding when to seek further medical care. Caregivers' knowledge regarding when to seek further medical care improved significantly (+9.6%; pre vs post, 48.6% vs 58.2%;  $F = 7.34$ ;  $P = 0.01$ ) over the course of the study. Between groups, VDI participant knowledge regarding when to seek further medical care did not significantly improve (+14.4%; pre vs post, 49.7% vs 64.1%) compared with standard participant knowledge (+4.9%; pre vs post, 47.5% vs 52.4%; group  $\times$  time;  $F = 1.79$ ;  $P = 0.18$ ).

Caregivers in the WODI group as well as in the VDI group rated discharge instructions favorably (Table 2). For both the VDI and WODI groups, the highest percentage of participants citing discharge instructions as very or extremely helpful ( $\geq 4$ ) was observed among the bronchiolitis participants (88.8% in both groups). No statistically significant differences in caregivers' perceived helpfulness were observed among any diagnosis groups.

## **Discussion**

This study found that in general, discharge instructions by providers and nurses in the pediatric emergency department improved knowledge, whether it came in a video or in a standard written and oral format. These findings highlight the importance and value of understandable, effective discharge instructions for caregivers leaving the pediatric emergency department with an ill child. More importantly, study findings indicate that VDIs do a better job of educating caregivers about a child's diagnosis and treatment than WODIs alone. This finding is consistent with an earlier study regarding the effectiveness of VDIs among English-speaking caregivers.

Although caregiver knowledge about the diagnosis and treatment improved significantly following VDIs, caregiver knowledge about illness duration and when to seek further care did not significantly improve. Understanding illness duration is an important part of setting caregiver expectations about home management and when to seek further care at the emergency department or primary care provider. However, previous studies have also shown that caregivers returning to the emergency department have insufficient understanding of illness duration and when to seek further medical care.<sup>3,13</sup> Discussing illness duration is a critical piece of discharge instructions, particularly as a previous study has found that instructions about illness duration are associated with increased satisfaction with ED care.<sup>6</sup> In addition, a previous project using these same videos has shown that English-speaking caregivers do not

understand more about illness duration after VDIs, indicating that either the prototype video does not adequately address illness duration or that illness duration is too patient-specific to be included in VDIs.<sup>12</sup>

In addition, study results indicate that Spanish-speaking caregivers find discharge instructions very or extremely helpful, whether they are provided face-to-face or have an additional video component. A similar result was found in an earlier, evidence-based project of English-speaking caregivers.<sup>12</sup> This was a surprise to the research team; the assumption was that in the current technology environment, younger parents might prefer a fast-paced, online learning component without the forced interaction of a nurse or provider. A recent study by Sheele et al<sup>20</sup> on adult English-speaking patients being discharged from an emergency department found that most patients who were surveyed preferred video instructions or a combination of VDIs + WODIs. This finding may underscore the importance Spanish-speaking families place on patient-specific information, community resources, and the value of speaking with professionals.

### **Limitations**

There are several limitations to this study. First, a consecutive sample of caregivers without randomization limits the generalizability of the study. However, because the nurses trained to collect data were only able to do so when the unit census allowed, it was difficult to use a more robust sample-recruitment method. In addition, having these nurses collect data limited our ability to track every patient who came through and who met the eligibility criteria. Second, it is possible that because the team collected the VDI + WODI (intervention) sample first and the WODI-only sample later, there may have been something that changed the way the nurses delivered WODIs to the 2 groups, which would affect the validity of study findings. Moreover, it is possible that because the nurses on the unit were not “blinded” to whether their patients were receiving the intervention or standard discharge teaching, it might have changed the way they delivered their WODIs. Third, not all diagnoses were recruited equally into the sample, which may have affected study findings. Finally, although we chose the most frequently seen diagnoses for inclusion in the sample, there was a possibility that videos about different diagnoses would result in different findings, which limited the generalizability of these findings to caregivers receiving discharge education about only fever, gastroenteritis, or bronchiolitis.

### **Implications for Emergency Nurses**

The results from this study demonstrate that when tailored to reflect diagnosis-specific education, VDIs can improve Spanish-speaking caregiver knowledge about discharge education more than just WODIs alone. Videos allow caregivers to grasp discharge education at their own pace during their ED visit and prepare their questions, which can potentially improve treatment compliance and follow-up and reduce ED readmissions. Most children in the United States are cared for in emergency departments that are not pediatric-specific and may have low pediatric readiness scores.<sup>21,22</sup> In settings where children are seen infrequently or nurses have limited pediatric experience, VDIs could be an effective tool for nurses to educate families about topics they do not feel familiar teaching.

### **Conclusions**

Delivering discharge instructions that help families achieve successful home care of an ill child is one of the most important aspects of an ED visit. Imparting accurate information about a child's diagnosis, treatment, illness duration, and when to seek further care is critical to a caregiver's confidence about taking a child home and to the success in managing the child's illness to prevent complications and reduce family stress as well as child's pain and discomfort.

VDIs can be integrated into nursing practice to standardize the ED discharge process and can act as an adjunct to nurse-provided WODIs with an interpreter for Spanish-speaking families. However, creating and disseminating VDIs is expensive and time consuming. This was a nurse-led project and took a substantial number of nurse hours to

complete in addition to extra funding to have the videos translated and recorded. Moreover, access to tablets in every room to show VDIs is expensive, and the technology required nurses to frequently troubleshoot the equipment. The resources needed to create a similar project in another emergency department might be prohibitive. Moreover, when the study was completed and VDIs were shown to be an effective education tool, unit nurses were reticent to adopt VDIs as a standard part of their practice. They perceived VDIs as requiring additional time, although if the video was started at the outset of a visit, it allowed the caregiver time to think about their questions and absorb the teaching. In addition, nurses were frustrated when the videos did not work the first time and felt that they were too complicated to integrate into their standard workflow.

Although VDIs did not improve satisfaction among Spanish-speaking caregivers, they offer an option to innovate and diversify the education options provided to the families for whom we care. Future studies should focus on how to improve knowledge about illness duration, when to seek further care, and how to use technology in a way that improves or enhances caregiver satisfaction.

### Acknowledgments

We would like to thank sincerely Scott Sugrue and the team from the Tufts University School of Medicine ACASI program, Stephany Anazgo, Dr Mary Ann Friesen, Dr Jill McCabe, and Rebecca Mulroe for their assistance and support.

### Author Disclosures

This research was supported by the 2016 Emergency Nurses Association Foundation STTI Research Grant.

Conflicts of interest: none to report.

Parameter	VDI (n = 75), mean (SD) and n (%)	WODI (n = 80), mean (SD) and n (%)	$\chi^2$ or t test (degrees of freedom)	P value
Child age (years)	2.8 (SD = 3.2)	3.1 (SD = 3.4)	t (153) = -0.62	0.54
Child sex				
Male	38 (50.7)	37 (46.3)		—
Female	37 (49.3)	43 (53.8)	$\chi^2$ (1, N = 155) = 0.30	0.58
Caregiver age (years)	31.9 (SD = 6.9)	33.2 (SD = 8.8)	t (153) = -0.99	0.32
Caregiver sex				
Male	8 (10.7)	8 (10.0)		—
Female	67 (89.3)	72 (90.0)	$\chi^2$ (1, N = 155) = 0.02	0.89
Diagnosis				

Fever	37 (49.3)	52 (65.0)		—
Bronchiolitis	9 (12.0)	10 (12.5)		—
Gastroenteritis	29 (38.7)	18 (22.5)	$\chi^2 (2, N = 155) = 4.99$	0.08

Diagnosis	WODI		VDI + WODI		Comparison by group	
	Mean response	% Very/extremely helpful ( $\geq 4$ )	Mean response	% Very/extremely helpful ( $\geq 4$ )	Mean response, P value	% Very/extremely helpful, P value
Gastroenteritis	4.00	77	4.31	79	Z = -1.19, P = 0.24	$\chi^2 (1, N = 47) = 0.05, P = 0.82$
Fever	3.96	80	4.17	86	Z = 0.66, P = 0.66	$\chi^2 (1, N = 89) = 0.54, P = 0.46$
Bronchiolitis	4.22	89	4.22	89	Z = -0.29, P = 0.77	$\chi^2 (1, N = 19) = 0.01, P = 0.99$
All diagnoses	4.00	80	4.23	84	Z = 1.29, P = 0.20	$\chi^2 (1, N = 155) = 0.32, P = 0.57$

## DETAILS

**Subject:** Patients; Emergency medical care; Health education; Bronchiolitis; Medical diagnosis; Computer aided design--CAD; Knowledge; Data collection; Caregivers; Children & youth; Illnesses; Polls & surveys; Gastroenteritis; Interpreters; Pediatrics; Nurses; Helpfulness; Health literacy; Consent; Emergency services; Video recordings; Quasi-experimental methods

**Identifier / keyword:** Video discharge instructions; Pediatrics; Emergency department; Spanish-language

**Publication title:** Journal of Emergency Nursing; JEN; Philadelphia

**Volume:** 46

**Issue:** 2

**Pages:** 180-187

<b>Publication year:</b>	2020
<b>Publication date:</b>	Mar 2020
<b>Section:</b>	Research
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English
<b>Document type:</b>	Journal Article
<b>DOI:</b>	<a href="https://doi.org/10.1016/j.jen.2019.11.006">https://doi.org/10.1016/j.jen.2019.11.006</a>
<b>ProQuest document ID:</b>	2487205793
<b>Document URL:</b>	<a href="https://www.proquest.com/scholarly-journals/instrucciones-de-alta-por-video-effectiveness/docview/2487205793/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/instrucciones-de-alta-por-video-effectiveness/docview/2487205793/se-2?accountid=211160</a>
<b>Copyright:</b>	©2019. Emergency Nurses Association
<b>Last updated:</b>	2022-10-12
<b>Database:</b>	Public Health Database

---

Document 15 of 55

## Finding Funding Support for Your Dissertation Research or Clinical Practice Project: JEN

[ProQuest document link](#)

---

### ABSTRACT (ENGLISH)

[...]other industry partners provide grant opportunities, and many of these can be contacted directly for guidance. [...]industry partners may provide alternative means of research and clinical practice support, such as datasets, devices, or therapeutic products free of charge. NIH's federal grants to support student research training are typically labeled as F and T followed by 2 numbers (eg, F31 or T32).<sup>5</sup> The F31 or Ruth L. Kirschstein National Research Service Award has a variable budget, which covers student stipends, tuitions, fees and other expenses such as health insurance and professional conference attendance.<sup>6</sup> Although the F31 mechanism will not directly cover the expenses for dissertation research, the stipend received, if awarded, could be allocated to fund the dissertation.

Funder Type	Description	Maximum funding	Maximum duration
ENAF	Seed grants	Small research projects to provide pilot data for larger projects	\$500 1 year
Research grants	Small research projects to advance emergency nursing practice	\$6,000	1 year
ANF	Nursing research grants	Research projects by new or experienced researchers in clinical practice or academia to enhance patient care or advance nursing science	\$25,000 1 year
AACN Impact research grants	Research focused on critical-care clinical research and priority areas such as nurse certification and healthy work environments	\$50,000	2 years
NSF	Special programs for graduate students	Dissertation research projects from an array of scientific disciplines	\$16,000 2 years
AHRQ	Health Services Research Dissertation Program	Projects conducted by PhD candidates to support health services' dissertations aligning with the mission of AHRQ	\$40,000 17 months
IIR	Medical education grants	Projects focused on medical and health care-related educational activities	Not listed
Table	Select nursing foundation research and clinical practice project grant opportunities	Not listed	Not listed

## FULL TEXT

With tuition expenses ever increasing, it is important for doctoral students to obtain funding for their dissertation research and clinical practice projects. These projects may never be completed without financial assistance from other individuals or entities. Although some individuals may opt to pay for projects from their personal funds, seeking external funding is typically recommended and needed. The merits of obtaining external funding include (1) increased credibility that an external agency has determined your project to have clinical and scientific importance warranting the funding (eg, grant); (2) demonstration of high achievement of academic efforts; and (3) the requirements to ensure that the project can be completed. The drawbacks of seeking external funding include the time required to write a competitive grant proposal and the knowledge that some funding agencies may only fund a small proportion of the proposals they receive (some lower than 1 in 10).<sup>1</sup> In this article, we identify potential internal or intramural and external or extramural funding sources. We provide information about where emergency nursing readers in graduate school could submit a grant to fund dissertation research or a clinical practice project. Although funding agencies and grant amounts vary considerably, we focus on a selection of grants supporting clinical and research projects for doctoral students.

### Internal Funding Sources

There is a variety of funding sources within employer and university settings. An advantage of these funding sources is that they may be less competitive, meaning your chances of receiving the funding would be greater than those if submitting to an external funding agency (see "External Funding Agencies"). In larger health systems, there may be a formal grant submission system. In smaller health systems, you may need to submit a formal proposal to the hospital board of directors or hospital health foundation, requesting funds for the project. Alternatively, you could negotiate with a hospital administrator to provide funds from a discretionary budget to pay for project expenses. Regardless of the path chosen to obtain funds, it is crucial you provide an explanation about how the project will directly benefit the patient population, improve care, and potentially lead to health-system cost savings in the long term. In addition, Grants.gov provides guidance on how to address the impact of or the need for your project to the funding agency that can be used to structure your internal funding proposal.<sup>2</sup> In academic settings, funds may be available at the school or university level to support your dissertation research or clinical practice project. Exploring these options can provide the necessary funds to complete the project.

### External Funding Agencies

There are extensive opportunities for external funding. Potential funders are usually private foundations, industries,



or governmental entities. A few examples of private foundations are the Emergency Nurses Association Foundation, American Nurses Foundation, American Association of Critical-Care Nurses, and Sigma Foundation for Nursing. Many of these associations and association-affiliated foundations have local chapters, that fund small grants independent of their parent associations. Membership of the association that you are seeking funding from may be a requirement to receive funding. Be sure to check grant requirements. It is noteworthy for readers seeking predoctoral project funding that the Emergency Nurses Association Foundation and American Nurses Foundation have committed to funding both dissertation research and clinical practice projects. Larger private foundations include the Robert Wood Johnson Foundation, American Heart Association, and Bill and Melinda Gates Foundation. Internationally, examples of large funding agencies include the United Kingdom Medical Research Council, Wellcome Trust, Canadian Institutes of Health Research, German Research Foundation, and Japan Science and Technology Agency.<sup>3</sup> Of the top 41 funding agencies in the world, the largest funder is the National Institutes of Health (NIH), United States. NIH spent more than \$26 billion in 2013 on research, representing approximately 60% of all research expenditures from these 41 funding agencies.<sup>3</sup> The specific mechanisms to fund predoctoral-degree research have been described in detail below. A select list of external funding agencies and types to seek for funding dissertation research or clinical practice projects is described in the <sup>Table</sup>.

Industry-sponsored research is another potential funder. For example, Bayer Global provides a variety of grants including education-focused grants.<sup>4</sup> For this particular funding opportunity, you would need to focus the dissertation research or clinical practice project on the educational outcomes of your study population (eg, demonstration of competency using simulation). In addition, other industry partners provide grant opportunities, and many of these can be contacted directly for guidance. Moreover, industry partners may provide alternative means of research and clinical practice support, such as datasets, devices, or therapeutic products free of charge. You will need to transparently report and minimize potential bias or conflict of interest when partnering with industry for research or clinical practice projects.

Several US federal agencies support doctoral students' research, including NIH, National Science Foundation, and Agency for Healthcare Research and Quality. NIH's federal grants to support student research training are typically labeled as F and T followed by 2 numbers (eg, F31 or T32).<sup>5</sup> The F31 or Ruth L. Kirschstein National Research Service Award has a variable budget, which covers student stipends, tuitions, fees and other expenses such as health insurance and professional conference attendance.<sup>6</sup> Although the F31 mechanism will not directly cover the expenses for dissertation research, the stipend received, if awarded, could be allocated to fund the dissertation. The National Science Foundation supports graduate student research through the Graduate Research Fellowship Program. The mechanism for predoctoral Agency for Healthcare Research and Quality support is the Grants for Health Services Research Dissertation Program (R36). Some federally sponsored grants are awarded to individual students, whereas others are awarded to institutions to recruit students interested in receiving training in a particular area of research. For example, 1 university center currently has funding to support students through a T42 grant mechanism. With this mechanism, dissertation and clinical practice projects can be funded up to \$20,000.<sup>7</sup> Typically, only dissertation and other research studies would be funded; however, some of these programs have funded clinical practice projects in the past. Information on previously funded projects can be found at <https://federalreporter.nih.gov/>. Information on current calls for proposals can be found at <https://grants.nih.gov/grants/oer.htm>.

### **Grant Expenses**

Funding agencies vary regarding the expenses that can be charged to a grant. Federal agencies have strict policies on allowable and unallowable costs. In general, most funding agencies will allow the following expenses to be charged to the grant: equipment and supplies (eg, glucometer and trauma care supplies), laboratory testing fees, consultation costs (eg, statistician), publication costs (eg, poster printing and open access journal fees), and travel directly related to the project (eg, mileage reimbursement and conference expenses to present findings). Some grants may allow you to be paid a stipend or salary as the principal investigator (person leading the project) from grant expenses. When salaries are allowable charged expenses, the grant may support salary expenses for other

persons to assist you with data collection and analysis. We recommend always checking with your organization's sponsored projects expert if one is on staff or with the funding agency to verify what expenses are allowable before submitting your grant application.

### Conclusions

As an emergency nurse in a doctoral program, you need to consider obtaining grant funding to support your dissertation research or clinical practice projects. External funding reflects both the importance of the subject being studied and the quality of your grantsmanship. Multiple sources are available to you as an emergency nurse to fund your projects. It is important during the grant writing phase, and especially before submitting the grant, that you understand what expenses are permitted by the grant. Do not be afraid to be creative in exploring funding options.

### Author Disclosures

Conflicts of interest: none to report.

Fun der	Type	Description	Maximum funding	Maximum duration
EN AF	Seed grants	Small research projects to provide pilot data for larger projects	\$500	1 year
	Research grants	Small research projects to advance emergency nursing practice	\$6,000	1 year
AN F	Nursing research grants	Research projects by new or experienced researchers in clinical practice or academia to enhance patient care or advance nursing science	\$25,000	1 year
AA CN	Impact research grants	Research focused on critical-care clinical research and priority areas such as nurse certification and healthy work environments	\$50,000	2 years
NS F	Special programs for graduate students	Dissertation research projects from an array of scientific disciplines	\$16,000	2 years
AH RQ	Health Services Research Dissertation Program	Projects conducted by PhD candidates to support health services' dissertations aligning with the mission of AHRQ	\$40,000	17 months
IIR	Medical education grants	Projects focused on medical and health care-related educational activities	Not listed	Not listed

## DETAILS

<b>Subject:</b>	Government agencies; Emergency medical care; Government grants; Graduate students; Clinical medicine; Patients; Funding; Research & development expenditures; Clinical research; Dissertations & theses; Health insurance; Nurses; Health services; Grants; Medical education; Fees; Certification; Associations; Candidates; Cost control; Nursing; Clinical nursing; Scholarships & fellowships; Emergency services; Professional practice
<b>Business indexing term:</b>	Subject: Research & development expenditures Cost control
<b>Location:</b>	United States--US
<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	2
<b>Pages:</b>	263-265
<b>Publication year:</b>	2020
<b>Publication date:</b>	Mar 2020
<b>Section:</b>	Understanding Research
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English
<b>Document type:</b>	Journal Article
<b>DOI:</b>	<a href="https://doi.org/10.1016/j.jen.2019.11.002">https://doi.org/10.1016/j.jen.2019.11.002</a>
<b>ProQuest document ID:</b>	2487205781
<b>Document URL:</b>	<a href="https://www.proquest.com/scholarly-journals/finding-funding-support-your-dissertation/docview/2487205781/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/finding-funding-support-your-dissertation/docview/2487205781/se-2?accountid=211160</a>
<b>Copyright:</b>	©2019. Emergency Nurses Association

Last updated: 2023-06-21

Database: Public Health Database

Document 16 of 55

# CE Earn Up to 7.5 Contact Hours: JEN

[ProQuest document link](#)

## FULL TEXT

### Instructions

- Read the articles identified as CE.
- The test for these CE activities will no longer be routinely mailed or faxed. A mailed test can be requested from the *JEN* editorial office (Managing Editor Annie Kelly, anniewkelly@gmail.com, 413-427-3620) as an accommodation for those who require a physical copy of the questions.
- Go to [http://www.ena.org/publications/jen/ce\\_articles/default.asp](http://www.ena.org/publications/jen/ce_articles/default.asp) and follow the instructions to take your CE test(s) online. There is only one correct answer for each question.
- If you pass, you can print your certificate of earned contact hours. If you fail, you have the option of taking the test(s) again at no additional cost.
- For questions contact Lippincott Williams &Wilkins: 1-800-787-8985.

### Registration Deadline

March 4, 2022

### Disclosure Statement

The authors and planners have disclosed no potential conflicts of interest, financial or otherwise.

### Provider Accreditation

Lippincott Professional Development (LPD) will award contact hours as follows: Clinical, 3.5; Research, 2.5; Practice Improvement, 1.5. (CEN-RO Category: Clinical).

LPD is accredited as a provider of continuing nursing education by the American Nurses Credentialing Center's Commission on Accreditation.

This activity is also provider approved by the California Board of Registered Nursing, Provider Number CEP 11749 for the number of contact hours indicated. LPD is also an approved provider of continuing nursing education by the District of Columbia, Georgia, and Florida #50-1223.

### Payment

Clinical member \$23.95; nonmember \$27.95.

Research member \$18.95; nonmember \$22.95.

Practice Improvement member \$13.95; nonmember \$16.95.

## DETAILS

<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	2
<b>First page:</b>	266
<b>Publication year:</b>	2020
<b>Publication date:</b>	Mar 2020
<b>Section:</b>	CE Tests
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English
<b>Document type:</b>	Instructional
<b>DOI:</b>	<a href="https://doi.org/10.1016/S0099-1767(20)30040-4">https://doi.org/10.1016/S0099-1767(20)30040-4</a>
<b>ProQuest document ID:</b>	2487205762
<b>Document URL:</b>	<a href="https://www.proquest.com/scholarly-journals/ce-earn-up-7-5-contact-hours/docview/2487205762/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/ce-earn-up-7-5-contact-hours/docview/2487205762/se-2?accountid=211160</a>
<b>Copyright:</b>	Copyright Elsevier Limited Mar 2020
<b>Last updated:</b>	2021-03-01
<b>Database:</b>	Public Health Database

# Development of the National Early Warning Score-Calcium Model for Predicting Adverse Outcomes in Patients With Acute Pancreatitis: JEN

[ProQuest document link](#)

## ABSTRACT (ENGLISH)

### Introduction

This study aimed to develop a new model on the basis of the National Early Warning Score to predict intensive care unit admission and the mortality of patients with acute pancreatitis.

### Methods

Patients diagnosed with acute pancreatitis in the emergency department were enrolled. The values of the National Early Warning Score, Modified Early Warning Score, and Bedside Index of Severity in Acute Pancreatitis in predicting intensive care unit admission and mortality of patients with acute pancreatitis were evaluated.

### Results

A total of 379 patients with acute pancreatitis were enrolled; 77 patients (20.3%) were admitted to the intensive care unit and 14 (3.7%) died. The National Early Warning Score and calcium level were identified as independent risk factors of intensive care unit admission. Serum calcium exhibited a moderate correlation with National Early Warning Score ( $r = -0.46$ ;  $P < 0.001$ ), Modified Early Warning Score ( $r = -0.37$ ;  $P < 0.001$ ), and Bedside Index of Severity in Acute Pancreatitis ( $r = -0.39$ ;  $P < 0.001$ ). A new model called National Early Warning Score-calcium was developed by combining National Early Warning Score and calcium blood test result, which had larger areas under the curve for predicting intensive care unit admission and mortality than the other 3 scoring systems.

### Discussion

A new model developed by combining National Early Warning Score and calcium exhibited better value in predicting the prognosis of acute pancreatitis than the models involving National Early Warning Score, Modified Early Warning Score, and Bedside Index of Severity in Acute Pancreatitis alone.

## FULL TEXT

## DETAILS

**Subject:** Medical records; Emergency medical care; Medical prognosis; Pleural effusion; Serum; Pancreatitis; Regression analysis; Risk factors; Calcium; Blood pressure; Mortality; Severity; Blood tests; Glucose; Pain; Acute; Oxygen saturation; Creatinine; Emergency services; Intensive care

**Identifier / keyword:** Predictive model; National Early Warning Score; Modified Early Warning Score; Bedside Index of Severity in Acute Pancreatitis; Pancreatitis

**Publication title:** Journal of Emergency Nursing;; JEN; Philadelphia

**Volume:** 46

**Issue:** 2

<b>Pages:</b>	171-179
<b>Publication year:</b>	2020
<b>Publication date:</b>	Mar 2020
<b>Section:</b>	Research
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English
<b>Document type:</b>	Journal Article
<b>DOI:</b>	<a href="https://doi.org/10.1016/j.jen.2019.11.003">https://doi.org/10.1016/j.jen.2019.11.003</a>
<b>ProQuest document ID:</b>	2487205754
<b>Document URL:</b>	<a href="https://www.proquest.com/scholarly-journals/development-national-early-warning-score-calcium/docview/2487205754/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/development-national-early-warning-score-calcium/docview/2487205754/se-2?accountid=211160</a>
<b>Copyright:</b>	©2019. Emergency Nurses Association
<b>Last updated:</b>	2022-10-20
<b>Database:</b>	Public Health Database

Document 18 of 55

# Call to Action: The Need for Best Practices for Boarding the Pediatric Intensive Care Patient in the Emergency Department: JEN

[ProQuest document link](https://www.proquest.com/scholarly-journals/development-national-early-warning-score-calcium/docview/2487205754/se-2?accountid=211160)

## ABSTRACT (ENGLISH)

Introduction In 2015, children presented to emergency departments in the United States more than 30 million times, accounting for more than 20% of all ED episodes.<sup>1,2</sup> Increases in critically ill patients and the overall population of children with special health care needs (CSHCN) who reside at home have led to a subsequent rise in patient acuity.<sup>3</sup> The current status of crowding in emergency departments and hospitals directly affects the care of these pediatric patients, leading to boarding of those requiring intensive care unit (ICU)-level care in the emergency department until appropriate beds become available.<sup>4</sup> Leading experts and governing bodies have identified this boarding and crowding as a major public health concern and a threat to patient safety.<sup>3,5</sup> These experts and government bodies call for research to address both these concerns and other deficiencies that may exist in pediatric emergency care.<sup>3,5</sup> Boarding the ICU patient, or the act of keeping a patient who requires critical care in the emergency department beyond the time of disposition (admit or transfer), reduces the quality of care and potentially increases mortality in adults.<sup>3,4,6</sup> With only 4,044 available pediatric ICU (PICU) beds and 90% of tertiary hospitals in the US reporting crowding, resources for children requiring critical care after presentation to the emergency department are in short supply. [...]it is important to examine the impact, outcomes, and potential improvements for pediatric boarders requiring ICU-level care.

Clinical Concerns Little is known about the outcomes of pediatric boarders, and the data currently available show conflicting results because of the variations in study design and limitations of observational and case studies.<sup>6,7</sup> Some previous studies have suggested commonalities between the effects of both inpatient and ED crowding on ED occupancy rates, the number of pediatric patients boarding in the emergency department, and the overall ED boarding time.<sup>1,7</sup> Additionally, limited studies in mixed adult and pediatric emergency departments have demonstrated increased mortality in patients with longer lengths of stay, including those requiring admission.<sup>8,9</sup> Although this has not been thoroughly examined in dedicated pediatric emergency departments and could be influenced by adult ED boarding populations, as the majority of children are cared for by general community emergency departments, pediatric mortality warrants further attention.<sup>10,11</sup> Given the limited pediatric literature, evaluation of current adult data demonstrates potential outcome-based impacts and clinical concerns for the PICU boarder. Adult patients who meet the ICU criteria are best cared for within the physical ICU itself.<sup>12</sup> Associations can be seen between delays to ICU admissions (particularly more than 6 hours) and increased hospital length of stay and ICU mortality.<sup>12</sup> Increased costs of care and rates of invasive procedures such as insertion of central lines and mechanical ventilation have also been observed.<sup>3,12</sup> Additional clinical concerns focus on the overall safety and risk for decreased quality of care while in the emergency department. [...]crowding also increases the number of patients who leave without being seen (LWBS) by a physician. [...]LWBS rates can be used to measure the consequences of ED crowding.<sup>7</sup> In pediatrics, for every percent increase in LWBS, an associated 9-fold increase in PICU admissions has been reported in recent literature; possible explanations include both the negative effects of crowding on patient outcomes and increased resource devotion to ICU-level patients impacting the LWBS rates.<sup>6</sup>

Potential Mitigating Strategies The American Academy of Pediatrics' Committee on Pediatric Emergency Medicine noted that solutions to ED boarding are complex, expensive, and resource intensive.<sup>4</sup> The Emergency Nurses Association acknowledged that there is no single set of solutions to ED boarding because of the vast differences between facilities;<sup>18</sup> however, numerous potential alleviating factors are offered by governing bodies and described in the literature. Emergency providers, emergency nursing leadership, and appropriate inpatient stakeholders must be actively engaged in examining flow processes both within the emergency department and in inpatient wards to determine opportunities for improvement.<sup>18,20</sup> Flow metrics and goals should be established and accompanied by focused quality projects to address any identified inefficient practices.<sup>19</sup> The known best practices for ED patient flow that should be considered for implementation include immediate bedding, quick registration, split flow (a process aimed at quickly facilitating the care of both emergency and urgent patients), integration of ordering providers in triage, and use of electronic tracking systems.<sup>19,20</sup> Inpatient capacity management must be assessed, and early discharge, specialized operating room, and bed management techniques that optimize flow should be considered.<sup>19</sup> Use of daily hospital-wide, multidisciplinary operational huddles aimed at safely maximizing patient flow has also been described in the literature to positively affect flow.<sup>21</sup> When considering hospital diversion, the American College of Emergency Physicians has suggested that it should be utilized only



when internal resources are exhausted but known outside resources may be available.<sup>20</sup> Adequately addressing patient flow issues takes time and, therefore, requires simultaneous efforts to improve the care of PICU ED boarders while they are still in the emergency department.

## FULL TEXT

### Contribution to Emergency Nursing Practice

- The current literature on boarding patients who require intensive care indicates that similar challenges and safety concerns may exist in pediatric and adult populations. However, there is a paucity of literature that comprehensively addresses pediatric implications.
- This article contributes a literature review on clinical concerns and discussion of potential improved interventions. It identifies the need for focused research for better understanding of overall impact and identification of best practices for pediatric intensive care unit boarders.
- Key implications for emergency nursing practice found in this article are recognition of the risks involved in boarding pediatric patients requiring intensive care and the need to proactively mitigate these risks, ensuring appropriate resources for all patients who present for care.

### Introduction

In 2015, children presented to emergency departments in the United States more than 30 million times, accounting for more than 20% of all ED episodes.<sup>1,2</sup> Increases in critically ill patients and the overall population of children with special health care needs (CSHCN) who reside at home have led to a subsequent rise in patient acuity.<sup>3</sup> The current status of crowding in emergency departments and hospitals directly affects the care of these pediatric patients, leading to boarding of those requiring intensive care unit (ICU)-level care in the emergency department until appropriate beds become available.<sup>4</sup> Leading experts and governing bodies have identified this boarding and crowding as a major public health concern and a threat to patient safety.<sup>3,5</sup> These experts and government bodies call for research to address both these concerns and other deficiencies that may exist in pediatric emergency care.<sup>3,5</sup> Boarding the ICU patient, or the act of keeping a patient who requires critical care in the emergency department beyond the time of disposition (admit or transfer), reduces the quality of care and potentially increases mortality in adults.<sup>3,4,6</sup> With only 4,044 available pediatric ICU (PICU) beds and 90% of tertiary hospitals in the US reporting crowding, resources for children requiring critical care after presentation to the emergency department are in short supply. Therefore, it is important to examine the impact, outcomes, and potential improvements for pediatric boarders requiring ICU-level care.

### Clinical Concerns

Little is known about the outcomes of pediatric boarders, and the data currently available show conflicting results because of the variations in study design and limitations of observational and case studies.<sup>6,7</sup> Some previous studies have suggested commonalities between the effects of both inpatient and ED crowding on ED occupancy rates, the number of pediatric patients boarding in the emergency department, and the overall ED boarding time.<sup>1,7</sup> Additionally, limited studies in mixed adult and pediatric emergency departments have demonstrated increased mortality in patients with longer lengths of stay, including those requiring admission.<sup>8,9</sup> Although this has not been thoroughly examined in dedicated pediatric emergency departments and could be influenced by adult ED boarding populations, as the majority of children are cared for by general community emergency departments, pediatric mortality warrants further attention.<sup>10,11</sup>

Given the limited pediatric literature, evaluation of current adult data demonstrates potential outcome-based impacts

and clinical concerns for the PICU boarder. Adult patients who meet the ICU criteria are best cared for within the physical ICU itself.<sup>12</sup> Associations can be seen between delays to ICU admissions (particularly more than 6 hours) and increased hospital length of stay and ICU mortality.<sup>12</sup> Increased costs of care and rates of invasive procedures such as insertion of central lines and mechanical ventilation have also been observed.<sup>3,12</sup> Additional clinical concerns focus on the overall safety and risk for decreased quality of care while in the emergency department.

In 2002, the Joint Commission reported that half of all sentinel events secondary to delays in treatment occur in emergency departments. Furthermore, ED crowding is cited as the root cause in 31% of these cases.<sup>7</sup> Pediatric patients are at an increased risk of harm, given the need for age-specific and weight-based medication dosing. CSHCN are at a higher risk, given their complex, high-acuity needs and often tenuous stability, with delays in care of even 5 to 10 minutes potentially causing irreversible problems.<sup>1,13</sup> Published research on adult participants also describes harm through demonstrated increased rates of hospital-acquired infections including surgical site infections and ventilator-associated pneumonia, conditions that also occur in pediatric patients.

Numerous factors place the pediatric patient in the emergency department awaiting ICU admission at risk for decreased quality of care. Specialized skills and knowledge are required to appropriately care for ICU patients of various ages, and varying critical care skill levels can be observed in both emergency nurses and providers.<sup>3</sup> In general, ED staff are trained in initial assessment and stabilization. Additionally, they are equipped to provide brief, episodic care, not ongoing longitudinal ICU care.<sup>12,14</sup> Additionally, clinical staffing models may not be able to support the same one-to-one care that is provided in the ICU, given the crowding and high patient acuity.<sup>3</sup> These knowledge, physical, and staffing gaps have resulted in delays in recognition and intervention for organ dysfunction, sepsis, infection, pain, or change in condition.<sup>12,15,16</sup>

When an emergency department is required to board a PICU patient, care is affected beyond the individual patient. Given the increased utilization of resources and attention required in caring for a critically ill child, during high-census time periods, care to other patients may be delayed.<sup>17</sup> Furthermore, as boarders occupy ED beds for a prolonged period of time, they cause outflow delays and crowding.<sup>7</sup> Johnson and Winkelman<sup>15</sup> reported that crowding directly leads to additional delays and increased mortality secondary to inadequate resources with subsequent reduction in the quality of care provided. Such crowding also increases the number of patients who leave without being seen (LWBS) by a physician. Thus, LWBS rates can be used to measure the consequences of ED crowding.<sup>7</sup> In pediatrics, for every percent increase in LWBS, an associated 9-fold increase in PICU admissions has been reported in recent literature; possible explanations include both the negative effects of crowding on patient outcomes and increased resource devotion to ICU-level patients impacting the LWBS rates.<sup>6</sup>

### **Potential Mitigating Strategies**

The American Academy of Pediatrics' Committee on Pediatric Emergency Medicine noted that solutions to ED boarding are complex, expensive, and resource intensive.<sup>4</sup> The Emergency Nurses Association acknowledged that there is no single set of solutions to ED boarding because of the vast differences between facilities;<sup>18</sup> however, numerous potential alleviating factors are offered by governing bodies and described in the literature. Interventions must be data driven and problem oriented.<sup>18</sup> Improvement of best practices can be categorized into focused quality improvement on patient flow, adoption of ED boarding care best practices (when it must occur), and prevention through engagement at the primary care level.<sup>4,18,19</sup> At this time, there is little evidence available to make distinct recommendations on the care of the PICU ED boarder.<sup>18</sup> However, given commonalities in the effects of crowding between adult and pediatric patients, it is important to consider and evaluate all available options for feasibility and potential impact.

As previously discussed, patient flow through both the emergency department and hospital directly affects the

practice of having to board ED patients. Emergency providers, emergency nursing leadership, and appropriate inpatient stakeholders must be actively engaged in examining flow processes both within the emergency department and in inpatient wards to determine opportunities for improvement.<sup>18,20</sup> Flow metrics and goals should be established and accompanied by focused quality projects to address any identified inefficient practices.<sup>19</sup> The known best practices for ED patient flow that should be considered for implementation include immediate bedding, quick registration, split flow (a process aimed at quickly facilitating the care of both emergency and urgent patients), integration of ordering providers in triage, and use of electronic tracking systems.<sup>19,20</sup> Inpatient capacity management must be assessed, and early discharge, specialized operating room, and bed management techniques that optimize flow should be considered.<sup>19</sup> Use of daily hospital-wide, multidisciplinary operational huddles aimed at safely maximizing patient flow has also been described in the literature to positively affect flow.<sup>21</sup> When considering hospital diversion, the American College of Emergency Physicians has suggested that it should be utilized only when internal resources are exhausted but known outside resources may be available.<sup>20</sup>

Adequately addressing patient flow issues takes time and, therefore, requires simultaneous efforts to improve the care of PICU ED boarders while they are still in the emergency department. Chalfin<sup>22</sup> noted that optimal critical care services are those that respond to and care for the patient wherever and whenever the need arises. The ideal system rapidly identifies potential ICU patients and then expeditiously facilitates required care and interventions.<sup>23</sup> The American College of Emergency Physicians has suggested that care of these patients should be led by an appropriate inpatient provider and if transfer to the inpatient unit is delayed, the hospital must supply supplemental nursing staff to care for them.<sup>20</sup> Clear delineation of responsibility between the emergency department and admitting team must occur; this can be further facilitated through the use of customizable “holding orders/order sets.”<sup>24</sup> Close attention should be given to ordering of unfamiliar medications, especially with CSHCN.<sup>13</sup> Given that critical care patients require a higher level of care, attention to safety, initiation of evidence-based interventions, and addressing nursing educational gaps are of utmost importance. Nursing care should include harm-prevention efforts such as adherence to guidelines for prevention of ventilator-associated pneumonia, central line–associated bloodstream infections, catheter-associated urinary tract infections, hospital-acquired pressure injury, and other hospital-acquired infections.<sup>25</sup> Such interventions may include creation of ED standards for elevation of head of bed, safe central line access, and frequent skin assessment with associated methods for pressure reduction. Frequent monitoring to ensure optimization of hemodynamics, as well as initiation of a sedation scoring tool with associated interventions, should also be incorporated into the care the emergency nurse provides to PICU ED boarders.

Finally, proactive prevention of ED boarding starts at the primary care level. The Committee on Pediatric Emergency Medicine<sup>4</sup> has described a model of working to build capacity to manage care outside the emergency department. Primary care providers should provide age-appropriate anticipatory guidance on how to manage acute illness or injury. This should include a review of when to call the office, poison control, or 911, as well as what situations require urgent care or ED services. By educating and empowering parents and caregivers before an event, unnecessary ED visits may be prevented, thereby decreasing the overall ED crowding burden.

### **Nursing Practice Implications**

Outside of their role as care providers, emergency nurses are key facilitators of ED flow, and any improvement efforts require their participation and leadership for success. Emergency nurses must first understand how crowding affects overall practice and ED boarding and then work to comprehensively alleviate these issues.<sup>15</sup> Nursing action plans must address appropriate staffing, education, protocols, and equipment for caring for boarded patients of all ages.<sup>19</sup> Special attention should be paid to pediatric-specific concerns, including increased risk for medication errors, unique needs of CSHCN, and pediatric caveats to early recognition of those at risk for organ failure.

## Future Directions

Further research is needed to better understand the true epidemiological impact of pediatric patients throughout the health care system. This should include the overall ED boarding burden as compared with adult populations, the impact of delayed transfers to tertiary centers, and the ED boarding phenomenon occurring in dedicated pediatric emergency departments. To further examine PICU-specific outcomes, larger cohort studies evaluating the same population with the same measures are required. These data from large cohort studies can be used to develop clinical care practice initiatives that can be implemented within the ED environment. Given the current limitations to pediatric-specific ICU boarding practices, evidence-based practice projects influenced by related adult-specific care practices should be considered. To enhance quality of care, identification of appropriate methods to support emergency nurses in real-time at the point of care should be developed, such as just-in-time tip sheets or designated clinical resources within the hospital. Finally, nursing-driven improvement to both ED patient flow and inpatient flow must be prioritized to free up appropriate available personnel resources to facilitate safe acuity-based staffing ratios.

## Conclusion

As the number of children requiring emergency care continues to outpace the number of available resources, it is imperative that emergency nurses are aware of and work to mitigate the effects of boarding a pediatric patient requiring ICU-level care. Safe care of these patients demands an understanding of their unique risks and vulnerabilities and a proactive approach to optimizing outcomes. Until further research can more clearly inform best practice, emergency departments should look to governing bodies and applicable adult literature for guidance on maximizing the care of these vulnerable patients.

## Author Disclosures

Conflicts of interest: none to report.

## DETAILS

<b>Subject:</b>	Workforce planning; Emergency medical care; Experts; Beds; Public health; Patients; Health care expenditures; Mortality; Hospitals; Physicians; Emergency services; Early discharge; Best practice; Length of stay; Pediatrics; Invasive; Leadership; Patient safety; Clinical outcomes; Artificial respiration; Crowding; Nosocomial infections; Adults; Management techniques; Patient admissions; Nursing; Hospitalization; Intensive care; Integrated services; Critical care; Inpatient care
<b>Business indexing term:</b>	Subject: Workforce planning Best practice
<b>Location:</b>	United States--US
<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	2
<b>Pages:</b>	150-153
<b>Publication year:</b>	2020

<b>Publication date:</b>	Mar 2020
<b>Section:</b>	Clinical
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English
<b>Document type:</b>	Journal Article
<b>DOI:</b>	<a href="https://doi.org/10.1016/j.jen.2019.10.009">https://doi.org/10.1016/j.jen.2019.10.009</a>
<b>ProQuest document ID:</b>	2487205745
<b>Document URL:</b>	<a href="https://www.proquest.com/scholarly-journals/call-action-need-best-practices-boarding/docview/2487205745/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/call-action-need-best-practices-boarding/docview/2487205745/se-2?accountid=211160</a>
<b>Copyright:</b>	©2019. Emergency Nurses Association
<b>Last updated:</b>	2022-10-20
<b>Database:</b>	Public Health Database

Document 19 of 55

# Optimizing Patient Outcomes in Emergency Cardiac Care Through Advances in Technology: Nurse Scientists in Action: JEN

[ProQuest document link](#)

## ABSTRACT (ENGLISH)

Cardiovascular disease is the top killer in the United States and worldwide, and cardiovascular emergencies account for approximately 10% of all ED visits in the US.<sup>1,2</sup> More than 8 million patients with chest pain and/or anginal

equivalent symptoms (eg, shortness of breath and diaphoresis) present to emergency departments each year, accounting for the second most common cause of ED visits for adults.<sup>2</sup> In 2019 alone, it was estimated that every 40 seconds, 1 American would suffer from an acute myocardial infarction, nearly 720,000 would suffer from a new coronary event, and approximately 335,000 would have a recurrent cardiac event.<sup>3</sup> Emergency nurses are often the first point of contact for individuals presenting with cardiac symptoms. AF is the most frequent arrhythmia seen in the emergency department, and if left untreated, individuals are at increased risk of mortality, stroke, left ventricular dysfunction, and heart failure.<sup>19</sup> AF is treated with beta blockers or calcium channel blockers; yet, patients in the emergency department often receive doses exceeding guideline-recommended doses. [...]the number of nonactionable alarms decreased with no reports of adverse patient outcomes.

## FULL TEXT

This issue of the *Journal of Emergency Nursing (JEN)* is focused on cardiovascular disease, a growing concern among our aging population and beyond. Cardiovascular disease is the top killer in the United States and worldwide, and cardiovascular emergencies account for approximately 10% of all ED visits in the US.<sup>1,2</sup> More than 8 million patients with chest pain and/or anginal equivalent symptoms (eg, shortness of breath and diaphoresis) present to emergency departments each year, accounting for the second most common cause of ED visits for adults.<sup>2</sup> In 2019 alone, it was estimated that every 40 seconds, 1 American would suffer from an acute myocardial infarction, nearly 720,000 would suffer from a new coronary event, and approximately 335,000 would have a recurrent cardiac event.<sup>3</sup> Emergency nurses are often the first point of contact for individuals presenting with cardiac symptoms. We are required to differentiate rapidly between life-threatening conditions and non-life-threatening ones and determine accurately which course of treatment will result in optimal patient outcomes.<sup>4</sup>

Acute coronary syndrome (ACS) is a spectrum of clinical syndromes (ST-elevation myocardial infarction, non-ST elevation myocardial infarction, and unstable angina) reflecting the progression of coronary artery occlusion.<sup>5</sup> Time is of the essence as myocardial infarction ensues after 20 minutes, and complete necrosis of myocardial cells can occur after 2 to 6 hours with total artery occlusion.<sup>6,7</sup> Prolonged ischemic time (duration and extent of ischemia) is associated with poor outcomes (eg, death and heart failure).<sup>8</sup> Early symptom recognition and intervention to restore blood flow to the affected artery within 30 minutes have the potential to prevent or minimize these events.<sup>9,10</sup> ACS is often an elusive and challenging diagnosis that depends on rapid assessment, triage, and risk stratification.<sup>11</sup> Emergency nurses are charged with identifying and recognizing quickly individuals who present with symptoms suggestive of ACS. Symptom recognition and timely reperfusion minimize ischemic time, salvage the myocardium, preserve left ventricular function, and improve survival.<sup>12-16</sup> We rely on assessment and triage for rapid clinical decision making, such as the acquisition of an electrocardiogram (ECG) within 10 minutes of presentation to the emergency department.<sup>13,17</sup> I suspect it is the combination of the excitement and challenge of these encounters that draws many of us to the field of emergency nursing.

Technology offers us new opportunities to refine the assessment and triage of cardiac patients in the emergency department. In this issue of *JEN*, we learn about the innovative ways in which clinicians are integrating rapidly evolving technology to advance patient care and improve outcomes. Pon et al<sup>18</sup> report on their quality improvement project to evaluate the causes of high dilTIAZem dosing for individuals presenting to the emergency department with atrial fibrillation (AF). AF is the most frequent arrhythmia seen in the emergency department, and if left untreated, individuals are at increased risk of mortality, stroke, left ventricular dysfunction, and heart failure.<sup>19</sup> AF is treated with beta blockers or calcium channel blockers; yet, patients in the emergency department often receive doses exceeding guideline-recommended doses. After identifying that nearly 70% of initial dilTIAZem doses were outside the recommended range (weight-based), Pon et al<sup>18</sup> developed and tested a novel text message notification system to monitor dilTIAZem dosing in their emergency department. The authors provided staff education after identifying knowledge deficit as a primary reason for these medication errors. Pon et al<sup>18</sup> improved care for ED patients with AF through technology.

Another way technology is evolving quickly is through cardiac monitoring. Cardiac monitoring, which includes 12-

lead ECG and bedside monitors, enables clinicians to detect arrhythmias, myocardial ischemia, and QT-interval measurements in real time. Cardiac monitoring was first introduced nearly 60 years ago for critically ill patients and focused on heart rate measurement and fatal arrhythmia detection.<sup>20</sup> Today, cardiac monitoring technologies are evolving quickly and being implemented across a variety of settings, including prehospital. Emergency nurses rely on the information provided by monitor devices for minute-to-minute clinical decision making. When individual parameters fall outside alarm thresholds for a few seconds, alarms are triggered in either audible or visual text message format. Many of these alarms are false or clinically irrelevant, leading to alarm fatigue. Alarm fatigue is a national patient safety hazard issue and occurs when nurses are desensitized by numerous alarms, which can lead potentially to patient injury or death.<sup>21</sup>

In this issue of *JEN*, we learn about strategies to manage alarm fatigue in the emergency department. Fujita and Choi<sup>22</sup> conducted a practice improvement project to implement and evaluate a program to reduce the number of clinically nonactionable physiological alarms in the emergency department. Using the Iowa Model of Evidence-Based Practice to guide their framework, Fujita and Choi<sup>22</sup> adjusted alarm default settings and implemented an education plan regarding safety and alarms. As a result, the number of nonactionable alarms decreased with no reports of adverse patient outcomes. The authors should be commended because this is the first project to our knowledge that addresses this complex and critical patient safety issue in the ED setting.

My clinical experiences as an emergency nurse directly inform my program of research, which aims to enhance the diagnostic accuracy of ACS and other time-sensitive cardiovascular conditions through noninvasive monitoring. I became intrigued by physiological monitoring at my first job in a rural emergency department, when local emergency medical services began transmitting ECGs from the field. I witnessed how ECGs provided critical information regarding the patients before their arrival at the hospital, which is a highly vulnerable period for individuals suffering from acute myocardial ischemia/infarction.<sup>23,24</sup> As a nurse scientist, I continue to be curious about how technologies not only provide physiological data regarding an individual but also have the potential to enhance access to life-saving care. This may be demonstrated by the use of drones to deliver automatic external defibrillators in hard-to-reach places.<sup>25,26</sup>

As articles in this issue of *JEN* illustrate, we are exploring innovative strategies that integrate an array of technology to optimize care and outcomes for patients with cardiovascular conditions, and beyond. I think it is important to note that these technologies will not replace our critical skills of triage and risk stratification, but rather augment them. Our work to improve patient outcomes, however, is far from done. Research in emergency cardiac care remains challenging and limited by a variety of barriers. These include, but are not limited to, time constraints, physical symptoms, emotional stress, and cognitive impairment.<sup>27</sup> There are not clear or established ethical standards to consenting conscious individuals in the emergency setting. Emergency research, moreover, inherently crosses a wide range of conditions, many in which patients are not conscious. I believe emergency nurses are in a position to lead this charge and conduct future research that informs clinical decision making. I suspect we will continue to embrace the challenges, and the fast pace that emergency nursing promises us, through research, innovation, and patient care.

## DETAILS

**Subject:** Physiology; Acute coronary syndromes; Emergency medical care; Atrial fibrillation; Heart failure; Electrocardiography; Nurses; Recurrent; Clinical outcomes; Symptoms; Patient safety; Ventricular dysfunction; Cardiac arrhythmia; Heart attacks; Decision making; Cardiovascular disease; Evidence-based nursing; Veins & arteries; Cardiovascular diseases; Myocardial infarction; Calcium channel blockers; Ischemia; Technology; Chest pain; Dosage; Emergency services; Clinical decision making; Beta blockers

<b>Location:</b>	United States--US
<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	2
<b>Pages:</b>	136-138
<b>Publication year:</b>	2020
<b>Publication date:</b>	Mar 2020
<b>Section:</b>	Guest Editorial
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English
<b>Document type:</b>	Editorial
<b>DOI:</b>	<a href="https://doi.org/10.1016/j.jen.2020.01.007">https://doi.org/10.1016/j.jen.2020.01.007</a>
<b>ProQuest document ID:</b>	2487205722
<b>Document URL:</b>	<a href="https://www.proquest.com/scholarly-journals/optimizing-patient-outcomes-emergency-cardiac/docview/2487205722/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/optimizing-patient-outcomes-emergency-cardiac/docview/2487205722/se-2?accountid=211160</a>
<b>Copyright:</b>	©2020. Emergency Nurses Association
<b>Last updated:</b>	2023-08-21
<b>Database:</b>	Public Health Database



# Creating the Future: Collaborative Practice Between Emergency and Critical Care Nurses: JEN

[ProQuest document link](#)

---

## ABSTRACT (ENGLISH)

In a classic multihospital study in which the outcomes of intensive care were evaluated,<sup>1</sup> important differences were found between predicted and observed death rates. Additional outcomes associated with collaboration among health care providers included decreased patient complaints, fewer errors in patient care, increased patient satisfaction, possible decreased patient care costs, improved job stability and satisfaction, and improved quality of patient care.<sup>2,3</sup> We are aware of the repercussions of lack of collaboration. Emergency nursing is characterized by patients of diverse ages and acuity levels with unpredictable health problems. The emergency nurse often focuses on prevention—the ED visit may be the patient's only encounter with the health care system.

## FULL TEXT

•This article was originally published in *JEN* in the June issue of 1992;18(3):183-185.

I was angry enough to cuss. I put down the telephone receiver after calling the cardiac care unit (CCU) to give report. I was told "The nurse is not ready to receive report" and "will call back when ready." I was going to discuss the issue with the CCU receiving nurse, but I could not get her to come to the phone. "She is busy," explained the unit clerk who took the call. Of course, by this time I was furious because I did not have the time to go to the bathroom but somehow did manage to assess my patients! I mentally noted the time. I would fix that CCU nurse! She would hear from me every 5 minutes until she *took* report. Better yet, I would show up in the unit unannounced and she could just deal with the patient.

Does this scenario sound familiar? I would bet that the CCU nurse could share a similar story—from a different perspective. Something to the effect of, "That ED nurse is always calling me! Doesn't she know I have got to move Mr. Weber out before I can accept the new patient? Housekeeping only moves so fast."

On the way home that evening, I thought about the battles that ICU and emergency nurses fight. I would like to share some of the insights that I have gained from battles I have participated in during 14 years of emergency and ICU nursing experience and from the literature in this area.

### Concept of Collaboration

For collaboration to occur between emergency and critical care nurses, each nurse must have a basic level of understanding and acceptance of the other's practice area. There must be mutual respect for each person's practice area. Collaboration involves assertiveness (meeting personal needs) and cooperation (meeting the needs of others); it allows us to accomplish more than we could do individually.

In a classic multihospital study in which the outcomes of intensive care were evaluated,<sup>1</sup> important differences were found between predicted and observed death rates. In some institutions, patients who were expected to die because of the severity of their condition recovered. In other institutions, patients who were expected to recover had additional complications or died. The differences in outcome appeared to be related to the interaction and communication between nurses and physicians. Additional outcomes associated with collaboration among health care providers included decreased patient complaints, fewer errors in patient care, increased patient satisfaction, possible decreased patient care costs, improved job stability and satisfaction, and improved quality of patient care.<sup>2,3</sup>

We are aware of the repercussions of lack of collaboration. Patients and families may be uncomfortable with displays of animosity between members of different departments; they may feel less trust if it seems to them that staff members themselves do not trust each other. Self-fulfilling prophecy is another problem. Nurses in the other unit may perform as they are “expected” to do. For example, the critical care nurse may in fact *not* tell the emergency nurse when the bed is ready. Ultimately, lack of collaboration decreases nursing’s own power base to enact system changes.

Ironically and unfortunately, nurses who collaborate with those in another unit may be viewed as “traitors” because they do not support the views of most of the nurses in their department. How did this situation arise?

### **Sources of Conflict**

The emergency nurse works on the principle of triage. Not all ED patients are given the same “level” of care or the same degree of nursing resources. At times, it may be best to find an alternative setting for the patient to receive care (such as a clinic). Unlike the ICU, the emergency department is a patient-controlled, not nurse-controlled, environment. Census is unpredictable. There are many nonnursing and general nursing functions (such as restocking linen and moving patients) as well as critical care functions. Emergency nursing is characterized by patients of diverse ages and acuity levels with unpredictable health problems. The emergency nurse often focuses on prevention—the ED visit may be the patient’s only encounter with the health care system.

In comparison, intensive care nursing developed in the 1960s with the advent of CPR, better treatment of hypovolemic shock, better prehospital transport services, technologic interventions that required closer observations than could be achieved on the floor, and organ transplantation. Patients were admitted for nursing care.<sup>4</sup>

Technologic advances have created increased specialization and fragmentation, so each unit focuses on specific patient problems. Patients may remain for a long time and the ICU nurse may encounter more patients who die. Critically ill patients require constant individual nursing attention and a smaller nurse to patient ratio. Fewer patients are able to communicate verbally.

Emergency nursing originated to assist the physician whereas critical care nursing originated to monitor the patient. Emergency nurses therefore function frequently in an interdependent role and critical care nurses function more independently under protocols and standing orders. The critical care nurse may not understand why an emergency nurse did not initiate an action and only later “get” an order and may therefore view the emergency nurse as passive. However, the emergency nurse deals with a multitude of physicians. Emergency nurses feel a strong responsibility to get each patient “accepted by a physician” and medically treated, in addition to providing nursing care. Bridges cannot be burned or medical care for the patient may be compromised.

Emergency nurses may not be viewed by critical care nurses as providing holistic care. The emergency nurse’s interaction with the patient and family may be so brief and episodic as to preclude an accurate assessment of psychosocial and spiritual needs. The critical care nurse has more opportunity to foster a stable interpersonal relationship. The emergency nurse may view the critical care nurse as simply a “machine manager.” Technology may have been the reason for creating the ICU, but in reality the critical care nurse uses data from many sources in formulating nursing diagnoses. The emergency nurse must have a broad knowledge base of the diversity of patient problems encountered in the emergency department. The critical care nurse usually has in-depth knowledge of a particular patient population. Each may view the other as having a knowledge deficit.

Emergency nurses have to compromise care because of the patient census. Critical care nurses may view these compromises as resulting in less than adequate nursing care because they may not understand what an unpredictable patient census does to the nurse to patient ratio.

### **Barriers to Collaboration**

Differences between expectations of a nurse's role and its actual execution interfere with collaboration. For example, the critical care nurse may expect the emergency nurse to "clean a patient up" or the emergency nurse may expect the critical care nurse to come to get a critical patient when the emergency department is busy. Existing language, values, and behaviors may support animosity. Turning one's back to someone during a verbal report or saying, "Just leave the chart on the table," are behaviors that indicate what the other nurse has to say is not important.

Repeatedly calling the ICU to see if the bed is ready indicates that the ICU staff is not trusted.

As illustrated in the scenario at the beginning, patient transfers between the emergency department and ICU can produce multiple conflicts. The timing of transfer may never be convenient for both units. The critical care nurse may believe that a patient is not ready to be transferred from the emergency department because of a still unstable condition and need for physician involvement. The emergency nurse may see the patient as stable enough to be transferred because more critically ill patients are arriving. Poor information exchange surrounding the transition of patients may produce conflict.<sup>5</sup>

Lack of accountability for actions may produce conflict: "It did not happen on my shift." "Someone else transcribed the order." "No one told me we were getting a new admit." Differences in basic nursing educational preparation and in qualifications for certification may discourage collaboration. Nurses may not assume the clinical competence of their peers because of the diversity of academic preparation (e.g., associate degree vs baccalaureate degree).

Nurses often must prove their clinical competence.

### **Strategies to Enhance Collaboration**

Administration and staff must work to create an environment conducive to collaboration. Interviewing staff members individually can identify sources of conflict; so can written surveys. Decentralized nursing leadership and nursing participation on decision-making committees can facilitate collaboration. Job descriptions that reflect accountability and responsibility and evaluation of nurses on these aspects can promote professional behavior. Nursing policies that influence both ICU and emergency department should be jointly developed by the two staffs. Interdepartmental committees with rotating chairs can promote collaboration. An adequate supply of equipment and a system for keeping the equipment functioning helps to eliminate controversy over equipment.

Emergency and critical care nurses can use observational time in each other's units to facilitate a better understanding of the practice area. Continuing education credit can even be given for such observation. After the experience, participants can relate perceptions of the other nurses' role to a group of both emergency nurses and critical care nurses. This encourages validation and clarification of perceptions. Joint educational offerings also allow nurses to meet one another outside of the patient care setting. This may increase the nurses' ability to see different perspectives and allow identification of common goals.

Marketing services to the community that demonstrate the interface between ICU and emergency department (e.g., comprehensive cardiac care or trauma care) may foster collaboration internally. Community projects that present a unified approach to outsiders and involve a goal of both practice areas (e.g., injury prevention programs) also promote collaboration.

We need to understand the histories and traditions of other nursing specialties. Reading journals targeted to those specialties can enhance appreciation of their clinical concerns. Clarifying personal expectations of nurses from the other unit will improve collaboration.<sup>6</sup> Emphasizing similarities of the practice areas may dispel myths and stereotypes. Conducting joint nursing rounds may allow the emergency nurse to appreciate the impact of interventions during resuscitation on outcomes (both positive and negative) and allow the critical care nurse to form a better picture of the emergency nurse's concerns during the resuscitation.

A short report sheet with equipment listed and necessary drug therapy could be sent to the intensive care unit

15 minutes ahead of patient transfer to allow staff time to set up and get supplies. Integrated critical care records can eliminate separate documentation and provide a formal mechanism for communication between nurses. Follow-up reports to emergency nurses would allow both departments to identify the importance of each other's clinical interventions.

In summary, we share certain commonalities regardless of practice setting. Competence, commitment, and compassion are necessary aspects of all of our nursing practices. Collaboration between emergency and critical care nurses may have unexpected benefits. United, nurses from two areas can effect more change from administration than either group could do alone.

I am saving my energy for bigger battles. In times of crisis—multicasualty events or Desert Storms—emergency and critical care nurses have united. Let us put aside our differences and focus on what we *share*. The next time you call the unit, why not invite the ICU nurse to lunch? At the very least, it will make sure that you both take the time to eat!

## DETAILS

<b>Subject:</b>	Clinical competence; Emergency medical care; Clinical outcomes; Censuses; Collaboration; Patients; Health care expenditures; Patient satisfaction; Health care; Intensive care; Nursing care; Health problems; Complaints; Unpredictable; Nurses; Critical incidents; Medical personnel; Critical care; Accountability; Emergency services
<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	2
<b>Pages:</b>	147-149
<b>Publication year:</b>	2020
<b>Publication date:</b>	Mar 2020
<b>Section:</b>	ENA 50th Anniversary
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English

<b>Document type:</b>	Journal Article
<b>DOI:</b>	<a href="https://doi.org/10.1016/j.jen.2019.12.012">https://doi.org/10.1016/j.jen.2019.12.012</a>
<b>ProQuest document ID:</b>	2487205706
<b>Document URL:</b>	<a href="https://www.proquest.com/scholarly-journals/creating-future-collaborative-practice-between/docview/2487205706/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/creating-future-collaborative-practice-between/docview/2487205706/se-2?accountid=211160</a>
<b>Copyright:</b>	©2019. Emergency Nurses Association
<b>Last updated:</b>	2021-04-09
<b>Database:</b>	Public Health Database

Document 21 of 55

## Editorial Board: JEN

[ProQuest document link](#)

### FULL TEXT

\_TVM:UNDEFINED\_

### DETAILS

<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	2
<b>Pages:</b>	A7-A8
<b>Publication year:</b>	2020
<b>Publication date:</b>	Mar 2020
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing

ISSN:	00991767
e-ISSN:	15272966
Source type:	Scholarly Journal
Language of publication:	English
Document type:	General Information
DOI:	<a href="https://doi.org/10.1016/S0099-1767(20)30015-5">https://doi.org/10.1016/S0099-1767(20)30015-5</a>
ProQuest document ID:	2487205701
Document URL:	<a href="https://www.proquest.com/scholarly-journals/editorial-board/docview/2487205701/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/editorial-board/docview/2487205701/se-2?accountid=211160</a>
Copyright:	Copyright Elsevier Limited Mar 2020
Last updated:	2021-02-14
Database:	Public Health Database

Document 22 of 55

# Knowledge Translation of Science Advances Into Emergency Nursing Practice With the Reach, Effectiveness, Adoption, Implementation, and Maintenance Framework: JEN

[ProQuest document link](#)

## ABSTRACT (ENGLISH)

The themes for this issue include ED flow and crowding,<sup>1,2</sup> critical care,<sup>1,3–8</sup> vascular emergencies,<sup>6,7,9,10</sup> and cultural or organizational patient-centered care.<sup>11,12</sup> Emergency nurses strive to develop and implement evidence-based interventions, which are often pragmatic interventions. [...]JEN readers practice in widely diverse emergency settings. To support the consistent spread of effective emergency nursing innovations across these diverse settings, this editorial introduces the Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) Planning and Evaluation Framework for integrating scientific advances with emergency nursing practice.<sup>13,14</sup> All evidence-based guidelines and interventions, however widely adopted in our current time, were born as a single idea. There are no exclusion criteria to receive care in the emergency department. [...]frameworks that fully address generalizability are essential to understand an intervention's relevance and priority in future emergency care and ongoing prospective research. The RE-AIM Framework is often used with another planning and evaluation tool called the Pragmatic Explanatory Continuum Indicator Summary (PRECIS-2) for insights on how broadly generalizable to emergency nursing practice the project is or will be.<sup>21</sup> As an emergency specialty, we face a timely

opportunity to improve the research and evaluation design when testing an intervention with a quality improvement or pragmatic design.<sup>22</sup> Randomized controlled trials of interventions that randomize individual patients or randomize clinical practice sites enhance confidence in the results, but require substantial resources and may limit the real-world clinical practice generalizability.

## FULL TEXT

Jessica Castner, PhD, RN, CEN, AE-C, FAEN, FAAN

I'm thrilled to introduce this second issue of the *Journal of Emergency Nursing (JEN)*, published as part of the 50th anniversary celebrations of the Emergency Nursing Association (ENA). The themes for this issue include ED flow and crowding,<sup>1,2</sup> critical care,<sup>1,3-8</sup> vascular emergencies,<sup>6,7,9,10</sup> and cultural or organizational patient-centered care.<sup>11,12</sup>

Emergency nurses strive to develop and implement evidence-based interventions, which are often pragmatic interventions. Moreover, *JEN* readers practice in widely diverse emergency settings. To support the consistent spread of effective emergency nursing innovations across these diverse settings, this editorial introduces the Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) Planning and Evaluation Framework for integrating scientific advances with emergency nursing practice.<sup>13,14</sup>

All evidence-based guidelines and interventions, however widely adopted in our current time, were born as a single idea. Nurses who provide direct patient care are positioned ideally to create care innovation ideas. Most emergency nurses are well versed in the Plan-Do-Study-Act quality improvement process of rapid, incremental, and consistent practice changes.<sup>15</sup> However, the process to test adequately the efficacy and effectiveness of an intervention to justify the full adoption and spread of the idea requires additional planning, testing designs, and resources. In this issue of *JEN*, Gillespie and Moon<sup>16</sup> provide a summary and overview of funding opportunities to test these nursing care ideas. Furthermore, when practicing emergency nurses present an idea to improve patient outcomes, several published processes and frameworks exist to guide them to refine, communicate, justify, test, and spread their new intervention. For example, in this issue of *JEN*, Fujita and Choi<sup>10</sup> planned their idea to customize patient monitor alarm settings by using the Iowa Model of Evidence-Based Practice to Promote Quality Care.<sup>17</sup> The Iowa model is reprinted in this current issue for ongoing reader reference.<sup>10 (p. 191)</sup> The nursing discipline uses the Iowa model frequently to improve patient care by identifying a practice problem and linking validated evidence-based solutions from a patient's and an organization's standpoint. To advance through the evidence-based process in this Iowa model, the nurses' idea or identified problem must also be a priority for the employing organization. Many brilliant and potentially impactful ideas that are generated by patients, nurses, and scientists may not align with the priorities of the emergency department or hospital organization, so other frameworks and resources are required to optimize innovations.

A myriad of research-to-clinical practice frameworks have been published. By 2012, Tabak et al<sup>18</sup> had already identified more than 60 theoretical models and frameworks, above and beyond quality improvement models, for the evidence-based dissemination and implementation of research-to-practice innovations. The review by Tabak et al<sup>18</sup> provides a convenient analysis for the reader to select a guiding project framework, depending on the level of intervention one desires to change: policy, system, community, organization, and/or individual. As a National Institutes of Health federally funded study in the United States, the Tabak et al<sup>18</sup> paper is publicly accessible on PubMed Central without cost to the reader at this time. A case study exemplar in this publication used the RE-AIM Planning and Evaluation Framework for a diabetes self-management intervention. Other useful, open access papers to guide the selection of an implementation framework include the works by Rankin et al<sup>19</sup> and Nilsen<sup>20</sup>. Rankin et al<sup>19</sup> introduce core implementation science definitions and principles, whereas Nilsen<sup>20</sup> categorizes several models relevant to their utility in (1) describing the process of knowledge translation to practice, (2) understanding or explaining what influences implementation, and (3) evaluating the implementation's success. RE-AIM falls into this third category as an evaluation framework to plan and measure successful implementation.<sup>13,19,20</sup>

## RE-AIM

The RE-AIM Framework is multilevel, and generally used to plan and evaluate behavior change interventions for

individual patient, staff, and setting levels.<sup>13,14</sup> At the individual level the “RE-” stands for Reach, Effectiveness, and Maintenance. At the staff and/or setting level, “AIM” stands for Adoption, Implementation, and Maintenance. <sup>Table 1</sup> includes definitions for each RE-AIM dimension and examples for emergency nursing. A visual depiction of the full RE-AIM Framework is included in the online <sup>Supplementary Figures 1 and 2</sup>, which include a link to an internet video explaining the framework. The strengths and usefulness of the RE-AIM Framework for emergency nursing interventions include the relevance to context, representativeness, and external generalizability. External generalizability refers to the extent to which an evidence-based intervention works as intended across different settings, populations, situations, and contexts. There are no exclusion criteria to receive care in the emergency department. Therefore, frameworks that fully address generalizability are essential to understand an intervention’s relevance and priority in future emergency care and ongoing prospective research.

Emergency clinicians and leaders can use the RE-AIM tool to evaluate their own novel practice innovations implemented at their site, or to critically appraise if a published intervention is applicable to their practice site.<sup>13</sup> If a published intervention is relevant to their practice site, emergency clinicians and leaders can use RE-AIM further to generate a plan to implement these published ideas at their site. The multilevel dimensions of the RE-AIM Framework resonate with how emergency nurses frequently solve problems, with pragmatic behavior change interventions addressing both the patient and contextual clinical environments. This type of pragmatic behavior change intervention is often undervalued, as we currently practice in a time when substantial interdisciplinary research resources and infrastructure have been committed to the development and testing of medications and medical devices. These past investments have resulted in an unbalanced overvaluation of the type of study design needed to determine the cause-and-effect relationships of an intervention, compared with projects designed to ascertain generalizability to the population level and tailored implementation across diverse clinical practice settings.

<sup>Table 2</sup> lists the generic phases of clinical trials aimed to test these cause-and-effect relationships and reduce the uncertainty of other influences causing the change in health. However, just because we have a high level of confidence that 1 particular intervention improves health, it does not mean that this intervention will be used widely in diverse practice settings, be valued by patients, demonstrate cost effectiveness, reduce health disparities, or produce the desired effect in complex patients with untested comorbidities, environmental or social risks. Emergency nursing research and practice improvement projects often address these later effectiveness-focused phases of clinical practice translation to test if the ideas work across the full range of patients who might benefit. Furthermore, many emergency nursing interventions did not begin from laboratory or animal testing research. The RE-AIM Framework is often used with another planning and evaluation tool called the Pragmatic Explanatory Continuum Indicator Summary (PRECIS-2) for insights on how broadly generalizable to emergency nursing practice the project is or will be.<sup>21</sup>

As an emergency specialty, we face a timely opportunity to improve the research and evaluation design when testing an intervention with a quality improvement or pragmatic design.<sup>22</sup> Randomized controlled trials of interventions that randomize individual patients or randomize clinical practice sites enhance confidence in the results, but require substantial resources and may limit the real-world clinical practice generalizability. Testing interventions as part of a multisite network is ideal. Example networks include the Veterans Health Administration’s Quality Enhancement Research Initiative (QUERI), the Michigan Emergency Department Improvement Collaborative (MEDIC), and the Pediatric Emergency Care Applied Research Network (PECARN).<sup>23-25</sup> It remains unclear how successfully direct care emergency nursing and patient priorities will integrate with the management and payer priorities in selecting topics to study in these networks. Working in a non-network setting or not having political access to network decision makers should never preclude an emergency nurse’s good intervention idea from development and testing resources. As an exemplar to disseminate a potential single-site intervention developed with limited resources for future network multisite testing, Pop et al<sup>11</sup> used the Template for Intervention Description and Replication (TIDieR) checklist and guide to report transparently on their falls precaution bundle.<sup>26</sup> *JEN* enthusiastically welcomes TIDieR-formatted submissions for our sections from emergency nurses engaged in the initial but resource-limited development, tailoring, and testing of clinical interventions. In this manner, *JEN* might



serve as a dissemination and knowledge translation vehicle to connect bright, practice-based improvement ideas yet to be tested rigorously for consideration in future expert multisite network testing designs. Regression discontinuity designs are feasible for a single site study and can be less costly and resource intensive than a randomized or step-wedge trial. See <sup>Box 1</sup> for more details on this design with the Fujita and Choi example.<sup>10</sup> Moreover, however rigorous, the clinical content of the findings in the Fujita and Choi study requires critical appraisal for clinical context and precision patient applicability. For example, whereas Fujita and Choi<sup>10</sup> seek to standardize overall unit care by reducing largely the number of clinically irrelevant alarms, London et al<sup>6</sup> call for personalized increases in QT interval monitoring for high-risk patients with rare but fatal signs and symptoms of long QT syndrome. *JEN* seeks to stimulate reasoned and scholarly debate in the balance among standardized processes with precision care.

### **In This Issue**

The 50th anniversary reprint of the 1992 Kidd<sup>3</sup> commentary presents a call to action for conflict resolution, collaboration, cooperation, mutual accountability, and teamwork with our critical care nursing colleagues. Kidd distinguishes the critical care nurse's practice as more autonomous because of nurse-initiated protocols or standing orders. Fortunately, emergency nursing has evolved to greater autonomy since 1992 by developing and testing the effectiveness of nurse-initiated protocols in states and countries where it is allowed by the nurse practice regulation.<sup>8,27,28</sup> Leveille et al<sup>8</sup> investigated tailored triage nurse-initiated protocols for febrile oncology patients, with improved process outcomes in ED flow and time to care. Further research is needed to ascertain the protocol intervention's impact on patient outcomes. Patient crowding and flow are impacted by the boarding of intensive care patients as well as the volume of nonurgent emergency visits. Bornais et al<sup>2</sup> provide insights into the need for interventions to reduce nonurgent visits for patients who live closest to the hospital, have providers referring them to the emergency department, find that the efficacy of emergency care is superior to other options, and require convenient time-saving clinical encounters. Abbadessa<sup>1</sup> identified a substantial gap in the published evidence on the impact of intensive care boarding practices in the emergency department on pediatric patient outcomes. Tan et al<sup>4</sup> provide novel evidence regarding the need to tailor early warning score calculations and communications for patients with acute pancreatitis. This tailored score promises to inform ED flow interventions as an early identification of patients at higher risk of intensive care services or mortality. The case reviews in this issue deepen clinical reasoning with precision care interventions for critical care patients who may experience rare events by analyzing life-threatening posterior cerebral artery stroke,<sup>7</sup> long QT syndrome,<sup>6</sup> and esophageal perforation.<sup>29</sup>

The implementation of the RE-AIM framework includes adopting interventions for cultural considerations and context. Whereas Wood et al<sup>30</sup> demonstrate the effectiveness of tailoring discharge instructions with video to improve knowledge for Spanish-speaking caregivers, other recently published evidence does not support the view that general video discharge instructions for acute otitis media, for example, increase caregiver knowledge.<sup>31</sup> Furthermore, in this issue of *JEN*, Leclerc<sup>12</sup> identifies the culturally contextual and relevant need for emergency nursing education in caring for indigenous patients. Finally, the adoption domain in the RE-AIM Framework includes an evaluation of who delivered the intervention. In this issue of *JEN*, the ENA provides leadership, through a position statement, on the role of the nurse practitioner.<sup>32,33</sup> ENA proposes advancing and refining the education, preparation, and defined role of the acute care nurse practitioner across the lifespan. Actualizing the recommendations in this position statement promises an increased capacity to meet population care needs for prescribing providers in general emergency departments, and further implement evidence-based translation to practice. We look forward to continued publication of both patient and setting intervention advancements and innovations in future issues of *JEN*.

### **Appendix**

#### **Supplementary Data**

To access the supplementary material accompanying this article, visit the online version of the *Journal of Emergency Nursing* at [www.jenonline.org](http://www.jenonline.org).

Dimension	Pragmatic summary questions <sup>13,14(p. 3-4)</sup>	Definition <sup>13(p. 3-4)</sup>	Emergency nursing example
Reach	“HOW do I reach the targeted population with the intervention?”	“The absolute number, proportion, and representativeness of individuals who are willing to participate in a given initiative, intervention, or program. Reasons for not participating.”	Wood et al <sup>30</sup> estimates 925 Spanish-speaking caregivers could have been screened for eligibility, but owing to trained staff availability and unit census, 164 (18%) were approached. Of these, 9 (5%) did not consent to participate.
“WHO is (was) intended to benefit and who actually participates or is exposed to the intervention?”	Effectiveness	“HOW do I know my intervention is effective?”	“The impact of the intervention on important outcomes, including potential negative effects, quality of life, and economic outcomes. Heterogeneity of effects and reasons for success or lack of such.”
Wood et al <sup>30</sup> demonstrated that adding video-discharge instruction, compared with usual discharge teaching care for Spanish-speaking caregivers increased knowledge about the child’s diagnosis and treatment.	“WHAT is (was) the most important benefit you are trying to achieve and what is (was) the likelihood of negative outcomes?”	Fujita and Choi <sup>10</sup> documented no reports of adverse outcomes after implementing their intervention to customize physiological alarms.	Adoption
“HOW do I develop organizational support to deliver my intervention?” “WHERE is (was) the program or policy applied? WHO applied it?”	“The absolute number, proportion, and representativeness of: a) settings; and b) intervention agents (people who deliver the program) who are willing to initiate a program. Reasons for adoption or non-adoption.”	A pharmacy resource specialist in Pon et al’s <sup>35</sup> intervention inserted a warning text pop-up in the medication dispensing unit so that all clinical staff withdrawing intravenous dilTIAZem would receive the alert in 1 clinical setting.	Implementation

<p>“HOW do I ensure the intervention is delivered properly?”</p>	<p>“At the setting level, implementation refers to the intervention agent’s fidelity to the various elements of an intervention’s protocol, including consistency of delivery as intended and the time required. Also includes adaptations made and the costs of implementation. At the individual level, implementation refers to the clients’ use of the intervention and implementation strategies.”</p>	<p>Pop et al<sup>11</sup> adapted an intervention to reduce patient falls in the emergency department by tailoring a falls prevention bundle.</p>	<p>“HOW consistently is (was) the program or policy delivered? HOW will (was) it be adapted? HOW much will (did) it cost? WHY will (did) the results come about?”</p>
<p>Wolf et al<sup>36</sup> identified risk for personal harm, potential legal liability, and poor guidance about follow-up interventions were barriers to emergency nurses conducting an access to firearm assessment. Note: Qualitative research is critical to address “WHY” results came about.<sup>13</sup></p>	<p>Maintenance</p>	<p>“HOW do I incorporate an intervention so it is delivered over the long term?”</p>	<p>“The extent to which: a) behavior is sustained 6 months or more after treatment or intervention; and b) a program or policy becomes institutionalized or part of the routine organizational practices and policies. Includes proportion and representativeness of settings that continue the intervention and reasons for maintenance, discontinuance, or adaptation.”</p>

Phase	Purpose	Participants
0	Preclinical safety, dose, and toxicity (basic science)	in vitro (test tube) or in vivo (animal testing)
1	Safety, dose, route (translate to humans)	<100 people, often healthy
2	Efficacy and adverse effects (translate to patients)	~100–1,000 people

3	Confirm efficacy, compare with other treatments, and monitor adverse effects (translate to patients)	>100 people, often >1,000
4	Long-term safety and efficacy, effectiveness (begin to translate to practice)	Several thousand people

## DETAILS

<b>Subject:</b>	Emergency medical care; Quality management; Intervention; Patient-centered care; Collaboration; Clinical medicine; Patients; Emergency services; Nursing; Nurses; Crowding; Multiculturalism & pluralism; Intensive care; Innovations; Nursing care; Evidence-based nursing; Generalizability; Translation; Clinical trials; Professional practice
<b>Location:</b>	Iowa; United States--US
<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	2
<b>Pages:</b>	141-146.e2
<b>Publication year:</b>	2020
<b>Publication date:</b>	Mar 2020
<b>Section:</b>	Editorial
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English
<b>Document type:</b>	Editorial
<b>DOI:</b>	<a href="https://doi.org/10.1016/j.jen.2020.01.006">https://doi.org/10.1016/j.jen.2020.01.006</a>

ProQuest document ID: 2487205690

Document URL: <https://www.proquest.com/scholarly-journals/knowledge-translation-science-advances-into/docview/2487205690/se-2?accountid=211160>

Copyright: ©2020. Emergency Nurses Association

Last updated: 2023-06-21

Database: Public Health Database

Document 23 of 55

# Commentary on Emergency Nurses Association's 2019 "Position Statement: Advanced Practice Registered Nurses in the Emergency Care Setting": JEN

[ProQuest document link](#)

## ABSTRACT (ENGLISH)

Rather than viewing the missing elements for acute care across the life span in the current Consensus Model as barriers, the 2019 ENA position supports the Model, thereby recognizing that a wide variety of APRN roles can each contribute to improving the delivery of emergency care in the United States. Other nursing specialties have grappled with this issue and similarly conclude that there is a place for various areas of expertise on the interdisciplinary care team, so long as the APRNs practice within their scope.<sup>7</sup> ENA has taken a bold step by supporting the introduction of a new population in the Consensus Model, should it come open for revision: acute care across the life span.<sup>1</sup> Whereas current options for primary care NPs include family practice, which in most states extends across the life span, the acute care role is divided distinctly into adult-gerontology or pediatric foci. The 2019 position statement on Advanced Practice Registered Nurses in the Emergency Care Setting represents the commitment of ENA in supporting safe and effective practice to the full scope for which these professionals are educated and trained, laying the groundwork for future efforts to support APRN practice through education, advocacy, and leadership. Author Disclosures Conflicts of interest:

## FULL TEXT

In August 2019, the Emergency Nurses Association (ENA) Board of Directors approved the revision of the organization's position statement, "Advanced Practice Registered Nurses in the Emergency Care Setting."<sup>1</sup> This statement represents the culmination of more than 3 years of work by members of the 2017, 2018, and 2019 Position Statement Committees and Institute for Emergency Nursing Advanced Practice Advisory Council. The statement helps not only to better define the role of advanced practice emergency nurses but also to provide support and guidance on issues such as educational paths and resources needed.

The 2019 position statement reflects the evolution of advanced practice registered nurse (APRN) practice, starting with the declaration that APRNs are "established members of emergency care teams throughout the U.S. and in

many countries worldwide.”<sup>1</sup> Nurse practitioner (NP) and clinical nurse specialist (CNS) practices have become more defined by unique, specialty-specific competencies, which serve as the standard for validation of safe practice.<sup>2,3</sup> These standards and documents have and will continue to evolve over time. The position statement represents inclusion of APRNs within the emergency nursing community and ENA’s role in supporting advanced practice. APRNs now have additional confidence in their place as members of the multidisciplinary emergency care team, rather than being viewed as an “extender” or “midlevel.” Furthermore, external stakeholders, including patients and families, can better understand that APRNs bring a unique approach to patient management in the specialty setting. APRNs providing emergency care primarily include NPs and CNSs, although other roles exist, such as the certified registered nurse anesthetist and nurse midwife.<sup>4</sup> As within other areas of health care, APRN practice has grown dramatically in recent years to meet the challenge of increasingly older and more medically complex populations. Along with this growth has come an increase in academic graduate programs to prepare individuals in their chosen role, postgraduate programs, and continuing education.

In 2008, the Consensus Model for APRN Regulation: Licensure, Accreditation, Certification, and Education<sup>4</sup> was published with the intent of promoting consistency and standardization for APRNs entering clinical practice. That same year, the Institute of Medicine (now known as the National Academy of Medicine), together with the Robert Wood Johnson Foundation, launched the work, which culminated in the consensus report, *The Future of Nursing: Leading Change, Advancing Health*,<sup>5</sup> calling for nurses to achieve higher levels of education and to “practice to the full extent of their education and training.” These 2 documents have served as an impetus for the progressive adoption of full-practice authority for APRNs in various states across the country. Currently, 22 states have established practice environments where APRNs can provide care to the full scope of their preparation.<sup>6</sup>

How the Consensus Model can be transitioned into advanced practice for specialties, such as emergency nursing, has been subject to various interpretations. General, or nondifferentiated, emergency departments serve pediatric, adult, and older adult patients with a wide range of acuity. The ability to provide emergency care in a general emergency department requires that APRNs have education and training to provide episodic management of conditions across the life span and the full range of acuity, from minor complaints to critically unstable conditions. For those APRNs practicing in all areas of a general, nondifferentiated emergency department, additional postgraduate certificates may be required. A specific and clarified acute care across the lifespan pathway for APRNs would enhance the Consensus Model’s direct relevance to APRN care in the ED setting.

Rather than viewing the missing elements for acute care across the life span in the current Consensus Model as barriers, the 2019 ENA position supports the Model, thereby recognizing that a wide variety of APRN roles can each contribute to improving the delivery of emergency care in the United States. This support comes with the caveat that it is the responsibility of the APRNs to practice within the scope of the role and population for which they have been educated, trained, and certified in addition to their licensure and credentialing. Other nursing specialties have grappled with this issue and similarly conclude that there is a place for various areas of expertise on the interdisciplinary care team, so long as the APRNs practice within their scope.<sup>7</sup>

ENA has taken a bold step by supporting the introduction of a new population in the Consensus Model, should it come open for revision: acute care across the life span.<sup>1</sup> Whereas current options for primary care NPs include family practice, which in most states extends across the life span, the acute care role is divided distinctly into adult-gerontology or pediatric foci. Likewise, the CNS scope of practice is challenged by the lack of a population inclusive of patients across the life span. By creating a population for acute care across the life span, those desiring in-depth preparation in pediatric or adult-gerontological care can continue to take these paths, similar to the family NPs. This acute care across the life span addition would provide a means for specialties such as emergency care or orthopedic APRNs who provide episodic, acute care to patients of all ages to do so without the need for additional postgraduate education and certifications.

ENA asserts a willingness to work collaboratively with other stakeholders because the role of the APRN continues to evolve as the organization designated by the American Nurses Association representing the specialty of emergency nursing. Acting on this, ENA has applied for membership on the Consensus Model for APRN Regulation: Licensure,

Accreditation, Certification, and Education committee, which oversees implementation and evaluation of the Consensus Model. Membership would allow the organization to be more present and advocate for APRNs in emergency care, now and in the future. ENA is currently involved in revision of the competencies for both NPs and CNSs in emergency care and working with appropriate organizations to ensure that scope and standards of practice are developed and maintained.

ENA's final position in the 2019 Advanced Practice Registered Nurses in the Emergency Care Setting statement is tied to the organization's mission of excellence in providing safe practice and safe care, the pillar of knowledge. In keeping with ENA's 5-year strategic goals,<sup>8</sup> the Emergency Nursing Advanced Practice Advisory Council has developed various educational offerings over the past 5 years, dedicated to advanced practice education. Presessions at ENA 2019 included point-of-care ultrasound and procedural presessions and a panel discussion on Doctor of Nursing Practice project development in the emergency department. The Advanced Practice Registered Nurses in the Emergency Care Setting position statement reaffirms ENA's commitment to advanced practice education and training, with future plans for both virtual and face-to-face offerings in the near future. The 2019 position statement on Advanced Practice Registered Nurses in the Emergency Care Setting represents the commitment of ENA in supporting safe and effective practice to the full scope for which these professionals are educated and trained, laying the groundwork for future efforts to support APRN practice through education, advocacy, and leadership.

#### Author Disclosures

Conflicts of interest: Dr. Carman is the Director of Emergency Nursing Advanced Practice, Emergency Nurses Association.

## DETAILS

<b>Subject:</b>	Emergency medical care; Accreditation; Conflicts of interest; General practice; Advocacy; Gerontology; Emergency services; Interdisciplinary aspects; Primary care; Advanced practice nurses; Acute services; Nursing; Pediatrics; Leadership; Nursing education; Nursing licensure
<b>Location:</b>	United States--US
<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	2
<b>Pages:</b>	139-140
<b>Publication year:</b>	2020
<b>Publication date:</b>	Mar 2020
<b>Section:</b>	Invited Commentary
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia

Country of publication:	United Kingdom, Philadelphia
Publication subject:	Medical Sciences--Nurses And Nursing
ISSN:	00991767
e-ISSN:	15272966
Source type:	Scholarly Journal
Language of publication:	English
Document type:	Commentary
DOI:	<a href="https://doi.org/10.1016/j.jen.2020.01.003">https://doi.org/10.1016/j.jen.2020.01.003</a>
ProQuest document ID:	2487205668
Document URL:	<a href="https://www.proquest.com/scholarly-journals/commentary-on-emergency-nurses-association-s-2019/docview/2487205668/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/commentary-on-emergency-nurses-association-s-2019/docview/2487205668/se-2?accountid=211160</a>
Copyright:	©2020. Emergency Nurses Association
Last updated:	2023-07-28
Database:	Public Health Database

Document 24 of 55

## Information for Readers: JEN

[ProQuest document link](#)

### FULL TEXT

\_TVM:UNDEFINED\_

### DETAILS

Publication title:	Journal of Emergency Nursing:: JEN; Philadelphia
Volume:	46
Issue:	2
First page:	A10



<b>Publication year:</b>	2020
<b>Publication date:</b>	Mar 2020
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English
<b>Document type:</b>	General Information
<b>DOI:</b>	<a href="https://doi.org/10.1016/S0099-1767(20)30016-7">https://doi.org/10.1016/S0099-1767(20)30016-7</a>
<b>ProQuest document ID:</b>	2487205647
<b>Document URL:</b>	<a href="https://www.proquest.com/scholarly-journals/information-readers/docview/2487205647/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/information-readers/docview/2487205647/se-2?accountid=211160</a>
<b>Copyright:</b>	Copyright Elsevier Limited Mar 2020
<b>Last updated:</b>	2021-02-14
<b>Database:</b>	Public Health Database

---

Document 25 of 55

## Thank you to JEN 2019 Reviewers: JEN

[ProQuest document link](#)

---

### FULL TEXT

\_TVM:UNDEFINED\_

### DETAILS

<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	2
<b>Pages:</b>	A13-A14
<b>Publication year:</b>	2020
<b>Publication date:</b>	Mar 2020
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English
<b>Document type:</b>	Credits
<b>DOI:</b>	<a href="https://doi.org/10.1016/S0099-1767(20)30017-9">https://doi.org/10.1016/S0099-1767(20)30017-9</a>
<b>ProQuest document ID:</b>	2487205637
<b>Document URL:</b>	<a href="https://www.proquest.com/scholarly-journals/thank-you-jen-2019-reviewers/docview/2487205637/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/thank-you-jen-2019-reviewers/docview/2487205637/se-2?accountid=211160</a>
<b>Copyright:</b>	Copyright Elsevier Limited Mar 2020
<b>Last updated:</b>	2021-03-01
<b>Database:</b>	Public Health Database

Document 26 of 55

## Assessing the Impact of ED Triage Directives on Febrile Oncology Patient Wait Times: JEN

## ABSTRACT (ENGLISH)

### Introduction

Fever during chemotherapy is a common and potentially severe complication being increasingly evaluated in emergency departments to minimize morbidity and mortality. Streamlining triage of these patients may improve health outcomes and wait times in the health care system.

### Methods

A retrospective chart review of febrile patients undergoing chemotherapy was conducted at a local emergency department to assess the impact of nurse-initiated protocols on wait times.

### Results

We identified 315 patients undergoing current chemotherapy presenting with fever. Of these, 140 (44%) and 87 (28%) were initiated on the sepsis and febrile neutropenia nurse-initiated protocols, respectively. In total, 197 (63%) were admitted. The febrile neutropenia protocol had a shorter wait time from triage to disposition than the sepsis protocol (403 minutes [SD = 23] vs 329 minutes [SD = 19],  $t = 1.71$ ,  $P = 0.01$ ). Furthermore, the febrile neutropenia protocol demonstrated shorter times from both triage to lab results reported, in addition to the physician initial assessment in the admitted patient subgroup.

### Discussion

Decreased wait times from triage associated with the use of a febrile neutropenia protocol could be accounted for by a lower number of lab results required through this protocol in addition to shorter physician assessment times in the admitted population. This study shows that nurse-initiated protocols may influence door-to-antibiotic time for patients undergoing chemotherapy. By having a targeted protocol for the cancer population, health care centers may be able to demonstrate decreased health care expenditure and increased resource availability. Furthermore, as the current population of patients undergoing chemotherapy is at a high risk for neutropenia, prompt management is crucial to minimize mortality.

## FULL TEXT

## DETAILS

<b>Subject:</b>	Laboratories; Infections; Emergency medical care; Waiting times; Neutropenia; Oncology; Morbidity; Health care expenditures; Mortality; Sepsis; Health status; Physicians; Chart reviews; Nurses; Chemotherapy; Bias; Patients; Clinical outcomes; Antibiotics; Cancer; Triage; High risk; Patient admissions; Nursing; Emergency services
<b>Identifier / keyword:</b>	Triage; Febrile neutropenia; Emergency nursing; Nurse-initiated protocols
<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	2
<b>Pages:</b>	254-262.e1
<b>Publication year:</b>	2020

<b>Publication date:</b>	Mar 2020
<b>Section:</b>	Triage Decisions
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English
<b>Document type:</b>	Journal Article
<b>DOI:</b>	<a href="https://doi.org/10.1016/j.jen.2019.12.007">https://doi.org/10.1016/j.jen.2019.12.007</a>
<b>ProQuest document ID:</b>	2487205632
<b>Document URL:</b>	<a href="https://www.proquest.com/scholarly-journals/assessing-impact-ed-triage-directives-on-febrile/docview/2487205632/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/assessing-impact-ed-triage-directives-on-febrile/docview/2487205632/se-2?accountid=211160</a>
<b>Copyright:</b>	©2019. Emergency Nurses Association
<b>Last updated:</b>	2021-04-09
<b>Database:</b>	Public Health Database

Document 27 of 55

# Transcultural Health Practices of Emergency Nurses Working With Indigenous Peoples: A Descriptive Study: JEN

[ProQuest document link](#)

## ABSTRACT (ENGLISH)

### Introduction

For decades, health inequalities have persisted among Indigenous peoples. As the Indigenous population is growing

in the cities, health care delivery in urban areas can be challenging. Emergency nurses are often the first contact in the health system, and they play a key role in the patient's experience. This study aims to describe the transcultural health practices of Canadian emergency nurses working with Indigenous peoples.

### **Methods**

A descriptive study was conducted among 30 emergency nurses.

### **Results**

Approximately 90% of the nurses who participated in the study had not received specific training about Indigenous health. The most common type of culturally appropriate nursing care was clinical examination (mean = 7.22), and sexuality care was the least frequent (mean = 5.47). The nurses were less confident in their ability to interview Indigenous peoples about the importance of home remedies and folk medicine (mean = 5.38).

### **Discussion**

In summary, emergency nurses had more confidence in their ability to provide technical care than in their knowledge regarding the cultural aspects of providing care. As Indigenous populations face challenges regarding access to health care, specific interventions should be implemented to support better-quality cultural care from emergency nurses.

## **FULL TEXT**

### **Contribution to Emergency Nursing Practice**

- The current literature on transcultural health practices of health professionals indicates some discomfort related to knowledge and skills associated with Indigenous peoples' health care.
- This article contributes the finding that emergency nurses do not receive specific training about Indigenous health. Altogether, nurses are less confident in their communication skills with Indigenous peoples.
- Key implications for emergency nursing practice found in this article are the need for education of emergency nurses regarding disparities in care and the development of strategies to promote self-efficacy for Indigenous cultural care.

### **Introduction**

In Canada, more than 1.6 million people self-identify as being Indigenous, which refers to First Nations, the Inuit, and the Métis.<sup>1</sup> The Indigenous population is growing and is seen mainly in the cities.<sup>1,2</sup> Education and employment opportunities remain the principal motivations for urban migration; however, access to health care services plays a role.<sup>2</sup> Furthermore, the number of older adults in the Indigenous population is growing. Despite the persistent health disparities between Indigenous and non-Indigenous peoples and the high rate of chronic diseases, the evidence does not indicate a higher use of health care services by Indigenous peoples.<sup>2,3</sup>

Health care delivery in urban areas can be challenging. For Indigenous peoples living off-community, the likelihood of experiencing difficulties in accessing first-contact services is significantly higher.<sup>4</sup> The predominance of the biomedical model that tends to treat only the disease and the infirmity seems to run counter to Indigenous peoples' holistic views on health (physical, mental, emotional, and spiritual well-being).<sup>5</sup> Thus, urban Indigenous populations could experience racism and judgment from health professionals, or they could feel that their needs are not understood.<sup>6,7</sup> In Canada, data obtained from the 2013 Canadian Community Health Survey<sup>8</sup> (n = 16,836) indicate that 48.4% of Indigenous peoples have reported experiencing discrimination and that this discrimination is a determinant of chronic disease.

In a large study conducted with an urban Indigenous population in the Province of Québec (N = 1,723), 57% of the participants felt that they had been victims of racism and discrimination by government services provided in the province.<sup>9</sup> Of the participants who had used government health and social services (70%), 18% reported that their

needs had not been met. In the same study, 22% of the participants indicated that they did not have accurate information about health and social services or that the government services did not meet the needs of the urban Indigenous population.<sup>9</sup> Because of events regarding possible discriminatory practices in the delivery of public services in Québec province, the government created the Public Inquiry Commission to examine the relationships between public service providers and Indigenous peoples.<sup>10</sup>

Health leaders and professionals play a key role in patients' experiences.<sup>11</sup> Seven of the recommendations in the Canadian Truth and Reconciliation Commission's Calls to Action<sup>12</sup> are related to the health of Indigenous peoples. These recommendations include the availability of appropriate health services and the need for cultural competency training for all health care professionals. Over more than 25 years, efforts have been made to incorporate cultural competence and working with vulnerable populations into the nursing and health care curricula.<sup>13</sup> It is even recommended that cultural competence should be an entry-to-practice level requirement.<sup>14</sup> In the context of working with Indigenous peoples, cultural competency and cultural safety should be rooted in an awareness of the impacts of colonialism.<sup>15</sup> However, the cultural safety training for health professionals who address the issue of social injustice and unequal power relation presents challenges.<sup>16</sup> The application of cultural safety, by creating a culturally competent environment,<sup>14</sup> creates some discomfort among health professionals in relation to their lack of practical knowledge.<sup>17</sup> In the emergency department, health professionals are continuously dealing with patients who present with acute pain, anger, hunger, tiredness, confusion, or intoxication. Thus, as Johnson and Withers<sup>18</sup> stressed, blaming the patient, which leads to loss of empathy, can be tempting.

To explore the sensitive topic of cultural competence in relation to health care for Indigenous populations, this study used a self-evaluation approach that is based on Jeffreys' cultural competence and confidence (CCC) model.<sup>19</sup> A review of the literature indicates that few instruments have been validated in French. More importantly, none has been designed specifically for Indigenous populations. Based on the issues outlined above, this study aimed to describe the transcultural health practices of emergency nurses who work with Indigenous peoples.

### **Conceptual Framework**

Jeffreys' CCC model provided the framework for this study.<sup>19</sup> The CCC integrates the concepts that explain, describe, influence, and/or predict the phenomenon of learning cultural competencies. In addition, it incorporates the construct of transcultural self-efficacy as a major influencing factor. According to Jeffreys' CCC model, "cultural competence is a multidimensional learning process that integrates transcultural skills in all 3 dimensions (cognitive, practical, and affective), involves transcultural self-efficacy (confidence) as a major influencing factor, and aims to achieve culturally congruent care."<sup>19</sup> (p.164)

The cognitive learning dimension includes knowledge, intellectual abilities, and skills.<sup>19</sup> In the present study, this dimension refers to the knowledge and comprehension of the cultural factors that could influence nursing care for Indigenous peoples. The practical learning dimension focuses on the development or practical application of motor skills.<sup>19</sup> In the present study, it refers to the verbal and nonverbal communication skills needed for interviewing Indigenous peoples about their values and beliefs. The affective learning dimension concerns attitudes, values, and beliefs.<sup>19</sup> It includes self-awareness, awareness of cultural gaps, acceptance, appreciation, recognition, and advocacy.<sup>20</sup> According to the CCC model, transcultural self-efficacy is the perception of confidence to perform or to learn transcultural nursing skills. The transcultural self-efficacy concept is based on Bandura's self-efficacy theory.<sup>21</sup>

### **Methods**

A descriptive and quantitative study was conducted. The study was nested in a larger project to examine the health trajectory of Indigenous peoples regarding health determinants and perspectives. This study specifically evaluated nurses' perspectives.

The eligible population included nurses working in emergency departments in 3 hospitals in Québec province (N = 233). Using volunteer sampling, 30 nurses were included in the sample (13% of the total sample). Meetings were held with all the nurses to explain the project. The 3 inclusion criteria were as follows: (1) being a nurse for more than 6 months, (2) not being Indigenous, and (3) having been exposed to care for Indigenous populations. The questionnaires were left with the assistant head nurses. The completed questionnaires were returned to them in sealed envelopes. To thank the participants, each emergency department held a random drawing for a gift card. The data were collected between September 2017 and May 2018.

### **Instruments**

Three questionnaires that could be completed within 20 minutes were distributed to the nurses. The first questionnaire examined the nurses' transcultural self-efficacy, the second questionnaire examined the nurses' cultural competence clinical evaluation, and the third questionnaire evaluated their sociodemographic characteristics.

#### **Transcultural self-efficacy tool**

The transcultural self-efficacy tool (TSET) contains 83 items that evaluate nurses' confidence in their ability to care for individuals from different cultures.<sup>19,22</sup> It contains 3 subscales: cognitive (25 items), practical (28 items), and affective (30 items).<sup>19</sup> The cognitive subscale measures confidence regarding the knowledge of the possible influence of cultural factors on nursing care. The practical subscale measures the confidence to interview patients from different backgrounds to learn about their values and beliefs. The affective subscale measures attitudes, values, and beliefs. The questionnaire uses a 10-point Likert scale (1 = not confident to 10 = totally confident). The process for the development and validation of this scale has been published.<sup>23</sup> A Cronbach  $\alpha$  of 0.97 was obtained for all the subscales with the French version of the questionnaire.<sup>24,25</sup> In the present study, the Cronbach  $\alpha$  values for the 3 subscales (cognitive, practical, and affective) were 0.93, 0.92, and 0.98, respectively.

#### **Cultural competence clinical evaluation tool—employee version**

The cultural competence clinical evaluation tool—employee version (CCCET—EV) is adapted from the TSET. It is comprised of 83 items that assess the dimensions of cultural competence in clinical behaviors.<sup>19,22</sup> The CCCET—EV contains 3 subscales: (1) culture-specific care (25 items), (2) cultural assessment (28 items), and (3) cultural sensitivity (30 items).<sup>19</sup> However, only the first subscale, the extent of culture-specific care, was used in the present study. This subscale evaluated the nurses' confidence in their ability to care for individuals from different cultures. It included items about physical examinations, patient education, illness prevention, and diagnostic testing. The tool used a 10-point Likert scale (1 = not confident to 10 = totally confident). In addition, the respondents had the option of selecting "A" ([clinical] area not available) or "B" (diverse clients not available). The development and validation of this scale have been previously examined.<sup>23</sup> A Cronbach  $\alpha$  of 0.94 was previously reported for the French version of the subscale.<sup>24,25</sup> In the present study, the Cronbach  $\alpha$  value was 0.92.

#### **Sociodemographic questionnaire**

The sociodemographic questionnaire was used in the present research to assess the nurses' personal characteristics (age, sex, and Indigenous identity), academic journeys (education level and training about Indigenous health), and nursing journeys (hospital setting, nursing experience, employment status, schedule, and experience in Indigenous communities).

IBM SPSS Statistics for Windows Version 24.0 (Armonk, NY) was used for the analysis. Descriptive analyses were performed; thus, means, frequencies, and percentages were calculated. This study was approved by the research ethics committees of the university and hospitals concerned. All participants were informed of the nature of the study and provided written informed consent.

## Results

A total of 30 non-Indigenous nurses from 3 emergency departments in Québec participated in the study. Most were women (80%) aged between 31 and 50 years, with an average of 16 years of experience (<sup>Supplementary Table 1</sup>). Most of the nurses had undergraduate diplomas, and 90% indicated that they had never received training about Indigenous health.

### Transcultural Self-Efficacy

The TSET was used to assess the nurses' confidence in their ability to use transcultural nursing skills to serve Indigenous populations. <sup>Supplementary Table 2</sup> presents the results obtained from the 3 subscales of the transcultural self-efficacy questionnaire: cognitive, practical, and affective. The mean for the cognitive subscale was 6.19. The 5 items presenting the highest means were diagnostic tests (6.93), blood tests (6.93), comfort and pain relief (6.89), rest and sleep (6.86), and informed consent (6.79). The 5 items presenting the lowest means were growth and development (5.31), birth (5.39), sexuality (5.50), anxiety and stress reduction (5.66), and diet and nutrition (5.67).

The mean for the practice subscale was 5.48. The 2 items presenting the highest means were level of French comprehension (6.38) and role of elders (6.10). The 2 items presenting the lowest means were acculturation (4.34) and worldview philosophy of life (4.46). Finally, the mean for the affective subscale was 7.06. The 2 items presenting the highest means were acceptance of similarities among cultural groups (8.41) and acceptance of differences among cultural groups (8.38). The 2 items presenting the lowest means were recognition of the inadequacies in the nation's health care system (5.00) and recognition of the importance of home remedies and folk medicine (5.38).

### Cultural Competence Clinical Evaluation

The CCET—EV was used to gather data about the nurses' provision of culture-specific care to Indigenous populations. <sup>Supplementary Table 3</sup> presents the results obtained from the cultural competence clinical evaluation. The overall mean of the subscale was 6.25. The 5 items presenting the highest means were physical examination (7.22), comfort and pain relief (7.20), diagnostic tests (7.08), blood tests (6.92), and pregnancy (6.89). The 5 items presenting the lowest means were sexuality (5.47), hygiene (5.52), illness prevention (5.62), health history and interviews (5.64), and anxiety and stress reduction (5.65).

## Discussion

As previously outlined, the cognitive subscale of the TSET refers to knowledge.<sup>19</sup> On the one hand, the results showed that emergency nurses had more confidence regarding their knowledge of the technical aspects, such as diagnostic and blood tests, of the care they provided to Indigenous peoples. On the other hand, the results demonstrated that the nurses had less confidence regarding the care associated with birth, growth, and development. Such care is less frequent, usually transfers to another department, and has a low priority in emergency departments.<sup>26</sup> The item with the lowest mean was found in the practical subscale, which refers to communication skills. The nurses had more confidence in their ability to interview Indigenous peoples about their French comprehension and the role of elders. French is the first or second language of most Indigenous peoples living near the study setting. However, the results regarding the comprehension of the term "elders" should be interpreted with caution. Indeed, for aboriginal communities, elders are the bearers of knowledge. Thus, these individuals are not necessarily the oldest in the community.<sup>27</sup> The nurses did not have a great deal of confidence regarding the subject of worldview or acculturation. Of course, trust needs to be built before such subjects can be discussed. In other words, emergency departments might not be the best place to discuss cultural values. It is important to outline the Québec province context. More specifically, because the access to first-line services is relatively difficult, health care providers in the emergency departments deal with a heavy workload.<sup>28</sup> As such, almost 60% of the patients admitted to emergency rooms worldwide could have been treated by primary care



physicians because the patients were not in critical condition or in need of urgent care.<sup>29</sup> Moreover, the number of visits to emergency departments in Québec has been increasing, and there is a correlation with the growth of the elderly population.<sup>29</sup> Finally, since 2015, Québec's health system has been reformed and several organizational changes have taken place.<sup>30</sup>

As reported in a recent study, the affective subscale had the highest means.<sup>31</sup> This result suggests that nurses feel confident about their own cultures, attitudes, and beliefs. However, they do not have the confidence regarding the importance of home remedies and folk medicine. Similar results were reported in Ontario (Canada). The health care workers in that study lacked knowledge and understanding of Indigenous issues, cultures, and medicinal practices.<sup>32</sup> Moreover, the same qualitative study conducted in Ontario reported ambivalence about the need for culturally appropriate versus universal care. Such an analysis was not possible with the quantitative methodology used in the present study.

The results obtained from the CCCET—EV indicated that the nurses had more confidence in their ability to provide the specific types of care that are typical of emergency departments (physical examinations, comfort, and pain relief). In such situations, it is possible to apply good techniques without having cultural competency. Health care professionals are expected to provide care in a culturally appropriate manner, but clients are the only ones to determine whether the care is culturally appropriate or not.<sup>14</sup>

An assumption of the CCC model is that the acquisition of culturally appropriate nursing skills is influenced by nurses' perceived self-efficacy and their exposure to transcultural nursing care concepts and skills throughout their formal education.<sup>23</sup> The fact that 90% of nurses never received training about Indigenous health may have influenced our results. This same fact can explain the lower mean found for the practical subscale. It indicates that the nurses had less confidence in their ability to interview Indigenous peoples (practical subscale). For instance, in the United States, there is a 90-minute training session grounded in cultural competency and decolonialism for mental health professionals to increase their knowledge, awareness, and skills regarding the care of Indigenous peoples.<sup>33</sup> In sum, recognizing the effects of complex intergenerational traumas on health and access to health services is critical for the ability to provide cultural safety care to Indigenous peoples in emergency departments.<sup>34</sup>

### **Limitations**

The main limitations of this study are related to the questionnaires that were used. The French versions of the TSET and the CCCET—EV showed good reliability; however, the European terminology could have led to some confusion for the Québécois nurses. Because the questionnaire required self-evaluation, the nurses might have rated themselves lower on skills. A low sense of self-efficacy can affect cultural competence development and assessments, but on the other side, overly confident nurses may overestimate their cultural abilities.<sup>19</sup> Indeed, this questionnaire is usually used with migrant populations and thus is relevant for Indigenous populations. A review of the literature indicates that the present study represents the first use of these questionnaires in relation to Indigenous populations. However, it must be noted that migrant and Indigenous populations do not share the same history in Canada. Indigenous peoples have been and are being affected by the legacy of colonialism (eg, the Indian Act and residential schools).<sup>3</sup> Another limitation is the small number of participants. Despite various efforts for the recruitment, the response rate was 13%, but it is not unusual to encounter response rates as low as 15%.<sup>35</sup> The small sample presents difficulties for generalizing the findings to other emergency departments.

### **Conclusions and Implications for Emergency Nurses**

The study found that emergency nurses had more confidence in their ability to provide technical care than in their knowledge about the cultural aspects of care. Most nurses recruited for this study had never received training about Indigenous health; thus, the development of strategies to promote self-efficacy in cultural care would be relevant.

There is emergent training on cultural safety in Canada.<sup>16,36</sup> However, a training program designed specially for emergency nurses with integration of local knowledge is required.<sup>37</sup> Training that includes observations and clinical case studies could be an option. Because culture is not static, continuing education would be required. Other research studies should consider using a pre-post cultural educational intervention. In addition, given that emergency departments are structured to provide urgent and acute care, it could be relevant to measure the impact of having a cultural support staff.<sup>37</sup> Québec just received the Public Inquiry Commission's recommendations on the relationships between the Indigenous populations and specific public services departments.<sup>38</sup> A total of 142 calls to action aim to reestablish the trust between Québec and Indigenous peoples. Nursing schools should continue to incorporate the government action plan to create service continuums for Indigenous populations. Examples are training in Indigenous communities, small classes for Indigenous students, participation in local meetings for health service accessibility, the extension of Indigenous liaison services to urban settings, and training focused on Indigenous realities and cultural safety.<sup>39</sup>

### Acknowledgments

We thank the emergency nurses for their participation. This research was supported by the clinical research fund from the authors' university.

### Author Disclosures

Conflicts of interest: none to report.

### Appendix

#### Supplementary Material

To access the supplementary material accompanying this article, visit the online version of the *Journal of Emergency Nursing* at [www.jenonline.org](http://www.jenonline.org).

Variables	Values
Age (years)	
Younger than 30	5 (16.7)
Between 31 and 40	10 (33.3)
Between 41 and 50	9 (30.0)
Older than 50	6 (20.0)
Sex	
Women	24 (80.0)
Men	6 (20.0)

Education	
College training	11 (36.6)
Undergraduate	16 (53.3)
Master	3 (10.0)
Training on Indigenous health	
Yes	3 (10.0)
No	27 (90.0)
Nursing experience (years), mean (SD)	15.93 (8.76)

Questionnaire subscale and items	Mean (SD)
Cognitive subscale	6.19 (1.22)
Five items with the highest means	
1. Diagnostic tests	6.93 (1.9)
2. Blood tests	6.93 (2.0)
3. Comfort and pain relief	6.89 (1.8)
4. Rest and sleep	6.86 (2.2)
5. Informed consent	6.79 (1.9)
Five items with the lowest means	
1. Growth and development	5.31 (1.9)
2. Birth	5.39 (2.3)
3. Sexuality	5.50 (2.4)
4. Anxiety and stress reduction	5.66 (1.8)

5. Diet and nutrition	5.67 (2.1)
Practical subscale	5.48 (1.26)
Two items with the highest means	
1. Level of French comprehension	6.38 (2.4)
2. Role of elders	6.10 (2.1)
Two items with the lowest means	
1. Acculturation	4.34 (1.9)
2. Worldview (philosophy of life)	4.46 (1.8)
Affective subscale	7.06 (1.19)
Two items with the highest means	
1. Acceptance of similarities among cultural groups	8.41 (1.7)
2. Acceptance of differences among cultural groups	8.38 (1.7)
Two items with the lowest means	
1. Recognition of inadequacies in the nation's health care system	5.00 (3.2)
2. Recognition of importance of home remedies and folk medicine	5.38 (2.4)

Questionnaire items	Mean (SD)
Culture-specific care	6.25 (1.9)
Five items with the highest means	
1. Physical examination	7.22 (2.1)
2. Comfort and pain relief	7.20 (2.4)
3. Diagnostic tests	7.08 (2.6)

4. Blood tests	6.92 (2.6)
5. Pregnancy	6.89 (2.8)
Five items with the lowest means	
1. Sexuality	5.47 (2.7)
2. Hygiene	5.52 (2.5)
3. Illness prevention	5.62 (2.8)
4. Health history and interview	5.64 (2.3)
5. Anxiety and stress reduction	5.65 (2.5)

## DETAILS

**Subject:** Emergency medical care; Health disparities; Population; Cultural competence; Culture; Medical personnel; Urban areas; Questionnaires; Chronic illnesses; Nurses; Confidence; Likert scale; Sexuality; Patients; Health behavior; Native peoples; Home remedies; Professional training; Cultural factors; Nursing care; Indigenous peoples; Sociodemographics; Cultural differences; Nursing skills; Clinical nursing; Education; Clinical assessment; Emergency services; Health care delivery; Health care access

**Location:** Canada

**Identifier / keyword:** Indigenous peoples; Emergency nursing; Cultural competence; Transcultural self-efficacy

**Publication title:** Journal of Emergency Nursing;; JEN; Philadelphia

**Volume:** 46

**Issue:** 2

**Pages:** 239-245.e2

**Publication year:** 2020

**Publication date:** Mar 2020

**Section:** International Nursing

**Publisher:** Elsevier Limited

**Place of publication:** Philadelphia

Country of publication:	United Kingdom, Philadelphia
Publication subject:	Medical Sciences--Nurses And Nursing
ISSN:	00991767
e-ISSN:	15272966
Source type:	Scholarly Journal
Language of publication:	English
Document type:	Journal Article
DOI:	<a href="https://doi.org/10.1016/j.jen.2019.10.018">https://doi.org/10.1016/j.jen.2019.10.018</a>
ProQuest document ID:	2487205602
Document URL:	<a href="https://www.proquest.com/scholarly-journals/transcultural-health-practices-emergency-nurses/docview/2487205602/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/transcultural-health-practices-emergency-nurses/docview/2487205602/se-2?accountid=211160</a>
Copyright:	©2019. Emergency Nurses Association
Last updated:	2021-11-19
Database:	Public Health Database

Document 28 of 55

# Improving Appropriate Dosing of Intravenous diITIAZem in Patients With Atrial Fibrillation or Flutter With Rapid Ventricular Response in the Emergency Department: JEN

[ProQuest document link](#)

## ABSTRACT (ENGLISH)

### Introduction

Atrial fibrillation and atrial flutter are common supraventricular arrhythmias in patients who present to the emergency department. Under the American Heart Association guidelines, diITIAZem is the calcium channel blocker frequently used by many practitioners for rate control. Currently, institution-specific data have identified that many patients receiving diITIAZem for atrial fibrillation or atrial flutter are given initial doses that exceed the recommended dose by more than 10%, resulting in hypotension in some patients.

### Methods

ED personnel were surveyed to determine their current knowledge of appropriate intravenous diITIAZem dosing and

methods of prescribing intravenous diITIAZem to determine the causes of higher dosing. Based on the baseline data, an intervention of adding a text alert when withdrawing diITIAZem from the automated medication dispensing cabinet was implemented.

### Results

Following the intervention, 29 patients received intravenous diITIAZem for rate control of atrial fibrillation or flutter with rapid ventricular response. For the primary outcome, the incidence of high-dose diITIAZem decreased by 19% ( $P = 0.03$ ). There was no change in the secondary outcome of a reduction in hypotension ( $P = 0.3$ ).

### Discussion

The interventions of education and medication alerts resulted in a significant increase in the percentage of patients receiving appropriate doses of diITIAZem and a nonsignificant decrease in the incidence of hypotension. This process-oriented intervention resulted in an improvement in appropriate diITIAZem doses at our site. Rate control was not statistically significantly different between the 2 groups. Long-term sustainability of this intervention requires further study.

## FULL TEXT

### DETAILS

<b>Subject:</b>	Patients; Emergency medical care; Polls & surveys; Intervention; Appropriateness; Drugs; Pharmacy; Cardiac arrhythmia; Atrial fibrillation; Calcium; Hypotension; Prescribing; Pharmacokinetics; Data collection; Automation; Nursing; Human subjects; Nurses; Education; Dosage; Emergency services
<b>Business indexing term:</b>	Subject: Automation
<b>Identifier / keyword:</b>	diITIAZem; Hypotension; Alert; Atrial fibrillation; Rapid ventricular response
<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	2
<b>Pages:</b>	246-253
<b>Publication year:</b>	2020
<b>Publication date:</b>	Mar 2020
<b>Section:</b>	Pharm/Tox Corner
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767

e-ISSN: 15272966

Source type: Scholarly Journal

Language of publication: English

Document type: Journal Article

DOI: <https://doi.org/10.1016/j.jen.2019.10.011>

ProQuest document ID: 2487205599

Document URL: <https://www.proquest.com/scholarly-journals/improving-appropriate-dosing-intravenous/docview/2487205599/se-2?accountid=211160>

Copyright: ©2019. Emergency Nurses Association

Last updated: 2023-08-21

Database: Public Health Database

---

Document 29 of 55

# A 55-Year-Old Man With Cold Agglutinin Disease: JEN

[ProQuest document link](#)

---

## ABSTRACT (ENGLISH)

The current literature on cold agglutinin disease (CAD) indicates that failure to recognize and manage CAD could be fatal. This article contributes an actual case study, pathophysiology, and the specialized nursing care required for patients with CAD. For emergency nursing practice, key implications from this article are avoiding exacerbations by warming phlebotomy tubes, infusions, and treatment rooms.

## FULL TEXT

### Contribution to Emergency Nursing Practice

- The current literature on cold agglutinin disease (CAD) indicates that failure to recognize and manage CAD could be fatal.
- This article contributes an actual case study, pathophysiology, and the specialized nursing care required for patients with CAD.
- For emergency nursing practice, key implications from this article are avoiding exacerbations by warming phlebotomy tubes, infusions, and treatment rooms.



J.M., a 55-year-old man presented to the emergency department with malaise, stating, "I'm getting sick again and need to be in the hospital." His appearance was disheveled and unkempt. He stated he did not have his own home or a steady job and that he was currently sleeping on his sister's sofa. Upon initial assessment by the emergency nurse, he was not forthcoming with his health history. Although he was alert and oriented, he was evasive and curt in his responses. He said he was admitted to other hospitals in a large city about 200 miles away for treatment for his current condition. He repeatedly said he needed to be admitted to the hospital but would not say for what diagnosis. It was not clear if he had knowledge of his past medical history or if he was refusing to provide the information. There was no record of his admission to this hospital or the emergency department. His vital signs were blood pressure 145/92, heart rate 120, respiratory rate 18, temperature 36.8°C (98.2° F), SpO2 96%. He had an unremarkable physical appearance, except for the skin on his hands and feet, which were dirty and thickly calloused. He denied pain. J.M. provided no additional information to the emergency physician, and after the emergency physician's assessment, with little historical background, blood work was ordered. Per emergency protocol, the nurse started a peripheral intravenous (IV) line and drew blood from the IV site for a complete blood count (CBC) and comprehensive metabolic panel. Although the patient warned the nurse that she would not be able to get blood from him, there was no difficulty starting the IV line, collecting blood, or flushing the IV with normal saline. Blood tubes were sent to the laboratory. In 20 minutes, a laboratory technician called the emergency nurse to notify her that blood samples were hemolyzed, and a recollect was needed. An emergency technician was sent to the room to draw blood using a butterfly needle. The technician reported that there was no difficulty drawing blood. At this time, the patient stated, "I told you so. You just need to admit me." Ten minutes after sending the tubes, the laboratory called again for a redraw. The original nurse returned to draw blood, using a large-bore needle in the antecubital area. Although there was no problem with blood flow, the nurse noted that the blood was darker and more viscous than usual. The tubes were sent and again were declared hemolyzed. The laboratory manager came to the emergency department, talked to the patient, and notified the emergency personnel that he most likely had cold agglutinin disease (CAD) that caused blood to clot immediately upon exposure to temperatures outside the body. The patient confirmed that he had "some blood disease" but stated he did not know its name. Shortly after, the patient was admitted with a diagnosis of anemia to a medical floor without blood work. Later, it was learned that the laboratory manager, using warmed blood tubes, took 2 attempts to draw blood from the patient successfully. His CBC revealed a hemoglobin count of 6.5 g/dL. A blood transfusion was administered, using warmed packed red blood cells (pRBCs).

### **Pathophysiology of Cold Agglutinin Disease**

CAD is a rare blood disorder that is a form of autoimmune hemolytic anemia, caused by exposure of RBCs to low temperatures. Production of abnormal cold-reacting autoantibodies (typically IgM) cause abnormal clotting (agglutination) of RBCs, leading to anemia and sometimes death. Normally, cold temperatures (less than 4° C [39.2° F]) release cold agglutinins (antibodies) that attach to antigens and activate complement to cause destruction of RBCs (hemolysis). In CAD, pathologic cold agglutinins are produced in the bone marrow at higher concentrations, which react optimally at refrigerator temperature, very poorly at room temperature, and not at all at body temperature.<sup>1</sup>

Upon exposure to cold ambient temperatures, especially in peripheral parts of the body, persons with CAD will experience internal hemolysis, leading to acrocyanosis from impaired blood flow.<sup>2</sup> Acrocyanosis is a purplish or gray discoloration of the skin at peripheral sites (finger tips, toes, nose, and ears), which, in most cases, is relieved by rewarming the affected part.<sup>1</sup> CAD is associated with Raynaud phenomena in 90% of cases and can have seasonal presentations of symptoms.<sup>1</sup> Peripheral ischemia and peripheral gangrene can result from prolonged exposure, and

severe anemia from hemolysis can also lead to shock or congestive heart failure.<sup>2</sup>

CAD is exacerbated by certain infections. Although cold agglutinins are normally activated in *Mycoplasma pneumoniae* infections and infectious mononucleosis, in a patient with CAD, abnormally high titers of cold agglutinins are found.<sup>1</sup> Other infections, such as influenza B and human immunodeficiency virus (HIV), are also associated with cold agglutinins.<sup>2</sup> Symptoms of anemia can occur with presence of mononucleosis or typically 1 to 2 weeks after onset. Some cases of hemolysis have occurred 2 months following onset.<sup>2</sup>

Depending on the severity of hemolysis, treatment consists of multiple pharmacological regimens including rituximab, bortezomib, cytotoxic agents, glucocorticoids, and others, and plasmapheresis to remove IgM antibodies from the plasma.<sup>1</sup> Patients should be taught to avoid cold temperatures, and some may need to avoid cold drinks and food.<sup>1</sup> Patients should alert health care workers of CAD because of blood-specimen hemolysis and deleterious effects of exposure to IV fluids, blood products, and cold ambient temperatures.

### **Discussion and Implications for Emergency Nursing**

Emergency care is unique from other nursing care because emergency nurses may perform diagnostic procedures based on protocol and not wait for provider orders. Therefore, knowledge of the basic pathophysiology of CAD is imperative for providing safe care. CAD will affect 3 general areas of emergency nursing care: blood draws, blood or fluid infusions, and ambient room temperatures.

#### **Blood Draws in the Emergency Department**

Blood specimens collected via ordinary phlebotomy procedures will clot shortly after exposure to room temperatures. Keeping the specimen tube warm during the blood draw and during transport to the laboratory is vital for accurate testing. Understanding CAD early will prevent unnecessary redraws due to specimen hemolysis.<sup>3</sup>

#### **Blood Transfusions and Fluid Resuscitation**

Injection of large amounts of room temperature blood products or IV fluids may trigger cold agglutinin production, leading to massive hemolysis. In 1 case, a patient with undetected CAD presented to the emergency department with severe anemia (3.8 g/dL). Per protocol, he was given a transfusion of O Rh-positive pRBCs at room temperature, which caused massive hemolysis, leading to cardiovascular shock and death within a few hours.<sup>4</sup> Recommendations are to use warming devices prior to infusion but to avoid heating RBCs above 40°C owing to potential thermal hemolysis.<sup>1</sup>

#### **Ambient Temperatures**

Colder room temperatures, especially in operating suites, may exacerbate or cause hemolysis. Therefore, warming the ambient temperature with space heaters or forced-air warming products may be necessary.<sup>4</sup>

### **Conclusion**

In our case, J.M. was diagnosed with anemia and received 2 units of warmed pRBCs. He was discharged to home after 2 days. The cause of J.M.'s CAD exacerbation was attributed to the outside winter temperature and his transient lifestyle. His admission was on a winter day, and the outside temperature, upon J.M.'s admission, was 43° F, which was an average winter temperature in the South. J.M. was homeless and slept in different locations within a 200-mile radius. He did not have a primary care provider let alone a hematologist. He stated that when he felt like he was having an exacerbation, he would go to the closest emergency department. The hospital social worker attempted to have J.M. follow up with a hematologist, but because J.M. lived a transient lifestyle and was resource-poor, he never made an appointment.

Patients presenting with CAD pose challenges for emergency staff that include blood draws, IV infusions, and providing a warm, safe environment. If precautions to prevent CAD exacerbations are not taken, patients are at risk for fatal hemolytic reactions. Because CAD is rare, a medical alert device (such as a bracelet or other accessory)

would aid emergency personnel in the event the patient is unresponsive or unable to communicate. An unfortunate complication is when patients do not know or do not understand their own medical histories. ED clinicians have the added responsibility of being aware of many potentially life-threatening conditions such as CAD.

## DETAILS

<b>Subject:</b>	Emergency medical care; Cold; Nursing care; Nursing; Patients; Pathophysiology; Emergency services; Mens health; Professional practice
<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	1
<b>Pages:</b>	102-104
<b>Publication year:</b>	2020
<b>Publication date:</b>	Jan 2020
<b>Section:</b>	Case Review
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English
<b>Document type:</b>	Journal Article
<b>DOI:</b>	<a href="https://doi.org/10.1016/j.jen.2018.11.016">https://doi.org/10.1016/j.jen.2018.11.016</a>
<b>ProQuest document ID:</b>	2333907422
<b>Document URL:</b>	<a href="https://www.proquest.com/scholarly-journals/55-year-old-man-with-cold-agglutinin-disease/docview/2333907422/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/55-year-old-man-with-cold-agglutinin-disease/docview/2333907422/se-2?accountid=211160</a>
<b>Copyright:</b>	©2018. Emergency Nurses Association

Last updated: 2023-06-21

Database: Public Health Database

Document 30 of 55

# Table of Contents: JEN

[ProQuest document link](#)

## FULL TEXT

\_TVM:UNDEFINED\_

## DETAILS

Publication title:	Journal of Emergency Nursing:: JEN; Philadelphia
Volume:	46
Issue:	1
First page:	A1
Publication year:	2020
Publication date:	Jan 2020
Publisher:	Elsevier Limited
Place of publication:	Philadelphia
Country of publication:	United Kingdom, Philadelphia
Publication subject:	Medical Sciences--Nurses And Nursing
ISSN:	00991767
e-ISSN:	15272966
Source type:	Scholarly Journal
Language of publication:	English
Document type:	Table Of Contents

DOI: [https://doi.org/10.1016/S0099-1767\(19\)30559-8](https://doi.org/10.1016/S0099-1767(19)30559-8)

ProQuest document ID: 2333907394

Document URL: <https://www.proquest.com/scholarly-journals/table-contents/docview/2333907394/se-2?accountid=211160>

Copyright: Copyright Elsevier Limited Jan 2020

Last updated: 2023-05-23

Database: Public Health Database

---

Document 31 of 55

# One Person Can Make a Difference: JEN

[ProQuest document link](#)

---

## ABSTRACT (ENGLISH)

As we embark on the celebration of Emergency Nurses Association's (ENA) 50th anniversary, it is time for us to pause and think about our past, celebrate the present, and propel ourselves into the future. Not only is 2020 a big year for ENA, but it is a big election year for our country, no matter what your political affiliation. ENA was formed when Anita Dorr and Judith Kelleher independently saw a need for the nurses they worked with to have further education and training to be emergency nurses. Thankfully, these women joined forces in December 1970 and created the National Emergency Department Nurses Association. It was the power of these 2 individual women who wanted more, coupled with their personal drive for our profession that started our professional organization that now has more than 44,000 members. Just imagine the impact we would make if we all were united in standing up to advocate for our profession.

## FULL TEXT

As we embark on the celebration of Emergency Nurses Association's (ENA) 50th anniversary, it is time for us to pause and think about our past, celebrate the present, and propel ourselves into the future. Not only is 2020 a big year for ENA, but it is a big election year for our country, no matter what your political affiliation.

ENA was formed when Anita Dorr and Judith Kelleher independently saw a need for the nurses they worked with to have further education and training to be emergency nurses. Thankfully, these women joined forces in December 1970 and created the National Emergency Department Nurses Association.

It was the power of these 2 individual women who wanted more, coupled with their personal drive for our profession that started our professional organization that now has more than 44,000 members. Just imagine the impact we would make if we all were united in standing up to advocate for our profession.

Imagine a place where workplace violence is not tolerated. Imagine a place where you have all the resources you need to care for the patients presenting to your care setting. Imagine the community in which you work having all the resources to care for patients in an outpatient or primary care setting, negating the need for patients to visit the emergency department for nonemergency, routine visits. Imagine a place where an admitted patient could be moved out of the emergency department so that boarding a patient is just a memory of the past.

The only way these scenarios can become a reality is if we all advocate for our patients and profession. Emergency nurses have never been known to be silent and just stand by; however, I challenge us as to where we are in advocating for these changes. Nationally, ENA is actively advocating, however, we cannot do it alone; we need your voice to join us.

The power of 1 voice calling for change can make an impact similar to that our founders made 50 years ago. Moreover, if we are united in this voice, imagine our collective impact. This year, I challenge all of you to remember that even 1 person can make a difference, and if we are united, just think of the cumulative difference we can make. So, make sure you are reaching out to your elected officials, making them aware of the challenges we face and letting them know that the time to change our health care system is now.

ENA is here to help at the national and local levels; be sure you are registered to receive the EN411 alerts notifying you of legislative issues at the national level. In addition, connect with your state ENA to get involved locally at your state or chapter level. It is the power of our voice that will make the change possible.

The year 2020 is going to be amazing, and I simply urge you to remember this: "One person can make a difference."

## DETAILS

<b>Company / organization:</b>	Name: Emergency Nurses Association; NAICS: 813920
<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	1
<b>First page:</b>	1
<b>Publication year:</b>	2020
<b>Publication date:</b>	Jan 2020
<b>Section:</b>	President's Message
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English
<b>Document type:</b>	Editorial

DOI: <https://doi.org/10.1016/j.jen.2019.11.001>

ProQuest document ID: 2333905417

Document URL: <https://www.proquest.com/scholarly-journals/one-person-can-make-difference/docview/2333905417/se-2?accountid=211160>

Copyright: ©2019. Emergency Nurses Association

Last updated: 2020-01-15

Database: Public Health Database

Document 32 of 55

# Serum Magnesium Levels and Neurological Outcomes in Patients Undergoing Targeted Temperature Management After Cardiac Arrest: JEN

[ProQuest document link](#)

## ABSTRACT (ENGLISH)

### Introduction

Magnesium plays a neuroprotective role at the physiologic level, but its neuroprotective role in patients undergoing targeted temperature management for cardiac arrest is not well established. We performed multiple logistic regression analysis to evaluate whether magnesium levels can predict neurological outcomes in patients undergoing targeted temperature management after cardiac arrest.

### Methods

We retrospectively investigated data on 86 patients who had undergone targeted temperature management after cardiac arrest between December 2015 and November 2017. The primary outcome was to determine whether magnesium levels predict unfavorable neurological outcomes for patients with return of spontaneous circulation after targeted temperature management. Cerebral Performance Category 3, 4, or 5 indicated unfavorable neurological outcomes. We performed multiple logistic regression to evaluate the primary outcome, adjusting for the time to return of spontaneous circulation, motor score of the Glasgow Coma Scale, first-recorded cardiac rhythm, pH, and magnesium levels.

### Results

Of the 86 patients, 58 had unfavorable neurological outcomes. The mean hospital stay was 19 days. Multivariable analysis indicated that magnesium levels were not associated with an unfavorable neurological outcome. In contrast, a time to return of spontaneous circulation greater than 30 minutes and Glasgow Coma Scale motor score of 1 were significantly associated with an unfavorable neurological outcome.

### Discussion

Magnesium levels were not associated with an unfavorable neurological outcome according to multivariable analysis. We found that a time to return of spontaneous circulation greater than 30 minutes and Glasgow Coma

Scale motor score of 1 might predict an unfavorable neurological outcome.

## FULL TEXT

### Contribution to Emergency Nursing Practice

- The current literature on serum magnesium levels indicates that its role in patients undergoing targeted temperature management for cardiac arrest has been not established.
- This article contributes to the finding that magnesium levels do not predict neurological outcome after cardiac arrest on the basis of multivariable analysis.
- A key implication for emergency nursing practice found in this article is that magnesium levels might not predict an unfavorable neurological outcome.

### Introduction

Cardiac arrest is a major public health issue in the developed world.<sup>1</sup> More than 100,000 cases occur every year in Japan.<sup>2</sup> Despite recurrent updates of guidelines for cardiopulmonary resuscitation (CPR) and the application of the chain of survival concept, the survival proportions for patients in many countries have been very low after cardiac arrest.<sup>2,3</sup>

It is well known that targeted temperature management (TTM) is one of the key treatments to improve survival after cardiac arrest.<sup>4</sup> Magnesium (Mg) plays a neuroprotective role at the physiologic level, but the role of serum Mg in clinical resuscitation is unknown. Naksuk et al<sup>5</sup> found that a serum Mg level of  $\geq 2.4$  mg/dL was a predictor of increased hospital mortality,<sup>5</sup> and Haider et al<sup>6</sup> showed that hypermagnesemia was a predictor of mortality in critically ill patients. Perucki et al<sup>7</sup> reported that high serum Mg levels were correlated with unfavorable neurological outcomes in patients who had undergone TTM after cardiac arrest. In the study conducted by Perucki et al,<sup>7</sup> TTM was performed, maintaining a target core temperature of 33°C (91.4° F) for 48 hours. Resuscitation science has not formulated a protocol for TTM,<sup>4</sup> and various protocols have been used and continue to be evaluated. However, the association between Mg levels at administration of different TTM protocols and neurological outcomes in patients with cardiac arrest has not been evaluated.

In our hospital, patients who achieve a return of spontaneous circulation (ROSC) after cardiac arrest are subjected to TTM, and their core temperature is maintained at 36°C (96.8° F) for 24 hours. We examined the association between Mg levels at administration of TTM and neurological outcomes in patients after cardiac arrest in our hospital. Our research question for this study was whether Mg levels predict neurological outcomes for patients undergoing TTM after cardiac arrest.

### Methods

This study used a correlational design with a retrospective chart review methodology.

The setting of the study was the Intensive Care Unit of the Department of Emergency and Critical Care Medicine, Dokkyo Medical University Saitama Medical Center, Saitama Prefecture, Japan. Data were extracted from the medical records of patients who had experienced cardiac arrest and achieved ROSC inside or outside of the hospital, including laboratory findings from blood sampling, neurological outcomes, and time course. All patients who achieved ROSC between December 2015 and November 2017 were subjected to TTM. The core temperature was maintained at 36°C (96.8° F) using Arctic Sun 5000 or MEDI-THERM III (IMI, Saitama, Japan) for 24 hours from ROSC. Muscle-relaxant drugs were generally not used for TTM. On the basis of the guidelines of the Japan Resuscitation Council,<sup>8</sup> we selected 36°C (96.8° F) as the target core temperature for TTM. The TTM in our hospital



was started in the intensive care unit and was not provided if cardiac arrest occurred because of trauma and in cases of unstable hemodynamics, severe cerebral hemorrhage, no attempt of resuscitation order, severe disability, dependency in activities of daily life, or pregnancy. In addition, TTM was not provided when the Glasgow Coma Scale (GCS) score was  $\geq 9$ , verbal score of the GCS was 4 or 5, and motor score of the GCS was 6.<sup>9</sup> Data were not used if initial blood data had not been obtained. The TTM protocol in our hospital remained unchanged during the study period.

Blood sampling was performed in the hospital within approximately 30 minutes from initial resuscitation. A clinical chemistry analyzer (JCA-BM6070; JEOL Ltd., Tokyo, Japan) was used for Mg level analysis, and a blood gas analyzer (RAPIDPoint 500 or RAPIDLab1265; Siemens Healthcare, Erlangen, Germany) was used for arterial blood gas analysis. Emergency physicians and nurses conducted all resuscitations according to the guidelines of the Japan Resuscitation Council.<sup>8</sup>

The diagnosis of cardiac arrest, defined as the cessation of cardiac mechanical activity confirmed by the absence of signs of circulation,<sup>10</sup> was made clinically by trained emergency providers. In addition, signs of circulation were confirmed by determining whether the carotid artery was pulsating and through findings from an electrocardiogram. Neurological outcomes were evaluated using the following Cerebral Performance Categories (CPCs) at discharge from hospital using medical records: CPC 1, normal or mild disability; CPC 2, moderate disability but independent in activities of daily life; CPC 3, severe disability and dependent in activities of daily life; CPC 4, persistent vegetative state; and CPC 5, death.<sup>10</sup> Patients were grouped by neurological outcomes according to previous studies<sup>11</sup>: favorable neurological outcome (CPC 1, 2) group and unfavorable neurological outcome (CPC 3, 4, or 5) group. CPCs are used in the International Utstein Resuscitation Registry Templates for evaluation of the prognosis after cardiac arrest.

The primary outcome in this study was to determine whether Mg levels predict unfavorable neurological outcomes at hospital discharge in patients with ROSC after TTM. Factors were compared between patients with favorable neurological outcomes and those with unfavorable neurological outcomes using Student's *t* test for parametric variables, the Mann-Whitney *U* test for nonparametric variables, and the chi-square test for categorical variables. Variables for multiple logistic regression analysis were the time from recognition of cardiac arrest to ROSC, which is called the time to ROSC in this paper ( $>30$  minutes vs  $\leq 30$  minutes); motor score of the GCS after ROSC ( $>1$  vs  $=1$ ); first-recorded cardiac rhythm (shockable vs nonshockable); pH; and Mg levels. In this study, Mg levels were used as a continuous variable and not as a categorical variable. When emergency medical services personnel or medical professionals, including emergency nurses, encounter a patient with sudden cardiac arrest, they record the cardiac rhythm by determination of whether the carotid artery is pulsating and by electrocardiography. In this manuscript, we called this rhythm the first-recorded cardiac rhythm. The first-recorded cardiac rhythm is subdivided into first-recorded shockable cardiac rhythm and first-recorded nonshockable cardiac rhythm. The first-recorded shockable cardiac rhythm is a cardiac rhythm that can be shocked to normal cardiac rhythm using a defibrillator or automated external defibrillator. The first-recorded nonshockable cardiac rhythm is a cardiac rhythm that cannot be shocked to a normal cardiac rhythm using a defibrillator or automated external defibrillator.

This study was conducted in accordance with the Act on the Protection of Personal Information and the Ethical Guidelines for Medical and Research Involving Human Subjects of Japan.<sup>12</sup> The requirement for individual informed consent had been waived because the procedures described in this study were performed in routine clinical practice, and the study presented no additional risks to the patients. The protocol for this research was approved by the Clinical Research Institutional Review Board of Dokkyo Medical University Saitama Medical Center (approval no. 1765). All statistical tests were two-sided, and *P*

**Results**

The <sup>Figure</sup> shows the selection of cases for inclusion in the analysis of the occurrence of cardiac arrests from December 2015 to November 2017. A total of 631 cardiac arrest cases were registered. Cases that were not resuscitated (n = 94), those without ROSC (n = 309), and those with unstable hemodynamics (n = 118), GCS score of 9 or higher (n = 10), cardiac arrests caused by severe cerebral hemorrhage (n = 7), trauma (n = 6), and missing data (n = 1) were excluded. Finally, 86 eligible cases were analyzed: 28 with favorable neurological outcomes and 58 with unfavorable neurological outcomes.

The baseline characteristics of patients who were provided TTM after ROSC are shown in <sup>Table 1</sup>. There was no significant difference in age, sex, cause of cardiac arrest, arrests witnessed, and bystander CPR between patients with favorable and those with unfavorable neurological outcomes. Those with unfavorable neurological outcomes had a significantly lower proportion of first-recorded shockable cardiac rhythm. In addition, those with unfavorable neurological outcomes had a significantly longer time to ROSC.

Laboratory findings at the time of initial resuscitation are shown in <sup>Table 2</sup>. Compared with those in the favorable neurological outcomes group, pH, partial pressure of oxygen, base excess, total protein level, and platelet count were significantly lower and partial pressure of carbon dioxide and lactate, potassium, and Mg levels were significantly higher in the group with unfavorable neurological outcomes. The mean hospital stay was 19.2 days for the entire study population.

A regression model was constructed including key elements of patient characteristics (time to ROSC, motor score of the GCS after ROSC, first-recorded cardiac rhythm, pH, and Mg levels) that were significantly different between those with favorable and those with unfavorable outcomes. The results of multiple logistic regression analysis of prognostic factors for unfavorable neurological outcomes in patients who had ROSC after cardiac arrest are shown in <sup>Table 3</sup>. Mg levels were not a predictor of neurological outcome according to the results from this regression model. A time to ROSC greater than 30 minutes and GCS motor score of 1 were found to be predictors of unfavorable neurological outcomes in this analysis, accounting for about 50% of the variance in the model.

## Discussion

We performed a multiple logistic regression analysis using retrospectively collected data to evaluate whether Mg levels predict neurologic outcomes in patients who had ROSC after cardiac arrest. Previously reported research results showed that high serum Mg levels correlated with unfavorable neurological outcomes in patients who were provided with TTM after cardiac arrest.<sup>7</sup> We hypothesized that Mg levels along with other key patient characteristics would explain a large proportion of the variance in our regression model based on this previous research. However, multiple variable analysis results in the current study showed that Mg levels do not significantly contribute to predicting favorable or unfavorable neurological outcome following ROSC according to our model.

Our study indicated that a time to ROSC greater than 30 minutes and motor score of GCS of 1 might predict neurological outcome after cardiac arrest. These findings reinforce previously reported research results<sup>9</sup> and further clarify the impact of Mg levels on neurological outcome after ROSC.

## Limitations

This study has several limitations. First, as with previous correlational designs using a retrospective chart review, unmeasured possible confounding factors may have influenced the association between Mg levels and patients' outcomes. Second, information on patients' medication and comorbid conditions as well as medical history, which might have included factors that could have influenced the occurrence of cardiac arrest, was not obtained. Third, we used combined data on patients who had experienced cardiac arrest at and outside of the hospital. A previous study has demonstrated that the neurological outcomes after cardiac arrest inside and outside of the hospital were very different.<sup>13</sup> Thus, this point could have an impact on the findings of this study. Moreover, as our sample size was

small, our sample size was not justified with a power analysis, and the study setting was limited to a single facility in Japan, the results might not be easily applicable to other geographical locations.

### Implications for Emergency Nurses

Our findings indicate that the time to ROSC can predict neurological outcomes after cardiac arrest. Early CPR and shocks with an automated external defibrillator before advanced life support are essential to increase survival after cardiac arrest by shortening the time to ROSC.<sup>14</sup> Therefore, emergency nurses should continue to focus on basic and advanced life support for patients who have experienced a cardiopulmonary arrest.

Emergency nurses who work in emergency departments, on rapid response teams, and on intensive care units often forecast the prognosis after cardiac arrests to provide information to the patient's family for advanced care planning and to consult with other medical professionals on the discontinuation of resuscitation. The findings from simple blood sampling, the time to ROSC, and the motor score of the GCS can be evaluated by emergency nurses, not only physicians. Our findings might contribute to resuscitation practices and further clinical trials that emergency nurses will conduct.

### Conclusions

According to multiple logistic regression analysis of our hospital data, Mg levels did not predict neurological outcomes after cardiac arrest in patients who had undergone TTM. In addition, a time to ROSC greater than 30 minutes and GCS motor score of 1 predicted unfavorable neurological outcomes after cardiac arrest in our regression model. Thus, basic and advanced life support for emergency nurses should continue to be encouraged to shorten the time to ROSC. However, the results of this study alone cannot change clinical practices. This scientific area requires further research such as prospective studies, including randomized controlled trials, to forecast accurate prognosis after cardiac arrest and share limited medical resources.

### Acknowledgments

Mitsuhiro Suzuki and Toshihiro Hatakeyama prepared the first draft of this paper and contributed equally in revisions according to comments from the co-authors.

We thank the physicians and nurses of Dokkyo Medical University Saitama Medical Center for their indispensable cooperation and support including information on resuscitation practices and data collection. We would also like to thank NAI (<https://www.nai.co.jp>) for English language editing.

### Author Disclosures

Conflicts of interest: none to report.

Characteristics of patients	Favorable neurological outcomes (n = 28)	Unfavorable neurological outcomes (n = 58)	Point estimations and 95% CI for the Student t test, odds ratio for $\chi^2$ test, or Z score for Mann-Whitney U test	P value
Age (y), mean (SD)	57.9 (17.7)	63.1 (15.1)	-5.2 (-12.5, 2.1)	0.16
Men, n (%)	24 (86)	48 (83)	0.8 (0.2, 2.8)	1.00

First-recorded cardiac rhythm, n (%)				0.03*
VF/pulseless VT	22 (79)	28 (48)	–	
PEA	4 (14)	20 (35)	3.9 (1.2, 13.2)	
Asystole	2 (7)	10 (17)	3.9 (0.8, 19.8)	
Cause of cardiac arrest, n (%)				0.61
Cardiac	23 (81)	42 (72)	–	
Respiratory	2 (7)	7 (12)	1.9 (0.4, 10.0)	
Others	3 (11)	9 (16)	1.6 (0.4, 6.7)	
Motor score of GCS, n (%)			–3.54	<0.001†
1	14 (50)	56 (97)		
2	0 (0)	0 (0)		
3	1 (4)	1 (2)		
4	13 (46)	1 (2)		
5	0 (0)	0 (0)		
The time to ROSC (min), mean (SD)	21 (13.8)	44 (18.4)	–22.9 (–30.1, –15.1)	<0.001†
ROSC >30 min, n (%)	6 (21)	46 (79)	14.1 (4.7, 42.4)	<0.001†
Cardiac arrest witnessed, n (%)	21 (75)	35 (60)	0.5 (0.2, 1.4)	0.18
Bystander CPR, n (%)	23 (82)	36 (62)	0.36 (0.1, 1.1)	0.06

Laboratory findings	Favorable neurological outcomes (n = 28), mean (SD)	Unfavorable neurological outcomes (n = 58), mean (SD)	P value
pH	7.2 (0.2)	7.0 (0.2)	<0.001 <sup>†</sup>
pO <sub>2</sub> (mm Hg)	195 (106)	132 (102)	0.02*
pCO <sub>2</sub> (mm Hg)	49 (24.9)	74 (28.5)	<0.001 <sup>†</sup>
Lactate (mg/dL)	84 (46.1)	114 (39.7)	<0.001 <sup>†</sup>
HCO <sub>3</sub> <sup>-</sup> (mmol/L)	15.7 (4.6)	15.9 (5.3)	1.00
BE (mmol/L)	-13 (7.1)	-17 (6.8)	0.02*
TP (g/dL)	6.6 (0.6)	6.1 (0.7)	0.001 <sup>†</sup>
K (mEq/L)	4.3 (1.4)	5.0 (1.3)	0.003 <sup>†</sup>
Mg (mg/dL)	2.4 (0.5)	2.7 (0.8)	0.002 <sup>†</sup>
IP (mg/dL)	6.9 (2.7)	8.2 (2.5)	0.006 <sup>†</sup>
WBC (cells/ $\mu$ L)	12,100 (4,400)	11,400 (5,900)	0.20
Hb (g/dL)	13 (3.5)	13 (3.1)	0.20
Plt ( $\times 10^4$ / $\mu$ L)	23 (6.8)	19 (8.0)	0.02*

Prognostic factors	Unstandardized coefficients	OR (95% CI)	P value
The time to ROSC >30 min	1.4	4.1 (1.1-14.8)	0.03*
Motor score of GCS = 1	1.0	2.8 (1.4-5.5)	<0.01 <sup>†</sup>

First-recorded nonshockable cardiac rhythm	0.1	1.2 (0.3-4.6)	0.84
pH	1.6	5.2 (0.1-207.6)	0.38
Serum magnesium (mg/dL)	-0.2	0.78 (0.3-2.3)	0.66
Model summary, R <sup>2</sup>	0.50		

## DETAILS

**Subject:** Carotid arteries; Laboratories; Medical records; Patients; Emergency medical care; Serum; Regression analysis; Medical prognosis; Arrests; Mortality; Variables; Cardiopulmonary resuscitation--CPR; Hemodynamics; Rhythm; Myocardial infarction; Coma; Defibrillators; Intensive care; Heart attacks; Automation

**Business indexing term:** Subject: Automation

**Location:** Japan

**Identifier / keyword:** Cardiac arrest; Magnesium; Resuscitation; Survival; Targeted temperature management

**Publication title:** Journal of Emergency Nursing;; JEN; Philadelphia

**Volume:** 46

**Issue:** 1

**Pages:** 59-65

**Publication year:** 2020

**Publication date:** Jan 2020

**Section:** Research

**Publisher:** Elsevier Limited

**Place of publication:** Philadelphia

**Country of publication:** United Kingdom, Philadelphia

**Publication subject:** Medical Sciences--Nurses And Nursing

**ISSN:** 00991767

**e-ISSN:** 15272966

Source type: Scholarly Journal

Language of publication: English

Document type: Journal Article

DOI: <https://doi.org/10.1016/j.jen.2019.10.006>

ProQuest document ID: 2333905413

Document URL: <https://www.proquest.com/scholarly-journals/serum-magnesium-levels-neurological-outcomes/docview/2333905413/se-2?accountid=211160>

Copyright: ©2019. Emergency Nurses Association

Last updated: 2022-06-08

Database: Public Health Database

---

Document 33 of 55

# On Evolutions and Revolutions in Emergency Care: Commemorating the Emergency Nurses Association's 50th Anniversary: JEN

[ProQuest document link](#)

---

## ABSTRACT (ENGLISH)

The year 2020 is a very special time of celebration for both the nursing discipline and for emergency nursing. This year has been designated as the World Health Organization and International Council of Nurses Year of the Nurse and the Midwife, celebrating the 200th anniversary of Florence Nightingale's birth and honoring the contributions of nurses to health around the globe. This year is also the 50th anniversary of the Emergency Nurses Association (ENA). Our anniversary year provides a critical time to examine the transformative upheavals, or revolutions, within the nursing discipline that have created the emergency nursing specialty as it exists today. This is also a crucial opportunity to explore how far our thinking and ideas have evolved along this journey. Our 50th anniversary commemoration provides an enlivening opportunity to contemplate how our progress to date will serve as the foundation for an ongoing trajectory of excellence over the next 50 years. There is no doubt that emergency nursing will continue to have an essential role in expanding the timeliness, reach, and effectiveness of health care. I'm writing this 50th anniversary editorial as a brief commentary on the emergency nursing specialty from an evolutionary perspective.

## FULL TEXT

The year 2020 is a very special time of celebration for both the nursing discipline and for emergency nursing. This year has been designated as the World Health Organization and International Council of Nurses Year of the Nurse and the Midwife, celebrating the 200th anniversary of Florence Nightingale's birth and honoring the contributions of

nurses to health around the globe.<sup>1</sup> This year is also the 50th anniversary of the Emergency Nurses Association (ENA). Our anniversary year provides a critical time to examine the transformative upheavals, or revolutions, within the nursing discipline that have created the emergency nursing specialty as it exists today. This is also a crucial opportunity to explore how far our thinking and ideas have evolved along this journey. Our 50th anniversary commemoration provides an enlivening opportunity to contemplate how our progress to date will serve as the foundation for an ongoing trajectory of excellence over the next 50 years. There is no doubt that emergency nursing will continue to have an essential role in expanding the timeliness, reach, and effectiveness of health care. I'm writing this 50th anniversary editorial as a brief commentary on the emergency nursing specialty from an evolutionary perspective.

### **Winds of Change**

In this issue of the *Journal of Emergency Nursing (JEN)*, we have reprinted "Winds of Change."<sup>2</sup> This is a transcript of Dr George T. Anast's 1975 Anita N. Dorr Memorial Lecture. In this lecture, he relays a personal tribute to our ENA founders with a rare first-person historical account of the creation of our specialty organization's predecessor, the Emergency Department Nurses Association. As I read the lecture transcript, I was struck by both the many similarities and the multiple differences in the commonly held patterns and beliefs about emergency nursing between 1975 and today. Dr Anast's speech reveals a plethora of perpetual problems and several enduring strengths (Table) that continue to be extremely relevant today. Several of the differences between the context in 1975 and that today are also astounding.

First, Dr Anast reveals that Anita Dorr was a chain smoker, practicing in a time when large commercial tobacco companies continued to successfully suppress information about the health-harming effects of cigarette smoking and perpetuate the addictive habit. Unfortunately, emergency nurses still deal with the human health consequences to morbidity and mortality that cigarette smoking, and now vaping, have on our patients and colleagues. Resources and support to quit smoking are a crucial part of every emergency discharge teaching plan for any patient who continues to smoke or vape.<sup>3</sup> The next substantial difference between the 1975 context and today's context is exactly who teaches courses to emergency nurses. According to the 1975 transcript, emergency nursing courses were taught almost exclusively by physicians. Fortunately, we have expanded our autonomy as a specialty and courses are now largely led, developed, taught, and evaluated by experts within our own specialty. We continue important interprofessional education collaborations with our interdisciplinary colleagues on an equal team footing.<sup>4,5</sup> The evolution in our education was most notable as Dr Anast refers to nurses' training as adequate preparation for medical school. With advanced practice nursing roles and degrees, the nursing profession has operationalized the educational preparation for nurses within our own discipline. Prescribing providers with nursing, and not just medical, graduate-level training, create an important advancement to meet the needs of society for high-quality health care. Advanced practice nursing providers are now a large portion of the emergency provider workforce.<sup>6</sup> Medical school is not necessary for advanced practice nurses, as Dr Anast had envisioned. Third, Dr Anast refers to a fear of speaking up for emergency nurses. Emergency nurses have a consistent and expert voice in shaping health care building on the strengths of (1) our professional organizations, (2) improved teamwork training (like TeamSTEPPS), and (3) the crucial role of nursing in advancing the Quadruple aim (patient experience, population health, reducing costs, and care team well-being).<sup>7-9</sup> Last, Dr Anast uses traditional gender stereotypes to apply female pronouns to nurses and male pronouns to physicians. Fortunately, the health care professions and our specialty are actively tackling adequate gender representation and equality.<sup>10</sup> Although it is clear that we have evolved a long way since this stereotyping was acceptable, much work continues to ensure that structural gender barriers do not interfere with anyone achieving their full potential and professional dreams.

Overall, what I found most delightful about Dr Anast's speech were his descriptions of Anita Dorr as a unique individual with an impressive personality, who evidently swore profusely. The nature of the work of the specialty continues to tend to attract those of us who are comfortable in taking charge in the midst of previously unsolved problems, uncertainty, and chaos. Emergency nursing is often characterized by those with a passion for practice autonomy and reasoned professional risk-taking. Anita Dorr was a woman who changed the world with few to no



resources, leaving a larger-than-life paragon of determination and perseverance for those of us who are privileged to carry on her legacy.

### **Evolution of Ideas in Emergency Nursing**

Observing 50 years of past growth also allows us a special vantage point to imagine the next 50 years of innovation and change in emergency nursing. Several philosophers have provided guidance on procedures that we can follow to best wrap our minds around how disciplines, and ideas within disciplines, change and evolve. Within the nursing discipline, nursing philosopher Dr Beth L. Rodgers<sup>11</sup> is best known for instilling an evolutionary perspective to thoughtfully examine changes and variations in ideas across time, disciplines, sociocultural contexts, and settings. Her evolutionary approach has been used to clarify ideas that are important to emergency nursing—ideas such as workplace bullying<sup>12</sup> and practice readiness for new nurses,<sup>13</sup> skill mix,<sup>14</sup> harm reduction,<sup>15</sup> professional commitment,<sup>16</sup> patient dignity,<sup>17</sup> patients' values,<sup>18</sup> futile care,<sup>19</sup> shared decision-making,<sup>20</sup> and emotional intelligence.<sup>21</sup> In regards to settings and contexts, *JEN's* International Nursing section is especially relevant to applying an evolutionary perspective by comparing and contrasting emergency nursing practice across different global settings. We look forward to publishing manuscripts that continue to refine our ideas over time and introduce novel ideas of relevance to the specialty.

Over the next 50 years, we have the responsibility and opportunity to guide the ongoing evolution of emergency nursing practice excellence, research, education, policy, and leadership. Will emergency nurse residency evolve to achieve similar government-funded support, graduate education requirements, and standardization that the medical profession has structured for their discipline's residency? *JEN* is relaunching the Nurse Educator section in 2020, which provides an excellent venue to fuel the dissemination of relevant innovations and refine ideas. Furthermore, will the concept of triage continue to be a process of rapidly sorting patients to obtain the right resources at the right time,<sup>22</sup> or will the triage idea continue to evolve to represent a distinct physical area of the emergency department or broader interdisciplinary team's initial intake into the acute care hospital setting?<sup>23</sup> *JEN's* Triage Decisions section continues to relay evidence-based manuscripts to inform the ongoing evolution of triage. Will the concept of "telehealth" fully integrate into emergency nursing triage, assessment, treatment, discharge teaching, and referrals to follow up in other health care settings?<sup>24</sup> We look forward to continuing to accelerate our specialty's evolutions and expand the boundaries of our knowledge and innovations in all areas of *JEN* publications.

### **The Specialty of Emergency Nursing as a Revolution**

Fifty years ago, emergency nursing as a specialty was an anomaly. Many emergency rooms and departments of hospitals, if they existed, were often staffed only as needed by ward nurses or nursing house supervisory staff for a brief period before assigning the patient to a specific inpatient ward or unit. The emergency care sector has revolutionized health care in 50 years from an anomaly to one of the most frequently utilized sectors of the entire health care system (roughly 1 emergency visit for every 6 outpatient office visits annually).<sup>25,26</sup> Philosopher Dr Thomas S. Kuhn's book *The Structure of Scientific Revolutions* provides a fascinating perspective by which to examine how this whole new, tradition-shattering worldview of the health care system as a discipline and specialty with practice that is rooted in science came to be over time.<sup>27</sup> Although Kuhn focuses on revolutionary scientific theories such as Newton's first law of motion or Copernicus and Galileo's observations that the sun is the center of the universe, the process of modernizing a discipline's shared commitments and mental models are relevant to emergency nursing. Kuhn's overall premise is that the professional community with the system of ideas and tools best poised to solve pressing problems evolves to dominate the worldviews of the discipline and ongoing scientific endeavors. Clearly, the demand for emergency care over the last 50 years is a pressing problem characterized by a system that is overburdened, underfunded, and highly fragmented.<sup>28</sup> Despite these challenges, the emergency care system offers access, efficiency, efficacy, convenience, and cultural competence that serves as an exemplar for primary care, telehealth, urgent care, and patient-centered medical home models.<sup>29,30</sup> Kuhn's process of revolutions remains particularly relevant as we examine much needed reprioritizations in health care and crises that require new worldviews for adequate problem solving.

The process of a discipline's revolution includes recognizing an anomaly, crisis, discontent over status quo, debates

over fundamental ideas and methods, rejecting an old system of thinking, a change of worldview, and a new “constellation of group commitments” within a discipline.<sup>27</sup> In the acute care hospital systems of the past, the emergency room or emergency department was an anomaly in the usual workings of the health care system. Decades of rapidly increasing needs and demands for emergency care have created several crises linked to crowding, fragmentation, limited access to trauma specialists, diversion, limited considerations for specialized pediatric care, and inconsistency in workforce preparation standards.<sup>28,31,32</sup> The capacity of emergency departments and the clinicians who provide care in this specialty evolved through repeated crises where the community need far outpaced the available resources. Before this crisis and as a professional discipline, nursing has had core problems that it considers as relevant and has established techniques.<sup>33-35</sup> However, conventional thinking about the fundamental knowledge, skills, and abilities of the generalist nurse were no longer sufficient to meet standards of care in the revolutionized emergency care arena. A specialized scope and standards with requirements for specialty certification were born and revised.<sup>36</sup> Likewise, priorities for emergency care–focused education, practice, and research challenged conventional thinking with new categories and worldviews.<sup>37,38</sup> ENA, as a specialty professional organization, routinely produces research, position statements, clinical practice guidelines, resolutions, and policy initiatives as an ongoing constellation of our ever-evolving group commitments as a community of emergency care specialists. Wow! Just look at how far we have come! Today, as we witness cotemporary crises in health care financing, where hospitals are increasingly taking insured patients to court to collect payments for copays and deductibles, nurses are in a trusted position of authority to lead the next reform revolution. With rural hospital closures, we also stand on the precipice of a new chapter of crises in access to emergency care. As new pressing problems in health care emerge in the future, how do we, as a specialty, continually revise our system of ideas and practice tools to remain well-poised to solve these new problems? What problems do we, as a specialty community, even consider to be our legitimate problems to solve? As evolution and revolution take place, an important change includes defining what constitutes legitimate problems in the specialty. For example, we have only just begun to address the predicted health effects of climate change as a legitimate problem, for which our specialty has an important role with key knowledge and solutions.<sup>39</sup> How do we ensure that we continue to evolve our standards and processes to solve these problems? Compared with 50 years ago, nurses today have a whole new way of seeing the world through the process by which the emergency nursing specialty evolved. Just imagine how different this worldview will be in 50 more years. The following examines workplace violence, nontransport emergency medical service (EMS) visits, and new models of holistic emergency nursing as examples of potential, ongoing revolutions.

In my own first position as an emergency nurse, workplace violence was often dismissed or ignored as if it was not a legitimate problem. We were encouraged to consider that patient-initiated violence was just an expected and acceptable part of the job. Thankfully, workplace violence is now well established as a legitimate problem in our specialty, worthy of ongoing research resources and addressed with innovations in individual, organizational, and policy interventions.<sup>40,41</sup> In this issue of *JEN*, Lee et al<sup>42</sup> provide important data that workplace violence is a major problem for emergency nurses in international settings as well. Ensuring that work place violence will no longer be a persistent problem in 50 years for emergency nursing around the globe is a worthy goal.

Currently in the United States, new nontransport guidelines, policies, and reimbursements for EMS fuel a revolution in the emergency nursing specialty. In this issue of *JEN*, we have published several manuscripts on the continually combining and evolving roles of emergency nursing, EMS, flight nursing, and ambulance nursing.<sup>43-45</sup> As revolutions often integrate the crosspollination and novel combinations of ideas across disparate disciplines and specialties, we can anticipate that new models of emergency nursing care in 50 years will incorporate home health nursing, community paramedic programs,<sup>46</sup> free-standing mobile emergency departments, military nursing in austere environments,<sup>47</sup> and telehealth solutions to address home-based, nontransport emergency treatment visits in all types of environments. With the exponential revolutions in the role of technology in health care, it borders on the unimaginable as to just how the emergency care sector will be able to stabilize and resuscitate human life from the imminent threats of death or loss of limb in the next 50 years. In this issue of *JEN*, London et al<sup>48</sup> provide an expert

synthesis of clinical risk for sudden cardiac death. With the exponential proliferation of novel telehealth devices, it is not terribly difficult to imagine that emergency nursing in the future will include community-based rapid response to impending sudden cardiac death detected by a real-time, remote, wearable sensor.

The holistic approach that characterizes nursing education has long been incorporated into the individual nurse–patient encounter. Now the entire emergency care system has begun to revolutionize standardized care processes and payment systems that account for social determinants of health. For example, in this issue of *JEN*, Bergenstal et al<sup>49</sup> developed personalized care plans to reduce the ED utilization of super-utilizers, or patients who were seen in the emergency department 4 or more times in the last year with the same presenting problem. In the next 50 years, I envision emergency nurses will continue to have key leadership roles to incorporate novel interventions into routine acute care encounters and personalized super-utilizer care plans. These care plans will incorporate holistic interventions that effectively address substandard housing conditions, unemployment, homelessness, food insecurity, lack of transportation, educational disparities, limited English proficiency, criminal justice involvement, intimate partner violence, social isolation, health literacy, stigma, and discrimination.<sup>50</sup>

### Onward Together

Since the founding of the ENA 50 years ago, the winds of change continue to rapidly evolve and revolutionize our ideas, specialty, and priority problems. There is a sense of renewal, inspiration, and motivation in reflecting on just how much has been accomplished in the last 50 years. May these reflections energize us to carry on this tremendous momentum and commitment to excellence well into the next 50 years. With the ingenuity, collective commitment, and resourcefulness infused in the origins of our specialty, one can only imagine how profoundly we will shape and influence the health care of the future over the next 50 years, together.

Perpetual problems	Enduring strengths
Information overload Workforce shortages Health care financing Protecting the role of nurses Expanding role of nurses Eradicating secondary/subservient status of nurses	Shared interests of EMS and emergency nurses Interdisciplinary collaboration and support <ul style="list-style-type: none"> <li>• American Academy Orthopedic Surgeons</li> <li>• Trauma Committees of physician organizations</li> <li>• American College of Emergency Physicians</li> </ul> Enthusiasm for continuing education/professional development Accelerating change through advanced practice roles Accelerating change through technology advances Organizing and expanding our professional organization

## DETAILS

<b>Subject:</b>	Teaching; Emergency medical care; Evolution; Revolutions; Telemedicine; Gender; Interdisciplinary aspects; Emergency services; Nursing; Advanced practice nurses; Patients; Smoking; Education; Philosophers; Health care; Anniversaries; Midwives
<b>Company / organization:</b>	Name: Emergency Nurses Association; NAICS: 813920
<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia

<b>Volume:</b>	46
<b>Issue:</b>	1
<b>Pages:</b>	2-7
<b>Publication year:</b>	2020
<b>Publication date:</b>	Jan 2020
<b>Section:</b>	Editorial
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English
<b>Document type:</b>	Editorial
<b>DOI:</b>	<a href="https://doi.org/10.1016/j.jen.2019.11.009">https://doi.org/10.1016/j.jen.2019.11.009</a>
<b>ProQuest document ID:</b>	2333905409
<b>Document URL:</b>	<a href="https://www.proquest.com/scholarly-journals/on-evolutions-revolutions-emergency-care/docview/2333905409/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/on-evolutions-revolutions-emergency-care/docview/2333905409/se-2?accountid=211160</a>
<b>Copyright:</b>	©2019. Emergency Nurses Association
<b>Last updated:</b>	2021-04-09
<b>Database:</b>	Public Health Database

Document 34 of 55

# Experiences of Care in the Emergency Department Among a Sample of Homeless Male Veterans: A Qualitative Study: JEN

## ABSTRACT (ENGLISH)

### Introduction

Homeless populations are historically high users of the emergency department for low-acuity issues that could be treated in more appropriate settings such as primary care. Veterans make up 11% of the homeless adult population and are often seen in community and Veterans Affairs Medical Center (VAMC) emergency departments. The purpose of this study was to describe the experiences of a sample of homeless male veterans as they attempt to access health care in the emergency department.

### Methods

Grounded theory methodology provided the overarching framework for this research project. Structured interviews were conducted with 34 male homeless veterans, with 25 discussing their ED care. Veterans were recruited and interviewed from one VAMC emergency department, an all-male emergency shelter, and 1 soup kitchen. Text units about ED use were extracted and compared from 25 recorded transcripts to identify categories.

### Results

Three categories defined ED experiences: “no other option,” “lack of voice,” and “feeling valued.”

### Discussion

The sample of homeless veterans in this study provided first-person knowledge about their experiences receiving care in emergency departments. These results are consistent with previous research indicating that homeless populations are high users of ED care; however, they often feel undervalued and lack of empathy from health providers. Emergency nurses are an integral part of the ED health care delivery system for the homeless, providing advocacy and much needed education about health problems and alternatives to ED care. The insight obtained about the lives and experiences of veterans in the ED is valuable to the practice of emergency nurses.

## FULL TEXT

### Contribution to Emergency Nursing Practice

- The current literature on homeless veterans' experiences using the emergency department for care indicates that, although they use the emergency department for convenience, there is a lack of continuity and follow-up care.
- This article contributes valuable insight about the lives and experiences of homeless veterans as they attempt to seek health care in the emergency department.
- Key implications for emergency nursing practice found in this article are that conducting a military history will help to better understand the needs and expectations of veterans experiencing homelessness. Also, being cognizant of the unique physical, mental, and social needs resulting from their military service and valuing them as individuals, while providing needed advocacy as necessary, will produce positive health interactions.

### Introduction

Homelessness is one of the most common characteristics found among people accessing the emergency department for care.<sup>1</sup> These individuals often use emergency departments as their primary source of care because of its ease and accessibility, while contributing to more than 1 million out of 136 million visits to the emergency department every year.<sup>2-5</sup> This overuse by the homeless creates a significant economic, time, and space burden on emergency departments and the overall health care delivery system.<sup>2,3,6</sup> Often, those who use the emergency department frequently represent a small sample of the ED population but make up a significant number of repeat visits.<sup>3</sup> The homeless are at an increased risk for high ED use because of their overall poor health status, including

high levels of chronic disease and morbidity,<sup>7</sup> increased exposure to natural elements, high rates of injuries, and unmet physical and mental health needs.<sup>8</sup>

The United States Department of Housing and Urban Development (HUD) and the United States Department of Veterans Affairs (VA) define homelessness as individuals who lack a fixed, regular, and adequate night-time residence or whose primary residence is a place not ordinarily used for routine sleeping accommodations for human beings.<sup>9</sup> Homeless veterans represent 11% of the adult homeless population.<sup>10</sup> The argument can be made that veterans have access to more health-related resources than other homeless subpopulations<sup>11</sup> because of their access to the Veterans Health Administration (VHA). However, only 40% of the nation's 22 million veterans are registered for VHA benefits,<sup>12</sup> and they often choose not to access the VA system.<sup>13-15</sup> Instead, they often opt to receive care in non-VA community settings. Various studies<sup>16-18</sup> indicate that frequent ED use by homeless veterans remains a significant problem both within the VA system and in the community.

Common characteristics and patterns of use of VA emergency departments among veterans has been previously examined.<sup>16-18</sup> The strongest sociodemographic correlation of VA ED use was found to be homelessness, with homeless veterans being 6 times more likely to be among the most frequent ED users.<sup>16</sup> In addition, homelessness has been shown to be 10 times higher among veterans who are treated and released from emergency departments and is a predictor of repeat visits and hospitalizations.<sup>17</sup> Homeless VA ED users are also more likely to use the emergency department repeatedly for nonemergent services and at higher rates than their housed veteran counterparts.<sup>18</sup> The general characteristics of homelessness (food insecurity, exposure to the elements) increases the likelihood of an individual using an emergency department for all health care needs, rather than some other source such as ambulatory care or primary care.<sup>8</sup> In addition to contributing to a crowded and financially burdened environment, the high use of emergency departments by homeless veterans often leads to a lack in continuity of care and poor health outcomes.<sup>2-4,8,16</sup>

In addition, those experiencing homelessness are frequently the subject of negative attitudes and behaviors from other people, including health care personnel.<sup>19</sup> This often leads homeless individuals to report a lack of trust in clinical providers and a further unwillingness to seek care unless deemed necessary.<sup>19-21</sup> Therefore, the purpose of this study was to describe the experiences of a sample of homeless male veterans as they attempt to access health care in the emergency department and make recommendations to emergency nurses and other stakeholders about effective approaches to ED care for this vulnerable population.

### **Methods Study Design**

Grounded theory methods by Glaser and Strauss were used to answer the research question in this study.<sup>22</sup> This method was chosen for its ability to produce theory that is "grounded" in the research data rather than deduced from a hypothesis and can explain real-world phenomena. Grounded theory requires a close relationship between data collection and data analysis to produce explanatory models of human behavior.<sup>22</sup> To gain a better understanding of the concepts and the main tenets of grounded theory, refer to the <sup>Table 22-26</sup>.

The study findings resulted from a larger qualitative study in which the purpose was to explore how homeless veterans manage their chronic health problems. The population of veterans being studied shared the same fundamental problem of being homeless, while also suffering from some chronic disease. The overall focus of the study was to determine how homeless veterans resolve the problem of chronic disease management through a social or psychological process. The specific aim addressed in the present study was to explore the role of the emergency department in how veterans manage these chronic health problems. Participants were included if they were men, United States veterans (self-disclosed), currently homeless as defined by the VA and HUD, and previously diagnosed with at least 1 chronic health problem. Institutional review board and VA Research and

Development Committee approval were obtained. Each participant received a \$35 gift card to a large chain grocery store as compensation for his time.

### **Sample and Setting**

Purposive or selective sampling followed by theoretical sampling was used to recruit 34 male homeless veterans from 3 locations across 1 large, urban, midwestern city. Detailed flyers were displayed and on-site recruitment occurred at 1 VA emergency department, a soup kitchen, and a large all-male emergency shelter. Informed consent was obtained, and data were collected in a private room at all 3 study sites, with only the participant and the principal investigator present.

### **Data Collection**

Semistructured interviews with participants, lasting between 30 and 60 minutes, were audio-recorded, transcribed, and verified by the principal investigator. Field notes and memos were also used to collect rich data and are consistent with grounded theory methodology.<sup>22</sup> Field notes allowed the researcher to follow up with any clarifying questions and record any general impressions of the environment and/or the participant. Memos were written congruently while data collection and analysis took place to enhance the development of emerging themes. Then, more advanced memos were written as the categories fully developed. Participants were asked 10 interview questions in the larger grounded theory study. Depending on the participants' responses to the guided questions, they were asked additional questions to better understand and capture their experiences in the data. To address the specific aim of this article, the focus was on 2 questions, which included, "Describe a time you needed to seek treatment for your chronic health problems" and "Can you give any advice or recommendations to health care providers working with homeless veterans with chronic health problems?"

### **Data Analysis Procedures**

The transcripts from the 34 participants were analyzed for text units pertaining to self-reported ED visits while homeless. Text units are defined as sentences, phrases, or stories<sup>25</sup> about homeless male veterans' experiences in emergency departments. The grounded theory technique of constant comparative analysis was used to analyze the resulting text units. Line-by-line coding, then substantive coding, and finally theoretical coding were used by the research team, which consisted of the principal investigator, 2 experienced qualitative nurse researchers, and 1 BSN honors student. The principal investigator and 1 nurse researcher met weekly to conduct line-by-line coding on the first 4 transcripts to discuss and establish initial themes. Then, substantive coding and theoretical coding were conducted individually by the entire research team on the remaining 30 transcripts. The research team met weekly to discuss the coded transcripts, analyze the data to reach group consensus and ensure rigor, and review the resulting categories to ensure theoretical saturation was achieved and theoretical sensitivity was maintained. The qualitative software MAXQDA (MAXQDA Analytics Pro, VERBI GmbH, Berlin, Germany)<sup>27</sup> was used to assist with data analysis procedures.

### **Results**

Twenty-five of the 34 study participants discussed care in the emergency department during their interviews when asked to "describe a time you needed to seek treatment for your chronic health problems." The average age of the participants was 56 years. Seventeen participants identified as African American, whereas the remaining 8 identified as Caucasian. More than 80% of the study population had more than 1 diagnosed chronic health problem with substance abuse (drugs and /or alcohol) being the most common; 13 participants used only VA emergency departments, 8 participants used only community emergency departments, and 4 participants used both VA and community emergency departments. Three categories emerged from the data analysis, which represents how veterans described their ED experiences. The categories include "no other option," "lack of voice," and "feeling

valued.”

### **No Other Option**

This category encompasses homeless veterans feeling that the emergency department is the only place to receive quick and accessible care (20 of 25 participants). They consider their health on a day-to-day basis without future concerns and hope to remain healthy. Participants described feeling how they have no place else to go except the emergency department to be treated immediately for their symptoms. For example, 1 participant described being treated in the emergency department for diabetes: *I been to the emergency room, in the last 2 months I've been 5 times. They're sick of looking at me, you know what I mean. My sugar was 688, they brought it down to 305 and put me out. I went back; my sugar was 650. They brought it down to 300 and put me out.*

Homeless veterans remained concerned about being treated for their health problems at the current time only because they believed the future was beyond their control. They were concerned about receiving follow-up care or making follow-up appointments, as the emergency department was available. One participant described his typical treatment for his health problems: *I just go to the emergency room, and they give me whatever medication I need, and then when I start to feel better, I leave it alone until another episode. Follow-up after that, me not being stable, I don't even think about that.*

Participants described attempting to deal with the problems the best they could because they perceived no other options were available. They were often hopeful that they would remain healthy and not need any health services as 1 participant openly described: *As far as my health, I just try to take care of myself the best I can, you know there is nothing I can do, you know but deal with the situation...I can't make myself better, so I usually go to the emergency room doctor.*

Also, they often lack understanding of how to appropriately navigate the health care system, how to obtain other available resources, and the time needed to access those resources that can be used to manage their care better. Another trend emerging from the data included descriptions associated with the convenience of ED treatment and how this served as a strategy to manage care. *Well if my back is hurting too bad, I go to the emergency room. Basically, that's what I've been doing, and then after I get the medication I just wait until that episode is over with, and then I won't worry about it until it happens again, or I do something to agitate it, and then I'm running back to the emergency room.*

Finally, the lack of health insurance did play a role in homeless veterans accessing the emergency department for care. One participant described using the emergency department for treatment of his chronic obstructive pulmonary disease: *I have lung disease, and it's not reversible. When I get sick, I normally do go to the emergency room because I don't have any health insurance, and so I can get my treatments by going to the emergency room.*

### **Lack of Voice**

This category includes how homeless veterans frequently feel they have no say in their health care situation, which can often lead to a lack of trust in the system and clinical providers (17 of 25 participants). The veteran participants described experiences in which they often felt discounted by the health care system. They wanted to be heard and have a say in their health care and social situations, as 1 participant explained after visiting the emergency department: *I just would like to be heard sometimes, I don't like to be talked at, I definitely do not like to be talked down to, but I would just like to be heard...if the provider or care source would just maybe listen, he would just know how to treat the person that they're providing service for. We don't need a lot. We may need a little patience but we don't need a lot.*

Often, participants described situations that could have been more easily resolved had their health care provider listened to them and tried to better understand their needs and life situations. For instance, 1 participant explained



how his needs might be different from another ED patient also experiencing homelessness: *I think health care providers really need to listen to our problems more and really listen and just take each individual case different. We all are different; some people need help with certain things, others need help with other things.*

In addition, homeless veterans vividly described experiences of feeling disposable, as 1 participant explained when attempting to interact with ED staff: *Because of my homelessness, I don't think they really take us as being very important people.*

Negative perceptions reinforced lack-of-voice experiences and, in our sample, appeared to prevent participants from reaching out for help and establishing relationships with care providers. A participant described not wanting to return for health care services because of his negative ED experience: *The doctor was rude. He came in and told me I had a year; he said "You'll be dead in a year if you don't change your ways."*

### **Feeling Valued**

While dealing with their social situation and chronic health problems, participants were still able to provide positive ED experiences that created feelings of value and self-worth (14 of 25 participants). This category incorporates the encouraging words that homeless veterans expressed about those in emergency departments who went out of their way to make a valuable contribution to veterans' health and social situations. Regardless of experiencing both positive and negative situations in the emergency department, many participants were quick to praise those who truly tried to help them. Participants provided encouraging stories in which they either experienced or witnessed other ED staff helping homeless persons: *All these people go beyond their job. I see 1 case worker; she takes a guy across the railroad to pick up stuff that he needs, and the case workers are taking people to their new place.*

Much emphasis was placed on feeling that individuals were genuine in their willingness to help and greatly appreciated when there was someone prepared to advocate for them. A veteran with suicidal ideations described how important it was that the ED psychiatric staff stepped in to help him: *I went to the emergency room and told them that I had had it, I was ready to kill myself. Right then, the psychiatric emergency department jumped in and they kept me in the hospital for a while until I felt I was all right. They asked me if I'm ready to go home yet, and I wasn't feeling it, I wasn't ready to go home, so I didn't go home.*

### **Discussion**

The study findings indicate that when male homeless veterans required treatment for their chronic health problems they often chose the emergency department as a source for medical care; 75% of study participants noted that they used emergency departments rather than another source, such as primary care, which supports previous research findings.<sup>11,16-18</sup> The theme "no other option" provided some insight regarding why this population are high users of emergency departments.<sup>16-18</sup> The findings suggest that homeless veterans perceive the emergency department as their best option for care rather than primary or ambulatory care services because of convenience, accessibility, and time constraints. Because of their lack of housing and frequent food instability,<sup>8</sup> homeless veterans often described using the emergency department because they had no other options. They are focused on finding food, shelter, and safety<sup>28</sup> rather than seeking appropriate health care services. The emergency department serves as their safety net, and veterans described their attempts to deal with their health issues on their own until symptoms became unavoidable. As a result, they sought out ED care for various reasons such as treatment for diabetes, chronic obstructive pulmonary disease, and medication refills.

Participants describe both positive and negative experiences when encountering emergency health services in both the VA and the community setting. Marginalization of vulnerable populations is not a new concept, and homeless veteran participants in this study describe how they often felt disposable, with no voice in their care, which often created an environment of distrust. The use of ED-integrated social services and/or having a plan to address

homelessness—such as emergency shelter access and transitional housing programs—in the emergency department can help increase levels of trust and create positive opportunities for those experiencing homelessness.

20

Veterans who experience homelessness often have more complex health care needs than the general population.<sup>3,29,30</sup> In addition, they are frequently nomadic and may seek health services across multiple states and health care networks, as participants in this study indicated. Therefore, another way to ensure that homeless veterans are being heard and increase their feelings of value is for ED providers to gain a full understanding of their health and social situations. It is important for providers to be aware, when providing services to our nation's heroes, and allow them the appropriate time, space, and support to adequately explain their health care needs.<sup>21</sup>

### **Implications for Emergency Nurses**

Emergency nurses are likely to encounter homeless populations, including veterans, because of their frequent visits to emergency departments across the United States.<sup>2</sup> Almost half the participants in this study (12 of 25) reported using community emergency departments as opposed to VA emergency departments at some point in time. This puts emergency nurses in the community, along with VA emergency nurses, in a unique position to provide health care, much-needed health education, and advocate for this vulnerable population. Veterans themselves have unique physical and mental health needs, because of their service in the military, to which emergency nurses should be alert. They are often exposed to hazardous materials—such as chemicals, cold injuries, and contaminated water—and experience mental health problems—such as post-traumatic stress disorder, substance abuse, and depression—because of their exposure to combat and other atrocities.<sup>31</sup> It is essential that emergency nurses take the time to ask pertinent health questions related to the veterans' military experience to gain understanding of health needs, increase trust, and create a positive health experience. A VA-developed tool<sup>32</sup> is available to assist nurses and other clinicians in obtaining valuable military and health history information from veterans to best provide for their unique health care needs. This includes asking about military era served; if the veteran experienced combat; talking with the veteran about stress, anxiety, depression, and other mental health issues; and discussing their housing situations.<sup>32</sup>

Findings from this study increase our knowledge and understanding about the experiences of homeless veterans receiving care in emergency departments. Recommendations from the data include emergency nurses working to provide comprehensive care, including evaluating a veteran's military history, while creating a respectful environment to increase trust. In addition, by giving a voice to those homeless individuals who may have been previously ignored through advocacy and health promotion, emergency nurses can create positive health interactions that can lead to open communication and positive health experiences. Ultimately, findings call for more education of emergency nurses and ED staff about homeless veterans and provision of the foundational knowledge for a much-needed educational intervention in the ED setting.

### **Limitations**

One limitation of this study was that participants were interviewed at 1 point in time and may not adequately represent homeless veterans seeking treatment at other VA and non-VA emergency departments across the United States. Another limitation of this study was that the veteran status of participants was self-disclosed. Participants were not asked to provide written proof of military service. However, owing to the nature of the questions asked during the interview process, it would be challenging for a participant to falsify military information and described experiences.

### **Conclusions**

By creating an environment that allows veterans experiencing homelessness to have a voice and feel valued,

emergency nurses can generate trust and understanding that opens the door for education about other care options. This study provided a unique first-hand perspective of homeless veterans' experiences seeking care in both VA and community emergency departments. When health care providers listen, support open communication, and convey that they value the patient, these interactions may increase receptivity to learning about other health care options and have a positive impact on follow-up care.<sup>2-4,30</sup> Future research is needed to assess the generalizability of our findings at other sites serving this population. Additional studies may also add to this body of knowledge by devising person-centered strategies that leverage the homeless veteran's experience as an opportunity to provide education about other care-delivery options and help to remove the barriers that perpetuate frequency of ED use.

#### Author Disclosures

This work was supported by a VISN 10 Research Initiative Program Grant from the United States (U.S.) Department of Veterans Affairs. The contents do not represent the views of the U.S. Department of Veterans Affairs or the United States Government.

Conflicts of interest: none to report.

#### Supplementary Data

##### Data Profile

Comparative analysis	<ul style="list-style-type: none"> <li>•Technique used to continually compare the concepts developing from the data.</li> <li>•This action of constantly comparing the concepts allows the researcher to note similarities and differences found in the data and eventually generates categories that can aid in explaining the phenomenon and increase its overall generality and explanatory power.<sup>22</sup></li> </ul>
Grounded theory methodology	<ul style="list-style-type: none"> <li>•Research methodology based on the views of 2 sociologists, Glaser and Strauss, who wanted to direct attention to generating theory as opposed to solely theory testing and verification.<sup>22</sup></li> <li>•Saw the need for theory that is “grounded” in the research data rather than deduced from a hypothesis and able to explain real-world phenomena.</li> <li>•Verified conceptual categories are then used to generate hypotheses about the relationships that exist between the categories and indicate the direction of further data collection and analysis.<sup>22</sup></li> <li>•Grounded theory requires the systematic collection of data (including field notes and memos), sampling, and analysis occur simultaneously while theoretical sampling and data collection occur as the new theory emerges.</li> </ul>
Line-by-line coding	<ul style="list-style-type: none"> <li>•Analyzing data line-by-line to review all possible ways it fits into categories</li> <li>•Unrestricted coding of the data that looks openly at every interpretation of the data.</li> </ul>
Substantive coding	<ul style="list-style-type: none"> <li>•Looking for data that fit with core variables</li> <li>•Substantive coding can occur early in the process but becomes the dominant coding technique as the categories become more developed and theoretically defined.<sup>23</sup></li> </ul>

Theoretical coding	<ul style="list-style-type: none"> <li>•A way to conceptualize initial codes and describe them in a theoretical way that explains the data.</li> <li>•Theoretical codes emerge from the data through comparative analysis and can be applicable to multiple perspectives, depending on their combination.<sup>24</sup></li> </ul>
Theoretical sampling	<ul style="list-style-type: none"> <li>•Strategy used in grounded theory to allow for presentation of the best cases of the phenomenon under study and creates a system of checks and balances on emerging categories.</li> <li>•This controlled and purposive process of data collection is based on the emerging theory rather than selective sampling as initially used in grounded theory.<sup>25</sup></li> <li>•Participants are chosen based on their knowledge of the topic and the need of the researcher to continually verify the newly developing theory by increasing the relationships between categories and properties, with the new data found by sampling not only purposefully but theoretically.</li> </ul>
Theoretical saturation	<ul style="list-style-type: none"> <li>•Reaching the point of replication at which no additional data are being found, and therefore the properties of the category can be fully developed.<sup>22</sup></li> <li>•Complete theoretical saturation fills the various gaps in the theory by maximizing differences among groups and maximizing variations in the data. This is achieved through comparative analysis and theoretical sampling by using “slices of data” to provide alternative views when looking at categories and their properties.<sup>22</sup></li> </ul>
Theoretical sensitivity	<ul style="list-style-type: none"> <li>•Maintaining theoretical sensitivity throughout the grounded theory process allows the researcher to remain sensitive to the data and allowing the categories and properties to emerge rather than having a priori hypotheses or biases about potential outcomes.<sup>24</sup></li> <li>•Theoretical sensitivity can be increased by professional experience, immersion into the literature, and becoming familiar with common ideas about the phenomenon under study. As grounded theory requires the systematic collection and analyzing of data, categories tend to emerge very quickly.</li> <li>•The constant fitting and refitting of data and widespread knowledge of the phenomenon ensures that all the data are explained and best fit in the resulting categories.<sup>26</sup></li> <li>•Preserved throughout the entire grounded theory process to develop a comprehensive formal theory.</li> </ul>

## DETAILS

**Subject:** Emergency medical care; Males; Homeless people; Health problems; Advocacy; Chronic illnesses; Veterans; Nurses; Primary care; Empathy; Grounded theory; Emergency services; Qualitative research; Health care delivery

**Location:** United States--US

**Company / organization:** Name: Department of Housing & Urban Development--HUD; NAICS: 925110

**Identifier / keyword:** Emergency service; Veterans; Homeless persons; Emergency nursing; Grounded theory; Qualitative research; Department of Veteran's Affairs

**Publication title:** Journal of Emergency Nursing;; JEN; Philadelphia

<b>Volume:</b>	46
<b>Issue:</b>	1
<b>Pages:</b>	51-58
<b>Publication year:</b>	2020
<b>Publication date:</b>	Jan 2020
<b>Section:</b>	Research
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English
<b>Document type:</b>	Journal Article
<b>DOI:</b>	<a href="https://doi.org/10.1016/j.jen.2019.06.009">https://doi.org/10.1016/j.jen.2019.06.009</a>
<b>ProQuest document ID:</b>	2333905383
<b>Document URL:</b>	<a href="https://www.proquest.com/scholarly-journals/experiences-care-emergency-department-among/docview/2333905383/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/experiences-care-emergency-department-among/docview/2333905383/se-2?accountid=211160</a>
<b>Copyright:</b>	©2019. Emergency Nurses Association
<b>Last updated:</b>	2023-07-07
<b>Database:</b>	Public Health Database

Document 35 of 55

# An Interdisciplinary Code Sepsis Team to Improve Sepsis-Bundle Compliance: A Quality Improvement Project: JEN

## ABSTRACT (ENGLISH)

### Problem

Sepsis is one of the leading causes of mortality, with more than 700,000 hospitalizations and 200,000 deaths annually. Various tools exist to aid in the early identification and treatment of sepsis, including electronic alert systems, standardized order sets, nurse-initiated protocols (NIPs) and specially trained teams. Despite available guidelines, mortality rates for severe sepsis and septic shock are near 50%.

### Methods

The aims of this rapid cycle quality improvement project were to develop and implement an interdisciplinary team to address early implementation of sepsis bundles in the emergency department and to compare sepsis bundle compliance 3 months pre- and 3 months postintervention implementation. The population included all patients above 18 years of age presenting to the emergency department with clinical indications of sepsis, severe sepsis, or septic shock. Data were collected via electronic health records (EHRs), switchboard-paging records, and a billing database.

### Results

The pre-post intervention analysis shows an improvement in time to each bundle element except antibiotics and completion of blood cultures. There were noteworthy changes in meeting bundle compliance in fluid resuscitation volume ( $\chi^2 = 16.3$ ,  $P \leq 0.001$ ): initial lactate collected within 180 min ( $\chi^2 = 11.3$ ,  $P \leq 0.01$ ) and time to second lactate within 360 min ( $\chi^2 = 27.7$ ,  $P \leq 0.001$ ). Mortality rates showed a steady decline from over 12% to 5%. No differences were found in mortality rates related to age or gender.

### Discussion

Interprofessional teams can use existing knowledge, skills, and tools to improve sepsis-bundle compliance and mortality outcomes in patients with sepsis presenting to the emergency department.

## FULL TEXT

### Contribution to Emergency Nursing

- The current literature on sepsis bundles indicate that an interdisciplinary team approach improves compliance in the emergency department.
- This article contributes information on procedures to improve sepsis-bundle compliance and decrease mortality in patients with sepsis presenting to the emergency department.
- Key implications for emergency nursing practice found in this article are that interdisciplinary collaboration, involvement of key stakeholders, and use of available tools can lead to early recognition and improved quality outcomes for patients with sepsis.

Sepsis is defined as suspected or confirmed infection combined with 2 or more systemic inflammatory response syndrome (SIRS) criteria.<sup>1</sup> Severe sepsis is defined as sepsis with organ dysfunction or hypoperfusion and septic shock being the presence of sepsis unresponsive to fluid resuscitation.<sup>1</sup> There continues to be controversy over the definition of sepsis, as medical professionals and professional organizations attempt to identify the best indicators of this infectious and inflammatory process that can be so devastating. As the Centers for Medicare and Medicaid Services (CMS) continue to link reimbursement to sepsis quality metrics, many health care organizations have leveraged clinicians to address methods that may improve outcomes. To improve compliance with use of the sepsis bundles, many interventions have been suggested to aid clinicians and providers. However, at present, there is no

single intervention that has been identified to improve overall bundle compliance.

### **Problem**

Sepsis is 1 of the leading causes of mortality with more than 700,000 hospitalizations and 200,000 deaths annually.<sup>2</sup> The Society of Critical Care Medicine (SCCM) released guidelines, known as the Surviving Sepsis Campaign (SSC), that include 3- and 6-hour bundles meant to guide early identification and early goal-directed therapy (EGDT) for the sepsis population. Bundle elements include antibiotic and fluid administration, as well as collection of blood cultures and lactate levels. Various tools exist to aid in the early identification and treatment of sepsis including electronic alert systems, standardized order sets, nurse-initiated protocols (NIPs), and specially trained teams. Even with evidence-based guidelines available to guide practice, many organizations continue to struggle with the outcome measure owing to lack of compliance with the bundle elements.<sup>3</sup> In addition, despite available guidelines, mortality rates for severe sepsis and septic shock are near 50%.<sup>4</sup> At present, our organization uses electronic sepsis screening, best-practice alerts (BPAs), NIPs, and standardized order sets. Our organization had the following bundle compliance: blood cultures 90%, correct antibiotic within specified time frame 84%, initial lactate collected 92%, second lactate if initial lactate greater than 2 mmol/L 10%, and adequate crystalloid fluid resuscitation 37%. Based on these initial data, we were meeting bundle requirements 10% of the time with a concurrent mortality of 1 in every 64 patients, or approximately 12.45%.

### **Framework**

The Rapid-Cycle Quality Improvement (RCQI) model was used for this project. This model contains 2 parts, the first of which must address 3 key questions: What are we trying to accomplish; is a change actually an improvement; and what change will result in an improvement?<sup>5</sup>

### **Purpose**

A review of internal data from the health care system suggested that 90% of septic patients requiring hospitalization present to emergency departments. Early recognition and intervention in the emergency department is essential for early goal-directed therapy and reduction of mortality.

The purposes of this single-site project were to determine if implementation of an interdisciplinary sepsis response team in the emergency department would result in improved bundle compliance, subsequent reduction in mortality, and identification of any demographic differences in age and gender within and between the pre/post groups that would have impact on sepsis-bundle compliance. Another purpose was to answer the following clinical question: What is the effect of implementing a code sepsis team on outcome measures and sepsis-bundle compliance compared with the current standard of care? The current standard of care involved use of an electronic alert system, NIPs, and standardized order sets alone.

### **Methods Design and Patient Population**

The design is a single-site quality improvement intervention comparing post-intervention patients to historic controls. We conducted a retrospective review of all patients above 18 years of age presenting to the emergency department with clinical indications of sepsis, severe sepsis, or septic shock over 6 months. Patients with hospice orders were excluded. This project was conducted in the 54-bed emergency department of a 238-bed community hospital in a mid-Atlantic state. Our emergency department has an average volume of 75,000 patients annually, with 35 to 38 admissions daily.

### **Intervention Phase 1 Team Development**

The initial phase of this project began in April 2017, by developing a project team that included key stakeholders. The team was composed of the following members: project lead, quality department director and sepsis data coordinator, ED clinical nurse specialist, ED clinical nurse champion, ED physician champion, intensive care unit

(ICU) medical director (sepsis physician lead), ED pharmacist, ED satellite laboratory representative, respiratory therapist (RT), switchboard manager, clinical process improvement engineer, and administrative sponsor.

### **Phase 2 Process Development**

In the second phase that began in June 2017, the clinical process improvement engineer mapped current ED practice in managing patients presenting with sepsis. Meeting biweekly, the team determined an appropriate process for paging the sepsis-response team upon electronic notification of sepsis to the bedside nurse. The process was outlined in an ED sepsis-alert algorithm. The process incorporated key words to be communicated to switchboard to ensure the alert was translated to appropriate team members, who from the team, and how they would respond to the page. The ED sepsis-alert algorithm was developed to guide when a nurse would initiate a sepsis alert. The nurses in triage and the primary emergency nurse used an existing best practice alert (BPA) to trigger completion of a full sepsis assessment. When completing the full sepsis screen, if the patient had suspected or confirmed infection along with 3 SIRS criteria, 1 being temperature of less than 36°C (96.8°F) or greater than 38.3°C (100.9°F) or white blood cell (WBC) count of less than 4,000 or greater than 12,000, the screen was considered positive, and the nurse would proceed with a sepsis alert. Three SIRS criteria became the trigger for this project because the providers and bedside staff were concerned that 2 SIRS criteria would lead to a high volume of false positive alerts and alarm fatigue. It is important to note that 3 SIRS criteria deviates from the standard set by the SCCM guidelines that require only 2 SIRS criteria. The BPA itself was triggered based on 2 SIRS criteria (respiratory rate [RR] > 20, heart rate [HR] > 90, or temperature 38.3°C). To initiate a sepsis alert, the nurse would call the switchboard and use the key words developed by the project team for consistency and clarity. The nurse would state, "sepsis alert ED room 4, patient name or MR number." The page, sent via a secured firewall network, was sent to the unit coordinator, technician, pharmacist, RT, and sepsis project lead. The unit coordinator would notify the physician in closest proximity or the assigned provider (if the patient had already been assigned). The team would respond and begin a sepsis checklist that outlined bundle elements by 1-, 3-, and 6-hour intervals. The group also worked to use the sepsis order set to ensure proper antibiotic orders, fluid resuscitation, and reflex lactates. The sepsis checklist then followed the patient to the admitting unit and was used as part of the handoff among staff. Communication also occurred between the nurse and admitting provider to address any remaining bundle elements.

### **Phase 3 Education**

The third phase involved education of all areas involved in the project rollout such as ED staff and physicians, satellite laboratory, main laboratory, pharmacy, RT, ICU nurses, ICU physicians, and switchboard. Education included inservices, quick tip sheets, and electronic communication. An inservice was provided to ED physicians during their monthly medical staff meeting with 95% attendance. The remaining providers were given handouts and verbal communication by the ED medical director. Training was provided to the 3 ED bedside sepsis champions, who then assisted with training via handouts, computer-based education, and didactic sessions during staff meetings and separately offered makeup sessions. The training lasted approximately 1 hour, and after 4 staff meetings and 3 makeup sessions, 100% of staff had completed the training. To ensure that all hospital staff members were aware of the quality improvement project, an article was placed in the "Now You Know," a weekly electronic newsletter. Cycle 1 of RCQI began with a "mock" sepsis alert drill before implementation to ensure that paging, equipment, and other processes were functioning as intended.

### **Phase 4 Implementation**

Project implementation and RCQI cycle 2 began September 1, 2017. During the initial 2 months of the project, no data were collected, and a RCQI process was used to identify barriers based on team feedback and retrospective



data review. The project team met biweekly to review data metrics, process failures, and to develop action items to address barriers prior to collection of postimplementation data. The final 3 months of the project included data collection that was compared with preintervention data to assess success or failure of the project in improving compliance with sepsis-bundle measures.

### **Phase 5 Evaluation**

RCQI processes were used to evaluate code-sepsis team function prior to postintervention data collection. Process failures included issues with paging through switchboard, incomplete sepsis screening in the emergency department, failure of team to respond to sepsis alert page, failure to use the sepsis order set, and problems with timing for laboratory interpretation.

### **Outcome Measurements**

The primary outcome was mortality rate in sepsis present on admission. Secondary outcomes were time to 3- and 6-hour sepsis-bundle measures: blood cultures; antibiotics, collection of initial and second lactate, if indicated; and fluid resuscitation. A second lactate was only indicated if the initial lactate was greater than 2 mmol/L, and fluid resuscitation was only indicated if blood pressure was documented as less than 90 mm Hg or if the initial lactate was greater than 4 mmol/L, as per SCCM guidelines. All 3- and 6-hour bundle elements were included in our review except for tissue-perfusion reassessment and use of vasopressors. We wanted to ensure that our focus remained on initial presentation that primarily affected the ED setting. In addition, completion of measures, when indicated, was compared pre- and postintervention. Basic demographic information including age and gender were retrospectively collected from the EHR. A comprehensive chart review was performed including vital signs, laboratory values, blood culture results, and administration of medication. Laboratory values reviewed include WBCs, blood glucose, bilirubin, platelet counts, creatinine, lactate, and international normalized ratio (INR) values. Laboratory values, along with documentation of suspected or confirmed infection, allowed the reviewer to determine time-zero for sepsis presentation. Sepsis-alert paging information was collected through an automated report provided by switchboard. Mortality data were provided by Crimson, a billing and coding database. Crimson is a performance data management platform under the Advisory Board geared to help health care organizations thrive under value-based purchasing. This health care organization is under contract with the Advisory Board and uses the Crimson platform to allow for rapid drill down of individual patient-level data. All mortality data were 30-day risk stratified.

### **Data Analysis**

Following Institutional Review Board (IRB) approval to ensure ethical aspects of implementing and studying the intervention were met, we began data collection. Data collection included 3 months of baseline data and 3 months of data postproject implementation. A systematic sampling of every third chart to total approximately 35 charts per month was included in the analysis. Only charts that had the required documented data were included in the study to avoid any missing data. Categorical data were analyzed using  $\chi^2$  tests. Continuous data were analyzed using an independent sample Student's *t*-test. A 1-way analysis of variance (ANOVA) was performed using the independent variables of age, gender, and group to determine if the demographic data affected the dependent variables of the sepsis-bundle compliance within and among the groups. Nonparametric tests, Mann-Whitney U tests, and  $\chi^2$  tests were used to determine any differences in age or gender in mortality rates. Missing data was excluded from the analyses. For example, if antibiotics, blood cultures, or initial lactate were not completed, the sample did not reflect that participant in the time to sepsis-bundle measure analysis, because there would be no "time" or "minutes" to analyze. Or for fluid resuscitation or second lactate, if indications were not met, that participant was not included in the analysis for completion of sepsis bundle measures or time to sepsis bundle measure.

## Results

A total of 214 patients with sepsis present on admission (POA) were included in the analysis. In a review of demographic data, the patient population ranged from 23 to 100 years of age, with a mean age of 70 years. There was also an equal number of male compared with female patients in pre/post data. Note there were differences in the sample size for completion of sepsis bundle measure and time to sepsis bundle measure, dependent upon whether the element occurred or was indicated (Table 1).

### Bundle-Element Completion

In Table 1, the  $\chi^2$  analysis review of bundle elements was completed for patients meeting criteria. Results suggest that although timing for antibiotics did not improve, antibiotics were provided to more patients who met sepsis criteria. However, a shortage of minibags was identified as a limitation. More information is provided in the limitations section. The number of patients who had initial and second lactate collected also showed considerable improvement ( $\chi^2 = 11.5$ ,  $P \leq 0.001$  and  $\chi^2 = 27.6$ ,  $P \leq 0.001$ , respectively). "Fluid resuscitation volume met" increased from 31% at baseline to 81%.

### Time to Bundle-Element Completion

Table 2 reviews the sample Student's *t*-test results, which compared the time-to-bundle elements pre- and postintervention. The time to intervention was affected for all but 1 bundle element. The time to antibiotics slightly increased in the postintervention period, and there was no significant change in time to blood culture collection. A change in provider practice related to blood culture collection in the emergency department was identified as a barrier. This is further discussed under "Limitations." The most frequent missed opportunity preintervention, which was a 22% compliance with completion of the second lactate, had a noteworthy improvement of 179 min or 73% in the postintervention period ( $t = 3.47$ ,  $P \leq 0.01$ ). In a 1-way ANOVA, the demographic variables of age and gender did not affect pre/post data sepsis-bundle compliance. It was, however, related to collection of blood cultures in both pre- and postintervention groups. Table 3 highlights the relationship of age ( $F = 3.68$ ,  $P = 0.05$ ) and gender ( $F = 8.32$ ,  $P \leq 0.01$ ) to the time to blood culture. The younger the patient, the more significant the delay in time to collection of blood cultures. This same analysis revealed a gender bias, suggesting that female patients had a 40 min to 50 min delay in time to treatment. The gender bias was present in pre- and post-data.

### Mortality

Nonparametric tests were completed to analyze any demographic differences in age or gender on mortality using Mann-Whitney U and Pearson  $\chi^2$  tests respectively. Results demonstrated no differences in these demographic variables ( $z = 161.5$ ,  $P = 0.22$ ;  $\chi^2 = 2.23$ ,  $P = 0.22$ ).

Data analysis also revealed an improvement from a baseline monthly mortality rate of 12.75% with a steady decline to 4.88% in the final month of postintervention data. See the Figure for a complete mortality trend of patients with sepsis POA pre- and postintervention.

### Discussion

The purpose of this project was to determine if implementation of an interdisciplinary sepsis-response team in the emergency department would result in improved bundle compliance and subsequent reduction in mortality. Only 3 studies reviewed addressed the use of a specially trained interdisciplinary team activated by an electronic sepsis alert to implement bundle elements.<sup>2</sup> A retrospective study suggests that an interdisciplinary team approach to sepsis care can be applied to inpatient medical response teams.<sup>6</sup> These results, in conjunction with the key findings of this quality improvement project show promise for implementing a code sepsis team, in addition to use of electronic alerts, nurse-driven protocols, and order sets to improve bundle compliance and patient outcomes. The program improved 4 out of 5 sepsis-bundle measures, as well as mortality.

Key findings of this project include that although clinicians expressed concern of high false positive alert rate, use of original guidelines requiring only 2 SIRS criteria would avoid missing patients who would require early bundled care. In addition, sepsis screening at triage further promotes early goal-directed therapy. This finding is consistent with the findings of Mitzkewich,<sup>7</sup> in that triage screening did not affect nursing workflow and allowed the patient to receive early treatment. Investigation of the EHR and cultural and systemic factors will continue in an effort to address gaps in care related to the gender bias revealed during data analysis.

This project contributes to the literature by supporting previous study recommendations that an interdisciplinary approach and the combination of existing tools can improve sepsis outcomes and process measures. Anecdotal data regarding age and gender bias may be key to addressing bundle compliance in other organizations. One previous retrospective cohort study of patients in the ICU with severe sepsis/septic shock identified subtle but significant gender differences in processes of care that did not affect mortality outcomes.<sup>8</sup> These gender and age disparities related to sepsis care need further exploration in future studies.

This quality improvement project had several limitations related to its retrospective design and the patient sample by using 3 SIRS criteria rather than 2; there were patients missed in the sepsis-alert process. No false positive alerts were identified during chart review. During the postintervention period, a hurricane in Puerto Rico destroyed several medical product-manufacturing plants. The backorder of minibags led to removal of antibiotics from automated medication dispensing systems and prompted use of alternative methods for administration of medication. Overall, this led to a delay in administration of antibiotics. An issue involving blood culture reporting by ED providers also led to a reduction in blood culture collection practices in the postintervention period that may have skewed results. This was a key limitation, as the study design does not negate other events occurring at the same time as the intervention.<sup>2,9</sup> We have corrected the problem that was leading to the reduction in blood-culture collection and are currently back to receiving adequate IV solution to stock antibiotics in our medication-dispensing systems. At the time of planning and implementation for this project, influenza season was beginning, which may have influenced provider concerns over a high false positive alert rate in addition to influencing overall results. Finally, despite involvement and education, there remains variation in provider engagement. This is even more difficult when considering patients with uncomplicated sepsis and supporting the need for aggressive treatment. ED volumes fluctuate, and with a focus on throughput, engaging clinicians to ensure proper bed placement—even if diagnostic values do not appear critical—is crucial.

Although the RCQI model was successfully applied to this project, future projects may benefit from following some major tenets of implementation science that focus more on understanding gaps between expected results and observed outcomes. Studies that identify barriers and facilitators to implementation of evidence-based practice can use behavioral theories to guide mechanisms of change to improve the process of implementation.<sup>10</sup>

### **Implications for Emergency Nursing**

These findings have several implications for ED clinicians. As the prevalence of sepsis continues to rise, raising the cost of health care, insurance, and regulatory entities have taken interest. In 2012, the National Quality Forum began work on endorsing sepsis measures, and the CMS has started the initial phases of regulating sepsis outcomes related to use of the evidence-based bundle elements.<sup>11</sup>

Although various tools exist to aid clinicians in the early diagnosis and treatment of sepsis, no single tool has been shown to improve bundle compliance. However, this project, along with the literature, reinforces that incorporating an interdisciplinary approach to existing decision-support tools improves care and patient outcomes.<sup>6,12-14</sup> Informing clinicians through use of a sepsis-alert algorithm only further encourages early identification and treatment.<sup>14,15</sup> Use of interdisciplinary sepsis champions to guide implementation of evidence-based care and provide peer coaching is

crucial.<sup>14</sup> Health care organizations should consider adopting an interdisciplinary team approach to sepsis care in the emergency department to encourage a high reliability organization through the combination of diverse skills and perspectives.<sup>14</sup>

Continuous education and awareness initiatives can help support sustainability and maintain focus on the importance of early recognition and goal-directed care.<sup>15</sup> With the fast pace of health care, frequent reinforcement of the 3- and 6-hour bundles—noted in the effect on blood culture collection during data analysis—process changes that may unintentionally affect multiple initiatives; therefore, clear communication and involvement of key stakeholders is necessary to avoid unwanted effects on outcomes. Although no single intervention has been shown consistently to improve sepsis-bundle compliance and outcome measures, this project supports that the combination of existing tools—in addition to specially trained teams—can have a positive impact. Editor’s Note:

1. Strategies in this performance improvement project can be applied to optimize care using the current Surviving Sepsis Campaign guidelines, which have been updated and approved, effective January 10, 2019. Readers are encouraged to review the updated bundle time frames (Hour-1 Bundle) and terminology for the Surviving Sepsis Campaign at <http://www.survivingsepsis.org/Guidelines/Pages/default.aspx> and in the related guidelines.<sup>1-3</sup>

## 2. References

3. Levy MM, Evans LE, Rhodes A. The surviving sepsis campaign bundle: 2018 update. *Crit Care Med.* 2018;46(6):997-1000. <https://doi.org/10.1097/ccm.0000000000003119>.
4. Rhodes A, Evans LE, Alhazzani W, et al. Surviving sepsis campaign: International guidelines for management of sepsis and septic shock: 2016. *Crit Care Med.* 2017;45(3):486-552. <https://doi.org/10.1097/CCM.0000000000002255>.
5. Rhodes A, Evans LE, Alhazzani W, et al. Surviving sepsis campaign: International guidelines for management of sepsis and septic shock: 2016. *Intensive Care Med.* 2017;43(3):304-377. <https://doi.org/10.1007/s00134-017-4683-6>.

## Conclusions

In conclusion, this quality improvement project used an interprofessional code sepsis team that utilized existing knowledge, skills, and tools. The results improved bundle/compliance and reduced mortality in patients with sepsis who presented in the emergency department.

## Author Disclosures

Conflict of interest: none to report.

## Supplementary Data

### Data Profile

Variable	Total Preintervention (n)	Goal met (n)	Goal met: yes (%)	Total Postintervention (n)	Goal met (n)	Goal met: yes (%)	$\chi^2$
Antibiotics 180 min	107	74	69%	107	76	71%	0.09

Fluid resuscitation 180 min	48	42	88%	29	27	93%	7.89
Fluid resuscitation volume met	45	14	31%	26	21	81%	16.25 <sup>‡</sup>
Initial lactate 180 min	107	83	78%	107	101	94%	11.52 <sup>†</sup>
Blood cultures 180 minutes	107	84	79%	107	84	79%	.00
Second lactate 360 minutes	51	11	22%	52	38	73%	27.69 <sup>‡</sup>

Variable	Pre-intervention Mean	Post-intervention Mean	t value	95% confidence intervals
Time to antibiotics	162.96	163.31	0.984	-33.91 to 33.21
N = 104	N = 106	Time to blood cultures	88.67	71.81
0.265	-12.86 to 46.58	N = 94	N = 94	
Time to initial lactate	83.98	70.56	0.313	-12.72 to 39.56
N = 94	N = 106		Time to fluid resuscitation	67.60
67.08	0.265	-24.71 to 25.74	N = 42	N = 26
	Time to second lactate	484.92	305.86	3.47 <sup>*</sup>

Variable	Sum of squares	Degrees of freedom	Mean square	F	P value
Gender	83,947.0	1	83,947.0	8.32	≤0.01

Age	37,127.3	1	37,127.3	3.68	0.05
Group	9,117.4	1	9,117.4	0.905	0.34
Corrected model	143,128.9	3	47,709.6	4.7	<0.01

## DETAILS

**Subject:** Laboratories; Emergency medical care; Quality management; Databases; Paging; Communication; Mortality; Sepsis; Intervention; Physicians; Interdisciplinary aspects; Blood; Pharmacists; Quality; Patients; Charges; Antibiotics; Septic shock; Compliance; Computerized medical records; Mortality rates; Health records; Resuscitation; Emergency services; Quality control; Quality improvement

**Business indexing term:** Subject: Quality control Quality improvement

**Identifier / keyword:** Interdisciplinary; Sepsis alert; Code sepsis; Emergency department

**Publication title:** Journal of Emergency Nursing;; JEN; Philadelphia

**Volume:** 46

**Issue:** 1

**Pages:** 91-98

**Publication year:** 2020

**Publication date:** Jan 2020

**Section:** Practice Improvement

**Publisher:** Elsevier Limited

**Place of publication:** Philadelphia

**Country of publication:** United Kingdom, Philadelphia

**Publication subject:** Medical Sciences--Nurses And Nursing

**ISSN:** 00991767

**e-ISSN:** 15272966

**Source type:** Scholarly Journal

**Language of publication:** English

Document type:	Journal Article
DOI:	<a href="https://doi.org/10.1016/j.jen.2019.07.001">https://doi.org/10.1016/j.jen.2019.07.001</a>
ProQuest document ID:	2333905360
Document URL:	<a href="https://www.proquest.com/scholarly-journals/interdisciplinary-code-sepsis-team-improve-bundle/docview/2333905360/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/interdisciplinary-code-sepsis-team-improve-bundle/docview/2333905360/se-2?accountid=211160</a>
Copyright:	©2019. Emergency Nurses Association
Last updated:	2022-03-24
Database:	Public Health Database

---

Document 36 of 55

# Workplace Violence Against Emergency Nurses in Taiwan: A Cross-Sectional Study: JEN

[ProQuest document link](#)

---

## ABSTRACT (ENGLISH)

### Introduction

Workplace violence against emergency nurses is common worldwide. This study aimed to gain a more thorough overview of the point prevalence of workplace violence against emergency nurses and the preventive measures used in emergency departments in Taiwan.

### Methods

In this multicenter, descriptive, cross-sectional study, the questionnaire, Violence Against Nurses Working in Emergency Departments, was used to collect data from 407 nurses working at 5 emergency departments in Taiwan from May to October 2015.

### Results

The results revealed that 378 emergency nurses (92.9%) experienced workplace violence over the last 2 years. The average visual analog scale score (1-10) of security effectiveness in preventing workplace violence was 5.0 (SD = 1.97). The average visual analog scale score of perceived safety level in terms of workplace violence was 4.38 (SD = 2.06). The average visual analog scale score of meeting nurses' needs was 5.72 (SD = 2.23).

### Discussion

This questionnaire survey revealed that the current preventive measures for workplace violence against emergency nurses in Taiwan were not effective. The relevant measures should be improved, thereby reducing the prevalence and severity of workplace violence against emergency nurses.

## FULL TEXT

## DETAILS

<b>Subject:</b>	Emergency medical care; Prevention programs; Demographics; Averages; Questionnaires; Violence; Nurses; Peer tutoring; Patient safety; Validity; Workplace violence; Prevention; Health care; Zero tolerance; Workplaces; Nursing; Departments; Emotional abuse; Emergency services
<b>Business indexing term:</b>	Subject: Workplace violence
<b>Location:</b>	United States--US; Taiwan
<b>Company / organization:</b>	Name: Emergency Nurses Association; NAICS: 813920
<b>Identifier / keyword:</b>	Emergency department; Nurses; Questionnaire; Workplace violence
<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	1
<b>Pages:</b>	66-71.e4
<b>Publication year:</b>	2020
<b>Publication date:</b>	Jan 2020
<b>Section:</b>	Research
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English
<b>Document type:</b>	Journal Article
<b>DOI:</b>	<a href="https://doi.org/10.1016/j.jen.2019.09.004">https://doi.org/10.1016/j.jen.2019.09.004</a>
<b>ProQuest document ID:</b>	2333905351
<b>Document URL:</b>	<a href="https://www.proquest.com/scholarly-journals/workplace-violence-against-emergency-nurses/docview/2333905351/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/workplace-violence-against-emergency-nurses/docview/2333905351/se-2?accountid=211160</a>



**Copyright:** ©2019. Emergency Nurses Association

**Last updated:** 2023-08-01

**Database:** Public Health Database

Document 37 of 55

# Personalized Care Plans: Are They Effective in Decreasing ED Visits and Health Care Expenditure Among Adult Super-Utilizers?: JEN

[ProQuest document link](#)

## ABSTRACT (ENGLISH)

### Problem

Super-utilizers comprise 4.5% to 8% of all ED patients, but account for 21% to 28% of all ED visits. Excessive use of the emergency department contributes to increased health care costs, recurrent and unnecessary ED workup, decreased emergency readiness, and reduced staff morale.

### Methods

The impact of personalized care plan implementation was evaluated using a within-subjects pre-post design. The number of ED visits for each enrolled patient (N = 65) were analyzed before and after personalized care plan enrollment at 90, 180, and 365 days. A post-hoc analysis was completed for each ED visit that resulted in a disposition of discharge. Total and average charges from the ED visits were analyzed to determine the intervention's effect on health care expenditure. Staff was anonymously surveyed to assess perceived efficacy and level of satisfaction with the intervention before completion of data collection.

### Results

Median ED visits had a statistically significant decrease over 90, 180, and 365 days. There was also a decrease in median, average, and total ED charges for all time points. ED staff perceived the personalized care plans to be an effective intervention and were satisfied with their implementation.

### Discussion

Personalized care plans effectively decreased the number of ED visits, reduced health care expenditure, and were well-received by the staff.

## FULL TEXT

### Contribution to Emergency Nursing Practice

- The current literature on personalized care plans indicates a potential effect on the number of ED visits, health care expenditure, and staff satisfaction in adult ED super-utilizers.
- This article contributes to research findings indicating that the number of ED visits and health care expenditure among super-utilizers enrolled in personalized care plans has decreased. In addition, ED staff reported personalized care plans to be useful and beneficial when caring for ED super-utilizers.

••Key implications for emergency nursing practice include increased ED super-utilizer identification, patient knowledge, communication, and staff satisfaction.

## Introduction

A disproportionate segment of the nation's health care spending is used to provide care to a tiny subset of the population. Only 1% of the population represents nearly 22% of total health care expenditure annually.<sup>1</sup> Frequent users of the emergency department, defined as persons with  $\geq 4$  visits per year,<sup>2,3</sup> are known as super-utilizers, frequent flyers, or super-users. Super-utilizers comprise 4.5% to 8% of all ED patients, but account for 21% to 28% of all ED visits.<sup>4</sup>

At times, patients seek care at emergency departments for preventable or non-emergent conditions that could otherwise be managed in the non-hospital setting, contributing to increased health care costs. A comparison of charges for evaluation of common conditions has revealed that charges are 320% to 728% higher in the emergency department when compared with clinics.<sup>5</sup> Furthermore, use of the emergency department for non-emergent conditions could lead to unnecessary testing and treatment, ED crowding, decreased emergency readiness, and weaker patient-primary care provider relationships.<sup>4,6</sup>

The suburban hospital emergency department (SHED) where this performance improvement (PI) project took place is a 42-bed facility that is staffed by emergency medicine trained physicians, nurse practitioners, physician assistants, emergency nurses, and ancillary staff. SHED has an annual census of approximately 53,000 visits, and it is estimated that more than 150 individuals visit SHED  $\geq 10$  times per year with the same chief complaint, symptomatology, or diagnosis. The most common diagnoses for these patients include chronic pain syndrome, alcohol abuse disorder, substance use disorder, mental health and behavioral disorders, and nausea and vomiting.

## Available Knowledge and Rationale

Studies suggest that interventions (ie, patient navigation, case management, and patient care plans) targeting ED super-utilizers are effective in decreasing ED visit frequency.<sup>4,6-13</sup> Evidence also supports that interventions in this patient population could improve secondary outcome variables such as decreased hospital admissions, increased clinic versus ED visits, improved housing stability, decreased radiation exposure, and reduced health care costs.<sup>4,8,11</sup> Personalized care plans provide a structured discussion framework for ongoing evaluation and treatment regimen between patients, providers, and nursing staff regarding the information on health concerns, implications of frequent ED use, and referrals to specialized services. These care plans are tailored directly to the needs of each super-utilizer. The structured format sets reasonable expectations while simultaneously directing safe and consistent care among providers. Personalized care plans collate and illuminate before the evaluation and treatment of an identified health concern by highlighting before effective treatments and pertinent diagnoses. Thus, when personalized care plans are implemented, medical providers are better equipped to anticipate patient care.<sup>14,15</sup> Furthermore, negotiation between patient and clinician regarding scheduled drug administration, testing, and disposition is enhanced.

Personalized care plans appear to be an effective means of reducing health care expenditure.<sup>4,6</sup> Super-utilizer-associated health care costs decrease by 26.6% to 40.9% when patients seek care for non-emergent conditions at appropriate medical facilities versus the emergency department.<sup>4,6,10</sup> The cost associated with super-utilizer hospital readmission decreases between 12.3% to 47.7% when personalized care plans are implemented.<sup>10</sup> Most super-utilizers have greater psychiatric comorbidities, more social problems, multiple health disparities, and decreased access to medical care when compared with the general population.<sup>8,11</sup> Personalized care plans improve access to more appropriate care and better resource utilization, thereby reducing excessive ED visits.<sup>4,6,10</sup> Collectively, these

outcomes show the importance of integrating personalized care plans into practice in the emergency department.

### **Project Aims**

The primary aim of this PI project was to evaluate the impact of personalized care plans on the number of ED visits in adult ED super-utilizers treated at a suburban hospital located in Minnesota. In addition, this project evaluated the effect of personalized care plans on health care expenditure, staff satisfaction, and perceived efficacy within SHED.

### **Methods Intervention**

A within-subjects pre-post design was used to evaluate the impact of the implementation of personalized care plans on the number of ED visits and billed charges in adult super-utilizers treated at a community hospital emergency department. Staff satisfaction and perceived efficacy of the practice change was also evaluated after implementation of the intervention. Adult super-utilizers ( $\geq 18$  years of age) that presented to SHED with the same chief complaint(s)  $\geq 4$  times in 365 days were eligible for project inclusion. Patients could be recommended to participate in the care-planning process by any hospital staff member via referral made to the SHED Care Plan Team (ED-CPT), which consisted of physicians and case managers. Finally, the ED-CPT performed a screening analysis to identify SHED's highest utilizers for a referral. Exclusion criteria included any patient with

After a patient was selected for personalized care plan enrollment, the ED-CPT developed a personalized care plan, published it within the electronic medical record (EMR; Epic ASAP, Epic Systems Corporation, Verona, WI), and notified the patient of the practice change through a certified letter. Each personalized care plan included the reason for enrollment, a summary of prior evaluation and treatment, pertinent socio-economic influences (known homelessness, known insurance-covered medical transport, state-assigned case manager), and available community and specialist resources. The personalized care plan also outlined the ED-CPT's management recommendations for the patients who reported to SHED for the same chief complaint that prompted enrollment. A template of the SHED personalized care plan is shown in <sup>Figure 1</sup>.

Patients enrolled in personalized care plans for  $\geq 90$  days between August 1, 2016 and December 10, 2018 were subject to retrospective chart review. The sample for the staff satisfaction and perceived program efficacy assessment included SHED technicians, emergency nurses, case managers, physician assistants, nurse practitioners, physicians, and doctors of osteopathic medicine.

Data collection periods were dependent upon when the patient was enrolled in a personalized care plan. For each patient enrolled  $\geq 90$  days, the number of SHED visits were recorded for the 90 days immediately pre- and post-enrollment. For each patient enrolled  $\geq 180$  days, the number of SHED visits were recorded for the 180 days immediately pre- and post-enrollment. Finally, for each patient enrolled  $\geq 365$  days, the number of SHED visits were recorded for the 365 days immediately pre- and post-enrollment. Patient demographics, chief complaint(s) that prompted enrollment, subsequent SHED visit chief complaint(s), and presence of concurrent mental health diagnoses were also recorded from the EMR.

A post-hoc financial analysis was completed for each SHED visit that resulted in a disposition of discharge. Billed charges for these visits were obtained by a SHED financial analyst. SHED visits that resulted in hospitalization were excluded from charge analysis because of an inability to determine what portion of the billed charges was attributable to the ED visit itself.

Before project completion, SHED staff received an anonymous 5-point Likert scale survey evaluating satisfaction with and perceived effectiveness of personalized care plans. Collected data were recorded in a Microsoft Excel (Microsoft Corporation, Redmond, WA) spreadsheet and converted to IBM SPSS Statistics Version 25 (Chicago, IL) for analysis.

### **Analysis**

Descriptive statistics were used to detail the demographic and clinical characteristics of the SHED super-utilizers with personalized care plans. Count data (SHED visits per person) and continuous sample characteristics were described using the median, interquartile range, and minimum and maximum values. Comparison of the number of SHED visits per person pre- and post-intervention were analyzed for day 90, 180, and 365.

Pre-post changes in ED visits and billed charges per person were evaluated using non-parametric statistics because of smaller sample sizes at the later observation periods and expected positive skew. Non-directional tests were performed with the level of significance set at 0.05. Preliminary power calculations indicated a sample size of 64 was needed to achieve 80% statistical power when testing for a significant change in SHED visits per person from the pre- to post-period at day 90, 180, and 365.

Staff satisfaction and perceived efficacy of personalized care plans were reported using descriptive statistics.

Categorical measures of the sample characteristics were summarized using the number and percent of the sample under consideration. Median scores with interquartile range were calculated for each job title and the entire SHED staff sample.

### **Ethical Considerations**

The project was formally evaluated using a PI checklist and was determined not to be human subject research. The project was deemed institutional review board exempt by Duke University School of Nursing and the clinical site.

### **Results**

A total of 65 patients were enrolled in this PI project. Two patients died within the first 90 days of personalized care plan enrollment, and their data was not included for analysis (90-day,  $n = 63$ ). Of the remaining 63 enrolled patients, 49 remained enrolled with personalized care plans at day 180 and 365. Of the 63 analyzed patients, 42 (66.7%) returned to SHED once or more after care plan enrollment. Thirty-nine (92.9%) of these patients presented back to SHED for the same chief complaint that prompted care plan enrollment. The mean age of patients was 47 years (range: 22 to 94 years, standard deviation = 15), and 67.7% of participants were female ( $n = 44$ ). Of the 65 enrolled patients, 58 (89.2%) had a concurrent mental health diagnosis as outlined by the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition*. Wilcoxon signed-rank tests were conducted to compare pre- and post-ED visits for day 90, 180, and 365 (Table 1). The number of ED visits showed a statistically significant decrease for all 3 observation periods.

Wilcoxon signed-rank tests were conducted to compare the median total and average pre-post charges at day 90, 180, and 365 (Tables 2 and 3). The number of patients included in total and average pre-post charge analysis varied per observation period. Patients were excluded from total and average pre-post charge analysis because of death ( $n = 2$ ), not having any outpatient-only ED visits ( $n = 1$ ), and for not being enrolled in a personalized care plan at day 180 and 365 ( $n = 14$ ). In addition, patients were excluded from average pre-post charge analysis if they did not have both pre- and post-intervention charge data (Table 3). There were statistically significant decreases for 90-day total, 180-day total, 180-day average, and 365-day total charges ( $P = 0.07$ ) and 365-day average ( $z = -1.5$ ;  $P = 0.14$ ) were not statistically significant.

Out of the 146 SHED staff that were surveyed, 104 completed the survey (Table 4). Overall, the staff was satisfied or very satisfied with the incorporation of personalized care plan implementation. Most staff agreed that personalized care plans were an effective intervention at SHED. Staff satisfaction and perceived efficacy questions are shown in Figures 2 and 3.

### **Discussion Summary and Interpretation**

As shown in Table 1, SHED visits had a statistically significant median decrease of visits per patient for day 90, 180, and 365 post-intervention compared with pre-intervention counterparts. However, 92.9% of enrolled patients that

presented back to SHED post-enrollment did so for the same chief complaint that prompted personalized care plan enrollment. These results further support the findings of prior studies that personalized care plans effectively reduce, but do not eliminate ED visits for super-utilizers.<sup>4,6-13</sup> It is, therefore imperative to address relevant chief complaints and recommend specific treatment guidelines as part of the personalized care plan in order to facilitate consistent patient care.<sup>14,15</sup> Interpretation of ED charge data indicates a decrease in median, average, and total charges, which supports previous studies.<sup>4,8,11</sup>

Overall, the SHED staff was satisfied or very satisfied with the ease of identifying enrolled patients, the selection of patients enrolled, the implementation of personalized care plans, and the care plan's ability to direct patient care during a subsequent SHED visit (Figure 2). The staff found personalized care plans to be both beneficial and effective (Figure 3). The staff also indicated that they were better able to anticipate patient care and believed that patients could better anticipate their care when they returned to SHED for their enrolled chief complaint(s). Emergency department technicians and registered nurses reported lower satisfaction scores compared with the case managers, physician assistants and nurse practitioners, and physicians and doctors of osteopathic medicine. Emergency department technicians and registered nurses were not directly involved in the development of personalized care plans and were not educated regarding the purpose and use, which could have adversely affected satisfaction results. In the future, all staff should receive comparable input and education to increase participation and proficient use of the intervention.

### **Limitations**

This PI project had several limitations. First, the sample size of this project was relatively small, and the statistical power was not met. All personalized care plans were developed and published within the EMR on different dates. Thus, the sample size was smaller for days 180 and 365 because not all patients reached these post-intervention periods. The inclusion of a larger sample would minimize this effect.

Enrollment in this project was through convenience sampling. Patient demographics (primarily females with concurrent mental health diagnoses) were consistent with previous study demographics.<sup>8,11</sup> The use of a randomized controlled design would help improve the generalizability of the project and limit threats to internal validity. In addition, patient-reported satisfaction with personalized care plan enrollment was not assessed. These data would be of significant interest when evaluating the effectiveness of this intervention. Future projects should consider a subject recruitment strategy that would result in a more balanced sample and collection of patient satisfaction. Because we only enrolled patients at a single institution, and personalized care plans were only identifiable in the EMR of a single organization, it cannot be determined if patients obtained care at other facilities during the study period. In addition, other emergency departments are only informed of the patient's enrollment in a personalized care plan when outside records are requested and if a SHED provider discusses the care plan in the progress note. Examining outcomes at multiple health care organizations within the same geographic area would assist in determining the overall effectiveness of personalized care plans.

In addition, charge data was only available for SHED visits that resulted in a disposition of discharge. It is unknown if the inclusion of other dispositions (ie, hospital admission or observation status) would have altered these results in any way. Furthermore, patient financial and demographic characteristics (ie, insurance, employment, and housing status) were not reviewed for consideration or analyzed in this PI project. Recommendations for future projects would include obtaining a complete ED charge analysis and examining more detailed patient characteristics that may influence ability to comply with a personalized care plan.

### **Implications for Emergency Nurses and Conclusions**

Personalized care plans reduce the financial burden, improve resource allocation, and improve health care

outcomes.<sup>4,8,11</sup> Personalized care plan implementation better supports the ED staff, is effective in decreasing ED visit frequency, and improves health care expenditure. The results of this PI project represent a tailored and effective intervention that addresses the needs of both the ED staff and super-utilizers.

#### Author Disclosures

Conflicts of interest: none to report.

#### Acknowledgments

The authors thank Dr Julie Thompson from Duke University School of Nursing for her assistance with statistical analyses and commitment to this project.

Outcome	Median number of visits per patient (IQR)	Visits per patient (range)	Z value	P value	Effect size (r)	Median change in number of visits per patient (IQR)
Pre 90-days	1 (0-5)	0-10	-2.747	0.01	.35 (medium)	0 (-2 to 0)
Post 90-days	1 (0-3)	0-9				
Pre 180-days	5 (1-9)	0-22	-4.610	<0.001	.66 (large)	-3 (-6 to 0)
Post 180-days	1 (0-4.5)	0-14				
Pre 365-days	13 (6.5-18)	4-63	-5.871	<0.001	.84 (large)	-7 (-13.5 to -4)
Post 365-days	4 (0-8)	0-21				

Outcome	Mean charge	Median charge	Minimum charge	Maximum charge	Z value	P value
Pre 90-days	\$3,339.71	\$1,393.50	\$0	\$18,889	-2.053	0.04
Post 90-days	\$1,966.34	\$257	\$0	\$15,437		

Pre 180-days	\$9,478.83	\$8,849	\$0	\$38,955	-4.451	<0.001
Post 180-days	\$3,352.88	\$2,340	\$0	\$20,640		
Pre 365-days	\$20,818.81	\$16,917	\$2,193	\$63,166	-5.733	<0.001
Post 365-days	\$5,551.38	\$3,233	\$0	\$25,267		

Outcome	Mean charge	Median charge	Minimum charge	Maximum charge	Z value	P value
Pre 90-days	\$1,643.24	\$1,502	\$386.50	\$3,570.33	-1.789	0.07
Post 90-days	\$1,331.21	\$1,112.33	\$257	\$3,300		
Pre 180-days	\$1,992.45	\$1,832.94	\$307	\$6,095.75	-2.378	0.02
Post 180-days	\$1,576	\$1,224.69	\$408	\$4,638		
Pre 365-days	\$1,951.53	\$1,907.65	\$535	\$5,672.40	-1.496	0.14
Post 365-days	\$1,787.18	\$1,413	\$408	\$5,420		

Job title	No. surveyed	No. returned	Returned (%)	Total responses (%)
EDT	28	11	39.3	10.6
RN	74	56	75.7	53.8
CM	4	4	100	3.8
PA/NP	7	6	85.7	5.8
MD/DO	33	27	81.8	26
Total	146	104	71.2	100

## DETAILS

<b>Subject:</b>	Enrollments; Patients; Emergency medical care; Intervention; Health care policy; Health care expenditures; Visits; Medical referrals; Hospitals; Individualized; Nurse practitioners; Morale; Efficacy; Care plans; Mental health; Nursing; Recurrent; Physician assistants; Emergency services; Financial analysis
<b>Business indexing term:</b>	Subject: Financial analysis
<b>Company / organization:</b>	Name: Microsoft Corp; NAICS: 334610, 513210
<b>Identifier / keyword:</b>	Emergency department visits; Personalized care plans; Super-utilizers; Health care expenditure; Staff satisfaction
<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	1
<b>Pages:</b>	83-90
<b>Publication year:</b>	2020
<b>Publication date:</b>	Jan 2020
<b>Section:</b>	Practice Improvement
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English
<b>Document type:</b>	Journal Article
<b>DOI:</b>	<a href="https://doi.org/10.1016/j.jen.2019.09.001">https://doi.org/10.1016/j.jen.2019.09.001</a>
<b>ProQuest document ID:</b>	2333905346
<b>Document URL:</b>	<a href="https://www.proquest.com/scholarly-journals/personalized-care-plans-are-they-effective/docview/2333905346/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/personalized-care-plans-are-they-effective/docview/2333905346/se-2?accountid=211160</a>



Copyright: ©2019. Emergency Nurses Association

Last updated: 2022-10-08

Database: Public Health Database

Document 38 of 55

# Winds of Change: Anita N. Dorr Memorial Lecture: JEN

[ProQuest document link](#)

## ABSTRACT (ENGLISH)

I am honored to be here today and indebted to you for this cordial invitation to deliver the Anita N. Dorr Memorial Address. It is altogether fitting that Mrs. Dorr be remembered in this way, by the organization that she was instrumental in founding. The continued and increasing success of EDNA assures Mrs. Dorr a place in history as one of the great leaders of American nursing...and justifies, in no small way, the sacrifices she made on behalf of her profession. Time passes swiftly and the events of today are soon forgotten. The media presents us with an uninterrupted stream of events that boggle the mind. Today, more than ever, it is difficult to maintain any historic perspective. The sheer mass of information, with the instant replays, makes it impossible to assemble in a time frame the events of the past, today, and of the future. Thus, in our confusion, we find ourselves living simultaneously in the past, the present, and the future. So in order to orient ourselves today, and since Mrs. Dorr was largely unknown to many of you, it might be useful to recall the events that led to the creation of EDNA and to some of the work of Mrs. Dorr.

## FULL TEXT

I am honored to be here today and indebted to you for this cordial invitation to deliver the Anita N. Dorr Memorial Address. It is altogether fitting that Mrs. Dorr be remembered in this way, by the organization that she was instrumental in founding. The continued and increasing success of EDNA assures Mrs. Dorr a place in history as one of the great leaders of American nursing...and justifies, in no small way, the sacrifices she made on behalf of her profession.

Time passes swiftly and the events of today are soon forgotten. The media presents us with an uninterrupted stream of events that boggle the mind. Today, more than ever, it is difficult to maintain any historic perspective. The sheer mass of information, with the instant replays, makes it impossible to assemble in a time frame the events of the past, today, and of the future. Thus, in our confusion, we find ourselves living simultaneously in the past, the present, and the future.

So in order to orient ourselves today, and since Mrs. Dorr was largely unknown to many of you, it might be useful to recall the events that led to the creation of EDNA and to some of the work of Mrs. Dorr.

Prior to 1963, virtually nothing had been done by the major medical organizations in an organized way to improve the training and skills of ambulance attendants and emergency department nurses. In 1963, in May, at Chicago's Fire Academy on De Koven Street, the American College of Surgeons Committee on Trauma held its first three day course for ambulance attendants. This meeting was an instant success and was duplicated in the next two years by other American College of Surgeons' chapters in other parts of the country, as well as by the American Academy of

Orthopedic Surgeons through its Committee on Injuries.

I was fortunate to be on the faculty of that first course in 1963 and was witness to the tremendous enthusiasm of the men and women who attended.

By 1965, the courses for attendants were in full swing. Concurrently, the shortage of physicians and nurses and alterations in the pattern of medical practice gave rise to what became known as the emergency department or the emergency room problem. An analysis of emergency department practices at times strongly suggested to me that increased training and skill levels in emergency department nurses might well result in significant improvements in patient care. I discussed this idea with Sam Banks, MD, then the chairman of the Chicago Committee on Trauma and with his blessing, proceeded to organize a one and a half day meeting for emergency department nurses.

It might be interesting for you to know that in canvassing the members of the committee with whom I worked, there was substantial opposition to the thought of doctors putting on postgraduate courses for nurses.

### **First Course Is Held**

The first course was held in the spring of 1966 at the American College of Surgeons' John D. Murphy Auditorium in Chicago. That meeting was attended by about 150 pioneers, chiefly from the middle west and the Chicago area. And it appeared by all measures to be a success. The following year, 1967, attendance at a two and a half day course was 450 with an equal number turned away for lack of space.

In the late summer of 1967, I attended a meeting in Rochester, New York, organized by David N. Kluge, MD, of the College of Surgeons. Dr. Kluge had earlier formed what he called STEP, Society for Total Emergency Programs, an organization to improve ambulance care in a multi-county area of upper New York State. This meeting in Rochester was an early attempt to draw together various groups of people interested in emergency care in a forum-type arrangement.

In addition to the forum, they had a group of workshops, one of which was specifically for emergency department nurses. That workshop was chaired by Mrs. Anita Dorr, head nurse at the Edward J. Meyer Memorial Hospital in Buffalo. I attended that seminar because I was interested in seeing what the emergency department nurses were doing.

### **Anita Dorr Appears**

Mrs. Dorr was a slender woman, slightly above average height. As she described her plan for in-service training in her emergency department at the Meyer Hospital, she appeared ill at ease and was obviously unused to speaking before groups. She chain smoked and she paced back and forth. Her voice was somewhat reedy and low pitched. Her eyes were quick, her gaze intelligent, and her facial expression changed but little as she spoke. Despite her obvious nervousness, she joked and brought sympathetic laughter often as she described problems and difficulties associated with operating a large emergency department in a busy metropolitan hospital.

After her talk, I introduced myself, and impressed by what I had heard, I was determined to invite her to Chicago to the next course.

As the courses began, initially they were largely taught by physicians. We were aware of the fact that some of the material should be taught by nurses. But it took time to uncover the teachers and to uncover the leaders, and Mrs. Dorr obviously appeared to be both. On close-up, as I talked with her, her features were sharp, her face was lined with prominent crow's feet at the edge of her eyes. She had a piercing sort of gaze and had the disconcerting habit of looking directly at you as she spoke. She was a woman of most impressive mien.

She was sure that she couldn't do it. She just stated categorically that she would never be able to talk in front of that many people. She said that wasn't her bag, and that she just couldn't possibly take such a long trip to Chicago, and like most nurses at that time, her chief feeling was that this was not something nurses did. Well, after some minutes of discussion, she agreed to come only if she could bring her assistant for company. Oddly enough, she even drove to Chicago because she didn't feel like flying at that time.

The third annual meeting of the post-graduate course for emergency department nurses was held in 1968. We had over 1200 nurses at the Palmer House. Mrs. Dorr did extremely well in her presentation and received excellent comments on her critique sheet. She was indeed one of the first nurse-teachers and did an outstanding job despite

the fact that she was scared to death. At that meeting on the second night, we had a banquet for all 1200. In the audience at that banquet there were two people in particular, Mrs. Dorr was there—and Judy Kelleher was there. In my after-dinner speech, I urged the nurses to set up a regular organization to carry on their own postgraduate education and determine their own future.

Shortly after the course was over, I heard that Mrs. Dorr had started to organize groups in Rochester and in Buffalo. Encouraged and aided no doubt by the previous experience with Dr. Kluge and the good advisors that she sought out there, she quickly assembled a preliminary set of by-laws and incorporated an Emergency Department Nurses Association in New York. At almost the same time, I heard that Mrs. Kelleher was organizing a group in California. Mrs. Dorr turned to me as an advisor and called me frequently. She said her difficulties were no budget, no staff, and she was more or less doing it single handedly—in the corner of her emergency department with only one typewriter. But, she got EDNA off the ground. I wish I had recordings of those conversations. with the expletives deleted, to share with you.

She traveled to hospitals when she could. She traveled mostly at her own expense, and I'm sure she neglected her family. In her heart she felt it was imperative that the organization get started and keep going. And strangely enough, almost like some of the things you've read about, Mrs. Dorr had never done anything like this before. It was as though she felt that in one way or another, that it had fallen to her to get the job done. Her determination, her single-mindedness, became almost frightening.

### **A Team Is Formed**

She met with Mrs. Kelleher at a course given by the American Academy of Orthopedic Surgeons, in 1968, and I should say that the Academy of Orthopedic Surgeons was one of the patron groups of emergency department nursing.

I give great credit to Judy for her wisdom, her graciousness, and her understanding. She, at that time, already demonstrated the true qualities of leadership by assessing the situation and going along with Anita and taking over as chairman of the west coast district.

It was a good team they put together. Anita with her single-minded determination, and Judy with her ingenuity and an almost uncanny ability to get what she needed for EDNA. I must say that I think Judy hit the west coast like a plague of locusts. She gathered enough money and help, always with graciousness, always with kindness, and always as an outstanding example of a leader in the field of nursing. The organization flourished and the roadrunner began running, and believe me, it ran like hell. By 1971, the first Congress was planned in Rochester. At this point, I made a decision to leave practice in Chicago and I began to lose contact with Judy and Anita as I became increasingly preoccupied with my own affairs. I left the city for a long, and I felt much needed, vacation prior to entering practice in the north.

It was late in the spring of 1972 that I learned from Judy that Anita was gravely ill. It was July before I managed to reach her by telephone despite numerous attempts. We talked for almost an hour.

### **A Shortness of Breath**

She told me that she had gotten on a plane and gone down to Houston, and as she was walking from the airplane down the hall in the terminal, she realized she was short of breath—and desperately short of breath. She went to the ladies room, as most women will, and kind of took stock of herself, and realized she was sick. She was alone in a strange city. She had a meeting scheduled downtown. For a moment she was frightened, but typically, like a good nurse that she was, she took a look at the situation and checked the schedule and found a plane back to Buffalo in a very short period of time.

She got on the plane, flew home, went from the airport directly to the hospital. She went to her own emergency department and checked in, seeking emergency care. She looked at her own chest x-ray and she was much too experienced a nurse to need much of an explanation of what she saw.

As we talked on, we talked about life and about death. She had only one regret and that was that she couldn't make it to the Congress. She was bitter in a way...the same bitterness of those who struggle hard in a field and find they are not going to be able to carry on the struggle...as though something was being taken away from her. But she was

resolute. She was confident that Judy and the rest would continue. But, like a good nurse, she simply hated like hell to take off her cap in the middle of a shift and walk off the floor. Her chief thought was that she was letting the rest of them down and that she was not doing her part.

She was on chemotherapy at the time and it wasn't helping much. She was nauseated and bitterly sick. I called back a week or two later, got to her husband. He advised me that she was back in the hospital. The tumor she had literally consumed her and she died shortly after that, quickly and with little agony.

By 1973, EDNA was viable, alive and well. Reorganization and new business management, through the ACEP, had been extremely effective. New regional directors were found, the Board of Directors learned the ropes of national organizations and national leaders. New leadership people were uncovered. The second congress in Dallas, with the ACEP, firmly established the format of the future, and the rest I think you know.

Now events are moving much faster than we can really conceive. Organizations that went unchanged for hundreds of years have literally collapsed in the last 15. Simultaneous with the great scientific adventures of the 60's and 70's, we have entered into a period of great social experimentation. Almost every aspect of life is being reviewed, often changing in several directions at once. There seems to be a new revolutionary set-up going on—it looks like everything is going to be reorganized and run a different way.

### **Accelerating Change**

Medicine appears to be one of the most rapidly changing aspects of life altogether. Ten years ago, who could have predicted with certainty the EMT, EMT I and EMT II, the mobile coronary care unit, the physician's assistant doing histories and physicals and making diagnoses, the three year medical school, the death of the rotating internship, nurses on strike, doctors on salary from the hospital, private practice on its way out, HMOs and the demise of the hospital operated school of nursing. The body of medicine which has been practically inviolate in this country for over 50 years now is open to anyone. A graduate degree in social sciences and they are free to dissect the body at will and unfortunately not necessarily put back the pieces in the order in which they remove them.

More than ever the public is aware of medicine and painfully aware of medical problems. Socially directed criticism of the medical and nursing professions is standard fare in periodicals as well as in state legislatures and here in our fair city of Washington.

We are part of the crisis, so we are told. We have been declared incompetent to deal with our own problems. The HMOs, the PSROs, Regional Medical Programs, Regional Health Care Planning, have all put in for a piece of the action. We are suddenly dancing to a dozen tunes at once, with a dozen partners, not necessarily of our own choosing.

When we are called upon to speak—that is, when the profession is called upon to speak, it seems tongue-tied. It seems no one wants to stand up and speak. As a result the organizations look at one another and typically start an intramural feud over who has the right to speak for all, as though anyone did. All the more indicative, say the planners, of the fact that we are somehow out of step with the times, that we are dollar oriented, that we are short sighted; and maybe, just maybe, they have a point.

Doctors and nurses are educated and trained for independent action. We are inwardly directed people who are largely results oriented. We deal largely with the real world where results and decisions are measured in EKGs, in the lab or on the autopsy table. Social abstractions are largely beyond the ken and training of medical people. However, this now appears to be the name of the game. We must all learn how to play it. In my opinion, nurses may have to learn it the fastest of all.

Medicine as a scientific discipline is hardly 100 years old. Up until the late 1800s, it was largely superstition, digitalis, and amputation. In 1873, the year Linda Richards, America's first graduate of nursing, received her diploma from Boston's Women and Children's Hospital, there were only 173 hospitals in the entire country.

### **Medicine Is 'Hospitalized'**

With scientific discoveries, however, of asepsis, anesthesia, bacteriology, principles of diagnosis and practice, medicine became hospitalized, and by 1909, there were 4,000 hospitals in the United States. Many of them, to be sure, were less than desirable. But strangely enough, at this date, 65 years later, there are barely twice that many.

The whole thing came into bloom almost at once.

With medicine more formalized, the educational requirements of doctors were fixed and became a function of the university. The Flexner report resulted in the closing of hundreds of diploma mills and the image of the doctor was very sharply drawn.

During this same period, the image of nursing, barely 50 years old as a profession, became sharply drawn as well. In that short time, medicine developed all of a sudden. The nurse was assigned a secondary role which she occupied largely untouched and unchanged for over 50 years. Only with the advent and the concept of the so-called professional nurse in the SO's as advocated by some of the nursing organizations was this image of the nurse to change at all.

However, the nursing shortage of the 60's provoked a raft of changes in the structure of nursing health care. Health care paraprofessionals appeared out of nowhere as planners and others grappled with the problems of so-called shortage of health care personnel. EMTs, PAs, super LPNs, associate degree programs, all sorts of things were brought up in an effort to ease the shortage. The associate shortage of physicians at the same time led to the re-evaluation of the doctor's role. Demands of the public for more and better care and demands by medical students for relevance and electives, all these factors led to considerable public debate over who could do what medically to whom, when, why, and how.

The nurse, who had occupied the secondary, though secure, role discovered all sorts of people in the nursing station administering health care in apparent violation of the medical and nursing practice acts which they had held sacrosanct for three generations.

The winds of change are now harassing the flames of Florence's lamp. If the flame keeps burning, or if it is going to keep burning, then it has to be turned up. Nursing must now assert itself in order to protect and expand its role. The nurse must see herself in her new role. If things are being reorganized, then the nurse must make herself heard so that she may achieve her rightful place in what people will come to call the new medicine of the 70's and 80's.

Nursing has not been exactly unheard during the last few years. The major nursing organizations have, from time to time, made themselves heard in a small way. However, I fear that so long in the secondary role, nurses have been afraid to speak up and feared the criticism of some doctor or a sharp reprimand from the nursing office.

### **Make Yourself Heard**

This organization, now some 8500 strong, deserves to be heard. No one has a monopoly on speaking for organized nurses. No one has a mandate to make all the decisions and to decide all the policies. You, sitting here, are now organized nurses. In virtually every state, as I can see here, you have substantial representation. I dare say you are the third largest professional nursing organization in this country. If you look at the membership roll, you are probably the second largest organization consisting almost exclusively of registered nurses.

I dare say that you must, through your Board and through your legislative committees, make yourself heard. You, through your representatives, have a right to speak on what you think the role of the nurse should be. You have a right to insist that nurses should become primary providers of health care, that their training and experience entitles them to move into careers of increasing satisfaction and responsibility. You have a right to insist that nurses be upwardly mobile. And that if a nurse has a degree and a certain amount of experience and can demonstrate her competence through examination, that she be allowed to enter medical school without suffering the indignity of going back to a useless premedical education.

You have a right to insist that if a state license, or otherwise, certifies physicians assistants and if these people are to move into a new role, then a nurse with requisite background should be admitted to any qualifying examination without starting all over in her profession. You have a right to appear before your state nursing board or your state legislature, and insist upon changes in the nursing practice act to allow you to use and to profit from additional training you have obtained. You have a right to bargain collectively, to obtain fair and just compensation for your labors, if reasonable negotiations on a professional level are of no avail.

You have a right as professionals to help in determining staffing patterns and the density of the nurse workers in the hospitals. You have a right to assess the workload level at which adequate care can be maintained.

These are just a few of the rights you are entitled to and upon which you should insist. It is up to you and this organization. Through these meetings, by the process of deliberation, you must determine what these rights are and work out the way in which you intend to avail yourself of them.

### Keep The Lamp Lit

When Miss Nightingale returned from the Crimea and advocated the development of schools for trained nurses, she shocked much of the medical establishment. She prevailed in the face of the most bitter opposition from some quarters. She believed that she was right and she persevered. She lit her lamp and she carried it, and that feeble flame enlightened the lives of hundreds of millions of people. It is time for you to turn up the wick now lest the lamp flicker and die in the winds of change. As a matter of fact, I would urge you, perhaps at this point, to have the lamp rebuilt and put a sealed beam in it and shine it right in their eye.

You should let people know what you think but think responsibly for yourselves. And act responsibly through your leaders.

## DETAILS

<b>Subject:</b>	Emergency medical care; Trauma; Success; Hospitals; Committees; Women; Leadership; Nurses
<b>Location:</b>	Chicago Illinois; New York
<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	1
<b>Pages:</b>	16-20
<b>Publication year:</b>	2020
<b>Publication date:</b>	Jan 2020
<b>Section:</b>	ENA 50th Anniversary
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English

Document type: Editorial

DOI: <https://doi.org/10.1016/j.jen.2019.11.004>

ProQuest document ID: 2333905330

Document URL: <https://www.proquest.com/scholarly-journals/winds-change-anita-n-dorr-memorial-lecture/docview/2333905330/se-2?accountid=211160>

Copyright: ©2019. Emergency Nurses Association

Last updated: 2020-01-13

Database: Public Health Database

---

Document 39 of 55

# Blast Incidents and Their Sequela: JEN

[ProQuest document link](#)

---

## ABSTRACT (ENGLISH)

The current literature on blast injuries indicates that the number of explosions is increasing and those injured by explosive incidents experience injuries of increased complexity. This article contributes to practice as there is a paucity of literature specific to emergency nursing. Key implications for emergency nursing practice found in this article are increased awareness of the classifications of blast injury and of common blast-related traumatic injuries to anticipate.

## FULL TEXT

### Contribution to Emergency Nursing Practice

- The current literature on blast injuries indicates that the number of explosions is increasing and those injured by explosive incidents experience injuries of increased complexity.
- This article contributes to practice as there is a paucity of literature specific to emergency nursing.
- Key implications for emergency nursing practice found in this article are increased awareness of the classifications of blast injury and of common blast-related traumatic injuries to anticipate.

### Case Review

A 39-year-old male patient is en route to your facility after an explosion of unknown origin occurred while he was getting into his car. The paramedics report that the patient is awake and alert but is confused and disoriented with regard to the place and date, with a resulting Glasgow Coma Score (GCS) of 14 (E-4, V-4, M-6). They also report that the patient has sustained a partial amputation to the left lower extremity. Bleeding has been controlled by placing a tourniquet around the thigh just above the knee. Also reported are burns to both lower extremities as well

as multiple small wounds to the patient's posterior legs and buttocks. The patient is complaining of lower extremity pain and ringing in his ears. He had reported a pain intensity of 10/10, and 20 mg of intravenous (IV) ketamine was administered initially at the scene, followed by a second dose of 10 mg, with a reduction in pain to 4/10. The patient's vital signs are as follows: blood pressure, 142/88 mmHg and heart rate, 122 beats/min, with the monitor showing sinus tachycardia. The patient's respiratory rate is 18 cycles/min, unlabored, with a pulse oximeter reading of 100% on a nonrebreathing mask. The arrival time is estimated to be 12 minutes.

## Overview

Explosions resulting in blast injuries in the United States are not as rare as one might expect. Over the past 25 years, some of the largest US mass casualty incidents have involved explosions.<sup>1</sup> Seventy percent of US mass casualty incidents resulting in 20 or more on-scene deaths involve blasts or fires of various origins.<sup>1</sup> From the truck bomb in Murrah Federal Building, Oklahoma City, to the 2 improvised explosive devices (IEDs) detonated during the Boston Marathon, there has been an increase in the number of international bombing incidents.<sup>2</sup> The RAND Database of Worldwide Terrorism Incidents indicates that between 1999 and 2006 (the last year that data were collected) there was a 4-fold increase in the number of terror-related explosive events worldwide and an 8-fold increase in the number of injuries related to these incidents.<sup>3</sup> Not only are the number of incidents rising, but the injuries they cause are also exponentially worse. Aside from the threat of explosions caused by IEDs, there is an ever present risk of structural explosions resulting from natural gas leaks. This article will provide insights into the pathophysiology and patterns of injury to be expected in the victims of explosions regardless of the origin. An overview of the most common blast injuries to anticipate when caring for patients after an explosion is also provided.

## Pathophysiology of Blast Injuries

The US Department of Defense adopted the Taxonomy of Injuries From Explosive Devices, which provides a common framework for characterizing blast injuries within the Department of Defense. This taxonomy assigns blast injuries to 5 categories—primary, secondary, tertiary, quaternary, and quinary—according to the mechanism of injury:<sup>4</sup>

1. Primary blast injuries from the initial blast wave result in barotrauma.<sup>4</sup> Overstretching and increased air or water pressure can damage susceptible organs and structures, such as the tympanic membrane (TM), lungs, eyes, abdominal contents, and brain.<sup>4</sup>
2. Secondary blast injuries occur when strong blast winds behind the explosion pressure front propel fragments and debris against the body, resulting in penetrating and blunt-force injuries.<sup>4</sup> For instance, IEDs are often constructed such that the fragments from the case holding the explosive device become weaponized upon detonation; this debris increases the number and severity of injuries. Other IEDs are constructed with items such as screws, nails, or small ball bearings placed within the device, called primary fragmentation, to increase the potential for injury.<sup>5</sup>
3. Tertiary blast injuries result from strong blast waves and pressure gradients that can propel the body and cause the same types of blunt-force injuries that would occur in a car crash, fall, or building collapse.<sup>4</sup> The blast itself can result in structural collapse, which can result in blunt impact injury.<sup>5,6</sup>
4. Quaternary blast effects result from other explosive products (such as heat and light) and from exposure to toxic substances from fuels, metals, and gases that can cause burns, blindness, and inhalation injuries.<sup>4</sup> These injuries also result in exacerbation or complication of pre-existing medical conditions.<sup>5-7</sup>



5. Quinary blast injuries encompass the myriad of health-related impacts that may be caused by postexplosion environmental contaminants such as propelled body fragments of the perpetrator or other victims, which upon exposure can result in a hyperinflammatory response or an infection (including the passage of blood-borne pathogens) as well as pathogenic contamination of the blast scene.<sup>7</sup>

These 5 classifications have been integrated into most of the domestic programs that train health care providers and first responders to provide medical care to those injured in the prehospital and emergency environments.

Explosive blasts are physical phenomena that result in a sudden release of energy. This process causes compression of the surrounding air or water and an increase in pressure (overpressure) above atmospheric pressure, resulting in an overpressure or blast wave.<sup>5</sup> This overpressure wave propagates outward from the explosion in a radial manner at supersonic speed, creating a wake of negative pressure (underpressure) that follows. After the negative-pressure wave passes, the relative pressures return to baseline.<sup>5</sup> The damage resulting from a blast wave depends on 5 factors, as referenced in the <sup>Table</sup>.<sup>5</sup> Explosive devices are unique in their ability to result in a wide variety of injuries that extend beyond simple blunt versus penetrating trauma.<sup>4</sup>

### **Rupture of the Tympanic Membrane**

Resulting from barotrauma, TM injuries are the hallmark of explosive incidents. Previously, TM ruptures were viewed as indicators of the extent of damage to other organs such as the lungs, intestines, or brain<sup>5</sup> and as a marker of the victim's location near the explosion site. However, current evidence suggests that although TM rupture suggests proximity to the blast, it can be an isolated injury.<sup>5,8,9</sup> Common clinical manifestations of TM rupture include ear or head pain, loss of hearing in the affected ear, bloody drainage, tinnitus, vertigo, and gait disturbances.<sup>5,8,9</sup> If the patient cannot hear what is being said, the emergency nurse should utilize alternative communication methods to ensure effective translation of information. Treatment of a ruptured TM is typically conservative. The majority of patients have a good prognosis and experience healing without any interventions; however, up to 30% of the patients may experience permanent hearing loss.<sup>10</sup>

### **Blast Lung Injury**

Blast lung injury, also a form of barotrauma, results from intense percussive force to the lung tissue from the blast wave of the explosion. As previously referenced, blast waves from explosions that occur near or within hard solid surface areas can be amplified; therefore, a victim in close proximity to the explosion or in an enclosed space is at the highest risk for lung injury.<sup>6,9</sup> Blast lung injury is the most common immediately fatal injury in victims who initially survive the explosion.<sup>9</sup> Clinical signs include tachycardia, cyanosis, decreased breath sounds, and subcutaneous air. Signs and symptoms range from dyspnea and cough to hemoptysis, hypoxia, hemo/pneumothorax, and pneumomediastinum leading to respiratory failure and hemodynamic instability.<sup>1,9</sup> The signs and symptoms of blast lung injury have been reported to occur up to 48 hours after the explosion and are more prevalent in victims with skull fractures, penetrating torso or head injuries, or burns covering greater than 10% of the total body surface area.

<sup>11</sup> A chest radiograph may show bilateral hilar consolidation caused by hemorrhage and edema, which takes on a butterfly appearance.<sup>9</sup> Management of blast lung injuries is largely supportive. Chest tube insertion should be anticipated for clinically significant hemo/pneumothorax. Signs of ventilatory failure should be managed with early intubation and mechanical ventilation.<sup>9</sup>

### **Musculoskeletal Injuries**

Musculoskeletal injuries are very common in victims of blast injury and account for more than 80% of all surgical intervention in the survivor population.<sup>12</sup> Soft-tissue and bony injuries can be the result of any of the 5 blast injury mechanisms; however, secondary blast injury is believed to be the most common.<sup>10</sup> Traumatic amputations and

musculoskeletal deformities are the most disturbing injuries that emergency nurses will encounter in victims injured in close proximity to a blast. Health care providers should not be distracted by the graphic damage because this may not be the most life-threatening injury. Initial care involves control of significant bleeding. If the victim arrives by emergency medical services (EMS), there should be a commercial tourniquet (CTQ) in place proximal to the injury to ensure adequate arterial compression. A CTQ is the device of choice, as it has been shown to be superior to an improvised tourniquet (eg, belt or scarf) in stopping life-threatening bleeding occurring in an extremity.<sup>13</sup> If a CTQ is not available, an improvised tourniquet should be applied until a CTQ is available. The CTQ should be placed immediately above the improvised tourniquet and tightened until the bleeding stops and distal pulse (if present) is no longer palpable.<sup>14</sup> If the victim is experiencing life-threatening hemorrhage at the time of CTQ placement, the device should be tightened to stop the bleeding. If no bleeding is present, or if bleeding is controlled, as a preventive measure, a CTQ should be loosely applied proximal to the injury so it can be quickly tightened in the event of a hemorrhage. If the victim arrives without a CTQ in place, consideration should be given to applying such a device proximal to the injury and tightening it depending on the amount of bleeding occurring. Victims arriving by a private vehicle may or may not have a CTQ in place. If the victim does not have a CTQ in place or if an improvised tourniquet has been used, a CTQ should be applied in the same manner as that referenced above. The blast effect of an explosion will also result in crush injuries. Crush injuries, if untreated, can lead to rhabdomyolysis, renal failure, and death from metabolic derangements.<sup>1,9</sup>

Treatment of small wounds caused by fragmentation remains under debate.<sup>15</sup> The nurse's role includes thoroughly assessing and documenting all wounds and their locations and presence of gross contamination. Anticipated interventions include wound irrigation, antibiotic and tetanus prophylaxis, and prepping for transport to the operating room or transfer for higher-level care. Placement of a pelvic binder is advocated in cases in which a pelvic fracture is suspected, such as high-level unilateral or bilateral amputations or blasts with associated femur fractures.<sup>16,17</sup> The requirement for imaging, such as ultrasound, radiographic studies, and computed tomography scanning, should also be anticipated in patients with wounds in the extremities, pelvis, abdomen, chest, neck, or head.

### **Ocular Injury**

All eye injuries should be promptly evaluated once other life-threatening issues have been mitigated. Open globe injuries and ocular foreign bodies are among the most serious conditions and should be quickly assessed by the emergency nurse, anticipating prompt consultation with an ophthalmologist for best outcomes.<sup>9</sup> If an ophthalmologist is not immediately available, the eye must be protected. Simple eyelid closure without pressure is an option, as is shielding without pressure application.<sup>9</sup> Other interventions to anticipate include ocular irrigation, tetanus, and antibiotic prophylaxis.<sup>9</sup>

### **Thermal Burns**

Thermal burn is a quaternary injury,<sup>1,18</sup> and victims presenting after a blast exposure often have burns that range from superficial to full-thickness burns.<sup>19</sup> Inhalation injury or circumferential burns to the neck, chest, or extremities require prompt attention in the context of the multitude of other life-threatening injuries. All other burns should be evaluated and triaged once other higher-priority injuries are mitigated. Basic interventions such as fluid resuscitation and prevention of hypothermia are staples in trauma management; however, special burn formulas for fluid resuscitation should be applied as burns insidiously accelerate the body's fluid requirements. Environmental control and warming measures are a priority in the patient with burn injuries as the damage to skin may rapidly result in the loss of body heat.<sup>9</sup>

### **Brain, Cardiac, Digestive, and Other Injuries**

In addition to the aforementioned injuries, the emergency nurse should assess for concurrent injuries to the brain,

heart, and digestive tract. These injuries are more complex and will be the topic of a future Trauma Notebook article.

### **Case Continuation**

Upon EMS arrival, police detectives riding with the patient report that their preliminary findings indicate that a small IED was placed under the patient's car and detonated remotely upon his entry into the vehicle. There were no additional victims at the scene, and photographs taken on scene showed moderate damage to the driver's side of the car, including buckling of the driver-side floor and partial disarticulation of the driver's door.

The primary assessment reveals that the patient is awake and alert with a patent airway and no evidence of inhalation injury or other potential obstructions. A cervical collar had been placed by the EMS. His breathing is spontaneous and nonlabored, with symmetrical chest rise and fall. The chest is clear of any obvious injury, and there is no pain or crepitus upon palpation. The patient has no distended neck veins or tracheal deviation. A CTQ is in place on his left thigh, without any evidence of distal bleeding. The patient has no other areas of external hemorrhage, and his skin is pink, warm, and dry. He has strong carotid and radial pulses. Two intravenous (IV) lines had been placed by EMS and are infusing normal saline at a combined rate of 250 cc/hour. The secondary assessment reveals that the patient has a GCS of 15 (an improvement over the GCS of 14 reported at the scene). He has partial and full-thickness burns to both lower extremities and buttocks, with multiple small and 3 larger wounds posteriorly above the level of the partial amputation of the left lower extremity. His pain upon arrival is 6/10. His lungs are clear, and his SpO<sub>2</sub> is 100% on 10 L of oxygen via a nonrebreather mask. The remainder of the secondary assessment is unremarkable. The patient's weight is 83 kg. A focused assessment with sonography in trauma (FAST) exam of the abdomen and chest shows negative results. Upon visualization of both ear canals, complete TM rupture is observed in the left ear, and the right TM is normal. The patient is transitioned to a nasal cannula at 4 L and maintains an oxygen saturation of 95%. An additional 20-mg IV dose of ketamine is administered for pain relief. The percentage of burn area is determined to be 25%, and the IV fluid-administration rate remains at 250 cc/hr. CefTRIAXone (2 g) is administered via IV piggyback, and the patient is given tetanus prophylaxis because he cannot recall his last immunization. The patient's blood sample is sent to the laboratory for a complete blood count with differential as well as serum chemistries, clotting studies, and typing and screening. The patient is taken to the radiology unit for radiography of the cervical spine, lower extremities, and pelvis, as well as for chest radiography. Apart from a severe compound fracture to the left lower extremity and several foreign bodies within the wounds on his legs, the chest, neck, pelvis, and left femur, radiographs are negative. The cervical collar is removed, and the patient is taken to the operating room. In the operating room, the orthopedic surgeon performs an above-the-knee amputation of the left leg because of the extensive vascular, soft-tissue, and bony damage caused by the explosion. In addition, all posterior wounds were explored and debrided. The patient is then transferred to the trauma intensive care unit, transitioned to a medical surgical floor after 24 hours, and discharged for rehabilitation on postoperative day 6.

### **Summary**

Explosive forces can result in a myriad of injuries ranging from minor to fatal. The medical literature is clear that all patients presenting after exposure to a blast injury should be treated as having multisystem trauma until proven otherwise.<sup>4,5,15,18</sup> Gathering information about the explosive incident is important, and providing an opportunity for EMS and law enforcement to provide intelligence related to what they find on the scene must be integrated into the patient handoff. Understanding the nature of blast effects and using a systemic approach in assessing these trauma patients are essential for prompt recognition and intervention for all life-threatening injuries as well as for appreciating all other injuries and prioritizing care to lead to the best possible outcome in the patient.

### **Author Disclosures**

Conflicts of interest: none to report.

1. Peak of the initial positive-pressure wave
2. Duration of overpressure
3. Medium of explosion
4. Distance from the incident blast wave
5. Degree of focusing because of a confined area or walls

## DETAILS

<b>Subject:</b>	Emergency medical care; Explosions; Injuries; Bombings; Eardrum; Ears & hearing; Lungs; Patients; Cardiac arrhythmia; Classification; Amputation; Health care; Nursing care; Taxonomy; Pain; Explosives; Nursing; Physical trauma; Emergency services; Professional practice
<b>Location:</b>	United States--US
<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	1
<b>Pages:</b>	129-133
<b>Publication year:</b>	2020
<b>Publication date:</b>	Jan 2020
<b>Section:</b>	Trauma Notebook
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767

e-ISSN:	15272966
Source type:	Scholarly Journal
Language of publication:	English
Document type:	Journal Article
DOI:	<a href="https://doi.org/10.1016/j.jen.2019.10.013">https://doi.org/10.1016/j.jen.2019.10.013</a>
ProQuest document ID:	2333905319
Document URL:	<a href="https://www.proquest.com/scholarly-journals/blast-incidents-their-sequela/docview/2333905319/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/blast-incidents-their-sequela/docview/2333905319/se-2?accountid=211160</a>
Copyright:	©2019. Emergency Nurses Association
Last updated:	2023-06-21
Database:	Public Health Database

---

Document 40 of 55

# Advanced Placement Paramedic Education for Health Care Professionals: A Descriptive Evaluation: JEN

[ProQuest document link](#)

---

## ABSTRACT (ENGLISH)

### Introduction

The delivery of emergency medical services is primarily performed by emergency medical technicians and paramedics in the United States. More recently, nurses and physicians have become more involved in the delivery of emergency medical services. Advanced placement paramedic education bridging programs have been developed to prepare the workforce, but the success of these programs is unknown. This study evaluated the demographics and performance of nonemergency medical services health care professionals who attended an advanced placement paramedic education program at a Midwestern university.

### Methods

This was a retrospective evaluation of student data from 2007 to 2017. Descriptive statistics were used to tabulate demographics, program performance, and individual performance in the National Paramedic Certification Examination.

### Results

The program admitted 305 students; registered nurses (95%) were the majority of students. Of the 305 admitted students, 271 (88.9%) fulfilled all program requirements and were eligible to take the National Registry of Emergency Medical Technicians paramedic certification examination. Of these 271 eligible students, 201 (74.2%)

took the National Paramedic Certification Examination. A total of 195 (97%) obtained certification at the first test attempt, whereas 200 (99.5%) obtained certification within 3 attempts. Of the 200 who passed the test, 175 (88%) successfully demonstrated entry-level competency in paramedic-level psychomotor testing.

### **Discussion**

The advanced placement paramedic program evaluated in this study had high rates of successful program completion, as well as high first-time and cumulative passing rates for the National Paramedic Certification Examination. Further research is needed to identify the best practices in determining student requirements and the methodologies in delivering advanced placement paramedic education bridging programs.

## **FULL TEXT**

### **Contribution to Emergency Nursing Practice**

- The current literature on advanced placement paramedic education for health care professionals indicates a gap in understanding the outcomes of advanced placement paramedic programs for health care providers.
- This article contributes major findings of high rates of completion (88.9%) and national certification (99.5%) from an advanced placement paramedic education program for nonemergency medical services health care professionals.
- Key implications of this research are that there is an advanced paramedic program for health care professionals wanting to bridge into the delivery of prehospital emergency medical services.

### **Introduction**

Emergency Medical Services (EMS) in the United States is primarily provided by professionals who function at 4 levels of practice, as defined by the EMS Scope of Practice Model.<sup>1</sup> These clinicians are able to function in many settings and practice situations, constituting a flexible workforce for the variable needs and challenges faced in the prehospital environment.<sup>1-5</sup> In Europe, nurses and physicians provide direct patient care with EMS, including ground transport, specialty care, aeromedical services, and disaster response.<sup>6-8</sup> In the Franco-German model of EMS delivery, nurses and physicians are able to provide expanded experiences and skills in the prehospital environment, which may be beneficial for the patient.<sup>7,8</sup> Similar examples and EMS crew configurations are present and supported in the US.<sup>9-12</sup>

In the US, there is a growing need to develop bridge programs for health care personnel to transition to EMS roles.<sup>3, 13-15</sup> As the workforce of nurses and physicians in EMS increases, a clear training paradigm to prepare these care providers for the specialized EMS environment is essential.<sup>12</sup> Paramedic programs have begun to satisfy this need by developing bridge and transitioning programs for health care personnel to transition to EMS roles. The Committee on Accreditation of Education Programs for the Emergency Medical Services Professions (CoAEMSP) in the US has reported program evaluation data collected from a compulsory CoAEMSP survey of all accredited paramedic programs in the US (Gordy Kokx, PhD, Associate Director CoAEMSP, e-mail communication, July 05, 2018). In 2015, 218 of 696 (31%) accredited paramedic programs offered advanced placement education for health care professionals, but only 124 (18%) admitted students in the last 5 years. In these programs, a range of health care professionals were admitted. Registered nurses were most frequently admitted to these programs, followed by paramedic program graduates (non-Commission on Accreditation of Allied Health Education programs) and physicians (US credentialed).

Although a number of advanced placement EMS education bridging programs have been developed, the performance of these programs in entry-level credentialing examinations is not clearly known or reported. To address this substantial gap in the published literature, the current study aimed to evaluate the demographics and

performance of non-EMS health care professionals who attended an advanced placement paramedic education program from 2007 to 2017 at a Midwestern university.

## Methods

This study was a retrospective, descriptive evaluation of the administrative records of students who were enrolled in a Midwestern university's advanced placement paramedic education course, titled "Paramedic certification for Health care Providers" from 2007 to 2017.<sup>13</sup> This time frame allowed for consistency in the use of an adaptive computer-based test and same psychomotor stations for the National Paramedic Certification Examination. This evaluation was granted exempt status by an Institutional Review Board, as the study involved examining normal educational practices.

The advanced placement paramedic course was designed by the EMS program medical director and a faculty committee to bridge the differences between the curricula of registered nurses and paramedics. This gap analysis was completed by identifying the differences in expected skills and knowledge competencies between registered nurses and paramedics to prepare the nurse to practice within the EMS setting. For example, paramedics are expected to perform endotracheal intubations, whereas this skill is not a basic part of the educational preparation of a registered nurse. This program was monitored by an advisory board comprising the university leadership, EMS program faculty, staff, alumni, and community partners. The community partners were varying health care professionals representing local health systems and EMS agencies. The program admission requirements were as follows: a minimum of 2 years of acute or critical care experience as a credentialed health care provider, with an active emergency medical technician credential and with Basic Life Support and Advanced Cardiovascular Life Support certifications.<sup>13</sup> A trauma certification such as a Trauma Nursing Core Course certification and an emergency pediatric certification such as Pediatric Advanced Life Support or Neonatal Resuscitation Program certification were preferred.<sup>13</sup> The advanced placement paramedic program admitted registered nurses, nurse practitioners, physician assistants, and physicians.<sup>13</sup> The program did not admit licensed practical nurses, respiratory therapists, chiropractors, physical therapists, and others with similar qualifications.<sup>13</sup>

Graduation from the advanced placement program involved completion of 4 key phases of training: 1) self-assessment, 2) onsite training through a didactic approach and simulation, 3) comprehensive program final examination, and 4) completion of capstone team lead experiences with an Advance Life Support (ALS) EMS agency. After enrollment, the program required students to complete a series of self-assessments to identify content areas to review before their classes. Students then attended a 2-week course at a Midwestern university. The course sessions included morning lectures and psychomotor skill or simulation stations in the afternoon. Students were scheduled approximately 10 shifts with local fire-based ALS EMS departments. Weekday shifts were scheduled for 6 hours in the evenings, and 2 weekend shifts were scheduled for approximately 15 hours during the day and evening. Patient care during these shifts was counted toward the students' capstone experiences. On the last class day, students completed a comprehensive written examination. The written examination was the same comprehensive program final examination taken by the traditional undergraduate paramedic students at the Midwestern university, which consisted of 180 questions with a minimum passing score of 80%. Advanced placement students were required to complete 50 out-of-hospital patient care experiences, more commonly referred to as capstone team leads, as a requisite for program completion. All students had the option of completing these capstone patient care experiences at their local ALS EMS systems or of returning to the Midwestern university to fulfil this requirement. A certificate of completion is issued only after all 4 of these requirements are completed. The program graduate was then able to proceed to seeking National Registry of Emergency Medical Technician (NREMT) paramedic certification.

Data were retrospectively collected from advanced placement course information from 2007 through 2017. Data were obtained from course rosters and student files. The data collected included demographic information, level of licensure, time to completion of all program requirements, score on the comprehensive program final examination, and years of experience. These data were linked with performance data from the National Paramedic Certification Examination conducted by the NREMT.<sup>16,17</sup> Descriptive statistics were used to analyze program demographics and performance data on the National Paramedic Certification Examination, including first-attempt, second-attempt, and cumulative third-attempt passing rates.

## Results

Over the 10-year study period, 305 students attended the course. Of them, 89% (n=271) completed all requirements and were issued a certificate of completion (Figure 1). Approximately 52% of students were female (n=159), with a median age of 34 years at the time of taking the course (Table 1). Registered nurses represented 95% (n=291) of all students, and 63% (n=191) of the students had completed a Bachelor of Science degree before attending the program. The most common clinical experiences of the students before the program were in the emergency department (73%, N=223), EMS (50%, N=152), and intensive care unit (46%, N=139) settings. A total of 224 (73.4%) students had experiences in more than one of the reported settings. Figure 2 depicts a cumulative number of students from each state, with the highest number of students from Washington (n=21), Colorado (n=19), Connecticut (n=19), and Nebraska (n=18). For the students who completed the course (n=271), the median days to completion of all program requirements from the first day of class was 102 days (interquartile range: 52–177 days). After course completion, 201 (74.2%) students scheduled and completed their first attempt of the National Paramedic Certification Examination (Table 2). The overall passing rate after 3 attempts was greater than 99%. Of these individuals, 175 (88%) passed the paramedic psychomotor examination, indicating an entry-level competency.

## Discussion

Aiming at adequately preparing the growing workforce of non-EMS health care professionals in the EMS system, a standard educational paradigm promises to enhance the safety of patients and providers.<sup>12</sup> In this evaluation, we demonstrated how 1 paramedic program has developed a curriculum to assure the training and preparation of health care professionals to function within the EMS setting. Only after completing all program requirements were advanced placement paramedic program graduates able to pass the National Paramedic Certification Examination, with a first-attempt passing rate of 97% and a cumulative third-attempt passing rate of 99.5%. This study adds to the body of literature, to describe and evaluate a non-EMS health care provider bridge educational program to become a paramedic.

In comparison, the advanced placement paramedic program graduates from the current study passed the National Paramedic Certification Examination at higher rates than did graduates of the traditional paramedic program at the same university. The traditional year-long paramedic program offered by the same Midwestern university from 2013 to 2017 included 117 students from 5 cohorts. This group of students in the traditional program had a first-attempt passing rate of 89.7% (n=105) and a cumulative third-attempt passing rate of 95.7% (n=112) for the same National Paramedic Certification Examination.

To the best of our knowledge, no published studies have evaluated the transition of non-EMS professionals to EMS care in the US and the students' entry-level competency rates after completing a bridge program. Per communication with CoAEMSP, in a 2015 self-reported survey of EMS programs in the US, 31% of surveyed paramedic programs (n=696) offered advanced placement education for health care professionals, and 18% of these programs have already admitted students in the past 5 years (n=124 programs) (Gordy Kokx, PhD, Associate Director CoAEMSP, e-mail communication, July 05, 2018). A wide range of health care professionals were admitted



in these programs, including registered nurses, nonaccredited paramedic program graduates, and US credentialed physicians. Of the programs that admitted advanced placement students in the past 5 years, 70% reported greater than 80% passing rates for the National Paramedic Certification Examination or state paramedic examination.<sup>16</sup> The passing rate reported in our study is consistent with this passing rate. Furthermore, the data from our study add to the literature by describing the curricula followed in the program and the students' outcomes in the NREMT National Paramedic Certification Examination.

As in all innovative curricula, there were challenges to the implementation and evaluation. Our 2 main challenges were incomplete capstone experiences and nonattempts of the NREMT National Paramedic Certification Examination. Thirty-four (11%) students completed the 2-week course and passed the comprehensive program final examination but were not granted a certificate of program completion owing to incomplete capstone experiences (Table 2). These incompletions can be attributed to 2 known challenges. Not all states, such as Tennessee, allow paramedic students to complete field time if they are not from an approved educational institute recognized by that state's EMS office.<sup>18</sup> Students from these states must return to a Midwestern university to complete their remaining capstone experiences or travel to another location that allows students of an out-of-state program. Second, because of the nationwide reach of the program, there were also challenges in obtaining affiliation agreements between the Midwestern university and EMS services that meet accreditation and legal requirements in all student residential regions. Both of these challenges created barriers to completing required capstone experiences and therefore to completing the program.

After attaining a certificate of program completion, 26% (n=70) of students did not take the NREMT National Paramedic Certification Examination. The NREMT National Paramedic Certification Examination was the main outcome measured as an external verification tool of entry-level competency. There are 2 common reasons for this issue. First, some students resided in states, such as Illinois, that have their own paramedic credentialing examinations, separate from the National Paramedic Certification Examination.<sup>19</sup> Second, some states, such as Nebraska, do not require proof of entry-level competency to provide paramedic licensure to non-EMS health care professionals.<sup>20</sup> Therefore, completion of the academic program may be sufficient to attain licensure. On the basis of our work, these 70 individuals completed the designed curriculum and passed the comprehensive final examination. However, entry-level competency could not be independently verified in our evaluation.

The existence of nontraditional and bridge educational pathways to EMS paramedic provider across the US needs to be further understood and evaluated. Further research into other alternative pathway paramedic education programs to identify the best practices and entrance requirements for success is warranted. Further program evaluation and research could include other measurements of success such as student satisfaction and employer feedback surveys for this group.

### **Limitations**

This study was limited to a single Midwestern university-based EMS educational program in Omaha, Nebraska. Each class had a maximum of 10 students, and the overall data were limited to the 305 students who attended the program within the 10-year period. Our data were obtained from a national group and not geographically segmented. Additionally, this study was limited to health care providers with at least 2 years of acute or critical care experience, and there was no formal requirement for previous EMS experience other than having an active emergency medical technician credential. The study measures were limited to the NREMT National Paramedic Certification Examination serving as evidence of attaining entry-level competency. As noted, some students who completed the program may not have had independent confirmation of entry-level competency, thus introducing measurement error. We do not know whether this group received exemptions to practice as paramedics from their states or EMS systems. Our

study showed that other non-EMS health professions can transition into EMS, but it did not explore the feasibility of paramedics transitioning into other health professional roles on an advanced placement pathway.

### Implications for Emergency Nurses

The results of our study have implications for emergency nurses seeking to function in EMS settings, such as aeromedical transport, and for those wanting to bridge their clinical expertise with EMS credentialing to support local EMS. We documented a high rate of non-EMS health care professionals, primarily experienced acute and critical care nurses, who successfully attained entry-level paramedic competency after program completion. For the specialty of emergency nursing, our study has implications such as successful workforce preparation to expand the role of emergency nursing into the prehospital EMS setting as paramedics.

### Conclusion

Our study evaluated the outcomes from an advanced placement paramedic program at a Midwestern university. The program had high rates of successful program completion, as well as high first-attempt and cumulative passing rates in the NREMT paramedic level computer-based examination. Future research is needed to identify the best practices in student requirements and methodologies in delivering advanced placement paramedic education bridging programs.

### Author Disclosures

Conflicts of interest: none to report.

Characteristic	Frequency (Median)	Percent (IQR)
Age (median, IQR)	(34)	(29–41)
Female	159	52%
Male	146	48%
Type of provider		
RN	291	95.4%
APRN	6	2.0%
MD/DO	4	1.3%
PA	3	1.0%
CRNA	1	0.3%
Highest level of education attained		
Bachelor's degree	191	62.6%

Associates degree	85	27.9%
Master's degree	16	5.2%
Certificate	6	2.0%
Medical degree (MD or DO)	4	1.3%
Doctor of nursing practice	3	1.0%
Years of clinical experience		
Emergency department (n=223)	(3)	(2-6)
Intensive care unit (n = 139)	(3)	(2-6)
Flight (n=54)	(3)	(2-7)
EMS (n=152)	(5)	(2-8.5)
Other (n=10)	(5)	(2-16)

Examination	Frequency	Percent
Comprehensive program final examination		
First attempt	287/305	94.1%
Second attempt	305/305	100%
National Paramedic Certification Examination		
First-attempt success	195/201	97.0%
Cumulative third-attempt success*	200/201	99.5%

## DETAILS

<b>Subject:</b>	Emergency medical care; Students; Advanced Placement program; Paramedics; Curricula; Workforce; Accreditation; Medical personnel; Physicians; Emergency services; Nurses; Best practice; Technicians; Pediatrics; Health services; Skills; Certification; Educational programs; Medical technicians; Professional training; Health education; Education
<b>Location:</b>	United States--US
<b>Identifier / keyword:</b>	Emergency Medical Services; Program Evaluation; Nurses; Curriculum; Paramedic; Emergency
<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	1
<b>Pages:</b>	44-50
<b>Publication year:</b>	2020
<b>Publication date:</b>	Jan 2020
<b>Section:</b>	Research
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English
<b>Document type:</b>	Journal Article
<b>DOI:</b>	<a href="https://doi.org/10.1016/j.jen.2019.10.010">https://doi.org/10.1016/j.jen.2019.10.010</a>
<b>ProQuest document ID:</b>	2333905307
<b>Document URL:</b>	<a href="https://www.proquest.com/scholarly-journals/advanced-placement-paramedic-education-health/docview/2333905307/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/advanced-placement-paramedic-education-health/docview/2333905307/se-2?accountid=211160</a>
<b>Copyright:</b>	©2019. Emergency Nurses Association

# Emergency Rabies Exposure Plan of Care: JEN

[ProQuest document link](#)

## ABSTRACT (ENGLISH)

Children frequently seek emergency care after coming in contact with a potentially rabid source or being bitten by a wild animal or an unfamiliar pet. Each emergency nurse must understand the who, why, how, when, and where to provide postexposure rabies care. On any given shift, you may be in triage when a camp leader arrives with two 8-year-old campers, one bitten on the hand by a stray dog and the other awoken by a bat flying overhead in the camp sleeping area. When these types of patients seek treatment in your emergency department, what is your plan of care?

## FULL TEXT

Children frequently seek emergency care after coming in contact with a potentially rabid source or being bitten by a wild animal or an unfamiliar pet. Each emergency nurse must understand the who, why, how, when, and where to provide postexposure rabies care. On any given shift, you may be in triage when a camp leader arrives with two 8-year-old campers, one bitten on the hand by a stray dog and the other awoken by a bat flying overhead in the camp sleeping area. When these types of patients seek treatment in your emergency department, what is your plan of care?

### Rabies

Rabies is a 100% vaccine-preventable, viral zoonotic disease that occurs in over 150 countries and territories worldwide. It is usually transmitted from the saliva of a rabid animal through a bite; a scratch; inhalation; or contact with the eyes, nose, or mouth.<sup>1-4</sup> In the United States, contact with an infected bat is the leading cause of rabies-associated deaths.<sup>1,2</sup> The second leading cause of rabies-associated deaths in the US is rabid-dog bites, which are usually sustained by US citizens during international travel.<sup>1,2</sup> Rabies is a virus that is transmitted to the central nervous system, leading to brain and spinal cord inflammation.<sup>1,2</sup> Two forms of rabies exist: (1) furious rabies, which is characterized by hydrophobia, hyperactivity, aerophobia, cardiorespiratory arrest, and death within a few days and (2) paralytic rabies, which occurs in 20% of cases and involves muscle paralysis at the bite or scratch site that spreads to the rest of the body, leading to coma and ultimately death.<sup>1-3</sup>

Children arriving at the emergency department with symptoms suggestive of rabies exposure present nonspecific flu-like symptoms, such as sore throat, weakness, headache, fever, neurologic changes, and unexplained tingling, prickling, or burning, which progress to encephalitis symptoms and ultimately death.<sup>1,2</sup> Pain, pruritis, and paresthesia in the bite area can be early signs of rabies, as opposed to other more commonly seen encephalitis processes caused by herpes, enteroviruses, or arboviruses.<sup>1,2</sup> Additional symptoms of rabies include delirium, hallucinations, abnormal behavior, and insomnia.<sup>1,2</sup> The incubation time for acute rabies is usually 2 to 10 days.<sup>1,2</sup> Emergency nurses need to be aware of the long incubation time of the rabies virus, which ranges from less than 1 week to 1 year.<sup>1</sup>

**Rabies Exposure Plan of Care In Whom, From The Animal Contact Perspective, Should The Emergency Nurse**

## **Suspect Rabies?**

Animal and wildlife contact puts the patient at risk for rabies, which is always fatal if not treated with the rabies vaccine before the onset of symptoms.<sup>1,2</sup> According to the Centers for Disease Control and Prevention (CDC), any mammal can get rabies.<sup>1,2</sup> Depending on the part of the world you are in, different animals carry the highest risk of transmitting rabies.<sup>1</sup> In the US, the highest contributors to rabies risk are wild animals such as bats, raccoons, skunks, and foxes.<sup>1,2</sup> Exposure to wild animals such as bats is of concern because bat teeth are tiny, and a bite mark may not be easily identified. Postexposure prophylaxis should be strongly considered for people who were in the same room as a bat, although they may be unaware of a bite or contact.<sup>1-3</sup> In many countries across the world, dogs are not vaccinated against rabies, which is a major public health concern because anyone bitten by an unvaccinated dog is at risk of developing rabies.<sup>1,2</sup> Provoked animals would attack a child in self-defense; therefore, an unprovoked attack may indicate that the animal is rabid.<sup>1,2</sup> Strange behavior in animals may indicate that the animal is rabid, and that the child should start the rabies postexposure vaccination protocol.<sup>1,2</sup> Animals that have not been vaccinated against rabies (which may include animals whose vaccination history is unknown) pose a high risk of transmitting the rabies virus.<sup>1,2</sup>

## **To Whom, From The Perspective Of Children, Should The Emergency Nurse Provide Rabies Vaccines?**

Emergency nurses need to be aware that children less than age 15 years account for 40% of those bitten by a suspected rabid animal.<sup>2</sup> The child's history should include the following details: allergies to foods (egg, chicken protein, and bovine gelatin); medications (amphotericin B, bovine gelatin, chlortetracycline, and neomycin); date of last tetanus immunization; rabies immunization history; current medication use, specifically immunosuppression medication; and immunocompromised status. If there is a wound, tetanus vaccination should be considered for children who have not undergone tetanus immunization within 5 years. Immunosuppressant medications should not be given to children requiring rabies vaccination, if possible.<sup>2</sup> Immunosuppressant medications may lower the efficacy of the rabies vaccine and could make the rabies vaccine ineffective.<sup>2</sup> Children who are immunocompromised should receive the current 4-dose vaccination schedule plus the fifth vaccination dose on day 28 (1 mL, intramuscular [IM] injection in the deltoid muscle on days 0, 3, 7, 14, and 28).<sup>2</sup> Corticosteroids or other immunosuppressive agents, illnesses, and antimalaria medications can interfere with active immunity, potentially diminishing the adequacy (effectiveness) of the rabies vaccine.<sup>2</sup> A child who must continue immunosuppressant medication during postexposure rabies care is advised to undergo blood tests to ensure that the rabies vaccine level is adequate to protect against rabies.<sup>2</sup> Caution should be exercised in children with a bleeding disorder, thrombocytopenia, or on anticoagulation therapy because of the risk of bleeding from the rabies IM injection. Health care providers need to contact the CDC, and in the US, each state's Department of Public Health decides who creates the rabies vaccine schedule.<sup>1,5</sup>

## **Why Should Emergency Nurses Care About Rabies Exposure?**

Untreated rabies is fatal if not treated before the symptoms appear, which is why emergency nurses should suspect rabies exposure and treat it accordingly.<sup>1,2</sup> Rabies exposure is an urgent medical event for which treatment decisions should not be delayed.<sup>1,2</sup> Children bitten by domestic animals (dogs, cats, ferrets, horses, cattle, and sheep) that have received the rabies vaccine and appear healthy may not need a postexposure rabies vaccine, per the discretion of the CDC, unless the animal tests positive for rabies.<sup>1,2,5</sup> When the vaccination status is unknown, the animal that bit the child should be confined for 10 days and observed for abnormal behavior or signs of the rabies virus.<sup>1,2,5</sup> If the animal shows signs of rabies during confinement, the child should receive postexposure rabies vaccination.<sup>1,2,5</sup>

An additional reason why an emergency nurse should care about rabies exposure is that there are no current diagnostic tools to identify rabies infection before the onset of symptoms.<sup>1-3</sup> Although various diagnostic tools can confirm rabies infection in living persons, this confirmation does not change the progression of the virus.<sup>1-3</sup> Only after death can the rabies virus be identified in infected tissues.<sup>1,2</sup>

## **how should emergency nurses provide postexposure rabies care?**

First, control any bleeding while providing any life-saving interventions from contact with the animal. Emergency

nurses must remember to provide meticulous wound care. Wash the animal bite site, scratches, and areas of contact with copious amounts of soap and water for at least 15 minutes or provide wound irrigation according to your facility's protocol.<sup>1,2</sup> Reconstitution of the medication and preparation of the rabies vaccine by the emergency nurse are according to the manufacturer guidelines, as are use of the diluent provided and calculation of the dose per kilogram weight (<sup>Table</sup>). Recommendations on how to administer the rabies vaccine have been outlined in the Table.<sup>3-10</sup> Concerning how the emergency nurse administers the rabies vaccine, it is recommended to be administered IM in the deltoid muscle in older children and adults and in the anterior lateral thigh in children younger than 2 years.<sup>1-4</sup> Subcutaneous and gluteal administration are not recommended, as these may produce lower antibody titers, and accidental administration using these routes necessitates re-administration of the vaccine.<sup>3</sup> Age- and development-appropriate pain control and distraction measures should be taken before administering the rabies vaccine to the child. The volume of the rabies vaccine dose for all children, regardless of age, is a standard 1 mL.<sup>3-8</sup> There are 4 available rabies immune globulin (RIG) formulations in the US. The dose of RIG is weight-based (20 units/kg of total body weight), which is why it is important to obtain the patient's weight upon arrival to the emergency department.<sup>3,4,6,7,9,10</sup> A pharmacist can help assist clinicians with appropriate dosing and rounding to help prevent vial wastage and minimize cost. RIG (human) is available in concentrations of 300 units/mL and 150 units/mL, depending on the manufacturer.<sup>6,9,10</sup> The emergency nurse needs to pay special attention to the vial concentration and manufacturer reconstitution instructions, as products may change because of availability. The protocol for the administration of RIG requires the emergency health care provider to infiltrate the wound with as much medication as possible. The remaining RIG should be administered IM in a different location from where the rabies vaccine is administered to avoid interference of the 2 medications.<sup>4</sup> If applicable, as much of the RIG should be injected into the site of the bite or wound to neutralize the virus, with the remainder administered IM at a site different from the vaccination site.<sup>3,4,6-9</sup>

#### **When Did The Potential Rabies Exposure Occur?**

The rabies virus undergoes retrograde axonal transport through the central nervous system from the nerves to the spinal cord and brain very slowly.<sup>1</sup> Information on when the bite or potential exposure occurred is important during patient assessment because the rabies virus travels through the body to the brain before rabies symptoms manifest.<sup>1-3</sup> Because of the long incubation time before rabies symptom occurrence, emergency nurses should inquire when potential rabies exposure could have occurred, including international travel within the year and potential exposure to an unreported wild animal or contact with a rabid animal.<sup>1</sup>

#### **Where Did The Potential Rabies Exposure Occur?**

Information on where in the US or internationally, if the rabies exposure occurred during international travel, the potential rabies exposure occurred is important to assist the health care practitioner in developing a postexposure rabies vaccination plan.<sup>1-3</sup> Animal related injury-reporting laws require information on the geographic location of rabies exposure to ensure proper reporting, surveillance, and prevention of further exposure to the rabid animal.<sup>1,2</sup> The location of the bite on the child's body affects the risk for contracting rabies.<sup>1-3</sup> Children bitten multiple times on their head, neck, or torso by infected animals are at a greater risk of contracting rabies because of the proximity to the brain.<sup>1-3</sup>

#### **Rabies Postexposure Prophylaxis**

Rabies postexposure prophylaxis (PEP) includes a dose of human rabies immune globulin (HRIG) and rabies vaccine given on the day of rabid-animal contact and then a dose of the vaccine administered on days 3, 7, and 14.<sup>1,3,4,6</sup> If an individual has never received rabies vaccination, PEP should always include both HRIG and the rabies vaccine.<sup>1,3,4,6</sup> Individuals with both bite and nonbite exposures, regardless of time of bite, are recommended to receive HRIG and rabies vaccine.<sup>1,3,4,6</sup> A person who was previously vaccinated or received preexposure vaccination for rabies should only receive 1 rabies vaccine, namely, HRIG (<sup>Table</sup>).<sup>1,3,4,6</sup>

#### **Rabies Vaccines**

There are 2 available rabies vaccines in the US. One is made from human diploid cell culture and contains neomycin.<sup>3,6-10</sup> Another rabies vaccine contains amphotericin B, bovine gelatin, egg and chicken protein, chlortetracycline, and neomycin.<sup>3,6-10</sup> A complete allergy history should be obtained before administration. If an

allergy to any of the vaccine components in the hospital's formulary vaccine exists, it is recommended to get an infectious disease consult immediately. Medications and hospital protocols for anaphylaxis and hypersensitivity-type reactions should be readily available in the event a reaction occurs.

RIG may be ordered to be administered in combination with rabies vaccine.<sup>4,6-9</sup> Ideally, RIG and rabies vaccine should be administered on the same day to avoid extra ED visits and copayments, but if RIG is not available, it may be given through the seventh day postvaccine.<sup>4</sup> Both medications may be stored in the hospital's automated medication dispensing device for ease of access; for cost reasons, certain hospitals may store them in the central pharmacy.

**Emergency Nursing Implications**

Patients and caregivers should be informed of potential side effects such as vaccine injection site pain, erythema, itching, and swelling. Other common side effects are headache, nausea, abdominal pain, muscle aches, dizziness, and fever. Hypersensitivity reactions are less common but can occur. A full list including more severe side effects can be found using the hospital's electronic drug information source or by contacting the pharmacist.<sup>3,4,5</sup> Emergency nurses in the US need to be aware that in April 2018, the World Health Organization published a position paper using a lower dose of vaccine given intradermal (ID) in underserved countries, but it is not yet approved in the US.<sup>1,2</sup> It is important for the emergency nurse in the US to know that until guidelines are updated, the only approved route of administration for rabies vaccine in the US is IM administration; the ID route of administration is considered off label (Table).<sup>1</sup>

Emergency nurses must comply with state and local animal bite reporting laws, ensure compliance with future rabies vaccines follow-up compliance, teach wound care, consider tetanus prophylaxis if not received within 5 years with a deep wound, and review rabies prevention teachings. The cost of rabies postexposure prophylaxis is high, which may be a barrier for a patient completing their full course of rabies prophylaxis (Table). All emergency nurses should inquire and provide appropriate referral if financial assistance is needed to cover the cost of rabies prophylaxis. Rabies prevention starts with keeping all pets up to date with their vaccinations (dogs, cats, ferrets, horses, cattle, and sheep), ensuring that domestic pets visit the veterinarian regularly, securing domestic pets, calling animal control for stray animals in the neighborhood, and teaching children not to touch unknown animals, including wildlife. Excellent Internet resources from the CDC and Departments of Public Health are available to teach parents and children about rabies.<sup>11,12</sup>

**Conclusions**

Emergency nurses should have a high suspicion of potential rabies exposure when patients seek care related to contact with a potential rabid animal or receive a bite from wildlife or an unfamiliar pet. The emergency nurse must obtain a thorough patient history of the who, why, when, and where the injuries occurred to develop an appropriate child-specific rabies postexposure care plan. Emergency nurses must review current recommendations of how to administer rabies vaccine and be diligent in reviewing rabies postexposure regimes. Rabies can be completely eradicated if animals receive the rabies vaccination and prompt rabies postexposure treatment is initiated and all follow-up rabies vaccines regime completed.

**Author Disclosures**

Conflicts of interest: none to report.

Patient PEP information	WHO and ACIP recommendations	Rabies vaccine dose/route/schedule	Rabies vaccine site of injection	HRIG recommendation	AWP Cost <sup>‡</sup>



PEP, no previous rabies vaccine	WHO Category II* and Category III†)	1 mL IM on days 0, 3, 7, and between 14-28 1 mL IM in 2 sites on day 0, then 1 mL IM in 1 site on days 7 and 21	< 2 years old in anterolateral thigh ≥ 2 years old in deltoid muscle	Category III bites 20 units/kg infiltrated/IM	Rabies Vaccine HDCV \$290.04/vial PCECV \$315.13/vial
ACIP	1 mL IM on days 0, 3, 7, and 14	Younger children in outer aspect of thigh Older children in deltoid muscle	20 units/kg infiltrated/IM	High Potency HRIG 300 unit/2 mL (per mL): \$426.07 1500 unit/10 mL (per mL): \$388.94	Previously immunized

## DETAILS

**Subject:** Emergency medical care; Vaccines; Nurses; Tetanus; Encephalitis; Postexposure; Rabies; Public health; Nervous system; Children & youth; Animal bites; Triage; Emergency services; Flying; Help seeking behavior

**Location:** United States--US

**Publication title:** Journal of Emergency Nursing;; JEN; Philadelphia

**Volume:** 46

**Issue:** 1

**Pages:** 121-125

**Publication year:** 2020

**Publication date:** Jan 2020

**Section:** Pediatric Update

**Publisher:** Elsevier Limited

**Place of publication:** Philadelphia

**Country of publication:** United Kingdom, Philadelphia

**Publication subject:** Medical Sciences--Nurses And Nursing

**ISSN:** 00991767

**e-ISSN:** 15272966

**Source type:** Scholarly Journal

Language of publication:	English
Document type:	Journal Article
DOI:	<a href="https://doi.org/10.1016/j.jen.2019.10.008">https://doi.org/10.1016/j.jen.2019.10.008</a>
ProQuest document ID:	2333905237
Document URL:	<a href="https://www.proquest.com/scholarly-journals/emergency-rabies-exposure-plan-care/docview/2333905237/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/emergency-rabies-exposure-plan-care/docview/2333905237/se-2?accountid=211160</a>
Copyright:	©2019. Emergency Nurses Association
Last updated:	2023-09-15
Database:	Public Health Database

---

Document 42 of 55

# Nursing Skills Fair in an Austere Military Environment: JEN

[ProQuest document link](#)

---

## ABSTRACT (ENGLISH)

The current literature on skills fairs indicates a lack of data on measurable improvements, such as subjective comfort levels or objective assessment results. This article contributes a description of the positive impact that an innovative skills fair had for a team of nurses deployed to an austere environment. Key implications for emergency nursing practice found in this article are that innovative and engaging skills fairs for staff can contribute to increased comfort level and knowledge. Skills fairs may be an intervention that can be helpful especially when new equipment is used or a new nurse or team needs to be oriented to a department.

## FULL TEXT

### Contribution to Emergency Nursing Practice

- The current literature on skills fairs indicates a lack of data on measurable improvements, such as subjective comfort levels or objective assessment results.
- This article contributes a description of the positive impact that an innovative skills fair had for a team of nurses deployed to an austere environment.
- Key implications for emergency nursing practice found in this article are that innovative and engaging skills fairs for staff can contribute to increased comfort level and knowledge. Skills fairs may be an intervention that can be helpful especially when new equipment is used or a new nurse or team needs to be oriented to a department.

A patient who has sustained multiple gunshot wounds, a patient who has survived an explosion from an improvised explosive device, and a patient with appendicitis are all examples of those who could present to a deployed military field hospital in an austere environment. These patients require a skilled, ultra-efficient medical team that is prepared to render life-saving emergency care, perform surgery, provide recovery care in a critical care inpatient setting, and expeditiously evacuate the patient from the austere environment to a permanent hospital in Germany or the United States. The nursing team may encounter new or unfamiliar equipment, compared with their home unit, in the deployed field hospital setting. The Joint Commission (TJC) states that it is an organization's responsibility to ensure that its employees can demonstrate skills competency, specifically with regard to the use of new or unfamiliar equipment.<sup>1</sup> TJC further relays that employees must possess the skills and knowledge to render safe care.<sup>1</sup> The purpose of this clinical paper is to describe the development and initial implementation of a nursing skills fair, an educational intervention for emergency care equipment, in an austere military environment.

### **Clinical Education Problem**

In the beginning of 2019, our field hospital was deployed to the Middle East. The nursing team consisted of registered nurses, licensed practical nurses (LPNs), and army medics. The nursing team's patient-care experience ranged from less than 1 year (for some of the LPNs and medics) to more than 10 years. Upon arrival at the hospital, the team encountered medical equipment that was unfamiliar and not used in military hospitals in the US. The primary reason for this difference is that all equipment in the field hospital must meet the aeromedical evacuation requirements for evacuating patients from the theater of operations with the help of air-transport teams. The most experienced nurses had difficulties operating the most basic medical equipment, such as the bedside vital sign monitor and the suction machine. Advanced life-saving equipment and skills such as intraosseous insertion, use of a defibrillator, and setting up for chest tube insertion were unfamiliar to LPNs and medics with minimal clinical experience.

### **Field-Hospital Context and Preparation of Personnel**

A field hospital is a mobile, expeditionary tent structure that is designed to provide care for emergent and surgical patients and stabilize them for transport out of a deployed theater of operations. The field hospital contains numerous tents that are constructed together with various vestibules and walkways connecting each of the different sections of the hospital. The field hospital consists of an emergency medical team; an operating room; a forward combined unit (FCU), which combines medical/surgical and intensive care patients; a patient administration team; and ancillary services such as radiology, pharmacy, and laboratory. The field hospital can range from a 32-bed to an 148-bed inpatient FCU, depending on the medical and surgical needs of the theater of operations. Patients receive care in the field hospital for various medical conditions, ranging from sick call/routine care to emergency medical and surgical care. The patients stay in the FCU until they have fully recovered and then return to duty or are transferred back to a hospital center in Germany or the US once their condition stabilizes.

Before deployment, nurses and medics are required to attend training courses specific to their scope of practice. Nurses attend the Trauma Nursing Core Course and the Tactical Combat Casualty Course (TCCC). Medics are required to attend a TCCC course. The TCCC is a useful course for rendering care at the point of injury, whereas the Trauma Nursing Core Course is a course that prepares nurses for taking care of a trauma victim who arrives at an emergency department after receiving prehospital care. Although both of these courses prepare the nurse and medic to provide expedient trauma care, neither of these courses provide hands-on training with the specific bedside equipment seen in a field hospital.

Organizations and nursing educators have a responsibility to ensure that nursing professionals within their area are competent in nursing skills required to perform patient care, both domestically and internationally.<sup>2</sup> Nursing

confidence directly impacts nursing competence, thus affecting patient outcomes.<sup>3</sup> Nursing staff may experience anxiety and stress anytime their work environment is complex, rapidly changes, or is unfamiliar. A field hospital can be a fast-changing and unfamiliar environment. Imagine being a nurse new to a hospital or department, receiving a first polytrauma patient, and not knowing how to operate the most basic bedside equipment like the vital sign machine or the suction machine. In an already heightened stress situation, the lack of confidence in using the equipment would not aid in maintaining composure and would cause a delay in care. Thus, specific hands-on training on how to use the equipment must be conducted upon arrival to the field hospital, and addressing the comfort level of the nursing staff in using the equipment is a rational priority for educators.

A literature review was conducted to assist with curriculum development for the skills fair. Seven relevant articles were integrated with our planning.<sup>1-7</sup> Most of the literature addressed how skills fairs can be useful in learning high-risk, low-volume procedures.<sup>7-11</sup> There were limited data concerning the development of a skills fair to learn about unfamiliar equipment.<sup>1-7</sup>

According to a review of the literature, skills fairs can be drawn out, can be too lengthy, and can lead to learner disengagement.<sup>4</sup> Additionally, the testing portion or competency assessment portions of skills fairs can cause learners to feel anxious and stressed, which could negatively impact learning. However, skills fairs continue to be an accepted forum for learning, especially when a large number of people are being assessed to determine their competency and skill levels.<sup>1</sup>

### **Skills Fair Topics**

The skills fair included 13 topics: intravenous pump use, Belmont rapid fluid infuser operation, mechanical ventilator familiarization, cardiac monitor, chest tube drainage set-up and maintenance, arterial line, central line, ER-REBOA catheter (Resuscitative Endovascular Balloon Occlusion of the Aorta), suction machine, Bair Hugger, ZOLL Defibrillator, electrocardiogram machine, and intraosseous access.

### **Tailoring the Skills Fair Timing**

The education committee explored numerous options to conduct the skills fair, taking into account patient-care and mission requirements. The majority of the staff worked 12-hour shifts; therefore, it was a priority to ensure that all staff would have an opportunity to attend the skills fair at a time most conducive to their learning. The education committee felt it would be overwhelming to present all skills at one time. Additionally, the education committee did not want to impose a skills fair during a time at which the clinical staff should otherwise be sleeping.

The skills fair consisted of five 1-hour blocks of instruction, with each hour of instruction consisting of 3 stations, each station lasting 20 minutes. The 1-hour blocks of instruction were offered from Mondays to Fridays, with both morning and evening sessions. The clinical staff attended a 1-hour block of training for 5 consecutive days. The learners had the option to attend either the morning or evening session, whichever worked best for their shift or their sleep rotation. The stations consisted of didactic learning, case study review, and hands-on demonstrations and return demonstrations. A session of 1 hour or less, suggested by the literature referencing learner disengagement, capitalizes on the attention span of an adult learner.<sup>4</sup>

### **Tailoring the Skills Fair Delivery Method**

The education committee sought to introduce a fun, innovative twist to the skills fair to maximize attentiveness and to create a relaxed, stress-free learning environment. "A Tour of the Middle East" was chosen as the theme for the skills fair, as the field hospital was located in a remote area in the Middle East. Skills fair attendees were given a passport booklet to use as a checklist for completion of each skills station. Each 20-minute station was assigned a Middle Eastern country, and skill station instructors provided the learners with captivating facts about the designated country before providing didactic information.

The education committee prepared the didactic information, ensuring the information was evidence-based, accurate, and standardized. The skills stations were presented via PowerPoint on a large television (visual learning style) with the material presented by an identified subject-matter expert (audio learning style); if applicable, demonstrations and return demonstrations of the skill were conducted (hands-on learning style). Some of the stations also had video instructions, which promoted both visual and audible learning styles simultaneously.

### **Evaluation Planning**

Multiple different evaluation methods have been used by nurse educators to determine the effectiveness of teaching and competency assessments. The ultimate goal of competency validation, as stated by the TJC, is for employees to possess the skills and knowledge to render safe care.<sup>4</sup> Organizational, educational procedures to validate these skills on new and unfamiliar equipment are imperative to deliver safe, quality care.<sup>4</sup> One method to gauge competency is to have students conduct a self-assessment or self-evaluation. An additional method is to administer written tests before and after the instruction to compare test scores.<sup>5</sup> We also prioritized assessing the comfort level with the professional skills we addressed in the skills fair. We developed a self-assessment, pre- and post-test competency checklist and skill comfort level questionnaire for the purposes of this project.

The purpose of the survey evaluation was to identify whether a knowledge gap was perceived overall, on the basis of subjective comfort level, and whether skills stations would be warranted in the future. The education committee utilized anonymous, voluntary pre- and post-test and assessment surveys as a method to measure the outcomes of the skills fair. As an anonymous survey, an individual's pretest scores could not be linked to the individual's post-test scores. The post-skills fair survey consisted of the same questions as the initial survey. Individual was asked to rate their comfort level with each of the skills fair topics. Comfort level was assessed using a 5-point Likert-type response that ranged from *extremely uncomfortable* to *extremely comfortable*.

### **Skills Fair Implementation and Evaluation**

There were 16 attendees at the skills fair who completed the pre- and post-test assessments. The average skills fair pre-test assessment score was 59.7%, and the average post-test assessment score was 94.4%. The voluntary survey was completed by 18 personnel before the skills fair started and by 13 personnel after skills fair completion. Two nurses completed the pre-test assessment but did not attend the skills fair, which explains the discrepancy of having 18 total voluntary surveys before the skill fair and 16 attendees. The post-test comfort levels were markedly higher than the pretest levels, but fewer participants completed the post-test survey. Before the skills fair, the overall subjective responses averaged higher on the "uncomfortable" side of the Likert-type scale. The post-skills fair responses revealed higher percentages on the "comfortable" side of the Likert-type scale (see <sup>Figure</sup>). There was a free-text box on the post-test survey to share overall thoughts regarding the skills fair. Over half of the students provided positive comments regarding the theme of the skills fair, with responses such as, "the theme was fun and overall this skills fair was fun," and "breaking up the medical knowledge with the tour theme was great."

### **Discussion**

This skills fair design and curriculum can be directly handed off to the next field hospital that is deployed to this area in the Middle East. The emergency department is a very fast-paced and dynamic environment, in which nurses must be prepared to react to any life-threatening medical and trauma emergency. This skills fair curriculum can help ensure that emergency nurses possess the technical knowledge and hands-on skills required for operating the available equipment in order to perform in those emergency situations when needed. Our skills fair intervention, developed for the unique military nursing austere environment, can be tailored and tested, using rigorous quality improvement or research designs, in other settings.

### **Limitations**

The education committee created the test questions for the pre- and post-test assessments and the survey questions; therefore, all questions were not validated for research or quality improvement. The differences in our pre- and post-skill fair response levels might be because of the difference in the number of participants who completed the surveys. These findings are not generalizable, and the intervention and evaluation should be modified for settings that are different from the deployed austere environment.

### **Implications for Emergency Nursing Practice**

Nursing skills fairs are often utilized in a clinical hospital setting to assess the familiarization levels of those providing direct patient care.<sup>4</sup> However, few existing studies show a measurable objective or subjective improvement in information learned, that is, familiarity or skills assessed. Our intervention description adds uniquely to the literature. Specifically, research articles regarding the need for and outcomes of competency-based learning for military nurses working in unfamiliar, complex deployed environments were nonexistent. This study provides insight for organizations, especially military medical leaders, that a skills fair is not just a “check the box” event but something that can lead to marked improvement in staff familiarization and comfort levels and potentially improve patient-care delivery.

We tailored the educational intervention to a fun and engaging theme relevant to the geographic context. The concept of the unique theme can be adapted to any hospital's geographic setting, whether it be learning about surrounding countries in an austere deployed environment or a more traditional setting. Tying each skill to learning about all of the best pizza restaurants in a suburban area surrounding a large medical center is an example.

Providing a unique theme can help motivate and engage emergency nurses in skills fair settings.

Nursing leaders and nurse educators should address staff comfort levels with unfamiliar equipment, whether the location is a deployed austere environment, an urban hospital setting, a rural hospital setting, or a mass-casualty disaster. Conducting an innovative skills fair, regardless of the medical setting, could increase staff engagement during the learning process, ultimately improving staff comfort level and positively impacting patient care.

### **Conclusion**

We relay a successful skills fair educational intervention development and implementation in an austere military field hospital setting. This adds uniquely to the body of literature, as there is a gap in published work describing skills fair interventions for this population. Future research and quality improvement are needed to develop valid and reliable measurement tools and to test the effectiveness of the intervention.

### **Acknowledgments**

The authors offer honorary recognition for Commander Abigail White, MSN, APRN, ACCNS-AG, CEN.

Activities in this report are not research, as defined by 45 CFR 46, and depict authorized operational activities, as determined by the US Department of Defense, in support of the defense mission.

### **Author Disclosures**

Conflicts of interest: none to report.

## **DETAILS**

**Subject:** Emergency medical care; Fairs & exhibitions; Cognitive style; Equipment; Nursing; Nurses; Teachers; Casualties; Patients; Trauma; Lifesaving; Medical equipment; Nursing skills; Suctioning; Education; Teams; Comfort; Emergency services; Professional practice

<b>Location:</b>	Middle East; United States--US; Germany
<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	1
<b>Pages:</b>	21-25
<b>Publication year:</b>	2020
<b>Publication date:</b>	Jan 2020
<b>Section:</b>	Clinical
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English
<b>Document type:</b>	Journal Article
<b>DOI:</b>	<a href="https://doi.org/10.1016/j.jen.2019.10.014">https://doi.org/10.1016/j.jen.2019.10.014</a>
<b>ProQuest document ID:</b>	2333905209
<b>Document URL:</b>	<a href="https://www.proquest.com/scholarly-journals/nursing-skills-fair-austere-military-environment/docview/2333905209/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/nursing-skills-fair-austere-military-environment/docview/2333905209/se-2?accountid=211160</a>
<b>Copyright:</b>	Copyright Elsevier Limited Jan 2020
<b>Last updated:</b>	2023-06-21
<b>Database:</b>	Public Health Database

# Thinking Outside the Box in Rural Trauma Transport: JEN

[ProQuest document link](#)

---

## ABSTRACT (ENGLISH)

The current literature on the care of trauma patients indicates that care is generally protocol driven and delivered in a systematic manner. This article contributes examples of the unique challenges that may be present when caring for trauma patients in the rural setting. Key implications for emergency nursing practice found in this article are the need to individualize care and be willing and able to recognize when it may be appropriate to stray from guidelines.

## FULL TEXT

### Contribution to Emergency Nursing Practice

- The current literature on the care of trauma patients indicates that care is generally protocol driven and delivered in a systematic manner.
- This article contributes examples of the unique challenges that may be present when caring for trauma patients in the rural setting.
- Key implications for emergency nursing practice found in this article are the need to individualize care and be willing and able to recognize when it may be appropriate to stray from guidelines.

More than 60% of trauma deaths occur in rural areas.<sup>1</sup> Many factors contribute to this statistic, including delays in care and limited availability of personnel, equipment, supplies, and support services (ie, pharmacy, blood bank, radiology).<sup>2</sup> In addition, trauma systems are often developed in urban settings and then extended for use in rural areas, with limited attention given to the unique challenges of rural trauma care.<sup>3</sup> Health care team members who are trained and certified in the care of trauma patients are required to demonstrate competency in the implementation of algorithm-based care.<sup>2,4-6</sup> Published guidelines in trauma care do allow for the flexibility to stray from traditional algorithms when special circumstances are present; however, doing so takes a high level of expertise and assertion, which may not always be present in the rural setting.<sup>4</sup> The purpose of this case review is to provide a specific example where providers made choices that were not directly apparent in traditional algorithms.

### Case Report

A 19-year-old female was driving 55 mph (88 km/h) via a rural highway when she was struck head-on by another vehicle. A ground ambulance crew staffed with 2 emergency medical service providers was the first to respond and immediately dispatched rotor air ambulance services to the scene. The flight crew arrived on scene within 10 minutes to find the victim extricated from the vehicle and placed in the back of the ambulance.

Upon initial assessment by the flight crew, the patient was found to be unresponsive to verbal and noxious stimuli, have multiple open wounds with compound fractures to both upper and 1 lower extremity, tachypnea, and substantial work of breathing. Clear signs of hypovolemic shock were present, including tachycardia and hypotension. Although the rotor crew was on scene, the patient was transported via ground ambulance to the nearest emergency department (without trauma designation) to receive replacement of blood products and stabilization before being transported to a trauma facility farther away. Care provided en route to the local



emergency room involved the following: giving tranexamic acid, placing a pelvic binder, and controlling external bleeding.

Upon arrival in the emergency department, the team immediately recognized the victim as a colleague's daughter. This affected many members on the resuscitation team, because it brought in an emotional/human element that was difficult to ignore. The trauma team worked hard to maintain professionalism and ensure that the personal relationship would not interfere with providing the typical standard of care. Care in the local emergency department was provided over a span of approximately 20 minutes and included 2 units of packed red blood cells, infusion of warmed crystalloids, intubation, and a chest x-ray to confirm endotracheal tube placement and rule out pneumothorax. Although a computed tomography (CT) scan prior to transport was briefly considered, the team decided that this would delay transport and access to definitive care.

The flight crew that arrived on the scene of the accident collaborated with the ground ambulance crew and the local emergency department to provide care to the patient. After stabilization, the flight crew then transported the patient via rotor air ambulance to a level II trauma center approximately 45 minutes away. While en route, an additional 2 units of packed red blood cells were infused. Platelets and fresh frozen plasma were not given, because they were not readily available and would have delayed transport.

After arrival at the trauma center, diagnostic testing was completed, and the extent of her injuries was confirmed. The injuries included open external bleeding to upper and lower extremities, subdural hemorrhage and grade 2 shearing hemorrhage, cervical subluxation at C<sub>1</sub>, lacerated spleen, pulmonary contusion, bilateral humerus fractures, pelvis fracture in multiple places, and left femoral neck and mid-shaft femur fractures. Some of the major treatments received in the hospital included multiple orthopedic surgeries, intracranial pressure monitoring, intravenous filter placement, and extensive physical therapy.

### **Rationale for Treatment in This Case**

The flight and ground ambulance crews were faced with the decision of where to bring the patient for immediate treatment. Weather was an issue for a flight to the nearest trauma center, which normally would have taken 25 minutes by air. Two options existed to transport the patient to a designated trauma center: a 70-minute drive or a 45-minute flight. Although both options were level II trauma centers, the option accessible by flight was known to have more availability and consistent staffing within specialty services (ie, interventional radiology), and the team suspected that these services would benefit the patient. However, a high index of suspicion for internal injury was present along with open external bleeding, hypotension, and tachycardia. In this situation, volume should be replaced with the type of fluid that has been lost.<sup>5</sup> The flight crew did not have access to blood products and did not believe that the patient would survive the 45-minute flight until after resuscitation with blood products had occurred. Published guidelines indicate that if flight to a trauma center is available, a small local hospital should be bypassed.<sup>4</sup>

<sup>5</sup> However, it is also noted that times exist when unique circumstances require clinicians to stray from guidelines.<sup>1,2,4-6</sup> A decision was made by the flight team to travel 8 minutes via ground ambulance to the local hospital to gain access to blood products. Although not essential, this also allowed for a controlled environment for intubation. Permissive hypotension is recommended for trauma patients with severe bleeding;<sup>5</sup> however, with the presence of a head injury, additional items need to be considered. The team was not inclined to allow for traditional permissive hypotension (mean arterial pressure of 40-50 mmHg) and instead aimed for slightly higher blood pressures (systolic blood pressure of 100 mmHg) because of the apparent head injury.<sup>5</sup>

CT scan before transport was considered; however, it was decided to forego the scan because no intervention could be performed at this location. The local emergency department did not have a trauma designation and did not have a surgeon on call to perform damage control surgery. Performing a CT scan could have delayed transport to a

trauma center by up to 1 hour. In addition, CT scans done before transport are often repeated and result in increased radiation exposure and increased cost of care.<sup>6</sup>

Health care in rural settings often has an added human element when the health care team is faced with providing care to someone they are connected with on a personal level. Limited literature exists on this topic, but it is evident that this adds a layer of difficulty to providing care. Rural health care providers should be aware of the potential of this type of occurrence and consider ahead of time what will be necessary to handle such circumstances. Caring for a colleague's daughter would likely qualify this as a critical incident, and the trauma team will have a high probability of needing to debrief and possibly seek follow-up care.<sup>5</sup>

### Conclusion

The main strength of this case was the teamwork that occurred among the ground transport, flight transport, and local emergency nurses and providers. The care provided and decisions for transport were dictated by weather, the distance from a trauma designated hospital, and the lack of blood products available in-flight.

The decisions made and care provided by the team seem to have resulted in positive outcomes for the patient. She was in the hospital for 57 days, 20 of which were in intensive care, and the remaining in inpatient rehab. She continues to undergo physical, hand, and speech therapy and is currently enrolled in college and is driving again. When developing and utilizing guidelines for the care of trauma patients, consideration needs to be given as to the needs of these patients in a rural setting. Providers in rural areas should know and understand how to use the guidelines; in addition, they should also feel empowered to use clinical judgment and reasonably stray from guidelines when unique situations are presented.

### Author Disclosures

Conflicts of interest: none to report.

## DETAILS

<b>Subject:</b>	Intubation; Emergency medical care; Bone surgery; Blood products; Patients; Head injuries; Trauma centers; Hospitals; Ambulance services; Medical imaging; Cardiac arrhythmia; Trauma; Fractures; Trauma care; Rural communities; Rural areas; Algorithms; Transportation; Emergency services; Professional practice
<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	1
<b>Pages:</b>	99-101
<b>Publication year:</b>	2020
<b>Publication date:</b>	Jan 2020
<b>Section:</b>	Case Review
<b>Publisher:</b>	Elsevier Limited

Place of publication:	Philadelphia
Country of publication:	United Kingdom, Philadelphia
Publication subject:	Medical Sciences--Nurses And Nursing
ISSN:	00991767
e-ISSN:	15272966
Source type:	Scholarly Journal
Language of publication:	English
Document type:	Journal Article
DOI:	<a href="https://doi.org/10.1016/j.jen.2019.10.012">https://doi.org/10.1016/j.jen.2019.10.012</a>
ProQuest document ID:	2333904880
Document URL:	<a href="https://www.proquest.com/scholarly-journals/thinking-outside-box-rural-trauma-transport/docview/2333904880/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/thinking-outside-box-rural-trauma-transport/docview/2333904880/se-2?accountid=211160</a>
Copyright:	©2019. Emergency Nurses Association
Last updated:	2023-06-21
Database:	Public Health Database

Document 44 of 55

# Evaluating the Use of a Modified Early Warning Score in Predicting Serious Adverse Events in Iranian Hospitalized Patients: A Prognostic Study: JEN

[ProQuest document link](#)

## ABSTRACT (ENGLISH)

### Introduction

Assessment of early clinical warning signs and appropriate response can prevent serious adverse events in hospitalized patients. The Modified Early Warning Score (MEWS) is an applicable early warning sign system that can be used to predict serious adverse events. This study aimed to evaluate the predictive capacity of the MEWS to identify patients in an Iranian hospital who are at risk of developing serious adverse events.

### Methods

In this prognostic study, 381 adult patients from the emergency department who were admitted to an inpatient hospital unit of an Iranian hospital from May 2018 to October 2018 were included. The MEWS tool was completed for each patient at the time of admission and then daily for a period of up to 30 continuous days after admission or until the development of a serious adverse event. Receiver operating characteristic, specificity, sensitivity, positive predictive values, and negative predictive values were calculated.

### Results

In this study, a MEWS of  $\geq 3$  on admission was associated with an increased likelihood of developing serious adverse events within 30 days of admission with the area under the curve of 0.82 (95% confidence interval [CI]: 0.77–0.85), sensitivity of 82.81% (95% CI: 71.3–91.1), specificity of 75.39% (95% CI: 70.3–80), positive predictive value of 40.5% (95% CI: 35.2–45.9), and negative predictive value of 95.6% (95% CI: 92.7–97.4).

### Discussion

A MEWS  $\geq 3$  on admission can predict the occurrence of serious adverse events in patients admitted to an Iranian hospital for 30 continuous days.

## FULL TEXT

### Contribution to Emergency Nursing Practice

- The current literature on the Modified Early Warning Score (MEWS) indicates that MEWS can identify patients at risk for clinical demise; however, evidence on the accuracy of MEWS to predict the risk of SAE in ED patients is limited.
- This article contributes the finding that with an appropriate cutoff point, the MEWS can accurately predict the risk of serious adverse events.
- Key implications for emergency nursing practice found in this article are that the calculation of a MEWS can help identify ED patients who are at risk of developing serious adverse events and who will benefit from admission to a higher level of care. Data derived from the calculation of MEWS can support the decision-making process for resource allocation including nurse-to-patient staff ratios.

### Introduction

A serious adverse event (SAE) is defined as an undesirable event that threatens life and leads to death, prolonged hospitalization, permanent or severe disability, or cardiac arrest or requires the need for a quick and unanticipated transfer to an advanced level of care.<sup>1</sup> A patient's probability of developing an SAE can be reduced by recognizing the early signs of clinical deterioration and providing appropriate interventions.<sup>2</sup> A large proportion of deaths occurring in hospitals are predictable if the early signs of deterioration are detected.<sup>3,4</sup> Subtle changes in a patient's vital signs such as heart rate, respiratory rate, or level of consciousness are often recognized as predictors of SAEs such as cardiac arrest, death, and unplanned admission to a critical care unit.<sup>4</sup> The rapid response system and rapid response teams were developed for the timely recognition and treatment of patients who are experiencing a clinical demise. Activation of these systems is frequently based on the changes in a patient's physiologic status as measured by their vital signs. The MEWS identifies these early, subtle, physiologic changes in a patient's status.<sup>5,6</sup> Morgan and Williams<sup>7</sup> developed the concept of the Early Warning Score (EWS) in 1997, and a wide range of early warning systems has been developed to meet the needs of different populations, such as the Pediatric Early Warning Score to detect clinical deterioration in children aged below 16 years, and the Modified Early Obstetric Warning Score for pregnant women.<sup>8,9</sup> The National Early Warning Score, designed by the Royal University Specialists in 2012, is recognized as the standard EWS in the United Kingdom.<sup>10</sup> The operational parameters, scoring, and interpretation of these early warning system tools may vary, but the ability of these systems and that of

rapid response teams to positively influence the nurses' competence to identify and manage deteriorating patients<sup>11</sup> and improve patient outcomes are robustly supported in the literature.<sup>12</sup>

Stenhouse et al<sup>13</sup> modified the Morgan's Early Warning Score in 2000. The Modified Early Warning Score (MEWS) system consists of physiological parameters (systolic blood pressure, temperature, heart rate, respiratory rate, and level of consciousness) (Table 1).<sup>14</sup> The scores obtained from this tool are used as a guide to detect changes in patients' physiologic status, direct interventions, and improve patient outcomes (Table 2).<sup>5,14-20</sup>

The compatibility of the MEWS tool with the traditional nursing assessment makes the MEWS tool applicable in the clinical setting, but a research gap exists in how the tool is specifically applied in the Iranian health system. The present study aimed to determine the capacity of the MEWS system to predict the risk for SAEs in patients admitted to an Iranian hospital.

## Methods

This prognostic tool validation study was carried out in the second largest hospital in eastern Iran, over a 6-month period from May 2018 to October 2018. The study was approved by the Regional Ethics Committee, and permission was obtained from Sabzevar University of Medical Sciences with ethical code IR.MEDSAB.REC.1396.132. A written informed consent was obtained from all patients.

## Sample

A convenience sample of hospitalized patients aged 18 years or older who presented to the emergency department in 1 of 3 randomly selected shifts (one morning, one evening, and one night) each week and were eventually admitted to the hospital were initially included in the study. Patients with an advanced airway (ie, tracheostomy or endotracheal tube) at the time of admission, those requiring cardiopulmonary resuscitation (CPR), those requiring endotracheal intubation, and those who died during the process of admission were excluded. Patients who were pregnant, those who were discharged from the hospital within 24 hours of admission, and those who were previously included in the study, discharged, and subsequently readmitted to the hospital were also excluded from the study. According to van Galen's study<sup>5</sup> (sensitivity = 0.61;  $\alpha$  = 0.95;  $d$  = 0.1;  $P$  = 0.19), the required sample size was 337 patients, and the sample size was calculated using the following formula:  $n_{sen} = z_{1-\alpha}^2 \times sen \times (1-sen) / d^2 \times p = (1.64)^2 \times 0.61 \times 0.39 / (0.1)^2 \times 0.19 \approx 337$

## Measures

The patient's blood pressure was measured using a Richter Riester Diplomat-Presameter sphygmomanometer (Jungingen, Germany), while temperature was measured with a Tympanic ri-thermo N Richter Thermometer (Jungingen, Germany). Reliabilities of the sphygmomanometer and thermometer were assessed separately and confirmed by examining the intraclass correlation coefficient (0.99 and 0.98, respectively). Respiratory rates and heart rates were each measured for a period of 1 minute. Level of consciousness was measured using the Alert-Verbal-Painful-Unresponsive scale.<sup>19</sup>

## Study Procedures

The MEWS tool was initially completed for each patient included in the study at the time of admission and then each morning for up to 30 continuous days after admission or until one of the following end points was reached: the patient was discharged from the hospital, developed SAEs, required CPR, died, or experienced a change in status necessitating a transfer to an advanced-level care facility.

All data, including measurement of the daily MEWS and calculation of the values, were collected by 2 baccalaureate-prepared registered nurses, each with 2 years of clinical experience in the emergency department and critical care unit. The inter-rater reliability was measured by Cohen kappa coefficient, and equivalence reliability was measured at 0.87.

## Analysis

SPSS v.22 and MedCalc v.18.9.1 software were used for data analysis. The following formulas were used to measure sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) of the MEWS tool.

Sensitivity =  $\frac{\text{True positive}}{\text{True positive} + \text{false negative}}$  Specificity =  $\frac{\text{True negative}}{\text{False positive} + \text{true negative}}$

PPV =  $\frac{\text{Sensitivity} \times \text{prevalence}}{\text{Sensitivity} \times \text{prevalence} + (1 - \text{specificity}) \times (1 - \text{prevalence})}$  NPV =  $\frac{\text{specificity} \times (1 - \text{prevalence})}{(1 - \text{sensitivity}) \times \text{prevalence} + \text{specificity} \times (1 - \text{prevalence})}$

An area under the curve (AUC) of 90–100 implies an excellent discriminatory power, an AUC of 80–90 indicates a good discriminatory power, an AUC of 70–80 shows a moderate discriminatory power, an AUC of 60–70 denotes a weak discriminatory power, and an AUC of 50–60 is valueless.<sup>21,22</sup> The predictive capacity of the instrument was analyzed for all days, but the times with the highest predictive capacity (time of admission, 1 day after hospitalization, 1 day before the occurrence of SAEs, and 2 days before the occurrence of SAEs) are reported below.

## Results

Four hundred twenty-four participants were initially recruited for the study. Thirty-six individuals were discharged against medical advice, while 7 were transferred to another hospital. Finally, a total of 381 individuals were included in the study.

In this study, there were no missing data. Men comprised 50.9% of the study participants, and the remainder were women. The most frequent reasons for hospital admission were related to cerebrovascular, respiratory, cardiac, and gastrointestinal complaints (Table 3). A total of 65 SAEs occurred in 64 patients, which resulted in the transfer of 14 patients to a critical care unit, performance of CPR in 28 patients, and death of 23 patients (Figure 1).

All patients in the study were either discharged from the hospital or developed adverse events while hospitalized within the 1-month time period. Sensitivity, specificity, PPV, and NPV values reported here were calculated at 4 different time points: at the time of admission, hospital day 1, and 1 day and 2 days before the occurrence of SAEs. The presence or absence of SAEs was determined based on the occurrence of specific events such as death, cardiopulmonary arrest, or transfer to a critical care unit.

### Cutoff Point of Mews

A MEWS  $\geq 3$  demonstrated the highest sensitivity and NPV, and the highest specificity and PPV were observed at a MEWS  $\geq 4$ , (Tables 4 and 5). The highest AUC, which indicates the highest sensitivity and specificity at the same time, was associated with a MEWS  $\geq 3$ . Therefore, a MEWS of 3 is considered as the cutoff point. At this point, the sensitivity, specificity, PPV and NPV for prediction of adverse events (in general) for MEWS are 0.98, 0.94, 0.77 and 0.99, respectively (Table 4).

### Predictive Capacity of Saes by Mews

Results suggest that the MEWS, with an AUC of 0.82–0.97, a sensitivity of 82.8–98.4, a specificity of 75.3–94, PPV of 40.5–76.8, and NPV of 95.6–99.7, can predict with high probability the occurrence of SAEs. Results suggest that the MEWS measured the day prior to the occurrence of SAE demonstrates the highest predictive accuracy (Table 5, Figure 2)

### Predictive Capacity of Death Event by Mews

Results suggest that the MEWS, with an AUC of 0.73–0.95, a sensitivity of 78.2–100, a specificity of 68.4–84.9, a PPV of 13.7–28.6, and a NPV of 98–100, can predict the risk of death. The greatest predictive capacity of the tool is 1 day prior to the patient's death (Table 5, Figure 3).

### Predictive Capacity of Cpr Event by Mews

Results suggest that MEWS, with an AUC of 0.77–0.94, a sensitivity of 82.1–100, a specificity of 69.4–84.8, a PPV of 17.6–34.1, and a NPV of 98–100, can predict the need for CPR. The highest predictive accuracy of the tool is the day before the occurrence of pulmonary cardiopulmonary arrest (Table 5, Figure 4).

### **Predictive Capacity of Hospitalization in Critical Care Unit Event by Mews**

Results showed that the MEWS, with an AUC of 0.77–0.94, a sensitivity of 85.7–92.8, a specificity of 67.5–81.6, a PPV of 9.2–15.9, and an NPV of 99.2–99.7, can predict the need for transfer to an advanced-level care facility. The highest predictive accuracy of the tool demonstrated on the day before a change in the patient's status necessitated a transfer (Table 5, Figure 5).

### **Discussion**

To the best of our knowledge, this is the first study to examine the predictive capacity of MEWS obtained in the emergency department in Iran. Results indicate that in terms of predicting SAEs (in general), MEWS has an AUC of 0.82–0.97, a sensitivity of 82.8%–98.4%, a specificity of 75.3%–94%, a PPV of 40.5%–76.8%, and an NPV of 95.6%–99.7%. These values support the robust discriminatory capacity of the MEWS tool. High values under the receiver operating characteristic curve suggest that along with demonstrating an appropriate sensitivity, the tool shows a favorable specificity.<sup>21,22</sup>

The findings of the study can be used by nurse leaders to more accurately predict and budget for staffing so that health care resources are allocated wisely, patients are provided an appropriate level of care, and negative health outcomes are avoided. The results of this study also demonstrate that MEWS of ED patients at the time of admission and upon arrival in the inpatient units have an AUC of 0.73%–0.82%, a sensitivity of 78.26%–85.71%, a specificity of 67.57%–75.39%, a PPV of 9.21%–40.51%, and a NPV of 95.62%–99.21% to predict the probability of SAEs (in general) as well as death, the need for CPR, and the need for transfer to a critical care unit. These AUC values indicate a good to moderate discriminatory power of the MEWS.<sup>21,22</sup> This level of discriminatory capability is clinically significant and valuable for the early prevention of clinical deterioration and negative patient outcomes. The prognostic accuracy of MEWS provides a powerful tool for communication among clinicians which, in addition to the individual vital sign predictors, will support the patient's need for admission to an advanced-level care facility.

The findings of the study are consistent with those of van Galen et al<sup>5</sup> and Smith et al's study.<sup>3</sup> According to van Galen et al,<sup>5</sup> the sensitivity, specificity, and NPV of MEWS to predict SAEs were 61%, 83%, and 98.1%, respectively. Smith et al<sup>3</sup> reported that the sensitivity, specificity, and NPV of the tool for predicting SAEs were 74%, 82%, and 97%, respectively.

The findings of our study suggest that the best cutoff point of the MEWS is  $\geq 3$ . Although the highest specificity and PPV were measured using a MEWS cutoff point of  $\geq 4$ , the authors recommend using a MEWS cutoff point of  $\geq 3$  to better reduce the probability of developing SAEs, which could increase the patient's morbidity or mortality risk.

The probability of developing SAEs in a patient with a score of  $\geq 3$  is 77%, and the probability of nonoccurrence of SAEs in a patient with a score of Table 2).<sup>5,14-20</sup> The reason for these variations in the suggested cutoff point of the MEWS can be attributed to the differences in the quality of care, treatment modalities, equipment, and facilities, as well as the differential diagnosis of the patient population. These variables will not only affect the likelihood of occurrence or nonoccurrence of SAEs but also skew the predictive value of the tool. At a MEWS of  $\geq 3$ , patients with subtle signs of clinical demise, potentially leading to an adverse event, can be identified through nursing assessment and the application of targeted interventions can be guided.

### **Limitations**

The main limitations of this study were as follows: the small sample size, use of convenience sampling, unblinding, and use of a single-center study. In this study, the MEWS tool was initially completed for the ED patients at the time

of admission to an inpatient hospital unit and then daily until one of the SAEs occurred, the patient was discharged, or patient reached a maximum length of stay of 30 continuous days. The researchers wanted to explore at which time point the MEWS tool demonstrates the best predictive capacity to identify the probability of SAE occurrence in a hospitalized patient. This daily MEWS assessment, prospective design, and heterogeneous population were the strengths of this study.

**Implications for Emergency Nurses**

Emergency nurses play a key role in identifying and managing patients with the potential for clinical demise. Early and accurate identification of these patients using the MEWS tool and performing appropriate interventions, including transfer to an advanced-level care facility, can reduce patient morbidity and mortality and promote more positive health outcomes. Nurse leaders can utilize data derived from the MEWS tool to effectively allocate health care resources including the determination of staffing needs.

The 2015 American Heart Association Guidelines for CPR recommend the use of early warning sign systems such as the MEWS for predicting cardiac arrest; however, the contradictory findings about the usefulness of these systems have also been highlighted.<sup>23</sup> Future studies should explore ways to foster better use of MEWS as a clinician-to-clinician or clinician-to-hospital management communication tool. Future studies should also explore improved methods for obtaining accurate and reliable scores. Given the importance and necessity of early recognition of a patient’s clinical deterioration and the consequences of delayed intervention, similar studies should be undertaken in emergency departments using a prospective method. Individual facilities may need to identify the best cutoff point for their unique setting.<sup>24</sup> To assess the effectiveness of this tool in predicting SAEs, additional studies in international emergency care settings should be conducted.<sup>25</sup>

**Conclusions**

The MEWS tool can accurately predict the occurrence of SAEs in general and specific adverse events. Predictive models such as MEWS can help identify the patients who are at risk of developing adverse events, and MEWS can be used as an early warning sign of an impending need for rapid response. When this identification triggers the application of targeted interventions, it can prevent or delay SAEs, promote positive patient outcomes, and improve patient safety. This study added uniquely to the research literature by testing the predictive capacity of the MEWS in Iran.

**Acknowledgments**

The authors thank the Mashhad University of Medical Sciences, participants of this study, and all colleagues from the Ghaem Hospital in Mashhad. The research was conducted as part of a Master’s dissertation of Medical-Surgical Nursing at Sabzevar University of Medical Sciences (registration no. 96184). The authors received no financial support for the research, authorship, and/or publication of this article.

**Author Disclosures**

Conflicts of interest: none to report.

	3 points	2 points	1 point	0 points	1 point	2 points	3 points
SBP (mm Hg)	≤70	71–80	81–100	101–199			



Respiratory rate (breaths/min)		<9		9–14	15–20	21–29	≥30
Heart rate (beats/min)		≤40	41–50	51–100	101–110	111–129	≥130
Temperature (°C)		≤35	35.1–36	36.1–38	38.1–38.5	>38.5	
Level of consciousness				Alert	Reacting to voice	Reacting to pain	Unresponsive

Author/year	Adverse outcome	Sensitivity %	Specificity %	PPV %	NPV %	AUC	Odds ratio	Cutoff point
Kruisselbrink et al, 2016 <sup>14</sup>	7-day mortality	0.48	0.90	0.23	NR	0.69 (0.59, 0.79)	8.69	METS ≥ 5
Churpek et al, 2014 <sup>15</sup>	Cardiac arrest, ICU transfer, death, and combined outcome	≥2= 67 ≥3= 39 ≥4= 20 ≥5= 8	≥2= 71 ≥3= 90 ≥4= 96 ≥5= 99	NR	NR	0.71 for cardiac arrest; 0.68 for ICU transfer; 0.88 for death; 0.70 for the combined outcome	NR	METS ≥ 2 to ≥ 5

Reini et al, 2012 <sup>16</sup>	Mortality in ICU, 30-day mortality, ICU length of stay and readmission to the ICU	62% for ICU death	85 for ICU death	NR	NR	0.80 for ICU death	5.48 for ICU death; 4.31 for 30-day mortality; 2.30 ICU length of Stay; 0.98 for ICU readmission	MEWS ≥ 6
Gardner-Thorpe et al, 2006 <sup>17</sup>	Transfer to critical care unit	75	83%	22	99	NR	NR	MEWS ≥ 4

De Meester et al, 2013 <sup>18</sup>	SAEs after ICU discharge	The shift of an SAE	38.5	96.2	NR	NR	0.80	8.25	MES ≥ 4
1 shift before an SAE	46.2	92.3	NR	NR	0.75	12.83	2 shifts before an SAE	38.5	92.3
NR	NR	0.77	7.69	3 shifts before an SAE	38.5	92.3	NR	NR	0.69

8.27	van Galen et al, 2016 <sup>5</sup>	Death, cardiac arrests, ICU-admissions, readmissions, and composite SAE	61 for SAE	83 for SAE	12.5 for SAE	98.1 for SAE	NR	7 · 5 f o r I C U - a d m i s s i o n s , 5 · 8 f o r d e a t h , 7 · 7 f o r c a r d i a c a r r e
------	------------------------------------	---	------------	------------	--------------	--------------	----	--



Cardiac	57	15
Gastrointestinal	44	11.5
Other	61	16
Total	381	100
	Mean	SD
Age (year)	62.61	17.43
Admission to discharge (day)	6.27	4.75
Admission to CPR (day)	5.25	3.38
Admission to death (day)	6.13	3.58
Admission to transfer to SCUs (day)	3.71	1.93

Cutoff point (standard score)	Sensitivity	Specificity	Positive predictive value	Negative predictive value
2 ≥	0.98	0.67	0.37	0.66
3 ≥	0.98	0.94	0.77	0.99
4 ≥	0.75	0.98	0.97	0.93

	Sensitivity (95% CI)	Specificity (95% CI)	PPV	NPV	AUC (95% CI)	Cutoff points
SAEs in general						
Time of admission	82.81 (71–91)	75.39 (70–80)	40.5	95.6	0.82 (0.77–0.85)	MEWS ≥3
Time of admission	42.19 (29.9–55.2)	87.38 (83.2–90.8)	40.3	88.2		MEWS ≥4

1 day after hospitalization	90.62 (81–96)	86.44 (82–90)	57.4	97.9	0.91 (0.87–0.93)	MEWS ≥3
1 day after hospitalization	51.56 (38.7–64.2)	95.27 (92.3–97.3)	68.7	90.7		MEWS ≥4
1 day before occurrence of SAEs	98.44 (91–100)	94.01 (91–96)	76.8	99.7	0.97 (0.95–0.99)	MEWS ≥3
1 day before occurrence of SAEs	75.00 (62.6–85.0)	98.74 (96.8–99.7)	92.3	95.1		MEWS ≥4
2 days before occurrence SAEs	93.88 (83–99)	92.08 (88–95)	65.7	98.9	0.96 (0.93–0.97)	MEWS ≥3
2 days before occurrence SAEs	51.02 (36.3–65.6)	98.02 (95.7–99.3)	80.6	92.5		MEWS ≥4
Death						
Time of admission	78.26 (56–92)	68.44 (63–73)	13.7	98	0.73 (0.69–0.78)	MEWS ≥3
Time of admission	30.43 (13.2–52.9)	83.24 (79.0–87.0)	10.4	94.9		MEWS ≥4
1 day after hospitalization	82.61 (61–95)	77.09 (72–81)	18.8	98.6	0.80 (0.75–0.83)	MEWS ≥3
1 day after hospitalization	26.09 (10.2–48.4)	88.27 (84.5–91.4)	12.5	94.9		MEWS ≥4
1 day before occurrence of death	100 (85–100)	83.52 (79–87)	28.0	100	0.95 (0.92–0.97)	MEWS ≥3
1 day before occurrence of death	78.26 (56.3–92.5)	90.50 (87.0–93.3)	34.6	98.5		MEWS ≥4
2 days before occurrence of death	100 (83–100)	84.94 (80–88)	28.6	100	0.93 (0.89–0.95)	MEWS ≥3
2 days before occurrence of death	50.00 (27.2–72.8)	93.67 (90.5–96.0)	32.3	96.9		MEWS ≥4
CPR						

Time of admission	82.14 (63–94)	69.41 (64–74)	17.6	98.0	0.77 (0.72–0.81)	MEWS $\geq$ 3
Time of admission	39.29 (21.5–59.4)	84.14 (79.9–87.8)	16.4	94.6		MEWS $\geq$ 4
1 day after hospitalization	85.71 (67–96)	78.19 (73–82)	23.8	98.6	0.83 (0.79–0.86)	MEWS $\geq$ 3
1 day after hospitalization	39.29 (21.5–59.4)	89.52 (85.8–92.5)	22.9	94.9		MEWS $\geq$ 4
1 day before occurrence of CPR	100 (88–100)	84.70 (80–88)	34.1	100	0.94 (0.92–0.96)	MEWS $\geq$ 3
1 day before occurrence of CPR	82.14 (63.1–93.9)	91.78 (88.4–94.4)	44.2	98.5		MEWS $\geq$ 4
2 days before occurrence of CPR	90.91 (71–99)	84.85 (80–88)	28.6	99.3	0.91 (0.87–0.93)	MEWS $\geq$ 3
2 days before occurrence of CPR	45.45 (24.4–67.8)	93.64 (90.4–96.0)	32.3	96.3		MEWS $\geq$ 4
Admission to the critical care units (CCU or ICU)						
Time of admission	85.71 (57–98)	67.57 (62–72)	9.2	99.2	0.77 (0.72–0.81)	MEWS $\geq$ 3
Time of admission	50.00 (23.0–77.0)	83.65 (79.5–87.3)	10.4	97.8		MEWS $\geq$ 4
1 day after hospitalization	92.86 (66–99)	76.02 (71–80)	12.9	99.6	0.85 (0.81–0.89)	MEWS $\geq$ 3
1 day after hospitalization	71.43 (41.9–91.6)	89.65 (86.1–92.6)	20.8	98.8		MEWS $\geq$ 4
1 day before occurrence of admission to the SCUs	92.86 (66–99)	81.20 (77–85)	15.9	99.7	0.94 (0.91–0.96)	MEWS $\geq$ 3
1 day before occurrence of admission to the SCUs	64.29 (35.1–87.2)	88.28 (84.5–91.4)	17.3	98.5		MEWS $\geq$ 4



2 days before occurrence of admission to the SCUs	87.50 (47–100)	81.69 (77–85)	10.0	99.6	0.90 (0.86–0.93)	MEWS $\geq$ 3
2 days before occurrence of admission to the SCUs	50.00 (15.7–84.3)	92.15 (88.8–94.8)	12.9	98.8		MEWS $\geq$ 4

## DETAILS

**Subject:** Emergency medical care; Patients; Medical prognosis; Blood pressure; Vital signs; Adverse; Ostomy; Critical incidents; Patient admissions; Consciousness; Nursing; Hospitalization; Critical care; Inpatient care; Clinical outcomes; Clinical assessment; Heart rate; Emergency services

**Location:** Germany

**Identifier / keyword:** Modified Early Warning Score; Serious adverse events; Sensitivity and specificity; Predictive value of tests

**Publication title:** Journal of Emergency Nursing;; JEN; Philadelphia

**Volume:** 46

**Issue:** 1

**Pages:** 72-82

**Publication year:** 2020

**Publication date:** Jan 2020

**Section:** Research

**Publisher:** Elsevier Limited

**Place of publication:** Philadelphia

**Country of publication:** United Kingdom, Philadelphia

**Publication subject:** Medical Sciences--Nurses And Nursing

**ISSN:** 00991767

**e-ISSN:** 15272966

**Source type:** Scholarly Journal

**Language of publication:** English

**Document type:** Journal Article

DOI: <https://doi.org/10.1016/j.jen.2019.10.015>

ProQuest document ID: 2333904858

Document URL: <https://www.proquest.com/scholarly-journals/evaluating-use-modified-early-warning-score/docview/2333904858/se-2?accountid=211160>

Copyright: ©2019 . Emergency Nurses Association

Last updated: 2023-02-24

Database: Public Health Database

---

Document 45 of 55

# Logic Models for Program Evaluation in Emergency Nursing: JEN

[ProQuest document link](#)

---

## ABSTRACT (ENGLISH)

In our work in emergency nursing, we often develop new and innovative programs. Examples of emergency nurse-led programs include the following: (1) bundled improvement interventions to implement new practice guidelines with multiple strategies and activities, (2) educational programs, and (3) injury prevention outreach programs. Careful program planning will include clear documentation of both the overall purpose and components of the program, as well as link specific program activities to the intended results. Programs need to be evaluated to make decisions about whether to adopt, modify, or abandon them. If successful, these programs need to be shared and replicated, and perhaps become models of best practice. Program planning and evaluation, similar to research, need a framework that others can follow to understand and replicate the project. One such framework is a logic model.

## FULL TEXT

### Logic Models

Helpful Online Tools and Resources for Developing Your Logic Model

1. Centers for Disease Control and Prevention's Program Performance and Evaluation Office (PPEO) Logic Models: <https://www.cdc.gov/eval/logicmodels/>
2. W.K. Kellogg Foundation Logic Model Development Guide: <https://www.wkkf.org/resource-directory/resource/2006/02/wk-kellogg-foundation-logic-model-development-guide> (provide name and email to download)
3. University of Kansas Community Toolbox, Developing a Logic Model or Theory of Change: <https://ctb.ku.edu/en/table-of-contents/overview/models-for-community-health-and-development/logic-model-development/main>

#### 4. University of Wisconsin-Madison Program Development and Evaluation, Designing Programs:

<https://fyi.extension.wisc.edu/programdevelopment/designing-programs/>

In our work in emergency nursing, we often develop new and innovative programs. Examples of emergency nurse-led programs include the following: (1) bundled improvement interventions to implement new practice guidelines with multiple strategies and activities, (2) educational programs, and (3) injury prevention outreach programs. Careful program planning will include clear documentation of both the overall purpose and components of the program, as well as link specific program activities to the intended results. Programs need to be evaluated to make decisions about whether to adopt, modify, or abandon them. If successful, these programs need to be shared and replicated, and perhaps become models of best practice. Program planning and evaluation, similar to research, need a framework that others can follow to understand and replicate the project. One such framework is a logic model. A logic model, sometimes called a program model or theory of change, is a planning tool and visual representation of the resources available for a project, the activities that will be carried out to complete a project, and the expected outcomes or results of a project. Think of a logic model as a diagram that shows the flow of the project along with the results to be measured and the expected program impact. Logic models are also excellent strategic planning and communication tools when developing a budget, generating buy-in, or applying for funding.<sup>1</sup>

#### **Creating a Logic Model**

Creating a logic model is easy, and there are many templates available. An excellent resource can be found at: [https://www.cdc.gov/eval/tools/logic\\_models/index.html](https://www.cdc.gov/eval/tools/logic_models/index.html). More resources, with blank templates and tutorials, are listed in the <sup>Box</sup>. A simple logic model can be created using the table feature of your word processor. Basic logic models can be broken down into depicting your planned work and your intended results. Your planned work will be listed in the first 2 columns as (1) inputs and (2) activities. Your intended results will be listed in the last 3 columns as (3) outputs/measures, (4) outcomes, and (5) impact. Overall, the first row of your table should contain columns that may be titled as follows: inputs, activities, outputs/measures, outcomes, and impact. These titles and the number of columns may vary depending on your program. Each column should link to the next in a logical if-then relationship.

<sup>Table 1</sup> includes definitions and examples for each column to demonstrate how a logic model might be set up. <sup>Table 2</sup>

illustrates how a logic model could be applied to a program described in this issue of the *Journal of Emergency Nursing (JEN)*, entitled, "Advanced Placement Paramedic Education for Health Care Professionals: A Descriptive Evaluation."<sup>2</sup>

#### **Program Evaluation**

Logic models are often used in program evaluation, which systematically examines a total program.<sup>3</sup> When a program evaluation is conducted, 2 broad areas are evaluated; process and impact. Process evaluation looks at how the program is implemented and how it actually functions. In process analysis, questions might be asked about how people felt about the program or what they thought were barriers to the successful implementation of the program. In essence, a process evaluation reviews whether the program is being implemented as planned. Alternatively, impact analysis (or outcome evaluation) examines the impact or effects of the intervention. Because the program and program activities are interventions, generalizable intervention research designs may also be used to evaluate the impact of a program.

#### **Outcome Evaluation Designs**

The outcome research or evaluation design will depend on several factors.<sup>4</sup> If the evaluation research team can randomize sites or participants into the program, randomized trials or stepped wedge design may be ideal. If there are multiple data points gathered on the outcomes over time from both before and after implementation, interrupted

time series or regression discontinuity designs may be applied. If contemporaneous controls or comparisons are available, a controlled before-and-after design can be considered. Lastly, and less rigorous, if there are no contemporaneous controls or comparisons, a before-and-after study that either compares the program participants with their own baseline or with other historic controls may be used. If the team conducting the evaluation had no control over implementing the program, observational designs and secondary data analysis may be considered. Single group quasi-experimental studies, observational designs and secondary data analyses limit the ability to draw causal conclusions that the program activities were directly responsible for the outcomes.

**Conclusion**

Emergency nurses have vital perspective, knowledge, and skills for developing innovative programs that improve care. Logic models provide tools for emergency nurses to plan, design, and evaluate programs. *JEN* welcomes and encourages manuscript submissions focused on program development and evaluation with implications for emergency nursing.

Planned work		Intended results		
Inputs	Activities	Outputs/ Measures	Outcomes	Impact
<p>Definition: program resources and/or infrastructure.            Examples: materials, personnel, expertise, partnerships, regulations, funding, and practice guidelines.</p>	<p>Definition: specific interventions.            Examples: action steps in education, research, practice, and/or leadership.            List all the activities that will be performed to complete the project.</p>	<p>Definition: immediate, short-term process indicators or evidence that activities were performed as planned. Types, level, and targets of services.            Examples: number of classes, duration of intervention, and the number of participants.            Note: this must be determined before the project begins.</p>	<p>Definition: measurable changes, effects, consequences, and results that came about as a direct or indirect result of the activities.            Examples: specific changes in participant behavior, knowledge, skill, attitude, and short-term change in health or functioning status.</p>	<p>Definition: overarching and long-term difference or change in the organization, system, or community.            Examples: long-term reduction in unit morbidity or mortality, sustained culture change, national workforce capacity or proportion with specialty certification, and sustained improvement in workforce retention.</p>

Inputs	Activities	Measures	Outcomes	Impact
--------	------------	----------	----------	--------

<p>Advisory board Program faculty and staff Alumni Community partners University classroom and simulation space Local fire-based ALS EMS Other EMS agencies Budget Qualified applicants</p>	<p>Gap analysis between paramedic and nursing curricula Develop admission criteria and select participants Create self-assessment Develop didactic and simulation content for a 2-week course on university campus Complete affiliation agreements with EMS systems Develop and administer an 180-item comprehensive written examination Schedule 10 shifts with local ALS EMS (per student) Schedule time to complete a total of 50 out-of-hospital capstone experiences</p>	<p>Demographic profile of students accepted into program Licensure type Degrees held Years of experience Areas of clinical experience before the course Number of students who attended the course Hours to completion Score on comprehensive final examination Number of students who completed the capstone course Number of affiliation agreements for capstone experiences Student satisfaction levels with the course Student satisfaction levels with the program faculty</p>	<p>Number of students who passed the comprehensive final examination Number of students who completed all curricular requirements Number of students who took the National Registry of Emergency Medical Technicians Paramedic Certification Number of attempts to pass the National Registry of Emergency Medical Technicians Paramedic Certification Number of students who pass the National Registry of Emergency Medical Technicians Paramedic Certification examination in 3 attempts or less Number of students who passed the paramedic psychomotor examination</p>	<p>Increased proportion of health care professionals in the national EMS workforce Proportion of students who attained the National Registry of Emergency Medical Technicians Paramedic Certification Number of students who have completed requirements to function as a paramedic in their state (if National Paramedic Certification is not required) Proportion of students who maintain current National Paramedic Certification Number of alumni employed in EMS role</p>
---	---	---	---	---

## DETAILS

**Subject:** Emergency medical care; Students; Intervention; Nursing; Certification; Planning; Logic; Design; Educational programs; Prevention programs; Nurse led services; Outreach programmes; Best practice; Injuries; Workforce; Emergency services; Clinical practice guidelines

**Business indexing term:** Subject: Workforce

**Publication title:** Journal of Emergency Nursing;; JEN; Philadelphia

<b>Volume:</b>	46
<b>Issue:</b>	1
<b>Pages:</b>	12-15
<b>Publication year:</b>	2020
<b>Publication date:</b>	Jan 2020
<b>Section:</b>	Editorial
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English
<b>Document type:</b>	Editorial
<b>DOI:</b>	<a href="https://doi.org/10.1016/j.jen.2019.11.005">https://doi.org/10.1016/j.jen.2019.11.005</a>
<b>ProQuest document ID:</b>	2333904849
<b>Document URL:</b>	<a href="https://www.proquest.com/scholarly-journals/logic-models-program-evaluation-emergency-nursing/docview/2333904849/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/logic-models-program-evaluation-emergency-nursing/docview/2333904849/se-2?accountid=211160</a>
<b>Copyright:</b>	Copyright Elsevier Limited Jan 2020
<b>Last updated:</b>	2023-03-20
<b>Database:</b>	Public Health Database

Document 46 of 55

# Development and Validation of the Ambulance Nurse Competence Scale: JEN

## ABSTRACT (ENGLISH)

### Introduction

In recent decades, major competency shifts have taken place in prehospital care in Sweden because staffing ambulances with registered/specialized nurses has become a priority. The aim of this study was to develop and validate a new instrument to measure the self-reported professional competency of specialist ambulance nursing students and registered/specialist nurses working in prehospital care.

### Methods

This study used a quantitative cross-sectional design to evaluate psychometric properties of a new instrument. The sample included 179 registered/specialist ambulance nurses and 34 specialist ambulance nursing students.

### Results

The analyses resulted in the Ambulance Nurse Competence (ANC) scale, consisting of 43 items and covering 8 factors: Nursing Care (n = 8), Value-based Nursing Care (n = 5), Medical Technical Care (n = 5), Care Environment's Community (n = 4), Care Environment's Serious Events (n = 8), Leadership Management (n = 3), Supervision and Professional Conduct (n = 4), and Research and Development (n = 6). All factors except Leadership Management achieved a Cronbach's alpha value greater than 0.71, explaining 59.62% of the total variance.

### Discussion

The ANC scale was systematically tested and showed satisfactory psychometrical properties. The ANC scale can be used in the education programs of future registered/specialist ambulance nurses as a tool for self-reflected learning and could also be of potential use in identifying competence gaps in registered/specialist ambulance nurses, which could direct the design of introductory programs. The scale could also be used as an outcome measure together with other instruments.

## FULL TEXT

### Contribution to Emergency Nursing Practice

- The current literature on the on prehospital care indicates that the nature of nurses' work in prehospital care is complex. Nurses' competence has been identified as 1 important factor in providing high-quality and safe care. Nurses' competence in prehospital care has not been explored in a comprehensive way.
- This article contributes to the promotion of a new instrument, the Ambulance Nurse Competence (ANC) scale, which has been developed, systematically tested, and shows satisfactory psychometric properties.
- Key implications for emergency nursing practice found in this article are that the ANC scale can be used in education of ambulance nurses as a tool for self-reflected learning and that it could also be used in designing introductory programs for ambulance nurses.

### Introduction

Prehospital care is described as early-induced, high-quality first aid administered to ill or injured patients from the alarm call to action taken on site or during ambulance transport to a medical facility.<sup>1</sup> In recent decades, prehospital care in Sweden has undergone major changes, in particular concerning the competence of prehospital care providers. The past 30 years have seen a transformation of prehospital care from being predominately a transport service to becoming an advanced emergency medical care service.<sup>2</sup> A large part of this process has been the requirement of ambulance staff to further their education in both nursing and medical science.<sup>3</sup>

There are several key factors that have had an impact on the required skill set within the ambulance service. First, ambulance services were not mentioned in the Health Care Act before 1982.<sup>4</sup> Second, in the mid-1990s, the Swedish National Board of Health and Welfare introduced new, stricter regulations regarding drug administration in ambulances.<sup>5</sup> Third, it was also decided that the care and treatment of patients should be based on evidence-based health care regulations<sup>6</sup> and professional conduct in health care. Currently, prehospital care is regarded as a significant part of a patient's total care experience and therefore it is considered important that prehospital health care staff have the same level of competence as staff working in hospitals. Fourth, in 2005, the National Board of Health and Welfare declared that every emergency ambulance should be staffed by at least 1 registered nurse.<sup>3</sup> This was in line with recommendations from the World Health Organization, which highlight the importance of nurses within all health care systems.<sup>7</sup> The Swedish nursing structure in prehospital care comprises both registered nurses and specialist nurses. A registered nurse has 3 years of higher education resulting in a bachelor's degree. To qualify as a specialist nurse in prehospital care, a minimum of 1 year work experience as a registered nurse is needed, followed by 1 year of higher education leading to a master's degree.<sup>3</sup>

In 2005, the Swedish National Board for Health and Welfare presented competency requirements for registered nurses aimed at ensuring safe and high-quality patient care. These competencies comprised 72 statements covering 3 main areas of professional competency: *nursing theory and practice; research, development, and education/supervision; and leadership*.<sup>8</sup> Twelve years later in 2017, the Swedish Society of Nursing developed new competency requirements for registered nurses, comprising 36 statements covering the following domains: *nursing process; person-centered care; teamwork and collaboration; evidence-based care; quality improvement; safety; informatics; leadership; and pedagogics*.<sup>9</sup> Specific competency requirements for specialist ambulance nurses were published by the Swedish Association for Ambulance Nurses in collaboration with the Swedish Society of Nursing in 2012.<sup>10</sup> In addition to ensuring the provision of safe, high-quality ambulance care for patients and relatives, the competency requirements are also suggested to be used to clarify the role and professional activities of specialist ambulance nursing students and specialist nurses within prehospital care. The competency requirements for specialist ambulance nurses consist of 42 statements covering the following domains: *nursing care; medical science; prehospital care environment; cooperation and leadership; and research, development, and education*.<sup>10</sup>

## Background

Professional competence among registered/specialist ambulance nurses continues to be of interest. Wihlborg et al<sup>11</sup> examined desired competencies of ambulance nurses from their own professional perspectives. The results revealed a total of 44 separate desired competencies grouped into 10 categories: the ability to execute leadership; generic abilities; interpersonal communication; institutional collaboration; pedagogic skills; possession of relevant knowledge; professional judgment; professional skills; research activities; and technical skills. Wihlborg et al<sup>11</sup> acknowledges that, to a certain degree, many of these competencies can be found in the competency requirements for specialist ambulance nurses developed by the professional associations. However, a limitation of the results in this study was the fact that nursing care was described in less detail compared with the details outlined by the professional associations.

Spitzed and Perrenoud<sup>12</sup> suggested that there have been 2 major phases of educational reforms influencing registered nurses' education in Europe in the last 3 decades. The first phase aimed at creating unified preregistration programs, and the second phase aimed at incorporating nursing programs into higher education.<sup>12</sup> Because of changes within health care and higher demands being placed on registered nurses' skills in Sweden, a postgraduate program in specialist nursing was introduced in 2001 that included prehospital care as one of several specializations.<sup>13</sup> To obtain a postgraduate diploma in specialist nursing, students must have fulfilled the course



requirements of 60 credits. In addition, students must have completed clinical components of the program that are tailored to the requirements of each specialization, as well as an independent project, that is, a thesis. The content of the postgraduate specialist nursing program is directed by a higher education ordinance<sup>14</sup> according to the 12 common learning goals. In addition to the common learning goals for postgraduate studies in specialist nursing, each specialization has additional specific learning goals. The prehospital care specialization program has 2 extra learning goals: (a) the ability to independently assess the ill or injured person's somatic and mental status including immediate needs and to demonstrate the ability to implement the actions required for patients with highly varying conditions, and (b) to demonstrate the ability to apply specialist knowledge in major accidents and disasters.<sup>14</sup> Sjölin et al<sup>15</sup> investigated the course curricula for specialist ambulance nurses in Sweden and found that the content consisted of 3 areas represented by medical, nursing, and contextual knowledge. The results showed an imbalance in the course content where medical knowledge had a major focus.<sup>15</sup> The number of students registering in postgraduate specialist nursing programs with a focus on prehospital care has increased from 86 registered nurses in 2001/2002 to 185 in 2017/2018.<sup>16</sup> Traditionally, more men than women have worked in prehospital care, but this gender imbalance is decreasing as more women are recruited.<sup>2</sup>

Despite there being a postgraduate program in prehospital care, the ambulance service employs 3 categories of registered nurses who work in teams together with paramedics. These include registered nurses without any specialization, registered nurses with specialist ambulance training, and registered nurses specializing in another field. The nature of nurses' work in prehospital care is complex and requires the ability to work independently, plan, and make complex decisions, particularly when working in an environment where there are no other professionals to consult.<sup>3,17</sup> Research has shown that factors such as professional competence are of importance in providing high-quality patient care.<sup>18,19</sup> In addition, research in emergency health care has shown that there is a need for strategies for evaluating competence development among registered nurses.<sup>20</sup> Competencies in emergency medical services and the evaluation of patient and staff experience in emergency care areas have been identified as priorities for research in prehospital care.<sup>21</sup>

It is no wonder that nurses' competence has an important impact on quality of care and patient safety. However, nurses' competency in prehospital care has not been explored in comprehensive and structured ways. Using an instrument that includes specific nursing competencies in the context of the work environment could contribute to self-reflected learning and further professional development among specialist ambulance nursing students and registered/specialist ambulance nurses.

### **Purpose**

The purpose of this study was to develop and validate an instrument intended for measuring self-reported professional competency among specialist ambulance nursing students and registered/specialist nurses working in prehospital care.

### **Methods Design**

This study used a quantitative cross-sectional design to evaluate psychometric properties of a new instrument.

### **Ethical Considerations**

This study was granted ethical approval by the Regional Ethical Review Board, Uppsala, Sweden, Dnr 2014/054.

### **Sample and Setting**

The participants in this study were specialist ambulance nursing students, registered nurses, and specialist nurses working in prehospital care. A sample of specialist ambulance nursing students (n = 34) studying at a university in central Sweden were invited to participate in the study and responded to the questionnaire in 2012. In 2015, registered/specialist ambulance nurses working in prehospital care in 3 counties located in central Sweden were

recruited to participate in the study.

### **Construction of the Questionnaire**

The development of the questionnaire was based on the competence requirements for specialist nurses in prehospital care that were established by the Swedish Society of Nursing and the Swedish National Association for Ambulance Nurses.<sup>10</sup> The requirements consist of 42 statements of competences related to what is expected of specialist ambulance nurses working in prehospital care. For the questionnaire all competency statements were reformatted into questions. A statement, such as “identifying symptoms and signs of ill health based on the patient’s story, promoting well-being, and preventing suffering and vulnerability in suddenly changing life situations,” was reformatted to a question “Do you think you have the ability to identify symptoms and signs of ill health...?” A 4-point Likert scale was used to rate respondents’ answers to the questions: (a) to a very low degree = 1; (b) to a relatively low degree = 2; (c) to a relatively high degree = 3; and (d) to a very high degree = 4. The questionnaire was complemented with questions addressing demographic data and pretested using 2 specialist ambulance nurses and 18 specialist ambulance nursing students to assess face validity. This resulted in the revision of 1 item that was divided into 2 items, leading to a final questionnaire consisting of 43 items focusing on the competences of registered nurses and specialist nurses within prehospital care.

### **Data Analysis Psychometric Testing**

Explanatory factor analysis (EFA) was used as a psychometric testing method to identify the underlying structure between measured variables and to extract potential factors of the scale. Principal component analysis (Varimax with Kaiser normalization) was used to assess construct validity,<sup>22</sup> and Cronbach’s alpha was used to determine reliability.<sup>23</sup> Factors with eigenvalues above 1 were analyzed.<sup>22</sup> The cutoff for factor loadings was set at 0.32 and over.<sup>24</sup> Factor scores were calculated by summing item scores in each factor divided by the highest possible score in the factor and then multiplying this by 100, transforming factor scores to 0-100 values. Analyses of psychometric properties were conducted using SPSS Statistics for Windows, version 25.0 (SPSS Inc, IBM Company, Chicago, IL).

### **Results SAMPLE**

The total sample consisted of 213 specialist ambulance nursing students, registered nurses, specialist ambulance nurses, and specialist nurses specializing in another area who were working in prehospital care. Of the nursing students recruited, the response rate was 54% in 2012 (n = 14) and 53% in 2015 (n = 20). In 2015, a total of 179 registered/specialist ambulance nurses working in prehospital care in the 3-county region responded to the questionnaire (response rate 34%). The ambulance nurses belonged to one of the following 3 categories: registered nurses (n = 61), specialist ambulance nurses (n = 88), and specialist nurses specializing in areas other than prehospital care (n = 29). The ambulance nurses were 43 years of age (median; range 24-66 years; mean 43.5 years) and 54% were men.

### **Construct Validity**

Sampling adequacy was tested using the Kaiser-Meyer-Olkin measure (KMO) and Bartlett’s test. The KMO value was 0.871; a value >0.6 is considered good. The Bartlett’s test value was 0.001; low values of significance level are considered to be good. Both tests indicate that the sampling is adequate for factor analysis.<sup>22</sup> The EFA resulted in an 8-factor solution explaining 59.62% of the total variance for the different factors. Factor loadings ranged from 0.37 to 0.82 (Table). A factor loading of  $\geq 0.35$  was considered satisfactory.<sup>24</sup> Four items (1, 9, 25, and 38) cross-loaded on 3 factors (Table). Assessment of the items resulted in those with the highest loading being selected. Each factor was examined for content in the items and, thereafter, the 8 factors for the Ambulance Nurse Competence (ANC) scale were labeled “Nursing Care” (8 items), “Value-based Nursing Care” (5 items), “Medical Care” (5 items), “Care Environments Emergency” (4 items), “Care Environments Serious Events” (8 items), “Leadership Management”

(3 items), "Supervision and Professional Conduct" (4 items), and "Research and Development" (6 items).

### Reliability

Cronbach's alpha values ranged between 0.71 and 0.88 for all factors except one with a value of 0.54. For the entire ANC scale, Cronbach's alpha was 0.94 (Table). Values of 0.70 or above were considered to be sufficient.<sup>25</sup> The factor that did not reach a level regarded as sufficient was Leadership Management, which consists of 3 items judged to be of importance for leadership competence, and therefore the factor remained in the model.

### Discussion

The exploratory factor analysis resulted in 8 factors explaining 59.62% of the total variance. The ANC scale consists of 43 items covering the following 8 competency areas (factor areas): *Nursing Care; Value-based Nursing Care; Medical Care; Care Environments Emergency; Care Environments Serious Events; Leadership Management; Supervision and Professional Conduct; and Research and Development*. All factors except one, Leadership Management, achieved acceptable Cronbach's alpha values greater than 0.71. The factor Leadership Management achieved a Cronbach's alpha value of 0.54, which might be because there are fewer items included in the factor and thus underestimate reliability.<sup>26</sup> In future studies, additional questions of central importance for leadership and management could be added to the scale to increase the reliability of this specific factor.

Several competency requirements have been developed for registered nurses. The competency requirement from the Swedish National Board for Health and Welfare<sup>8</sup> was used in the development of the original Nurse Professional Competence (NPC) scale<sup>27</sup> and the NPC Scale Short Version.<sup>28</sup> The NPC scales have been used to assess professional competence among newly graduated nurses and registered nurses. Subsequently, in 2017, the Swedish Society of Nursing developed new competence requirements for registered nurses. They were based on the following core competencies for nurses: *nursing process, person-centered care, teamwork and collaboration, evidence-based care, quality improvement, safety, informatics, leadership, and pedagogics*.<sup>9</sup> Although the NPC scale was developed based on earlier competency requirements, it was found that it is valid and conforms to the mentioned core competencies in the current competency requirements for registered nurses.<sup>29</sup>

Prehospital nursing care requires abilities such as independent assessments and treatment of patients with highly varying conditions in different environments, as well as abilities to use specialist knowledge in major accidents and disasters.<sup>14</sup> Therefore, the specific competency requirements for specialist ambulance nurses that were developed by the Swedish Association of Ambulance Nurses and the Swedish Society of Nursing<sup>10</sup> were selected as a basis for the development of the ANC scale. The working and reference group from these societies consisted of specialist nurses, lecturers, and researchers in the field of prehospital care, as well as physicians with expertise in prehospital care.<sup>10</sup> However, there is no consensus in the way the content of the specialist ambulance nurses' competencies is described. In the higher educational ordinance, the specialist ambulance nursing program is based on learning goals distributed into the areas of knowledge and understanding, skills and abilities, and judgment and approach, where nursing is clearly visible.<sup>14</sup> However, the study by Wihlborg et al, which aimed to identify the desired competencies of specialist ambulance nurses according to themselves as professionals, found that content relating to nursing care was more detailed in the Swedish Association of Ambulance Nurses and the Swedish Society of Nursing competency requirements for specialist ambulance nurses than in the findings in their study.<sup>11</sup> This has also been addressed from an educational point of view. Sjölin et al<sup>15</sup> through their investigation of the course curricula for specialist ambulance nurses in Sweden, found that the content of assessed curricula consisted of the following 3 areas: medical, nursing, and contextual knowledge. They also identified an imbalance in the course content where knowledge in nursing care had less focus than medical knowledge.<sup>15</sup> In the ANC scale, the 2 competence areas nursing care and value-based nursing care represent one-third of the items in the scale.

The core competencies described by Cronenwett et al<sup>30</sup>—*patient-centered care, teamwork and collaboration, evidence-based practice, quality improvement, safety, and informatics*—can be found in the ANC scale. Other important nursing competencies such as leadership and care pedagogies described in the competency requirements for nurses from the Swedish Society of Nursing,<sup>9</sup> can also be found in this new ANC scale. Although the ANC scale was designed from the Swedish context, it is interesting to note that, while nurses working in ambulance service are not common all over the world, they do exist in some countries, including Belgium, Finland, and the Netherlands. As the scale is refined for use among specialist ambulance nursing students and registered/specialist ambulance nurses, it could potentially be of use in these countries as well. There has previously been a gender imbalance within prehospital care with a higher number of male nurses than female nurses, but there is an indication that this is changing as more women are recruited.<sup>2</sup> The findings in this study support that this gender imbalance is decreasing as the male nurses working in ambulance service consisted of 54%.

### **Limitations**

Limitations of the study are that the sample derives from three out of 21 counties and a rather low response rate. However, the sample includes relevant categories of nurses which are represented in prehospital care.

### **Implications for Emergency Nurses**

The ANC scale can be used in the education programs of future specialist ambulance nurses as a tool that can contribute toward their self-reflected learning and to help them track their progression toward the learning goals. From a faculty perspective, it could be used to more successfully match the specialist nursing program with student needs. The scale could also be of potential use in identifying competence gaps in registered/specialist ambulance nurses, which could direct the design of introductory programs for newly employed registered/specialist ambulance nurses, or contribute to competency development in registered/specialist nurses working in the ambulance service. It could also be used as an outcome measure together with other instruments in assessing the impact of registered/specialist ambulance nurses' competencies on quality of care.

### **Conclusions**

The ANC scale was systematically tested as a tool to be used in measuring competencies of registered/specialist ambulance nurses demonstrating satisfactory psychometrical properties. The ANC scale can be used to assess competency among future specialist ambulance nurses as well as among current registered/specialist ambulance nurses to direct education and training for professional development.

### **Acknowledgments**

We are grateful to all the individuals who participated in the study, to Jari Appelgren for statistical advice, and to Gabrielle Mackay Thomsson for language revision.

### **Author Disclosures**

Funding: This study was mainly supported by research funds from Karlstad University and the County Council of Värmland, Sweden. Conflict of interest: none to report.

Items (n = 43) Do you have the ability to...	Factors								Explained variance	Cronbach's alpha
1	2	3	4	5	6	7	8	59.62	0.94	Nursing care, 8 items
								29.46	0.83	- apply a systematic approach in nursing care of sick and/or injured patients'





0.65	0.03	0.26	0.03	0.17	0.23	0.02	-0.03	-	ma ke us e of the pat ien ts' ex per ien ce an d kn owl ed ge en sur ing tha t nur sin g car e an d tre at me nt are ba se d on the pat ien ts' dig nit y an d
------	------	------	------	------	------	------	-------	---	--











0.60	0.22	0.16	-0.10	0.02	0.27	0.08	0.04			Value-based nursing care, 5 items
								6.49	0.77	- promote patients' and families' involvement in health promotion and self-care





0.14	0.78	0.13	0.13	0.07	0.09	0.06	0.10			- identify patients and related relatives suspected of being subjected to abuse or violence and report according to legislation
------	------	------	------	------	------	------	------	--	--	---







0.17	0.10	0.81	0.06	0.25	0.05	0.08	0.09			- interpret values and vital parameters as a basis for decisions for health care interventions
------	------	------	------	------	------	------	------	--	--	--



0.16	0.10	0.79	0.15	0.30	0.06	0.16	0.04				- make use of medical technical equipment
0.25	0.14	0.68	0.09	0.26	-0.04	0.02	0.13				- carry out and evaluate care and treatment based on care pace during transport

0.23	-0.11	0.53	0.26	0.23	0.17	0.31	0.18			Care environment - community, 4 items
								4.68	0.71	- apply a professional approach with respect to the patient's home environment



0.13	0.14	0.07	0.74	0.2 1	0.1 1	0.2 0	0.1 1			- interact and communicate with representatives of the community and caregivers to ensure good and safe care
------	------	------	------	----------	----------	----------	----------	--	--	--





0.26	0.08	0.31	0.44	0.30	-0.14	0.21	0.08			Ca re en vir on me nt –s eri ou s ev ent s, 8 ite ms
								3.75	0.87	- ma ke us e of an d ap ply inf or ma tio n an d co m mu nic ati on tec hn olo gy

0.24	-0.15	0.16	0.21	0.52	-0.23	0.07	0.22													- identify risk environments and create safe care space
0.21	0.11	0.22	0.32	0.52	0.04	0.00	0.13													- establish preparedness for threats and violent situations

0.15	0.37	0.14	0.27	0.52	-0.06	0.04	0.25				- carry out triage of patients in serious events
0.16	0.18	0.10	0.14	0.69	0.11	0.05	0.02				- systematically plan and address ill health in connection with CB RN E injuries





0.10	0.07	0.27	-0.14	0.70	0.25	0.22	0.13				- collaborate with rescue service and police in serious event
0.06	0.07	0.21	0.05	0.73	0.10	0.24	0.14				Leadership management, 3 items





0.17	0.03	-0.05	0.09	0.24	0.62	0.22	0.13	- respect and make use of associates' knowledge and experience from care and rescue work toward common goals
------	------	-------	------	------	------	------	------	--

0.07	0.30	0.21	0.08	0.18	0.38	0.20	-0.09				- contribute to cost-effectiveness and optimal resource utilization in care
0.23	0.07	0.10	0.21	0.02	0.65	-0.14	0.33				Supervision and professional conduct, 4 items

									3.2 8	0.7 4	- initiate and take res po nsi bilit y for su per visi on in nur sin g car e
--	--	--	--	--	--	--	--	--	----------	----------	---



0.14	0.23	0.29	0.22	0.10	-0.03	0.58	0.23			- understand the importance and consequences of following or deviating from treatment guidelines
------	------	------	------	------	-------	------	------	--	--	--

0.15	0.05	0.08	0.12	0.15	-0.07	0.67	0.22				- take responsibility for in-depth and continuous supervision of students
0.00	0.02	0.19	0.18	0.18	0.20	0.46	0.37				Research and development, 6 items



0.08	-0.0 0	0.12	-0.11	0.1 4	0.2 0	0.4 1	0.5 4			- im ple me nt evi de nc e- ba se d car e
------	-----------	------	-------	----------	----------	----------	----------	--	--	--



0.05	-0.0 0	0.19	-0.01	0.1 4	0.3 9	0.2 2	0.5 5			- tak e res po nsi bili ty for de vel opi ng inf or ma tio n and co m mu nic ati on su pp ort for the ma na ge me nt of nur sin g dat a
------	-----------	------	-------	----------	----------	----------	----------	--	--	---

0.08	0.12	0.11	0.01	0.10	-0.01	0.08	0.82	- participate in the development of new technology and equipment
------	------	------	------	------	-------	------	------	--

-0.04	0.08	0.06	0.01	0.10	0.03	0.02	0.81			- identify short comings in relation to safety and contribute to safe and comfortable transportation
-------	------	------	------	------	------	------	------	--	--	--

0.15	-0.03	-0.01	0.21	0.22	0.02	0.15	0.67	- share knowledge of the profession's responsibilities to other professions, the general public and to patients
------	-------	-------	------	------	------	------	------	---

## DETAILS

**Subject:** Ambulances; Emergency medical care; Higher education; Education reform; Students; Nursing education; Collaboration; Validity; Questionnaires; Nursing; Ambulance services; Prehospital care; Ethics; Staffing; Research & development--R &D; Nurses; Quality; Leadership; Skills; Educational programs; Patient safety; Learning; Quantitative psychology; Health care; Nursing care; Professional conduct; Specialization; Competence

**Location:** Sweden

<b>Identifier / keyword:</b>	Ambulance nurse; Competencies; Prehospital; Psychometric properties; Scale development; Specialist nurse
<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	1
<b>Pages:</b>	34-43
<b>Publication year:</b>	2020
<b>Publication date:</b>	Jan 2020
<b>Section:</b>	Research
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English
<b>Document type:</b>	Journal Article
<b>DOI:</b>	<a href="https://doi.org/10.1016/j.jen.2019.07.019">https://doi.org/10.1016/j.jen.2019.07.019</a>
<b>ProQuest document ID:</b>	2333904800
<b>Document URL:</b>	<a href="https://www.proquest.com/scholarly-journals/development-validation-ambulance-nurse-competence/docview/2333904800/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/development-validation-ambulance-nurse-competence/docview/2333904800/se-2?accountid=211160</a>
<b>Copyright:</b>	©2019. The Author(s)
<b>Last updated:</b>	2023-01-20
<b>Database:</b>	Public Health Database

# Making Ends Meet...When They Shouldn't: Accidental Misconnections Involving Endotracheal and Tracheostomy Cuff Ports: JEN

[ProQuest document link](#)

---

## ABSTRACT (ENGLISH)

The Luer connector, with its simple twisting male and female design features, is a standard in the health care industry. This simple and novel design with both a functional connection and a dependable seal is used almost exclusively in a variety of equipment familiar to most emergency departments, including, but not limited to, intravenous (IV) tubing and syringes as well as automated blood pressure inflation tubing. In addition to these common sources, emergency nurses must also at times care for patients with tubes or catheters serving various purposes, including those for hemodialysis, enteral feedings, airway (tracheostomy), and pain management, which also utilize a Luer connector. This nearly universal adoption of the Luer connector as part of health care device design supports standardized work; however, this commonality has not been without cost to patient safety. Its widespread implementation throughout health care has simultaneously contributed to unexpected and inadvertent tubing misconnections, many of which have led to serious patient harm. One type of tubing misconnection possible in an ED setting is the inadvertent connection of IV tubing, a medication-filled syringe, or enteral tubing to the Luer connector found on an endotracheal balloon port of a cuffed endotracheal or tracheostomy tube. Such connections are possible because of the identical Luer connections, but more importantly, they are also dangerous, as they can result in the administration of fluids, medications, or movement of air into the patient by the wrong route. Although such a connection may seem implausible, especially in an emergency department, this low-frequency, high-harm event can occur in an instant anywhere Luer connectors are present. Most misconnection events are underreported. Several examples are reported in the literature, and many have resulted in serious or even fatal outcomes.

## FULL TEXT

### Introduction

The Luer connector, with its simple twisting male and female design features, is a standard in the health care industry.<sup>1</sup> This simple and novel design with both a functional connection and a dependable seal is used almost exclusively in a variety of equipment familiar to most emergency departments, including, but not limited to, intravenous (IV) tubing and syringes as well as automated blood pressure inflation tubing. In addition to these common sources, emergency nurses must also at times care for patients with tubes or catheters serving various purposes, including those for hemodialysis, enteral feedings, airway (tracheostomy), and pain management, which also utilize a Luer connector. This nearly universal adoption of the Luer connector as part of health care device design supports standardized work; however, this commonality has not been without cost to patient safety. Its widespread implementation throughout health care has simultaneously contributed to unexpected and inadvertent tubing misconnections, many of which have led to serious patient harm.<sup>1-3</sup>

One type of tubing misconnection possible in an ED setting is the inadvertent connection of IV tubing, a medication-filled syringe, or enteral tubing to the Luer connector found on an endotracheal balloon port of a cuffed endotracheal or tracheostomy tube. Such connections are possible because of the identical Luer connections, but more importantly, they are also dangerous, as they can result in the administration of fluids, medications, or movement of air into the patient by the wrong route. Although such a connection may seem implausible, especially in an emergency department, this low-frequency, high-harm event can occur in an instant anywhere 2 Luer connectors are present. Most misconnection events are underreported.<sup>4</sup> Several examples are reported in the literature, and

many have resulted in serious or even fatal outcomes.<sup>2,3,5,6</sup>

### **Error Examples**

Although most emergency nurses might believe that an event such as this could never happen under their watch, there is a potential for using the wrong port, connector, or catheter during high-intensity, chaotic care settings common to ED environments. The Institute for Safe Medication Practices (ISMP) and ISMP Canada have both received reports to their Medication Errors Reporting Programs, where the use of an identical Luer connection was a major contributing factor to wrong route errors. In several cases (occurring either during or after resuscitation attempts), IV medications were inadvertently administered to the balloon port of the endotracheal tube due to the Luer compatibility of the syringe with the balloon port connection. The balloon inflation port connection is used to inflate the cuff portion of the catheter or tube, helping to anchor and maintain correct positioning of the tube during medical treatment. In each of these cases, once the medication was inadvertently injected by this route, the balloon (cuff) expanded, causing harm to the patients.<sup>7,8</sup>

One of the earliest reported events of this type involved the misconnection of enteral pump tubing to a tracheostomy balloon port. Because the feeding tube was inadvertently connected to the balloon port of the endotracheal tube, the fluid-filled cuff resulted in complete occlusion of the patient's airway. As the pressure alarms sounded on the ventilator, the patient experienced a cardiopulmonary arrest, but thankfully survived.<sup>6</sup> In a similar event, one that resulted in a fatality, a practitioner inadvertently connected an IV fluid set to the Luer lock connection on the tracheostomy balloon port instead of the intended central lumen catheter. Discovered by the code team, the IV line was disconnected, and the balloon cuff reinflated, but unfortunately not in time to recover the patient.<sup>8</sup>

The United States Food and Drug Administration medical device database also describes a fatal report of a pediatric case involving the misconnection of an IV line to a tracheostomy balloon port (<sup>Figure</sup>). In this event, the infused IV fluid expanded the tracheostomy cuff until it ruptured, causing aspiration of the IV fluid.<sup>9</sup> A similar case was reported to ISMP involving a nurse who disconnected an insulin infusion to thread it through the sleeve of the patient's gown (because the gown was without snap closures). When the nurse reconnected the line, it was mistakenly connected to the tracheostomy balloon port. As the insulin infusion began to fill the cuff, the patient became cyanotic. Upon quick discovery of the misconnection, the nurse disconnected the balloon port and removed 30 mL of fluid from the balloon.<sup>10</sup> Once again, in 2018, ISMP learned of a different case of an IV antibiotic infusion being connected to a tracheostomy balloon port that resulted in the cardiac arrest of a young patient.<sup>11</sup>

Endotracheal and tracheostomy tubes with high-volume, low-pressure balloon cuffs are manufactured to accept a large volume of air. Engineers from the ECRI Institute (a research-based patient safety organization) have confirmed that the pressures generated in the balloon cuffs by the inadvertent administration of fluid from an IV or enteral infusion device can overinflate and occlude a patient's airway.<sup>6</sup> Unfortunately, if the balloon cuff can expand, the infusion pump being used to administer the IV medication or fluid will not sound an alarm before the balloon ruptures, which occurs with approximately 70 mL of fluid.<sup>6</sup>

### **Contributing Factors**

The design of the Luer connector and its ubiquitous use throughout health care consequently contribute to the easy connection of functionally dissimilar catheters and tubing.<sup>1,2,4</sup> Other factors that lead to these types of events include the movement of patients from 1 service or clinical location to another, dim lighting, staff fatigue associated with working consecutive shifts, a Luer connector without a cap or cover (often sitting in proximity to a similar-looking central line access port), and routine use of catheters and tubing in an unintended manner (eg, using IV extension sets to lengthen enteral feeding sets).<sup>5,6,12</sup>

### **Transitions to New International Organization of Standardization Standards for Connectors**

Standards for small-bore connectors (those less than 8.5 cm in diameter) have been adopted and endorsed by patient safety advocates to eliminate the risk of inadvertent tubing misconnections. This movement has been a collaborative effort between the International Organization of Standardization (ISO), the Association for the Advancement of Medical Instrumentation, practitioners, regulators, safety organizations, and manufacturers, and it is focused on engineering the next generation of medical devices so that they cannot be inadvertently connected to

one another.<sup>13</sup> The transition to new ISO compatible devices began with enteral feeding devices (also referred to as ENFit). Phase II implementation is scheduled for the differentiation of neuraxial applications (NRFit) used for pain management and anticoagulation. Phase III implementation of the ISO standards is slated to include breathing systems and respiratory (medical) gases, intended to prevent the types of events discussed in this article.<sup>13</sup> Although it is unclear how quickly these transitions will occur (phase I implementation has been significantly delayed), it has been suggested by regulators and patient safety organizations that the health care community must not wait to create an awareness of this practice risk and must take necessary preventative actions until transition to each new device connection can occur.<sup>3-5,14</sup>

### **Safe Practice Recommendations**

Although engineering changes offer the strongest and most sustainable strategy to eliminate tubing misconnections and reduce patient harm, there are several safe practice recommendations that emergency nurses and organizations can adopt (while awaiting the implementation of the new ISO standards) to reduce the chance of tubing misconnections to an endotracheal or tracheal balloon cuff.<sup>11</sup>

- Always trace IV lines, catheters, or other tubing from their respective sources (and infusion pump if used) to the patient's access site into the body before making connections or administering medications or solutions. For patients with multiple tubes, remind staff that situational awareness of each tube's location and insertion site can be easily lost, especially if the tubing is covered by bedclothes and sheets, or the administration source is located on the opposite side of the bed from the tube or catheter.<sup>11,13</sup>
- Develop a standardized "line reconciliation" process to recheck all connections and trace all tubes and catheters to their source when patients arrive in a new setting, following a resuscitation event, or as part of a handoff process. Have your organization consider the benefit of an independent double-check of line attachments using available technology and a second practitioner, especially for selected high-alert medications or solutions, or if administering products to high-risk patients, to verify correct line attachment before administration.<sup>11,13</sup>
- Label all tubes and catheters at the point(s) of connection. Apply labels on lines, catheters, and tubes near insertion sites when the patient has more than 1 connection into the body (eg, IV, enteral, epidural, tracheostomy). When appropriate, position the respective delivery system (eg, pump) on the same side of the patient from which the catheter exits. If possible, position catheters and tubes that have different purposes on different sides of the patient's body.<sup>11,13</sup>
- Teach staff to limit the frequency of disconnecting and reconnecting tubing (eg, threading the tubing through clothing) to reduce the risk of misconnections and infections. Ensure patient gowns with snap closures are available to avoid the need for unnecessary disconnection.<sup>11</sup>
- Alert all clinicians and technologists working in the emergency department, including respiratory therapists and radiology staff, to the risk of wrong route errors owing to misconnecting IV/enteral tubing, parenteral syringes, or IV flushes to endotracheal or tracheostomy balloon ports or any other Luer-compatible connector. Teach nonlicensed personnel assisting in the department that they must get help whenever there is a perceived need to disconnect or reconnect a medical device.<sup>13</sup>
- Emphasize the risk of misconnections between IV/enteral tubing and endotracheal tube/tracheostomy balloon access ports in orientation and training modules. Use simulation to demonstrate these misconnections to reinforce awareness of these possible events.<sup>11,13</sup>



••Be proactive and understand the risks that are latent in your emergency department. Gather an interdisciplinary group to evaluate the potential for tubing misconnections with available medical devices. An updated *Tubing Misconnections Self-Assessment Tool for Healthcare Facilities*, which was created by the Baxter Clinical Center of Excellence, in collaboration with ISMP, is available for free to guide organizations through a risk assessment.<sup>11,14</sup> Go to <http://www.baxtermedicationdeliveryproducts.com/ccoe/misconnections.html>

••Volunteer as the ED representative to work with biomedical staff and other clinicians to conduct product evaluations (eg, failure mode and effects analysis) before new equipment purchases and provide first-hand expertise to these decisions. As part of this work, take the opportunity to manipulate new tubes, catheters, connectors, syringes, and tracheostomy/endotracheal tubes to uncover misconnection hazards and give first-hand feedback before a purchase decision is made.

••Report all potential near miss events (close calls) and actual misconnections of any type to the patient/medication safety officer, risk manager, device manufacturer, and ISMP ([www.ismp.org/merp](http://www.ismp.org/merp)), even when they are caught before harm occurs.<sup>10</sup>

The current design of health care device connectors places organizations, including emergency departments, at risk for tubing and catheter misconnections. ED staff treating patients with endotracheal tubes and tracheostomy tubes need to be aware of the risk for misconnection between the Luer port used to inflate an endotracheal cuff and available IV or enteral tubing.

The fast-paced ED environment combined with a variety of patient acuity and resource challenges can contribute to an unanticipated tubing misconnection event. Each time an ED staff member encounters a patient with a tube or catheter that contains Luer connection, the potential for a misconnection exists. Do not be fooled into believing that an IV or enteral Luer could not be inadvertently connected to an endotracheal or tracheostomy balloon cuff in your department. The risk exists everywhere, even in organizations with experienced emergency staff, who consider themselves highly reliable, committed to zero harm. Share your knowledge of these rare but serious events and plan today to protect patients from devastating consequences.

#### Author Disclosures

Conflicts of interest: none to report.

## DETAILS

<b>Subject:</b>	Standards; Pain management; Catheters; Equipment; Nurses; International organizations; Health care industry; Medical errors; Catheterization; Blood pressure; Patient safety; Inflation; Drugs; Connectors; Ostomy; Medical equipment; Ports; Pain; Patients; Dialysis; Clinical outcomes; Tracheotomy; Fluids; Emergency services; Enteral nutrition
<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	1
<b>Pages:</b>	111-115

<b>Publication year:</b>	2020
<b>Publication date:</b>	Jan 2020
<b>Section:</b>	Danger Zone
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English
<b>Document type:</b>	Journal Article
<b>DOI:</b>	<a href="https://doi.org/10.1016/j.jen.2019.10.007">https://doi.org/10.1016/j.jen.2019.10.007</a>
<b>ProQuest document ID:</b>	2333904767
<b>Document URL:</b>	<a href="https://www.proquest.com/scholarly-journals/making-ends-meet-when-they-shouldn-t-accidental/docview/2333904767/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/making-ends-meet-when-they-shouldn-t-accidental/docview/2333904767/se-2?accountid=211160</a>
<b>Copyright:</b>	©2019. Emergency Nurses Association
<b>Last updated:</b>	2022-09-13
<b>Database:</b>	Public Health Database

---

Document 48 of 55

# Can Sudden Cardiac Death Risk in the Young be Identified in the Emergency Department?: JEN

[ProQuest document link](#)

---

## ABSTRACT (ENGLISH)

Sudden cardiac death in the young is devastating for the family and the community. Although it has diverse etiologies, many are inherited. Discovering the disease in 1 patient offers the chance to save otherwise asymptomatic family members. Although some diseases can be discovered during autopsy, others require electrocardiograms for diagnosis, making it difficult to estimate the prevalence of disease and cause of death. Careful assessment of the history of present illness, family history, and electrocardiogram can guide clinical teams toward sometimes rare and difficult diagnoses. The purpose of this review article is to summarize the bench to bedside diagnosis of inherited dysrhythmia syndromes, which if missed on first presentation to the emergency department, have significant implications for the patient and the entire family.

## FULL TEXT

### Contribution to Emergency Nursing Practice

- The current literature on sudden cardiac death in the young indicates that it is often missed in the first presentation to the emergency department.
- This article contributes a review of current literature on the prevalence and methods of detection for sudden cardiac death.
- Key implications for emergency nursing practice found in this article are that careful assessment can prevent sudden death not only in the patient but also in up to 50% of family members.

### Introduction

Sudden cardiac death (SCD) is specifically defined as the death of a person that is witnessed and not attributable to a traumatic mechanism, that ensues within 1 hour of new symptoms or an unwitnessed death 24 hours after being seen seemingly well.<sup>2</sup> Such sudden unexpected death in the young is rare but devastating for the family and the community they live in. Warning signs are often missed and include near syncope, syncope, seizure or palpitations; however, the first presentation is often sudden death.<sup>2</sup> Survival is estimated at only 7% despite increased attention to out-of-hospital cardiac arrest and the chain of survival.<sup>3</sup> The purpose of this review article is to identify and characterize the major causes of SCD in the young to increase awareness of the subjective and objective presentations to the emergency department that may aid in early identification of patients who should undergo additional testing and treatment. Much of the information presented here for emergency nursing readers is a translation of the authors' previously published work for an international emergency physician audience.<sup>1</sup>

### Causes of SCD in the Young

SCD is explained mainly by inherited arrhythmogenic and structural causes such as hypertrophic cardiomyopathy (HCM), dilated cardiomyopathy (DCM), long QT syndrome (LQTS), Wolff-Parkinson-White (WPW) syndrome, Brugada syndrome (BrS), catecholaminergic polymorphic ventricular tachycardia (CPVT), and idiopathic ventricular fibrillation.

### Identifying the At-Risk Population

A high index of suspicion for SCD conditions should be maintained as presenting with symptoms that are subtle or unrelated to a cardiac event such as single-vehicle car crashes, drowning, and other unexplained accidents. Unexplained fractures, particularly facial fractures from face-first syncope should be red flags. Seizures and epilepsy may also be masquerading as convulsive syncope.<sup>4</sup> The first manifestation of inherited dysrhythmia syndromes is sudden death 50% of the time. If considered early, prodromal symptoms of SCD may be recognized before sudden death, preventing mortality not only for the patient but also for the entire family.

The electrocardiogram (ECG) can be the first and only clue to future sudden death. ECGs in the emergency department are obtained for specific symptoms such as palpitations, chest pain, syncope, or shortness of breath; at

other times, an ECG is obtained for preoperative purposes only in an asymptomatic individual or per a clinical protocol.

ECGs in inherited dysrhythmia syndromes can range from markedly abnormal to absolutely normal. To make this more complicated, the same patient may have an abnormal ECG on 1 occasion, followed by a normal or near-normal ECG on another occasion that may reveal their underlying condition attributed to medications, fever, and electrolyte abnormalities. LQTS is often missed as QT intervals are dynamic and take on average 10 ECGs to discover.<sup>5</sup> Conditions such as CPVT will not be revealed by a baseline 12-lead ECG but only during stress or exercise. Structural cardiac conditions such as HCM often present with characteristic ECG patterns that can be identified by the astute clinician.<sup>6</sup>

### **Warning Symptoms Before SCD**

Stattin et al<sup>7</sup> addressed the concept of prodromal symptoms before SCD in the younger patient population. They examined 15 cases of sudden unexplained death aged between 1 and 35 years who met the traditional SCD criteria, all with negative autopsy. The mean age at death was 15 years. This cohort included 4 identified cases of congenital LQTS and 2 cases of CPVT, with the remainder classified as normal without an identifiable underlying cause. Of the 15 cases, 6 had reported varying signs and symptoms of illness in the days before death, including seizure, vomiting, dizziness, and syncope.

SCD can be divided into 2 general categories: autopsy positive and autopsy negative. Each will be discussed separately with prevalence, presenting symptoms and signs, and ECG findings and examples given with an emphasis on the ED presentation.

### **Autopsy-Positive SCD in the Young Hypertrophic Cardiomyopathy**

HCM remains the most prevalent cause of sudden cardiac death at 1 in 200 people in the general population, accounting for up to 15% of SCD in the young and the single most common cause of death in athletes.<sup>8</sup> Autopsy findings are generally positive for unexplained left ventricular hypertrophy.<sup>9</sup>

Patients with HCM typically die of ventricular fibrillation. Although the degree of left ventricular hypertrophy and secondary outflow obstruction are seen on echocardiography, recent investigations have demonstrated muscle cell disarray at a microscopic level that predisposes to SCD but may not be present on echocardiography. This cellular disarray may only be evident on histologic review of cardiac tissue postmortem.<sup>6,7</sup> Patients may present with exertional chest pain, syncope, or (rarely) palpitations. The initial premortem diagnosis includes echocardiography and ECG. The ECG evidence for HCM includes giant negative T waves, abnormal repolarization, and abnormal Q waves (Figure 1).<sup>6,7</sup>

Often the electrocardiographic findings mimic those found in highly trained athletes, making this distinction difficult. Given the nonspecific ECG abnormalities of HCM and sometimes normal appearance on echocardiography, additional testing can include cardiac magnetic resonance imaging (MRI), which is the gold standard for assessment of ventricular volumes and function and can detect cases of HCM that echocardiography misses.<sup>10</sup>

HCM is caused by mutations in more than a dozen genes, including the following: *MYH7* and *MYBPC3*, encoding  $\beta$ -myosin heavy chain and myosin binding protein C, with 40% of patients gene negative.<sup>6,7</sup>

### **Arrhythmogenic Right Ventricular Cardiomyopathy**

Arrhythmogenic right ventricular cardiomyopathy (ARVC) is an inherited cardiomyopathy characterized by progressive structural and functional abnormalities secondary to the replacement of myocardium by fibrofatty tissue.

<sup>11</sup> Penetrance is highly variable, with athletes being most affected, and prevalence is likely underestimated at 1 in 5,000, accounting for 11% to 22% of SCD in athletes.<sup>12</sup>

Symptoms are highly variable and can often be absent in the early or concealed phase. Even in this phase, the risk

of sudden death is real, notably during exertion. Important presenting clinical manifestations are more frequent in males and include arrhythmias, exertional chest pain, exercise intolerance, heart failure, and syncope.<sup>13</sup> Unfortunately up to 50% of the time, patients present with SCD. Palpitations are the most common prodromal symptom, followed by syncope.<sup>14</sup> Exertional palpitations and syncope should always be a red flag. There are major and minor criteria based on echocardiography, cardiac MRI, ECG, malignant arrhythmia, and family history. Major criteria for 2-dimensional echo include, but are not limited to, regional RV akinesia, dyskinesia, and fractional area change of  $\leq 33\%$  in general.<sup>13</sup> Major MRI criteria include some of the following: regional RV akinesia and end-diastolic ratios.<sup>14</sup> ECG abnormalities are present in the resting ECG up to 90% of the time.<sup>15</sup> They include the following: delayed S upstroke in V1-V3 with T wave inversions. However, this finding may be normal in those with complete right bundle-branch block (RBBB) and those younger than 14 years. An epsilon wave is seen 30% to 33% of the time and is described as a tiny bump in the slope after the R wave that is quite subtle. Any monomorphic ventricular tachycardia with a left bundle-branch block pattern, particularly captured during exertion, is highly suggestive of ARVC.<sup>12</sup> ARVC is caused by genetic mutations in desmosomes, the intracellular meshwork that allows cells to adhere to each other. A total of 13 genes have been characterized, including *DSC2*, *DSG2*, *DSP*, *JUP*, *PKP2*, and *TMEM43*. Less common but still prevalent causes include the following: *CTNNA3*, *DES*, *LMNA*, *PLN*, *RYR2*, *TGFB3*, and *TTN* (Figure 2).<sup>16</sup>

### **Dilated Cardiomyopathy**

DCM, characterized by ventricular dilatation, contractile dysfunction, and thinned ventricular walls, is the most frequent cause of heart failure in the young. The incidence of DCM is about 7 cases per 100,000 individuals and about 0.57 per 100,000 cases within the pediatric population, and it accounts for around 60% of childhood cardiomyopathies.<sup>17,18</sup> Primary genetic mutations responsible for encoding have been identified and include 60 genes, responsible for different proteins in the nucleus, sarcomere, cytoskeleton, and cell membrane.<sup>19</sup> Acquired causes including infectious disease, drugs, and endocrine abnormalities.<sup>20</sup>

The following initial symptoms of heart failure are present in most patients: fatigue after mild exertion, orthopnea, ankle edema, and excessive sweating. Sudden death in DCM occurs in 12% of patients and disproportionately affects children.<sup>21</sup> ECG and echocardiographic screening in suspected patients and relatives is recommended, and nearly 60% of familial DCM could be detected.<sup>22</sup>

Diagnosis can be suspected often on symptoms and ECG alone, as in 1 series, the ECG was abnormal 100% of the time.<sup>23</sup> ECG abnormalities include myriad subtle and nonspecific findings, such as poor R wave progression, ST-T wave abnormalities, and QRS fragmentation.<sup>21</sup> In essence, depolarization has gone awry (Figure 3).

### **Autopsy Negative Causes of SCD Long Qt Syndrome**

LQTS is 1 of the most common causes of autopsy-negative SCD with an overall prevalence of 1 in 2,000.<sup>24</sup> There are 3 main types of congenital LQTS and over 18 disease-causing mutations. LQTS is inherited in an autosomal dominant fashion but with variable penetrance and genetic expressivity.<sup>25</sup> Torsades de pointes (TdP) is the cause of SCD and can be triggered by startle, sleep, exercise, fever, electrolyte derangements, and medications.<sup>25</sup> Symptoms include syncope and sudden death as the sentinel event. Drowning and trauma caused by sudden fainting can also represent the manifestation of LQTS.<sup>26</sup>

Because the QT interval changes with heart rate, classically, the QT corrected (QTc) is used to standardize the assessment of this electrocardiographic interval. Classic ECG findings of LQTS are a prolonged QTc (470 ms for males, 480 ms for females), late peaking T waves and bradycardia; however, 20% of the time ECG is normal.<sup>27</sup> A technique known as Vectorcardiography can be used to improve diagnostic accuracy of LQTS using QT peak

calculations, though this is more commonly performed by electrophysiology.<sup>28</sup> QT and QTc assessment are standard parts of ECG evaluation in the emergency department. To prevent TdP, assessment of QTc should be performed on selected patients based on the DOSE mnemonic (ie, Drug-Overdose-Slow rhythm-Electrolyte disturbance) (Figure 4).<sup>29</sup>

### **Preexcitation Syndromes, Including Wolff-Parkinson-White**

WPW is the best-known of the preexcitation syndromes that leads to premature ventricular depolarization. The WPW ECG pattern is an accessory pathway between the atria and ventricles that shortens the PR interval, creating the delta wave. Supraventricular tachycardia and atrial fibrillation are thought to be the basis for ventricular fibrillation and SCD. At least 0.1% to 0.3% of the population has a WPW ECG pattern, with a lifetime risk of 4% of SCD in this population.<sup>29</sup> Preexcitation ECG patterns can be seen in asymptomatic patients or can lead to symptoms such as dizziness, syncope, palpitations, or SCD.<sup>29</sup> ECG findings include short PR often less than 110 ms and a delta wave or slurred upstroke of the R wave (Figure 5).<sup>30</sup>

### **Brugada Syndrome**

BrS is characterized by cardiac conduction abnormalities that can result in sudden death because of malignant arrhythmias. There are no exact data about the prevalence of BrS, ranging from 1 in 2,000 in endemic areas to more than 1 in 160,000 in a study of Japanese children.<sup>31</sup>

The clinical spectrum shows wide variability, including syncope and sudden death as the presenting sign. Although the average age of SCD is 40 years, Brugada has been implicated in sudden infant death syndrome.<sup>32</sup> There also have been isolated case reports of Brugada ECG pattern in patients with febrile seizures in the pediatric emergency department.<sup>33</sup> Brugada ECG pattern can be triggered by fever, electrolyte disturbances, and drugs such as flecainide.<sup>34</sup> This induced Brugada ECG pattern can lead to SCD.

ECG findings of Brugada pattern include a typical RBBB with ST elevation in V1-V3. However, patients may present with other electrical findings in BrS, including first-degree atrioventricular block or other intraventricular conduction delay and sick sinus syndrome.<sup>35</sup> The most effective approach to unmasking BrS diagnostic ECG patterns is via pharmacological challenge with antiarrhythmic therapy (Figure 6).<sup>36</sup>

### **Conclusions**

The emergency team gets a moment in time to identify risk and prevent sudden cardiac death in both the patient and up to 50% of the family.<sup>37</sup> Studies suggest that there are prodromal symptoms leading up to sudden death and that many patients see a provider before SCD. First, emergency clinicians should be diligent about getting a proper history of present illness, detailing the events of the symptoms and asking specific questions about family history. Second, obtaining an ECG and looking carefully for evidence of cardiac causes in the young, apart from coronary artery disease, is warranted. Finally, astutely picking up a suspicious story and a suspicious ECG should lead to exercise limitation and referral to cardiology for consideration of genetic testing. There may not be a second chance to identify and prevent SCD in the young.

### **Author Disclosures**

Conflicts of interest: none.

## **DETAILS**

<b>Subject:</b>	Patients; Emergency medical care; Convulsions & seizures; Long QT syndrome; Cardiac arrhythmia; Death & dying; Medical diagnosis; Relatives; Mutation; Nuclear magnetic resonance--NMR; Heart failure; Electrocardiography; Autopsy; Cardiomyopathy; Pain; Teams; Sudden death; Nursing; Emergency services
-----------------	---

<b>Identifier / keyword:</b>	Sudden cardiac death; Emergency; Preventative medicine
<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	1
<b>Pages:</b>	105-110
<b>Publication year:</b>	2020
<b>Publication date:</b>	Jan 2020
<b>Section:</b>	Clinical Science Translation Review
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English
<b>Document type:</b>	Journal Article
<b>DOI:</b>	<a href="https://doi.org/10.1016/j.jen.2019.09.009">https://doi.org/10.1016/j.jen.2019.09.009</a>
<b>ProQuest document ID:</b>	2333904750
<b>Document URL:</b>	<a href="https://www.proquest.com/scholarly-journals/can-sudden-cardiac-death-risk-young-be-identified/docview/2333904750/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/can-sudden-cardiac-death-risk-young-be-identified/docview/2333904750/se-2?accountid=211160</a>
<b>Copyright:</b>	©2019. Emergency Nurses Association
<b>Last updated:</b>	2021-04-09
<b>Database:</b>	Public Health Database

# Physostigmine for Antimuscarinic Toxicity: JEN

[ProQuest document link](#)

---

## ABSTRACT (ENGLISH)

The current literature on the use of physostigmine indicates a more favorable safety and efficacy profile than previously thought. This article contributes to a nursing-oriented review of the role of physostigmine in the treatment of anticholinergic delirium. Key implications for emergency nursing practice found in this article are recognition of the clinical manifestations of antimuscarinic toxicity, management including screening for contraindications to physostigmine, and administration and monitoring of physostigmine therapy.

## FULL TEXT

### Contribution to Emergency Nursing Practice

- The current literature on the use of physostigmine indicates a more favorable safety and efficacy profile than previously thought.
- This article contributes to a nursing-oriented review of the role of physostigmine in the treatment of anticholinergic delirium.
- Key implications for emergency nursing practice found in this article are recognition of the clinical manifestations of antimuscarinic toxicity, management including screening for contraindications to physostigmine, and administration and monitoring of physostigmine therapy.

### Physostigmine for Antimuscarinic Toxicity

Anticholinergic toxicity can occur because of the overdose of numerous substances, including over-the-counter antihistamines, tricyclic antidepressants (TCA), antipsychotics, and certain plants. These agents have antimuscarinic properties, which lead to both central and peripheral manifestations.<sup>1</sup> Physostigmine, a cholinesterase inhibitor that increases cholinergic signaling in both the central and peripheral nervous systems, can be used to manage these antimuscarinic manifestations. Despite its availability, physostigmine use remains controversial and it is infrequently employed for fear of bradycardia, asystole, and seizures which have been reported following its use.<sup>2,3</sup> These adverse effects, however, occurred in two patients with TCA overdoses which are known to cause cardiac toxicity and seizures in addition to their antimuscarinic manifestations.<sup>2</sup> Furthermore, both of these patients had not undergone serum alkalinization, which is now considered the standard of care in managing TCA overdoses.<sup>3,4</sup> Moreover, the second case involved a combined TCA and beta-blocker overdose, which may manifest with seizures and bradyarrhythmias, making it difficult to attribute these grave effects to physostigmine alone.<sup>2,4,5</sup>

With newer and safer antidepressants available on the market, such as selective serotonin reuptake inhibitors, patients are less likely to be prescribed a TCA. Consequently, routine avoidance of physostigmine in anticholinergic toxicity cases is unnecessary. Furthermore, emerging studies demonstrating the favorable efficacy of physostigmine have prompted a re-evaluation of its place in therapy.<sup>6-11</sup> The purpose of this review is to familiarize the emergency nurse with the clinical manifestations of anticholinergic toxicity, and to review screening for contraindications to physostigmine, administering the antidote, and monitoring for adverse effects.

### Clinical Manifestations of Antimuscarinic Toxicity

The peripheral manifestations of antimuscarinic toxicity include tachycardia, decreased gastric motility, altered



mental status, mydriasis, erythema, anhidrosis, hyperthermia, dry mucous membranes, and urinary retention.<sup>12</sup> Hyperthermia can be exacerbated by some of the central manifestations of toxicity leading to rhabdomyolysis, acute kidney injury, and possibly death.<sup>12,13</sup>

Central manifestations of anticholinergic toxicity include hyperactive/agitated delirium, auditory and visual hallucinations, seizures, and coma.<sup>1,2</sup> Although less common, hypoactive manifestations, such as lethargy and sedation, are also possible.<sup>1</sup> Agitated delirium can pose a safety risk to both the patient and hospital personnel, so prompt management is crucial.

### **Management of Antimuscarinic Toxicity**

Patients should be examined for topically applied products, such as transdermal scopolamine patches, and decontaminated (ie, remove the patch) to terminate continued exposure. Continuous cardiac monitoring should be initiated, observing for QRS complex widening and dysrhythmias. In addition, intravenous (IV) access should be established early on.

Hyperthermic patients should be rapidly cooled to return the patient to a normothermic state as quickly as possible. Hypotension and rhabdomyolysis should be treated with IV fluids. Vasopressors can be used if fluids alone are insufficient to maintain hemodynamic stability.<sup>2</sup> Conduction abnormalities, such as QRS widening with diphenhydramine, can be managed with sodium bicarbonate.<sup>2</sup>

Seizures should be managed with benzodiazepines, consistent with general acute seizure management. Antipsychotics and antihistamines are often administered empirically in the management of acute undifferentiated agitation in the emergency department.<sup>14</sup> Given the anticholinergic effects of both the antipsychotics and antihistamines, agents such as haloperidol and diphenhydrAMINE may exacerbate the patient's toxicity. Therefore, their use in patients with anticholinergic toxicity is not recommended.

Physostigmine readily distributes into the central nervous system to increase the central effects of acetylcholine. Thus, it directly counteracts the cause of the delirium without exacerbating agitation and delirium. Benzodiazepines have often been used first-line to control anticholinergic delirium. However, in comparison to benzodiazepines, physostigmine has demonstrated a reduction in both agitation and delirium in >80% of patients, while the benzodiazepines controlled agitation in only 24% and had no effect on delirium.<sup>6-8</sup> In addition, physostigmine has resulted in fewer complications, namely less sedation leading to reduced intubations, and fewer and shorter intensive care unit stays compared to the benzodiazepines.<sup>3,6,8</sup> In appropriately selected patients, physostigmine has demonstrated a reasonable safety profile, refuting the safety concerns associated with previous case reports.<sup>4,6-10</sup>

### **Screening for Contraindications to Physostigmine Use**

Although physicians and pharmacists are traditionally responsible for identifying any contraindications to therapy, nurses can play a significant role in screening for clinical signs that may preclude physostigmine use. In addition to its labeled contraindications, physostigmine should be used cautiously in patients who have coingested medications known to be epileptogenic.<sup>8</sup> Physostigmine should also be avoided in suspected TCA overdoses, which manifest similarly in overdose. Electrocardiogram findings indicative of TCA ingestions (including therapeutic use) include QRS widening and a terminal R wave in the aVR lead >3 mm in height.<sup>2</sup> Thus, physostigmine should be avoided if either of these findings are present. Furthermore, physostigmine should be avoided in the setting of bradycardia as heart rate is expected to decrease following its administration.

### **Physostigmine Administration**

Physostigmine is dosed at 1 to 2 mg intravenously or intramuscularly in adult and 0.02 mg/kg (up to 0.5 mg) in pediatric patients.<sup>15,16</sup> When administered through IV, it should be given slowly over 2 to 5 minutes to minimize the risk of bradycardia, bronchorrhea, and seizures.<sup>15,16</sup> Atropine should be available at the bedside should

bronchorrhea or bradycardia occur with physostigmine. However, as atropine is an anticholinergic agent, it should be used judiciously.

### Monitoring Following Physostigmine Administration

A rapid, dramatic improvement in mental status may be observed following treatment with physostigmine within 3 to 8 minutes.<sup>16</sup> Given that the half-life of physostigmine is often shorter than that of the agent it is reversing, repeat dosing may occasionally be required.<sup>9,16-18</sup> It is reasonable to administer additional doses of physostigmine every 10 to 15 minutes if patients continue to present harm to themselves and staff. Patients should be monitored for adverse effects including hypersensitivity, bradycardia, bronchospasm, bronchorrhea, and seizures. Symptomatic bradycardia should be treated with IV atropine, and seizures should be treated with benzodiazepines.

### Implications for Emergency Nursing Practice

As the role of physostigmine for anticholinergic delirium evolves, nurses need to be familiar with parameters for its safe use. Emergency nursing can be crucial in the prompt recognition of the clinical manifestations of anticholinergic delirium, as well as manifestations of conditions that would preclude the use of physostigmine, that would facilitate safe and efficacious treatment.

### Conclusion

Physostigmine can be used for anticholinergic delirium in appropriately selected patients. Signs of cardiotoxicity, such as bradycardia and QRS prolongation should be ruled out before its use. Because of its comparatively short half-life, patients should be closely monitored as they may occasionally need repeat doses.

### Author Disclosures

Conflicts of interest: none to report.

## DETAILS

<b>Subject:</b>	Patients; Emergency medical care; Cardiac arrhythmia; Psychotropic drugs; Histamine; Anesthesia; Delirium; Nursing; Hyperthermia; Efficacy; Clinical nursing; Emergency services; Medical screening; Professional practice
<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	1
<b>Pages:</b>	126-128
<b>Publication year:</b>	2020
<b>Publication date:</b>	Jan 2020
<b>Section:</b>	Pharm/Tox Corner
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia

Country of publication:	United Kingdom, Philadelphia
Publication subject:	Medical Sciences--Nurses And Nursing
ISSN:	00991767
e-ISSN:	15272966
Source type:	Scholarly Journal
Language of publication:	English
Document type:	Journal Article
DOI:	<a href="https://doi.org/10.1016/j.jen.2019.09.002">https://doi.org/10.1016/j.jen.2019.09.002</a>
ProQuest document ID:	2333904723
Document URL:	<a href="https://www.proquest.com/scholarly-journals/physostigmine-antimuscarinic-toxicity/docview/2333904723/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/physostigmine-antimuscarinic-toxicity/docview/2333904723/se-2?accountid=211160</a>
Copyright:	©2019. Emergency Nurses Association
Last updated:	2023-08-01
Database:	Public Health Database

Document 50 of 55

# Top 10 Pitfalls to Avoid When Caring for the Older Adult: Part II: JEN

[ProQuest document link](#)

## ABSTRACT (ENGLISH)

In *Top 10 Pitfalls to Avoid When Caring for the Older Adult: Part I*, three potential pitfalls were identified: 1) assuming a fall is minor, 2) failure to consider how physiological changes associated with aging affect the ability to compensate when ill or injured, and 3) “need to work up” every abnormal finding. Moreover, it was noted that persons aged 65 years and above are placed in the older adult category; however, aging-related changes start as early as in the third decade of life, with people maturing differently.<sup>1–4</sup> Recommendations regarding how to avoid these pitfalls were provided. The other pitfalls to avoid are as follows.

## FULL TEXT

In *Top 10 Pitfalls to Avoid When Caring for the Older Adult: Part I*, three potential pitfalls were identified: 1) assuming a fall is minor, 2) failure to consider how physiological changes associated with aging affect the ability to compensate when ill or injured, and 3) “need to work up” every abnormal finding. Moreover, it was noted that

persons aged 65 years and above are placed in the older adult category; however, aging-related changes start as early as in the third decade of life, with people maturing differently.<sup>1-4</sup> Recommendations regarding how to avoid these pitfalls were provided.<sup>1</sup> The other pitfalls to avoid are as follows.

#### **Pitfall 4: Failure to Recognize the Fragility of Older Adults' Skin and Bones**

The decrease in circulation and subcutaneous body fat (cushioning) that accompanies aging can lead to skin breakdown in as little as 30 minutes, especially when older adults are lying/sitting on a hard surface such as a backboard, thin mattress, floor, or chair without a cushion.<sup>3,5</sup> Common sites for pressure sores include the heels, buttocks, shoulders, elbows, tips of toes, ear and nose creases (from oxygen tubing), and the chin and base of the skull (from cervical collars).<sup>5,6</sup> Shearing injury and avulsion of skin layers occurring when hoisting patients up in a stretcher, when sliding them from stretcher to stretcher, or when sliding them from the stretcher or radiology table are related to lack of stabilizing subcutaneous tissue.<sup>7</sup> Wet clothing, bed linens, or incontinence pads increase risk of breakdown and shearing injury.<sup>5,6</sup> In addition to these tears, the lack of subcutaneous fat leads to more rapid onset of cold injury from cold packs as well as heat loss, chilling, hypothermia, and more rapid absorption of toxins through skin surfaces.<sup>5-7</sup>

Calcification of cartilage, atrophied muscles, and poor bone strength and density lead to an increased risk of fractures in older adults. Avulsion fractures occur when calcified tendons snap or small pieces of osteoporotic bone are pulled away from the main boney structure.<sup>6</sup> Poor nutrition and decreased ability to absorb essential vitamins and minerals (especially vitamin D and calcium) lead to an increased risk of injury as well as a delay in healing times, as both are needed for healthy skin and bones.<sup>6,8</sup> Healing times for wounds and fractures vary in older adults and depend on their condition; they can take 20%–60% longer to heal than they would in a younger person. Prolonged healing combined with a decreased ability to fight infection creates an additional risk, especially if the wound becomes infected.<sup>6,8,9</sup> Backboards should be avoided unless necessary, and timely backboard removal is important to proper skin care for the older adult. Carefully removing a backboard and/or moving the older adult can decrease the potential for skin shearing and twisting motions that lead to skin injuries/bone avulsions. In tandem with careful movement, preventing further wound contamination will help avoid the pitfall associated with fragile skin and bones. Ensure the skin remains dry and monitor for redness in pressure areas.

#### **Pitfall 5: Assuming That Confusion is Due to Alzheimer Disease or Dementia**

Is the patient's confusion old, new, or different? Causes of confusion in older adults vary widely and may involve overlapping reasons.<sup>10,11</sup> An older adult with an underlying cognitive disorder (Alzheimer disease, Lewy body or vascular dementia, or other medical condition) may have minor changes in mentation or may experience severe confusion depending on the progression of the disorder.<sup>10,11</sup> Identifying the patient's baseline mental status is important. The overwhelming atmosphere of an emergency department, lack of sensory devices such as hearing aids or glasses, or multiple people asking questions at the same time can make it difficult for older adults to assimilate all information, making it appear as though they are confused.<sup>10,11</sup> Delirium should be suspected whenever there is new or sudden onset of confusion or mental status change. Stroke, head injury, electrolyte or glucose imbalance, hypoxia, fever, pain, and new medications can lead to new confusion (even psychosis) and warrant consideration.<sup>10,11</sup> Several medications, especially those with anticholinergic actions (diphenhydramine is a good example), as well as nonsteroidal antidepressants, antibiotics,  $\beta$ -agonists, proton pump inhibitors, dopaminergic agents, and antidepressants have been implicated in alteration of mental status, confusion, and hallucinations in older adults.<sup>10-12</sup> The Confusion Assessment Method (CAM) may assist in identifying delirium by prompting the practitioners to look for sudden onset of confusion, signs of inattention (difficulty focusing, easily distracted, trouble tracking conversation), disorganization (rambling, illogical or irrelevant thoughts), and altered level of consciousness (hypervigilant to stuporous).<sup>13</sup> When a patient presents with a sudden onset of confusion or change in cognitive abilities, a rapid neurological assessment must be performed by comparing the patient's current neurologic status with his or her baseline status. Assessment involves a rapid head-to-toe examination, including point-of-care testing for glucose, oxygen saturation, and temperature; exploring underlying causes; and obtaining a medication history. Reviewing this information with a critical eye may help identify the cause or help determine the

need for other tests. More importantly, this action may save the patient's life if the change is due to life-threatening causes (hypoxia, infection, medication reaction, hypoglycemia, etc).<sup>10,11</sup> Two of the approaches used by the author (J.S.) that helped decrease confusion in the older adult included: 1) ensuring that the older adults' glasses are on/clean and their hearing aids are working and in place or providing them with a device to help them hear and 2) limiting the number of people talking to the older adults simultaneously. Funneling questions, requests, and commands through a single person can decrease the overwhelming stimuli and confusion.

#### **Pitfall 6: Being Embarrassed to Ask Whether the Older Adults Engage in Sex**

Asking older adults about their sexual activity may shed light on their presenting condition. Symptoms of a urinary tract infection, abdominal pain, unusual rash, or joint pain must include a differential diagnosis of sexually transmitted infection, the incidence of which has increased by 23% in older adults compared with 11% for the rest of the population over the last 4 years.<sup>14</sup> Older adults may not share information about their sexual activities unless one specifically asks, and oftentimes, providers are hesitant to ask.<sup>14,15</sup> A second consideration is related to the use of phosphodiesterase-5 inhibitors (PDEi-5s). It is important to note that older adults treated with nitroglycerin or other nitrates after the use of PDEi-5s have a highly increased risk of developing severe hypotension secondary to profound vasodilation. The half-life of PDEi-5s ranges from 24 to 72 hours, and some are taken daily.<sup>15-17</sup> Sildenafil (Viagra; Pfizer, New York), tadalafil (Cialis; Eli Lilly and Company, Indianapolis), and vardenafil (Levitra; Bayer AG, Leverkusen, Germany) are widely known prescription drug names. However, how many people are aware that sildenafil is also sold under the brand name Revatio for pulmonary hypertension and tadalafil under the brand name Adcirca, or know that PDEi-5s are also used as a treatment for prostate issues, Reynaud's disease, and angina?<sup>15-18</sup> Do not assume that older adults no longer engage in sexual activities –even those confined to bed. Hence, ask them questions related to sex, especially when symptoms may be related to sexually transmitted infections, and about the use of drugs typically used for sexual enhancement (as well as other conditions). This may help avoid missing a serious consequence.

#### **Pitfall 7: Multiple Medications –Need We Say More?**

Pitfall risks associated with medications are numerous! The more medications an older adult takes, the higher the risk of an interaction or adverse reaction.<sup>19</sup> Fall risk increases significantly if 5 or more medications are being taken.<sup>19</sup><sup>20</sup> The risks associated with medications are as follows: sedation, increased risk of bleeding, hypotension, bradycardia, fluid and electrolyte imbalance, decreased appetite, and altered mental status, including psychosis. Beneficial medications can turn toxic when the aging kidneys and liver are unable to process them efficiently, leading to symptoms of overdose.<sup>4,12,19</sup> A combination of multiple drugs, especially if a new drug is added to the treatment mix, may lead to a decreased ability of the liver to metabolize each of the drugs and thus toxicity.<sup>4,12,19</sup> One in every 6 hospital admissions (1 in every 3 patients aged more than 75 years) is related to an adverse drug reaction, and 1 in every 5 patients is taking inappropriate medications based on the American Geriatrics Society (AGS) Beers Criteria for Potentially Inappropriate Medication Use in Older Adults.<sup>12,19</sup> Changes in older adults' behavior or physical ability should prompt one to look at changes in medications or a drug interaction. The Beers Criteria<sup>12</sup> is a resource that emergency providers should have at their fingertips, not only to determine whether a medication is appropriate to administer, but also to assist them when assessing a patient's symptoms. Obtaining a complete list of the patient's medications and reconciling them, as well as consulting with a pharmacist, may help identify the cause of the patient's symptoms, prevent inclusion of additional medications, and avoid the pitfall associated with multiple medications.

#### **Pitfall 8: Not Asking About Herbal Supplement Usage**

Older adults are turning to the Internet to find alternatives to expensive prescription drugs and are using herbal supplements to treat their conditions.<sup>21,22</sup> Many of these supplements contain the same active ingredient as that in prescription drugs, which may lead to doubling of the active ingredients or to counteraction to the medications prescribed by the medical provider.<sup>21,22</sup> It is important to specifically ask older adults whether they are using herbal supplements, recognize that these substances can cause the same serious consequences as those caused by prescription drugs with similar actions, and have access to a reliable and evidence-based resource on herbal

supplements.<sup>23</sup>

### **Pitfall 9: Discharging Home Without Knowing Whether the Plan Is Safe**

Discharging a patient home can be risky. Is the home safe? Is there someone capable of assisting with care at home? Is the 101-year-old patient going home to an 80-year-old son or daughter? Who is normally the caregiver –the 94-year-old parent or the 78-year-old child? Only 4% of adults aged 65 years and above live in institutionalized settings.<sup>24</sup> The rest live alone or with family members. Many of them function independently or co-dependently with a spouse or equally debilitated sibling, child, or significant other.<sup>24</sup> If the older patient is being discharged to home or an independent facility, it is important to involve social workers or other agency familiar with home assessments early in the discharge planning to ensure the older adult is being discharged to a safe environment and has the resources necessary to comply with discharge instructions. If a safe discharge is not the case, consider arranging home health care, assisted living, or admission to ensure safe and proper care, rather than having to return because of the inability to manage at home.<sup>25,26</sup> The discharge instructions provided to the patient should be considered. Older adults may have more difficulty seeing/reading/hearing instructions, which frequently become more complicated when new medications are involved.<sup>27</sup> Multitasking required to learn new information can be challenging for older adults.<sup>27</sup> Hence, the instructions should be written in a manner that older adults can understand and printed using a font, size, and color that they can read. A verbal run-through of the instructions should be performed in an area with few distractions. The patients should be asked to repeat what they are supposed to do when they get home.<sup>27</sup> The discharge planning and teaching must be initiated as early as possible in the visit as this allows for spacing out the information over time.<sup>25,26</sup>

### **Pitfall 10: Assuming the Disaster Plan Is Older-Adult Ready**

Age-related changes should be incorporated into every facility's disaster response. Noise, unfamiliar environment, and missing assistive devices (hearing aids, glasses, oxygen tanks, wheel chairs, walkers, etc) can lead to situational disorientation, difficulty following directions, and mobility challenges in older adults. The provision of a caregiver may be needed, even for "minor care" patients, because of confusion or mobility issues. Triage decisions may be affected by "abnormal" findings that are "normal" for that patient (confusion, mental status, altered vital signs, etc). Obtaining medical records, medication lists, and history may be problematic. Care providers in the "less acute" care areas will need to be adept at monitoring and re-triage, as "stable" older adults may not be able to compensate because of physiological changes associated with aging, and their condition might suddenly deteriorate.<sup>4,28,29</sup> Discharge may be challenging because of the additional services an older adult may require (specialized housing, assisted care, and medications).<sup>25-27</sup> Hence, disaster plans should be reviewed taking into account the proportion of older adults in the area (ie, do you have enough staff assigned to areas to assist and monitor –especially the minor injury area? enough wheelchairs? commodes? blankets?). A drill should be planned based on a disaster involving several older adults. The Centers for Disease Control and Prevention's *Planning for an Emergency: Strategies for Identifying and Engaging At-Risk Groups*<sup>30</sup> has many useful tips related to disasters involving older adults.

There are many pitfalls to avoid when providing care for older adults. Increasing awareness, knowledge, and attention will help emergency nurses assess older adult with a critical eye, process the information associated with potential pitfalls, enhance the quality of care for older adults, and avoid the pitfalls that could lead to serious consequences or death. Are you avoiding the pitfalls?

### **Clinical Resources**

ENA's Geriatric Emergency Nurse Education course, articles found in the Geriatric Section of *JEN* over the years, and the Geriatric Emergency Department Guidelines approved by ENA are all excellent resources that provide tips on assessment and care of older adults, as well as ways to make your emergency department geriatric friendly.<sup>31</sup>

## **DETAILS**

<b>Subject:</b>	Infections; Antidepressants; Bones; Hypoxia; Delirium; Skin; Older people; Cognitive ability; Prescription drugs; Patients; Electrolytes; Aging; Dementia; Fractures; Psychosis; Pain; Hearing aids; Adults; Nurses; Brand names
<b>Business indexing term:</b>	Subject: Brand names
<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	1
<b>Pages:</b>	116-120
<b>Publication year:</b>	2020
<b>Publication date:</b>	Jan 2020
<b>Section:</b>	Geriatric Update
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English
<b>Document type:</b>	Journal Article
<b>DOI:</b>	<a href="https://doi.org/10.1016/j.jen.2019.10.016">https://doi.org/10.1016/j.jen.2019.10.016</a>
<b>ProQuest document ID:</b>	2333904708
<b>Document URL:</b>	<a href="https://www.proquest.com/scholarly-journals/top-10-pitfalls-avoid-when-caring-older-adult/docview/2333904708/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/top-10-pitfalls-avoid-when-caring-older-adult/docview/2333904708/se-2?accountid=211160</a>
<b>Copyright:</b>	©2019. Emergency Nurses Association
<b>Last updated:</b>	2021-07-15
<b>Database:</b>	Public Health Database

# CE Earn Up to 8.0 Contact Hours: JEN

[ProQuest document link](#)

## FULL TEXT

### Instructions

- Read the articles identified as CE.
- The test for these CE activities will no longer be routinely mailed or faxed. A mailed test can be requested from the *JEN* editorial office as an accommodation for those who require a physical copy of the questions.
- Go to [http://www.ena.org/publications/jen/ce\\_articles/default.asp](http://www.ena.org/publications/jen/ce_articles/default.asp) and follow the instructions to take your CE test(s) online. There is only one correct answer for each question.
- If you pass, you can print your certificate of earned contact hours. If you fail, you have the option of taking the test(s) again at no additional cost.
- For questions contact Lippincott Williams &Wilkins: 1-800-787-8985.

### Registration Deadline

December 3, 2021

### Disclosure Statement

The authors and planners have disclosed no potential conflicts of interest, financial or otherwise.

### Provider Accreditation

Lippincott Professional Development (LPD) will award contact hours as follows: Clinical, 4.0; Research, 2.0; Practice Improvement, 2.0. (CEN-RO Category: Clinical).

LPD is accredited as a provider of continuing nursing education by the American Nurses Credentialing Center's Commission on Accreditation.

This activity is also provider approved by the California Board of Registered Nursing, Provider Number CEP 11749 for the number of contact hours indicated. LPD is also an approved provider of continuing nursing education by the District of Columbia, Georgia, and Florida #50-1223.

### Payment

Clinical member \$26.95; nonmember \$31.95.

Research member \$15.95; nonmember \$18.95.

Practice Improvement member \$15.95; nonmember \$18.95.

## DETAILS

**Subject:** Nursing education; Accreditation



<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	1
<b>First page:</b>	134
<b>Publication year:</b>	2020
<b>Publication date:</b>	Jan 2020
<b>Section:</b>	CE Tests
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English
<b>Document type:</b>	Instructional
<b>DOI:</b>	<a href="https://doi.org/10.1016/S0099-1767(19)30578-1">https://doi.org/10.1016/S0099-1767(19)30578-1</a>
<b>ProQuest document ID:</b>	2333904563
<b>Document URL:</b>	<a href="https://www.proquest.com/scholarly-journals/ce-earn-up-8-0-contact-hours/docview/2333904563/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/ce-earn-up-8-0-contact-hours/docview/2333904563/se-2?accountid=211160</a>
<b>Copyright:</b>	Copyright Elsevier Limited Jan 2020
<b>Last updated:</b>	2020-02-10
<b>Database:</b>	Public Health Database

Document 52 of 55

# The Deadly Trio: Heroin, FentaNYL, and Carfentanil: JEN



## ABSTRACT (ENGLISH)

The current literature on opioid use and synthetic opioids including fentaNYL and analogs indicates a significant increase in drug overdoses. Opioids also account for the second leading cause of accidental death in the United States. This article contributes to increasing awareness of the dangerous effects surrounding the concurrent overdependence of 3 potent opiates and the need for aggressive acute overdose treatment. Key implications for emergency nursing practice include the need for increased use of opioid use screening tools and effective treatment for opioid overdose.

## FULL TEXT

### Contribution to Emergency Nursing Practice

- The current literature on opioid use and synthetic opioids including fentaNYL and analogs indicates a significant increase in drug overdoses. Opioids also account for the second leading cause of accidental death in the United States.
- This article contributes to increasing awareness of the dangerous effects surrounding the concurrent overdependence of 3 potent opiates and the need for aggressive acute overdose treatment.
- Key implications for emergency nursing practice include the need for increased use of opioid use screening tools and effective treatment for opioid overdose.

### Introduction

Opioid dependence is a public health epidemic; the United States is experiencing an unprecedented number of opioid-related deaths.<sup>1</sup> Opioids are the primary drugs associated with deaths from overdose and include prescription pain relievers, such as oxyCODONE (OxyCONTIN), HYDROcodone (Vicodin), and methadone.<sup>2</sup> The availability and use of prescription pain relievers has increased over the last several decades in the US. In 2017, there were 11.4 million persons aged 12 years or older in the previous year who used opioids in the US, most of whom used prescription pain relievers.<sup>3</sup> There were 11.1 million people aged 12 years or older who used opioid prescription pain relievers in 2017, compared with 886,000 people who used heroin. Around 562,000 individuals who used opioid prescription pain relievers also used heroin in the previous year.<sup>3</sup> Since 1999, the number of drug overdoses has almost tripled, with approximately 60% of these overdoses involving an opioid.<sup>4</sup> The increased opioid use of heroin and synthetic opioids, such as fentaNYL and its analogs, has had a significant impact in deaths from drug overdose.<sup>4</sup> Opioid overdoses treated in emergency departments in the US have risen 30% from July 2016 through September 2017 in 52 areas in 45 states. Overdoses in large cities have risen 54%, and the Midwestern States have been hit the hardest, with an approximate 70% increase in overdoses treated in emergency departments.<sup>5</sup>

Opioid overdose is now the second leading cause of accidental death in the US, secondary to motor vehicle accidents.<sup>4,6</sup> The mortality associated with opioid use in the US has been devastating, with an estimated 130 Americans dying each day from opioid overdose.<sup>7</sup> Reports suggest that more people died from drug overdoses in 2014 than in any year on record, with most of those deaths (61%) involving opioids.<sup>8</sup> Moreover, in 2015, death from heroin alone surpassed gun homicides for the first time.<sup>9</sup>

Although there is much speculation regarding the cause of such significant escalation, research has associated the overprescribing of opioid pain relievers with a sharp increase in the prevalence of opioid dependence, which in turn

has been associated with a rise in heroin use and deaths from overdosing.<sup>10</sup> Data support this theory because 45% of people who used heroin were also dependent on prescription opioid painkillers.<sup>5</sup> Knowledge of the effects of overprescribing opioids, specifically oxyCODONE (OxyCONTIN) and HYDROcodone (Vicodin), has led to nationwide policy changes with more stringent guidelines that have significantly decreased the availability of prescription opioids. Unfortunately, because the actual demand for opioids has not been effectively addressed, people with opioid dependence may obtain opioids by any means necessary, consequently increasing the demand for illicit opioids.<sup>11</sup>

Although heroin remains the apparent drug of choice, compelling evidence has emerged indicating the involvement of other drugs, such as fentaNYL and carfentanil, which are having a significant impact on the crisis.<sup>1,12</sup> Individuals seeking heroin may unknowingly obtain a supply of heroin mixed with fentaNYL and/or carfentanil. As a result, they may be using a substance that is more potent than heroin alone, and placing themselves at increased risk of overdose and death.<sup>11,13</sup> For example, fentaNYL is 50 to 100 times more potent than morphine, and 50 times more potent than heroin.<sup>14</sup>

The purpose of this article is to educate health care professionals not only about the epidemiology and pharmacology of heroin, fentaNYL, and carfentanil use but also about the associated physiologic effects and health-related complications. In addition, useful management strategies are discussed, along with preventative measures and implications for practice and policy.

### **Epidemiology of Heroin, FentaNYL, and Carfentanil Use Heroin**

Heroin use is more prominent than ever in the US. The use of heroin has grown at a disturbing rate, and the overdose death rates have increased each year. In 2016, there were 15,469 heroin-related deaths in the US, a 19% increase from 2015.<sup>15</sup> The nationwide crackdown on the illegal distribution of prescription opioids triggered a shift to the use of cheaper and more readily available heroin. The incidence of heroin initiation was 19 times higher in individuals who previously used prescription opioids than in those who did not.<sup>16</sup> Heroin is a highly addictive opioid drug produced from morphine, a naturally occurring substance extracted from the seedpod of the Asian opium poppy plant. Heroin has been available for over 5,000 years and has been used for a variety of medical conditions.<sup>17</sup> Today, however, heroin is a schedule I controlled substance, which indicates that it has no approved medical use. Heroin is widely available, making it 1 of the most commonly used opiates. Because heroin use has increased in the US, suppliers are challenged to keep up with the unprecedented demand. In an effort to keep up with demand, suppliers have adopted deceptive practices to keep up with the supply while still maintaining the potency. Therefore, it is not uncommon to see heroin tainted with various additives, such as fentaNYL or fentaNYL analogs.<sup>13</sup> The danger is that persons who use opioids are often unaware of the additives and assume it is the usual heroin they are using.<sup>15</sup> In reality, the substance or substances they are injecting could be hundreds of times more potent than heroin and may lead to an increased risk of overdose and death.<sup>13</sup>

### **Fentanyl**

FentaNYL use started in 2013, and the current epidemic does not appear to be diminishing. Contributing factors for current fentaNYL usage include availability, profitability, a decrease in the availability of prescription opioids, and a significant number of opioid users.<sup>18</sup> FentaNYL and fentaNYL analogs have been associated with an increase in opioid overdoses. According to the Centers for Disease Control and Prevention, fentaNYL is the drug associated with most overdose deaths.<sup>2</sup> In New York City, for example, while fentaNYL accounted for less than 3% of the total drug overdoses before 2015, in 2016 heroin mixed with fentaNYL accounted for 61% of deaths from drug overdose.<sup>19</sup> A similar phenomenon was observed in Miami in 2016, when deaths from opioid overdose increased by 182% as a result of fentaNYL-laced heroin.<sup>13</sup>

FentaNYL was first developed by Dr Peter Janssen in Belgium in the 1960s and was used as an anesthetic, but in the 1970s it became a drug associated with recreational overdose.<sup>4</sup> FentaNYL is a synthetic opioid with potency 50 to 100 times greater than morphine and 50 times greater than heroin.<sup>20</sup> FentaNYL and fentaNYL analogs may be purchased through the Internet or on the dark Web (darknet) using a variety of different payment methods, such as credit cards, PayPal, and cryptocurrencies (eg, Bitcoin).<sup>18</sup> The majority of illicit fentaNYL and fentaNYLlike substances in the US is sourced by China.<sup>21</sup>

### **Carfentanil AND SYNTHETIC OPIOIDS**

Carfentanil, classified by the Drug Enforcement Agency as a fentaNYL analog, has recently entered the US drug market and has caused multiple deaths from overdose across the nation.<sup>4</sup> Developed by Janssen Pharmaceutica in 1974, carfentanil is not meant for human consumption. Instead, it is used as a sedative for large animals and marketed under the trade name Wildnil. At 10,000 times more potent than morphine and 100 times more potent than fentaNYL, carfentanil is the most potent commercial opioid in the world, with a lethal dose of carfentanil estimated at only 20 µg, an amount barely visible to the naked eye.<sup>22</sup> This powerful drug has recently been found in the heroin supply both on its own and in combination with other fentaNYL analogs and heroin. Intentional overuse of carfentanil is rare, because most informed persons who use opioids are aware of the extreme danger this drug poses. However, carfentanil was involved in 7.6% of all opioid-related deaths in the US between July and December 2016, and as such, it was the most common fentaNYL analog involved in deaths from opioid overdose.<sup>23</sup> In comparison, the fentaNYL analogs, furanyl fentaNYL and acetylfentanyl, were involved in 3.5% and 2.9% of deaths from opioid-induced overdose, respectively, during this same timeframe.<sup>23</sup> Ocfentanil is another synthetic fentaNYL analog that has been associated with overdose deaths in Europe. It is approximately 2.5 times more potent than fentaNYL, but with a shorter duration of action. Case reports of ocfentanil overdose deaths have begun to appear in the US and Canada, and the numbers will likely increase in the coming years.<sup>24</sup>

The production of novel synthetic opioids represents an ever-changing process as illicit drug manufacturers work to remain 1 step ahead of legislation. They continue to introduce novel drugs and as-yet unregulated compounds. The producers of these drugs typically make slight structural changes to avoid legislative control. The amendment to the Controlled Substance Act in 1986 states that a drug is classified as an analog if its chemical structure is similar to that of a controlled substance in schedule I or schedule II.

### **Pharmacology of Heroin, FentaNYL, and Carfentanil**

Opioids exert their effects in the body through the activation of opioid receptors in the brain and spinal cord. There are 3 main classes of opioid receptors designated mu, kappa, and sigma. The mu opioid receptors mediate most opioid effects regarding spinal and supraspinal analgesia, as well as respiratory depression, euphoria, and constipation. In the pain pathways of the brain and spinal cord, activation of the mu opioid receptors suppresses the release of pain-modulating neurotransmitters (substance P and glutamate) and inhibits the depolarization of pain-transmitting neurons.<sup>25</sup>

The human body produces several endogenous opioid peptides, which include β-endorphin, the enkephalins, the dynorphins, and nociceptin. The endogenous opioids are agonists at the various mu, kappa, and sigma opioid receptors, with the exception of dynorphin, which binds a distinct opioid-like receptor called the nociceptin opioid receptor (formerly called the opioid receptor-like 1). Although endogenous opioids do exert analgesic effects, their efficacy is significantly less than that of exogenous opioids such as morphine.<sup>25</sup>

### **Heroin**

Heroin is more potent than morphine, the archetypal opioid analgesic against which other opioid agonists are compared. Heroin is approximately 10 times more permeable at the blood-brain barrier than morphine. The rapid

penetration of the blood-brain barrier by heroin means that a person who uses opioids experiences a profound euphoric rush within several minutes of drug administration. This high can last for several hours after an injection. Heroin enters the brain quickly and is rapidly converted by hydrolysis into 6-monoacetyl morphine and then to morphine.<sup>26</sup> Both 6-monoacetyl morphine and morphine have higher affinities to central opioid receptors than heroin and are most likely responsible for most heroin effects in the central nervous system. To enhance elimination by the kidneys, morphine undergoes glucuronidation to morphine-3 and morphine-6 glucuronides. Although morphine-6-glucuronide does exert activity at opioid receptors, it is a hydrophilic molecule and crosses the blood-brain barrier with difficulty. Normal elimination of morphine and its metabolites from the body depends on good hepatic and renal function. Impairment of the liver or kidney can greatly enhance the duration of action for both morphine and its metabolites.<sup>26</sup>

### **Fentanyl**

FentaNYL is a high-potency, synthetic opioid. It may be administered orally or parenterally, but given its highly lipophilic nature, transdermal and buccal dosage forms are also available.<sup>18</sup> The highly lipophilic nature of fentaNYL allows it to cross the blood-brain barrier very quickly, and thus, it exerts a significantly more rapid onset of action in the brain than morphine.<sup>18</sup> The elimination half-life of fentaNYL is similar to that of morphine (2 to 4 hours).

Metabolism of fentaNYL occurs mainly through the actions of cytochrome P450 CYP3A4. The 3A4 family of enzymes is responsible for metabolizing a large number of different drugs and, as such, there is the potential for drug interactions with fentaNYL through 3A4 competition, induction, or inhibition. Some synthetic fentaNYL analogs, such as alfentanil, alpha-methylfentanyl, butyryl fentaNYL, SUFentanil, and carfentanil have appeared on the illicit drug market and as heroin additives.<sup>18</sup> Confirmed deaths of overdose from acetylfentanyl and butyryl fentaNYL were first reported in the US in 2013 and 2015, respectively.<sup>1</sup>

### **Carfentanil**

The extreme potency of carfentanil is likely because of its exceptionally high affinity for mu opioid receptors.<sup>18</sup> Limited data are available regarding the pharmacokinetics of carfentanil in humans. In healthy human volunteers, the half-life of carfentanil was 42 minutes when administered by intravenous bolus.<sup>18</sup> Carfentanil is metabolized by liver N-dealkylation and monohydroxylation. Although carfentanil metabolites do exhibit activity at mu opioid receptors, the parent carfentanil compound is responsible for most of the drug's action.<sup>18</sup>

### **Physiologic Effects of Opioid Use and Dependence**

Most evidence suggests that, when opioids are given at equipotent doses, the adverse effects they cause are similar. The most common acute adverse effects of opioid use include sedation, nausea, vomiting, pruritis, and dizziness.<sup>18</sup> When injected, opioids cause a euphoric rush that is accompanied by dry mouth, flushing, a feeling of heaviness, nausea, and itching. After this initial rush, users often become drowsy for several hours, mental function may be impaired, and cardiac and respiratory function can be slowed. Opioids exert powerful respiratory depressant effects through activation of central opioid receptors in the pons and brainstem. They decrease central respiratory drive, reduce tidal volume, and markedly decrease respiratory rate. Given its lipophilicity and high potency, fentaNYL can exert profound and rapid respiratory depressant effects, especially if injected.<sup>18</sup> In addition to its central respiratory depressant effects, recent studies suggest that fentaNYL may also increase chest wall rigidity, a factor that may increase its lethality in overdose deaths.<sup>27</sup> Opioids also exert a powerful inhibitory effect on the gastrointestinal tract through activation of peripheral mu opioid receptors. The resulting constipation can be clinically significant and does not generally improve with time.<sup>18</sup>

Although the short-term physiologic effects of opioids are well-defined, many of the long-term adverse effects are not as well understood. Opioids are highly addictive and can cause physical dependence, even with short-term use. The

underlying mechanism of opioid addiction is multifactorial and involves dopamine reward pathways, dysregulation of numerous neurotransmitter pathways, and neurotrophic changes in multiple neuronal pathways.<sup>28</sup> In a patient with physical dependence, opioid abstinence can result in a severe withdrawal syndrome. Symptoms of heroin withdrawal can begin within 6 to 12 hours after the last dose. Symptoms generally peak approximately 24 to 48 hours after the last dose and can last for several days.<sup>28</sup> With continued use, tolerance can develop to many of the physiologic effects of opioids. As tolerance develops, higher doses of opioids are needed for analgesia and euphoria. Although tolerance to the respiratory depressant effects of the opioids does occur, it may not be sufficient to prevent respiratory depression as the amount of opioid taken increases.<sup>29</sup> Tolerance generally does not occur to the constipating effects of opioids, and as a result, individuals using opioids will continue to experience this adverse effect.

With long-term use, opioids may also cause irreversible changes in the structure of the brain and permanently alter both neuronal and endocrine function. Persons who use opioids can experience long-term effects on their cognitive function, including decreases in attention span and concentration, as well as visual and verbal recall.<sup>30</sup> Lee and Pau<sup>31</sup> found that individuals with previous heroin dependence (even those who were abstinent for 18 months) exhibited poor impulse control and were more likely to engage in reckless behaviors when compared with those who did not use opioids. Chronic opioid use can alter many neural pathways, including those for gamma-aminobutyric acid, glutamate, and dopamine, on a cellular, biochemical and molecular level.<sup>28</sup> Many of these neural changes occur in pathways associated with drug reward and addictive behaviors such as the mesolimbic region, nucleus accumbens, and ventral tegmental area.<sup>28</sup>

Chronic opioid use may also affect the endocrine system and predispose persons who use opioids to a condition called opioid-induced androgen deficiency (OPIAD).<sup>32</sup> Opioid-induced hypogonadism may occur in chronic users as a result of suppression of the hypothalamic-pituitary-gonadal axis.<sup>32</sup> Symptoms of OPIAD may include reduced libido, irregular menses, fatigue, night sweats, osteoporosis, loss of muscle mass, depression, and hot flushes. Evidence suggests that OPIAD is underdiagnosed and undertreated.<sup>33</sup>

### **Management Strategies**

Maintaining airway patency, breathing, and circulation are priorities in the management of a suspected or confirmed case of opioid intoxication or overdose.<sup>18</sup> Once the patient is stabilized with airway, breathing, and circulation, the next critical priority for care is the administration of naloxone. Naloxone, whether intravenous, intramuscular, intranasal, subcutaneous, endotracheal, or sublingual may be administered to rapidly reverse central and peripheral opioid effects.<sup>1</sup> However, the onset of action for naloxone is usually within 5 minutes for subcutaneous routes, so parenteral routes are preferred because of the 30-second onset when given intravenously.<sup>18</sup> The intranasal route is beneficial in decreasing complications during administration and the risk of needle stick injuries, especially in settings outside of the hospital.<sup>18</sup> NARCAN (naloxone hydrochloride) nasal spray 4 mg is an opioid antagonist indicated for emergency treatment of a known or suspected opioid drug overdose when the person is experiencing respiratory and/or central nervous system depression. The onset of action for intranasal NARCAN is within 2 minutes.<sup>34</sup>

Determining the specific type of opioid overdose is often challenging because commonly used toxicologic testing does not include fentaNYL analogs. Furthermore, some fentaNYL analogs are difficult to differentiate, and specific testing for fentaNYL analogs varies across the US and over time.<sup>35</sup> Because of the uncertainty in the type and dosage of the opioid, the effectiveness of naloxone and its duration of action vary, thus requiring larger and repeated doses to reverse respiratory depression.<sup>1,13,18</sup> For example, treatment for a heroin overdose may include 1 to 2 doses of naloxone. However, in the case of carfentanil, multiple doses are often needed.<sup>24</sup>

Because traditional naloxone dosing protocols may be ineffective, additional naloxone infusions may also be indicated for the treatment of select fentaNYL analogs. Some patients may require an unusual amount of naloxone to reverse opioid-related effects.<sup>36</sup> FentaNYL, for example, is a rapid-acting and highly potent respiratory depressant with a duration of respiratory depression greater than that of heroin. In addition to its central depressant effects on respiratory centers, there is evidence that fentaNYL can directly increase chest wall rigidity and thus make reversal of respiratory depression more difficult.<sup>37</sup> Studies also suggest that fentaNYL and naloxone may share a transporter across the blood-brain barrier. It is possible that if the transporter becomes saturated with fentaNYL, it can lead to impaired transport of naloxone into the brain and thus impede its ability to antagonize the respiratory depressant effects of fentaNYL. Carfentanil is also a highly lipophilic, fast-acting, and extremely potent fentaNYL analog that can cause very rapid and profound respiratory depression that may be particularly difficult to reverse with standard naloxone doses.<sup>22</sup> Moreover, reversing any opioid-induced respiratory depression can be complicated by the presence of alcohol or other drugs of abuse, which can suppress the central nervous system. Research continues into the development of new and better alternatives to naloxone for the treatment of overdoses that result from high potency, long-acting synthetic opioids.

Although greater availability of naloxone has provided a first-line treatment for acute opioid overdose, it does not provide any long-term solutions to the opioid crisis. A 2017 study by Weiner et al<sup>38</sup> examined the 1-year mortality of patients who received naloxone through emergency medical services for an opioid overdose. The study found that 10% of patients who survived the initial overdose died within 1 year from an opioid overdose, and of these deaths, over 50% were within 1 month of the initial overdose. Patients who survive an opioid overdose should thus be considered very high risk and should receive treatment for their opioid addiction as soon as possible after their overdose.

After stabilization of patients, additional measures are available to aid in recovery from opioid addiction. Treatment options should be discussed with patients to determine the appropriate course of action. For example, several Food and Drug Administration–approved medications are available for the medical management of opioid dependence. Both methadone (Dolophine, methadose) and buprenorphine (Suboxone, Subutex, Probuphine, and Sublocade) suppress withdrawal and relieve cravings, whereas naltrexone (Vivitrol) assists in the maintenance of abstinence after detoxification by blocking the effects of opioids at their receptor sites in the brain.<sup>39</sup> ED health care providers should be knowledgeable about the various treatment options including medication-assisted treatment (MAT) centers in their community to facilitate patient access to care and to make the appropriate referrals. MAT centers combine the use of medications with counseling and behavioral therapy, which is considered the standard of treatment of opioid use disorder.<sup>39</sup> For patients who want treatment, access to MATs is a crucial component to help patients recover from opioid use disorders.<sup>40</sup>

In addition to the use of medications, behavioral therapies that aid substance abuse patients in adopting healthier lifestyles and modifying their drug-related attitudes and behaviors are available.<sup>39</sup> The most commonly used therapies are cognitive behavioral therapy, multidimensional family therapy, motivational interviewing, and contingency management, although there are several other evidence-based treatment modalities supported by National Institute on Drug Abuse for the treatment of substance abuse. Moreover, substance abuse treatment may be delivered at varying levels of intensity and in diverse settings (inpatient, outpatient, and therapeutic communities) that are often tailored to the needs and preferences of the client.<sup>39</sup> The best course of treatment is often achieved through an individualized combination of therapies and services, including but not limited to clinical and case management, recovery support programs, continuing care, HIV/AIDS services, medical and mental health services, legal services, and family services.<sup>40</sup>

First responders, emergency nurses, physicians, and other health care providers are the staff who play important roles in the care and management of opioid overdose patients. Currently, the management of overdoses related to fentaNYL and fentaNYL analogs includes supportive care and naloxone. In addition, ED health care providers do not consistently receive formal education on the management of opioid overdoses that include highly potent agents such as fentaNYL and fentaNYL analogs. Although accidental exposure by first responders poses a safety threat, the risk of clinically significant exposure is extremely low. Nonetheless, both the American College of Medical Toxicology and the American Academy of Clinical Toxicology recommend the use of nitrile gloves to provide sufficient protection for routine handling, and the use of a N95 respirator where drug particles or droplets are suspended in the air.<sup>41</sup> It is recommended that all professionals likely to encounter such drugs receive education about the manifestations of opioid intoxication and that naloxone is readily available. Professionals should be competent to provide medical assistance and administration of naloxone if indicated.<sup>41</sup>

### **Nursing Implications**

Nurses and other health care providers play an important role in educating persons at high risk for opioid overdose, family members, and others, about opioid dependence being a chronic disorder and how to prevent and manage opioid overdose. Interventions should include the availability of naloxone to users, first responders, and significant others to prevent respiratory depression and to reverse the overdoses often associated with heroin, fentaNYL, and carfentanil. Education should include information explaining that when heroin is laced with fentaNYL and carfentanil, 6 or more naloxone doses may be required, and even then may not succeed. The public and family members need to be encouraged to call 911 if they suspect opioid overdose. In addition, users should be educated not to use alone. Emergency nurses are in an ideal position to help reduce the impact of opioid dependence. When seeing patients in the emergency department, nurses can assess for persons who use opioids through the use of several standardized assessment tools, such as the Drug Abuse Screening Test, which is a 10-item self-report tool that has been found to be valid, sensitive, and reliable for the screening of substance use disorders.<sup>42</sup> The CAGE (cut down, annoyed, guilty, eye opener) questionnaire adapted to include drug use is a quick tool to assess for drinking and drug use.<sup>43</sup> Another brief self-report tool that may be used in the emergency department for adult patients includes the Opioid Risk Tool, which assesses risk for opioid abuse among individuals prescribed opioids for treatment of chronic pain. Patients categorized as high risk are at an increased likelihood of future abusive drug-related behaviors. The test can be administered and scored in less than 1 minute.<sup>44</sup>

Emergency nurses can identify high-risk patients and advocate for appropriate patient referral for substance dependence treatment, as well as for the dispensing of naloxone to the family and friends of the at-risk patient. Emergency nurses can also play an important role in the education of the patient and significant others and can work with providers to help develop treatment plans that minimize use of opioids or opioid alternatives.<sup>45</sup> Emergency nurses may advocate for initiating buprenorphine for opioid-dependent patients on presentation to the emergency department. ED-initiated buprenorphine treatment for opioid dependence is associated with a decrease in self-reported opioid use and greater engagement in treatment.<sup>46,47</sup>

Policy implications should include the enactment of broad-based legislation that rapidly adds all new synthetic opioid agonists to Drug Enforcement Agency schedule I similar to the Synthetic Drug Abuse Prevention Act of 2012. In addition, all prescribers should use the state Prescription Drug Monitoring Program. To prevent opioid dependence and death, sustained vigilance is required. Universally accepted evidence-based practice guidelines need to be developed to guide health care providers in the management and treatment of opioid-dependence disorders. Global efforts to reduce the supply of these illicit opioids, including heroin, fentaNYL, and fentaNYL analogs, must be made.

### **Conclusion**



Opioid overdose continues to be a major public health problem in the US. Overdoses involving an opioid have increased because of the use of heroin and synthetic opioids, such as fentaNYL and its analogs. Persons who use heroin may be unaware that it contains fentaNYL and fentaNYL analogs, creating a potentially lethal combination. To address this growing problem, an increased number of naloxone doses may be necessary to reverse overdoses with heroin, fentaNYL, and carfentanil combinations.<sup>48</sup> Education about fentaNYL and fentaNYL analogs could also reduce mortality among illicit drug users. Efforts must be made to improve naloxone availability to emergency response personnel and those in contact with at-risk persons.

#### Author Disclosures

Conflict of interest: none to report.

## DETAILS

<b>Subject:</b>	Emergency medical care; Epidemiology; Accidental deaths; Narcotics; Drug overdose; Heroin; Pain; Opioids; Overdoses; Opiates; Fentanyl; Emergency services; Suppliers; Medical screening; Professional practice
<b>Business indexing term:</b>	Subject: Suppliers
<b>Location:</b>	United States--US
<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	1
<b>Pages:</b>	26-33
<b>Publication year:</b>	2020
<b>Publication date:</b>	Jan 2020
<b>Section:</b>	Clinical
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal

Language of publication:	English
Document type:	Journal Article
DOI:	<a href="https://doi.org/10.1016/j.jen.2019.08.005">https://doi.org/10.1016/j.jen.2019.08.005</a>
ProQuest document ID:	2333904528
Document URL:	<a href="https://www.proquest.com/scholarly-journals/deadly-trio-heroin-fentanyl-carfentanil/docview/2333904528/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/deadly-trio-heroin-fentanyl-carfentanil/docview/2333904528/se-2?accountid=211160</a>
Copyright:	©2019. Emergency Nurses Association
Last updated:	2023-06-21
Database:	Public Health Database

Document 53 of 55

## Editorial Board: JEN

[ProQuest document link](#)

### FULL TEXT

\_TVM:UNDEFINED\_

### DETAILS

Publication title:	Journal of Emergency Nursing;; JEN; Philadelphia
Volume:	46
Issue:	1
Pages:	A7-A8
Publication year:	2020
Publication date:	Jan 2020
Publisher:	Elsevier Limited
Place of publication:	Philadelphia
Country of publication:	United Kingdom, Philadelphia

<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English
<b>Document type:</b>	General Information
<b>DOI:</b>	<a href="https://doi.org/10.1016/S0099-1767(19)30560-4">https://doi.org/10.1016/S0099-1767(19)30560-4</a>
<b>ProQuest document ID:</b>	2333904497
<b>Document URL:</b>	<a href="https://www.proquest.com/scholarly-journals/editorial-board/docview/2333904497/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/editorial-board/docview/2333904497/se-2?accountid=211160</a>
<b>Copyright:</b>	Copyright Elsevier Limited Jan 2020
<b>Last updated:</b>	2020-01-07
<b>Database:</b>	Public Health Database

Document 54 of 55

## Information for Readers: JEN

[ProQuest document link](#)

### FULL TEXT

\_TVM:UNDEFINED\_

### DETAILS

<b>Publication title:</b>	Journal of Emergency Nursing;; JEN; Philadelphia
<b>Volume:</b>	46
<b>Issue:</b>	1
<b>First page:</b>	A12
<b>Publication year:</b>	2020

Publication date:	Jan 2020
Publisher:	Elsevier Limited
Place of publication:	Philadelphia
Country of publication:	United Kingdom, Philadelphia
Publication subject:	Medical Sciences--Nurses And Nursing
ISSN:	00991767
e-ISSN:	15272966
Source type:	Scholarly Journal
Language of publication:	English
Document type:	General Information
DOI:	<a href="https://doi.org/10.1016/S0099-1767(19)30561-6">https://doi.org/10.1016/S0099-1767(19)30561-6</a>
ProQuest document ID:	2333904491
Document URL:	<a href="https://www.proquest.com/scholarly-journals/information-readers/docview/2333904491/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/information-readers/docview/2333904491/se-2?accountid=211160</a>
Copyright:	Copyright Elsevier Limited Jan 2020
Last updated:	2020-01-07
Database:	Public Health Database

Document 55 of 55

# Prehospital and Transport Nursing: The Next 50 Years: JEN

[ProQuest document link](https://www.proquest.com/scholarly-journals/information-readers/docview/2333904491/se-2?accountid=211160)

## ABSTRACT (ENGLISH)

As the Emergency Nurses Association (ENA) celebrates 50 years since its founding in 1970, transport nursing is also approaching this same milestone. Outside of the military, transport nursing was formally established 47 years ago in 1972 with the founding of the first dedicated civilian helicopter service. Nurses caring for patients during transport have a storied history, evolving from a recognized need to keep patients safe even when not in a hospital setting. Transport nursing established its roots when nurses strove to meet the immediate needs of their patients by

innovating ways to transfer patients, often with limited to no dedicated transport resources. I recall stories from my mentors of how hospital-based nurses would conduct impromptu transfers of a preterm newborn from a small rural hospital to an academic medical center in the back of a hearse. I recall how they would retrofit a bus to serve as a “mobile intensive care unit” capable of transferring multiple patients before the establishment of ambulances as we know them today. Today, patient transport has evolved into highly dedicated and specialized teams that are often based on the needs of the patient, available at a moment’s notice, and usually anchored by nurses that transport patients via rotor-wing (helicopter), fixed-wing (airplane/jet), or the ground (ambulance). Patient transfers range from scene responses, where the transport team assumes care of the patient in the prehospital setting (eg, motor vehicle crash and stroke in a remote setting) to transferring patients between hospitals for higher levels of care. Because of increasing hospital closures and consolidation of specialty services at large urban academic medical centers, transport teams are increasingly relied upon to transfer severely ill or injured patients to the appropriate level of care. The transport industry has evolved from a few transport options in the beginning to a current state of oversaturation that is now transitioning into contraction.

## FULL TEXT

As the Emergency Nurses Association (ENA) celebrates 50 years since its founding in 1970, transport nursing is also approaching this same milestone. Outside of the military, transport nursing was formally established 47 years ago in 1972 with the founding of the first dedicated civilian helicopter service.<sup>1</sup> Nurses caring for patients during transport have a storied history, evolving from a recognized need to keep patients safe even when not in a hospital setting. Transport nursing established its roots when nurses strove to meet the immediate needs of their patients by innovating ways to transfer patients, often with limited to no dedicated transport resources. I recall stories from my mentors of how hospital-based nurses would conduct impromptu transfers of a preterm newborn from a small rural hospital to an academic medical center in the back of a hearse. I recall how they would retrofit a bus to serve as a “mobile intensive care unit” capable of transferring multiple patients before the establishment of ambulances as we know them today.

Today, patient transport has evolved into highly dedicated and specialized teams that are often based on the needs of the patient, available at a moment’s notice, and usually anchored by nurses that transport patients via rotor-wing (helicopter), fixed-wing (airplane/jet), or the ground (ambulance). Patient transfers range from scene responses, where the transport team assumes care of the patient in the prehospital setting (eg, motor vehicle crash and stroke in a remote setting) to transferring patients between hospitals for higher levels of care. Because of increasing hospital closures and consolidation of specialty services at large urban academic medical centers, transport teams are increasingly relied upon to transfer severely ill or injured patients to the appropriate level of care.<sup>2,3</sup>

The transport industry has evolved from a few transport options in the beginning to a current state of oversaturation that is now transitioning into contraction.<sup>4</sup> The use of helicopters continues as a major mode of transport, often without critically examining whether this intervention is necessary or improves patient outcomes. Major national initiatives such as the Cancer Moonshot<sup>5</sup> and All of Us<sup>6</sup> campaigns are model visions for the future of health care that recognize and prioritize improved access and personalization of care. We, as a transport specialty, have spent the last almost 50 years establishing the practice and the industry that have saved countless lives. Now, just as the rest of health care embarks on a major transformation focused on improving the quality and precision of care, so too must we.

ENA’s position statement, “Interfacility Transfer of Emergency Care Patients,” coupled with professional ethical principles (eg, nonmaleficence, beneficence, and respect for persons) provide the foundation to guide our transformation.<sup>7,8</sup> Evolving prehospital care and transport nursing into the next era will require us to grapple with the extremely complex problems of examining *if*, *how*, and *when* to best move patients.

*If* we should move a patient is a question that often remains unasked. I have completed countless transfers where many involved have questioned why we were transferring the patient. My own clinical experiences range from moving patients by air that clearly would not benefit from transfer (eg, in case of a devastating head bleed), to the use of helicopters to move patients not experiencing a time-sensitive condition. There are circumstances where

transfer via helicopter is the only option, such as in the Great Plains region of the United States, where hospitals are separated by hundreds of miles and a primary helicopter or fixed-wing response is the only transport option. However, in more populous settings where multiple transport programs and transport options exist within the same geographic region, the decisions of *if* and *how* to transfer become more complicated. Each transfer decision depends on many factors (eg, patient/family choice, local referral practices, and local resources), thus the complicated nature of this problem and the current need to generate evidence in pursuit of personalizing care and improving quality.

When the possibility of transferring a patient is introduced, once the process is initiated, the health care team must ensure that the transport is necessary and ethical and resist following the idiomatic path of least resistance. ENA position statement 1 specifically addresses this obligation: “Emergency nurses advocate for and facilitate patient transfers where they promote patient well-being and optimal patient outcomes.”

There are cases when transfer may not be in the best interest of the patient. Like common practice in end-of-life decisions and circumstances, we need to slow down and consider what priority goals we are actually trying to accomplish. In the case of a terminally ill patient being considered for transfer for a second opinion, we must routinely consider the impact of relocating the patient and family away from their home community, along with the financial and emotional impact the transfer may have. Even though the patient is critically ill, do they require a helicopter? It is not uncommon for patients to be transferred and after several days or weeks of further workup, receive the same prognostic outcome, resulting in substantial additional costs and burden for the patients and their families with little to no associated benefit from the transfer. Alternatively, we must also strive to return the patient currently in our care to their home or local communities, when possible, for the same aforementioned reasons.

The decision to transfer a patient touches upon several ethical principles:<sup>8</sup> (1) beneficence—whether the patient will benefit from this transfer, (2) nonmaleficence—whether the patient will be harmed (eg, financially), and (3) respect for persons—whether we have and are providing adequate information to make a fully informed decision related to the risk and associated cost, both short and long term, related to the transfer? These are just some of the questions we must remember to address to improve the quality and precision of the care we deliver.

*If* we decide to transfer the patient, then *how* (eg, helicopter transfer, depending on distance, can cost more than \$60,000)? Does the patient actually require a helicopter, or can they be transferred by a qualified ground critical care transport nurse and team? Current practice is to routinely use helicopters to transfer patients when the severity of illness is deemed high, with little consideration for cost effectiveness or clinical benefit. We have plenty of evidence that supports the positive impact that helicopters yield during time-sensitive conditions such as trauma and myocardial infarction.<sup>9-15</sup> The use of helicopters in these time-critical situations is uncontroversial. However, there is no evidence to support the use of helicopters in non-time-sensitive conditions. Does a 20- to 30-minute air transfer versus a 60- to 90-minute ground transfer actually provide measured benefit, considering that many patients have been admitted for many hours or days before transfer? The rationale driving this use of helicopters is to reduce the out-of-hospital time that the patient experiences, citing concerns for equipment malfunction and safety events, or that air crews are more highly trained and provide a higher level of care.<sup>16</sup> In my opinion, it is easier to care for patients in ambulances that offer more room and less noise restrictions than helicopters, the cost is substantially less (often one third or less than the price of air transfer),<sup>17</sup> and often the same crews that transfer patients by air can also do so by ground. In this issue, Menard and Menard's article entitled, “Thinking Outside the Box in Rural Trauma Transport: A Case Review,” describes the circumstances surrounding the *if* and *how* related to a prehospital trauma transfer case, explicating the challenges of providing care in low-resource settings.<sup>18</sup>

Finally, we must also consider *when* to transfer. Again, for time-sensitive emergencies such as myocardial infarction or neurological emergencies, robust transfer networks and protocols continue to be developed and used. Even when a time-sensitive condition is present, we must balance additional considerations related to patient and transport crew safety. Additional considerations include weather (eg, snow storm) and other transport related factors such as availability of an appropriate transport crew (eg, perfusion for patients on extracorporeal membrane oxygenation therapy, neonate team). For example, it is safer for the patient and transport crew to stay at a referring facility while

weather clears, rather than to attempt the transport by ground. In some of these weather-related cases, the patient ends up arriving at the receiving facility within the same time frame whether they were immediately transferred by ground or waited several hours and were then transferred by air or ground.

For the conditions not requiring time-sensitive treatment, the decision of when to transfer is not always a straightforward consideration. There are times when patients may not appear to be sick, but given their history, may be better served at a larger hospital. Transferring those patients earlier in their hospital trajectory, by ground, before they progress in acuity, may improve outcomes and reduce overall use of health care resources and total expenditure. My own program of research is focused on leveraging electronic health record data and artificial intelligence to identify patients that would benefit from early transfer or who would not benefit from helicopter transfer with the goal of developing decision support tools to improve transport utilization and posttransport outcomes.<sup>19,20</sup> Pragmatically, we must also consider the actual time of transfer. Although hospitals want to maximize “patient in bed” times related to bed occupancy, do we really need to transfer a patient in the middle of the night, or can the transfer wait until morning? From a patient’s perspective, undergoing interhospital transfer is a grossly disruptive process,<sup>21</sup> even more so when conducted at night when we normally attempt to minimize patient contact and sleep disruptions. Furthermore, conducting transfers overnight also negatively impacts the transport crews, many of whom are on 24-hour shifts or are called in from home to complete longer fixed-wing missions. The patient experience during interhospital transfer has received little attention, is a prime area for future qualitative and quantitative inquiry, and aligns with ENA position statement 7 to improve patient-care strategies: “Emergency nurses advocate for further research and collaborate with Emergency Medical Services to examine transfer risks and identify improved patient-care strategies.”

Transitioning transport nursing in the next 50 years will require dedicated training programs and research to address the complex questions of *if*, *how*, and *when* to move patients.

Several articles in this issue of the *Journal of Emergency Nursing* present such approaches. Ogle et al’s article<sup>22</sup> entitled, “A Nursing Skills Fair in an Austere Military Environment,” provides an overview and initial results of a training program that was developed to quickly orient and train providers in a new field hospital. Similarly, Leggio’s article<sup>23</sup> entitled, “Advanced Placement Paramedic Education for Health Care Professionals: A Descriptive Evaluation,” presents results of an education program to educate and train hospital-based providers in paramedicine, highlighting the need for additional training of hospital-based providers to function in the prehospital/ambulance setting. Taking an alternative approach, Nilsson et al’s article<sup>24</sup> entitled, “Development and Validation of the Ambulance Nurse Competence Scale,” discusses the development of a tool to assess nurses’ transition to ambulance transport.

We have made great strides in prehospital and transport nursing. As evidenced by the work presented in this issue, we are beginning to address the issues of *if*, *how*, and *when* head-on. Just as our predecessors did, we must continue to develop new lines of inquiry, innovate new approaches to providing care in prehospital and transport settings, and as ENA position statement 6 explicates, “Emergency nurses actively engage in policy development specifically for interfacility transfer,” continue to engage in advocacy and policy efforts. I am confident that the next 50 years will see dramatic improvements in the quality of care provided to our patients and ourselves as emergency transport nurses.

## DETAILS

**Subject:** Emergency medical care; Ethics; Nurses; Clinical outcomes; Patients; Helicopters; Teams; Heart attacks; Nursing care

**Publication title:** Journal of Emergency Nursing; JEN; Philadelphia

<b>Volume:</b>	46
<b>Issue:</b>	1
<b>Pages:</b>	8-11
<b>Publication year:</b>	2020
<b>Publication date:</b>	Jan 2020
<b>Section:</b>	Guest Editorial
<b>Publisher:</b>	Elsevier Limited
<b>Place of publication:</b>	Philadelphia
<b>Country of publication:</b>	United Kingdom, Philadelphia
<b>Publication subject:</b>	Medical Sciences--Nurses And Nursing
<b>ISSN:</b>	00991767
<b>e-ISSN:</b>	15272966
<b>Source type:</b>	Scholarly Journal
<b>Language of publication:</b>	English
<b>Document type:</b>	Editorial
<b>DOI:</b>	<a href="https://doi.org/10.1016/j.jen.2019.11.008">https://doi.org/10.1016/j.jen.2019.11.008</a>
<b>ProQuest document ID:</b>	2333904406
<b>Document URL:</b>	<a href="https://www.proquest.com/scholarly-journals/prehospital-transport-nursing-next-50-years/docview/2333904406/se-2?accountid=211160">https://www.proquest.com/scholarly-journals/prehospital-transport-nursing-next-50-years/docview/2333904406/se-2?accountid=211160</a>
<b>Copyright:</b>	©2019. Emergency Nurses Association
<b>Last updated:</b>	2020-01-13
<b>Database:</b>	Public Health Database



## Bibliography

Citation style: APA 6th - Annotated with Abstracts - American Psychological Association, 6th Edition

The power of self-compassion: JEN. (2020). *Journal of Emergency Nursing*, 46(2), 135.  
doi:<https://doi.org/10.1016/j.jen.2020.01.002>

In the emergency department or other emergency care settings, there is very little downtime. Contrary to inferences made by my state representatives that nurses relax and play cards during shifts, we all know the reality of our care settings. Or this moment can take place at unexpected times, such as when we are logging into our electronic medical record, and instead of experiencing frustration that the program is not moving quickly enough, we use that moment to contemplate.

Retention of tourniquet application skills following participation in a bleeding control course: JEN. (2020). *Journal of Emergency Nursing*, 46(2), 154-162. doi:<https://doi.org/10.1016/j.jen.2019.10.020>

**Introduction**The American College of Surgeons' Stop the Bleed program has trained more than 1 million individuals to recognize and treat external hemorrhage. Central to this training is tourniquet application. No published studies review the retention of this skill after initial class participation.**Methods**One hundred fourteen volunteers agreed to participate. A random sample of 57 was selected and 46 participated. Upon return 6 months later, each participant demonstrated tourniquet application. An observer compared the application process with steps on a checklist. Each step completed correctly was tallied, and the total score for all 10 steps was computed as a percentage correct between 0% and 100%.**Results**The baseline score on the tourniquet skill test was 100% following initial training. At 6 months, mean scores were lower, 69% (SD = 31%) ( $\chi^2 = 52.09$ ,  $df = 1$ ,  $P < 0.001$ ). Fourteen volunteers (30%) attained a score of 100%, and 28 volunteers (61%) achieved a passing score. Bleeding was stopped or reduced to non-life-threatening levels by 34 participants (74%). Participants with passing scores were more likely to stop or reduce the bleeding than those with failing scores (97% vs 35%;  $\chi^2 = 20.99$ ,  $df = 1$ ,  $P < 0.001$ ). Of the 17 volunteers who failed, 18% stopped the bleeding, 18% slowed bleeding to a non-life-threatening level, and 64% were unable to control bleeding.**Discussion**At 6 months, 39% of participants were unable to successfully apply a tourniquet, and 26% were unable to control life-threatening bleeding. This study demonstrates that refresher training is needed within 6 months of initial training.

Esophageal perforation after cervical spine fusion presenting with dysphagia and a burning sensation: JEN. (2020). *Journal of Emergency Nursing*, 46(2), 220-224. doi:<https://doi.org/10.1016/j.jen.2018.12.019>

Anterior cervical spinal surgery is, at present, one of the most effective clinical methods of treating cervical spinal stenosis.<sup>1</sup> Dysphagia occurs in 71% of patients during the first 2 weeks after surgery and gradually decreases with time; the use of steroid medications can significantly reduce the incidence and severity of postoperative dysphagia.<sup>2,3</sup> When a patient who has been taking steroids continues to experience dysphagia or burning throat pain, strong consideration must be given to other rare postoperative complications. ...]of triage, the patient appeared in no distress and was classified as category III according to the Taiwan Triage and Acuity Scale (a 5-level triage scale modified from the Canadian Triage and Acuity Scale CTAS), had a Glasgow Coma Scale score of 15, and the following vital signs: temperature of 38.2°C (100.8°F), respirations of 18/min, pulse of 108/min, and blood pressure of 108/62 mm Hg. Laboratory tests showed an increased white blood cell count of 10.66/mm<sup>3</sup> with 79.0% of segmented neutrophils, elevated C-reactive protein (CRP) of 24.52 mg/dL, and erythrocyte sedimentation rate (ESR) of 34 mm/h. The patient was subsequently discharged from the hospital 42 days after readmission.**Discussion**Anterior cervical spine surgery is a common procedure for treatment of cervical spondylosis with spinal stenosis, and it has a high rate of success with long-term effectiveness.<sup>1</sup> Possible complications of the procedure include vocal-cord paralysis (incidence: 0.07%), postoperative hematoma (incidence: 0.1 to 0.5%), wound infections (incidence: 0.1% to 1.6%), esophageal perforation (incidence: 0.2% to 1.15%), dural tear and cerebrospinal fluid leakage (incidence: 0.3% to 13%), and dysphagia (incidence: 71%).<sup>1,2</sup> One of the most notable aspects of this case was that although the patient presented with the common complication of dysphagia, his problem turned out to be the rare and potentially fatal complication of esophageal perforation.

Tailoring a comprehensive bundled intervention for ED fall prevention: JEN. (2020). *Journal of Emergency Nursing*, 46(2), 225-232.e3. doi:<https://doi.org/10.1016/j.jen.2019.11.010>

**Introduction**Falls in the emergency department pose an important challenge for patient safety. Multifactorial fall prevention bundles have been associated with a reduction in patient falls in the inpatient setting. The purpose of this project was to tailor and implement a comprehensive fall prevention bundle in our emergency department.  
**Methods**Fall bundle components for this intervention were selected on the basis of a review of fall prevention research and included fall risk assessment, safe ambulation, safe toileting, staff communication, early warning, and patient education. The fall risk assessment was tailored to the emergency department through an appraisal of select inpatient fall risk assessments, literature search for ED-specific fall risk factors, and a site-specific chart review, after which pertinent fall risk factors were integrated into a modified screening. Fall prevention materials that were both practical and applicable to the emergency department and facilitated patient safety along each bundle domain were selected for implementation at our site.  
**Results**The tailored fall prevention bundle was championed by the interdisciplinary ED Fall Prevention Team and implemented over the course of 5 months in 1 emergency department. Education on fall prevention equipment was delivered in a peer-to-peer format, and an online module was designed to guide staff through the new fall risk assessment. The fall prevention bundle was adopted into clinical practice after staff education was completed, and the fall risk screening was merged into the electronic medical record.  
**Discussion**ED fall prevention requires a comprehensive bundled approach, which includes a fall risk screening and multifactorial interventions that are tailored to the ED setting. Successful implementation relies on the involvement of front-line staff from the design through the delivery of the bundled fall prevention measures. Continued inquiry and innovation in ED fall prevention will help provide a safer health care environment and improve patient outcomes.

Customizing physiologic alarms in the emergency department: A regression discontinuity, quality improvement study: JEN. (2020). *Journal of Emergency Nursing*, 46(2), 188-198.e2. doi:<https://doi.org/10.1016/j.jen.2019.10.017>

**Introduction**Clinical alarms promote patient safety by alerting clinicians when there is an indication or change in a condition requiring a response. An excessive volume of alarm fires, however, contributes to sensory overload and desensitization, referred to as alarm fatigue, which has significant implications when alarms are missed. This evidence-based, practice project aimed to implement and evaluate a program that reduces the number of clinically nonactionable, physiologic alarms in an emergency department. Although alarm fatigue is an important negative consequence, the focus of this project is not on alarm fatigue but on measures to reduce the volume of clinically nonactionable alarms that lead to alarm fatigue. The Iowa Model was used as a conceptual framework.  
**Methods**This project involved adjusting default alarm settings and implementing an education plan on the safe use of alarms. The sample population included all patients on physiologic monitors at an emergency department. Retrospective data were collected, and regression discontinuity design was applied to compare the rate of alarm fires triggered by the physiologic monitor between pre- and postimplementation of an alarm protocol.  
**Results**A significant change in the rate of alarm fires occurred with an estimated reduction of 14.96 ( $P = 0.003$ ). There were no reports of adverse outcomes such as a delay in responding to a change in patient condition or delay leading to cardiopulmonary arrest.  
**Discussion**A reduction in nonactionable, physiologic alarms was attained after implementing multimodal strategies inclusive of adjusting default settings, staff education on managing alarms, and emphasis on staff accountability.

Code critical: Improving care delivery for critically ill patients in the emergency department: JEN. (2020). *Journal of Emergency Nursing*, 46(2), 199-204. doi:<https://doi.org/10.1016/j.jen.2019.04.001>

**Problem**Although certain critically ill patients in emergency departments—such as those experiencing trauma, stroke, and myocardial infarction—often receive care through coordinated team responses, resource allocation and care delivery can vary widely for other high-acuity patients. The absence of a well-defined response process for these patients may result in delays in care, suboptimal outcomes, and staff dissatisfaction. The purpose of this quality improvement project was to develop, implement, and evaluate an ED-specific alert team response for critically ill medical adult and pediatric patients not meeting criteria for other medical alerts.  
**Methods**Lean (Lean

Enterprise Institute, Boston, MA) principles and processes were used to develop, implement, and evaluate an ED-specific response team and process for critically ill medical patients. Approximately 300 emergency nurses, providers, technicians, unit secretaries/nursing assistants, and ancillary team members were trained on the code critical process. Turnaround and throughput data was collected during the first 12 weeks of code critical activations (n = 153) and compared with historical controls (n = 168). Results After implementing the code critical process, the door-to-provider time decreased by 62%, door to laboratory draw by 76%, door-to-diagnostic imaging by 46%, and door-to-admission by 19%. A year later, data comparison demonstrated sustained improvement in all measures. Discussion Emergency nurses and providers see the value of coordinated team response in the delivery of patient care. Team responses to critical medical alerts can improve care delivery substantially and sustainably.

Complexities of identifying posterior cerebral artery cerebrovascular stroke: JEN. (2020). *Journal of Emergency Nursing*, 46(2), 210-213. doi:<https://doi.org/10.1016/j.jen.2019.02.001>

Delays in treatment are associated with long-term disability as well as substantial financial burdens.<sup>3</sup> On average, patients will incur \$21,500 in acute-care hospital bills alone.<sup>4</sup> The most recent estimate of financial burden from 2012 reports that the United States spends 34 billion dollars in indirect and direct costs related to care of patients with stroke. According to the National Health Interview Survey, more than 73% to 90% of people were able to identify the most 5 common cardiovascular-related signs and symptoms and “would call 9-1-1 right away if someone was having a stroke.” According to the American Heart Association (AHA), best-practice stroke guidelines include having a stroke protocol in place for pre-hospital and hospital providers. Hospitals should have a goal of door-to-CT scan within 20 minutes and a door-to-needle time of less than 60 minutes if the patient is eligible for tissue plasminogen activator (t-PA) intravenous therapy (IV-tPA).<sup>13</sup> Care should be taken to obtain a blood glucose reading as well to ensure that hypoglycemia is not imitating a stroke.

Advanced practice registered nurses in the emergency care setting: JEN. (2020). *Journal of Emergency Nursing*, 46(2), 205-209. doi:<https://doi.org/10.1016/j.jen.2019.12.011>

APRNs have existed for more than 50 years and are established members of emergency care teams throughout the United States (US) and in many countries worldwide.<sup>2-6</sup> Nearly a decade ago, the Institute of Medicine identified APRNs as necessary for the future of health care delivery in the US.<sup>7,8</sup> Since then emergency departments (EDs) in the US and abroad have become increasingly overcrowded, in part due to their status as a health care safety net for those who cannot access a primary care provider.<sup>9,10</sup> It is estimated that EDs provide more than 47% of all hospital-associated health care in the US.<sup>9</sup> As a result, there is currently a substantial mismatch between the need for emergency services and the available resources to provide that care.<sup>10</sup> APRNs have been identified as particularly important for bridging this gap in both urban and rural settings.<sup>11-14</sup> The regulatory landscape for APRNs in the US continues to evolve, and APRNs who work in the emergency care setting face a few unique licensing and certification challenges. The Consensus Model’s licensing paradigm could create barriers to APRN practice in the emergency care setting because it would require APRNs who treat the full population of the emergency care setting to complete three courses of graduate study and to obtain and maintain three certifications (eg, Family Nurse Practitioner, Adult-Gerontological Acute Care Nurse Practitioner, and Pediatric Acute Care Nurse Practitioner).<sup>1,17</sup> CNSs, for whom there are fewer courses of study than for NPs, would be required to have and maintain 2 licenses (Adult-Gerontology CNS and Pediatric CNS), but they would be restricted to either primary or acute care.<sup>18</sup> ENA Position The following are the positions of the Emergency Nurses Association (ENA): APRNs are established members of the emergency care team and are critical to the future of quality health care across the US and worldwide. Background The emergency care setting is unique when compared to most other practice settings in that its patient population consists of all ages and all combinations of medical history and chief complaint, rather than a narrow subset of them, as is the case with most other specialties (eg, pediatric oncology, adult cardiology, etc).<sup>19</sup> Although some APRNs only treat a subset of the patients in the emergency care setting, for example, only pediatric patients or only adults with urgent or chronic needs, other APRNs are called upon to treat all patients and conditions, from nonemergent, episodic chronic care to acute, complex, life-threatening traumatic and medical conditions.<sup>2,20-23</sup> APRNs are licensed and regulated by state law, and reciprocity across state lines is determined by each state. The Consensus Model’s proposal that US states license APRNs as “primary care” or “acute care”

APRNs, along with its stipulation that an APRN only be allowed to expand his or her scope of practice by completing another graduate program of study, stands in contrast to how APRNs are currently licensed and regulated today.<sup>24-29</sup> In nearly all states, APRNs are licensed at the role level, and the scope of practice is determined not only by formal education and national certification but by clinical experience as well.<sup>30</sup> Degree-granting programs are designed to prepare APRNs for entry-level competency, and postgraduate training after one's formal course of education confers clinical expertise.<sup>6,29,31-34</sup> It is, therefore, no surprise that APRNs who are currently providing safe and effective primary and acute care across the country are certified as family nurse practitioners (FNPs), acute care nurse practitioners (ACNPs), Adult NPs, Pediatric NPs, Adult-Gerontological NPs, Adult-Gerontological CNSs, and Pediatric CNSs, among others.<sup>15,21,35,36</sup> The Consensus Model has been a powerful force for raising the quality of APRN education and training in the US and has successfully championed full practice authority for APRNs in all states.<sup>15</sup> Regardless of the outcome of these and future discussions over whether and how to implement the Consensus Model's definitions of primary care, acute care, and scope of practice, APRNs will continue their long tradition of providing safe, effective care in the emergency care setting, and ENA will remain committed to interprofessional collaboration and advocacy on their behalf. Resources Advanced Practice Registered Nursing Consensus Work Group, The National Council of State Boards of Nursing APRN Advisory Committee.

Traffic safety and older drivers: JEN. (2020). *Journal of Emergency Nursing*, 46(2), 235-238.  
doi:<https://doi.org/10.1016/j.jen.2019.12.010>

Older adults, defined as individuals aged 65 years and older, comprise the fastest-growing segment of the United States population, with a projected increase to 53 million by 2030.<sup>1</sup> As the older adult population continues to grow, the number of older drivers will increase.<sup>2</sup> It is anticipated that there will be an increase in fatalities and injuries from motor vehicle crashes (MVCs) among older drivers.<sup>3</sup> Currently, MVC is ranked as the second leading cause of injury-related death, after falls, among persons 65 years and older.<sup>4</sup> Common age-related changes that impact functional abilities, in addition to medical conditions and medications, can heighten an older driver's crash risk.<sup>3</sup> A decreased physiologic reserve to respond to injury increases the risk of morbidity and mortality in this population.<sup>3</sup> In addition, these normal age-related changes complicate the assessment of older patients with trauma.<sup>5</sup> Thus, caring for this special population is a clinical challenge for emergency nurses.<sup>5</sup> Age-Related Changes and Impact on Driving Safety Aging is associated with declining functional abilities and increased susceptibility to injury in traffic crashes.<sup>6,7</sup> Age-related changes in the human body, including the deterioration of sight and hearing and the onset of muscle, joint, and skeletal disorders,<sup>5</sup> contribute to an older person's propensity for crash involvement and injury.<sup>6</sup> Changes in strength and cognition, medical conditions and comorbidities, and medication effects, which are especially impairing for older drivers, contribute to the decline in some functional abilities and can interfere with the ability to perform driving tasks and navigate complex roadway situations.<sup>6,7</sup> Driving is a complex task involving visual, motor, and cognitive skills that may be affected by age-related changes, even with healthy aging.<sup>8</sup> These changes may become particularly evident in stressful or complex driving tasks, such as turning left, merging, or changing lanes.<sup>6</sup> However, with large individual differences in the onset and degree of functional impairments, it is a driver's performance rather than chronological age that determines fitness to drive.<sup>6</sup> Cognition and Reaction Times Although older minds can be just as sharp as younger ones, they do react more slowly; moreover, as a person gets older, his or her brain needs more time to process information.<sup>8,9</sup> Cognition is the mental function or process of acquiring knowledge and comprehension associated with thinking, understanding, remembering, judging, problem solving, and information processing.<sup>8</sup> Cognition involves sensory experiences and memories.<sup>8</sup> Furthermore, cognition is the ability to remember information, recognize and respond to traffic signs and pavement markings, or the ability to focus and make sound decisions quickly to avoid a crash.<sup>8</sup> Cognition does not act in isolation.<sup>9</sup> There is a constant interaction between the physiological system and cognitive performance.<sup>9</sup> Declines in physiological performance, such as processing of visual information, exacerbate the effects of aging on cognitive functioning.<sup>9</sup> Perceptually, an older driver may have difficulty seeing and determining the speed and distance of the traffic into which he or she needs to merge.<sup>9</sup> On the motor function level, older adults may have difficulty turning their necks, instead relying on the side and rearview mirrors to perceive the traffic around them.<sup>9</sup> Cognitively, because of declines in attention and working memory, they may have difficulty integrating all the information needed to make a decision on the appropriate time to merge into the traffic flow.<sup>9</sup> When they do respond, the response may be slower

than that required by the situation. Visual Impairment With aging, a person experiences visual impairment, including reductions in visual acuity and contrast sensitivity, an increase in glare sensitivity, and reduced peripheral vision.<sup>8</sup> These age-related impairments are important for driving as 80% to 90% of traffic-relevant information is sensed through the eyes.<sup>8</sup> The most frequent error made by older drivers who are involved in crashes is inadequate surveillance.<sup>10</sup> Inadequate surveillance includes looking at but not fully perceiving another vehicle and failing to scan thoroughly at intersections, which could exacerbate problems with information gathering and processing.<sup>10</sup> Injuries Older adults are at a disadvantage compared with younger people when it comes to their ability to tolerate injury in MVCs.<sup>7</sup> Aging results in increased fragility and frailty.<sup>7</sup> Fragility refers to the ability to tolerate a physical insult (eg, the ability to tolerate crash forces).<sup>7</sup> Fragility increases beginning around middle age and continues to progress with age.<sup>6</sup> Frailty is the diminished ability to recover from injuries and resume the level of daily life activity once enjoyed before being injured.<sup>7</sup> Age-related fragility and frailty increase the likelihood that an older, crash-involved driver will sustain a fatal or serious injury.<sup>3</sup> The more fragile a person, the more severe the injury they will sustain, given similar physical crash conditions.<sup>11</sup> In addition, the more frail the driver, the higher the likelihood of death for a given injury.<sup>11</sup> Physiological changes associated with aging increase an older driver's susceptibility to injury and, specifically, predispose this population to chest injuries.<sup>12</sup> Older drivers are more vulnerable to injury in a crash because skeletal structures are more easily injured, and the consequences of any physical insult are likely to be more serious compared with that in younger drivers in similar crash conditions.<sup>7</sup> This increased vulnerability is because the energy required to cause an injury decreases with age due to a loss of mass, strength, and flexibility.<sup>5</sup> A similar crash load from an airbag or steering wheel to the chest of a young male may result in a chest contusion or fracture, while it may cause a life-threatening aortic rupture if applied to an older adult.<sup>12</sup> Medical conditions, such as osteoporosis, reduce the tolerance of the musculoskeletal system to crash forces and increase the likelihood of sustaining an injury or a more severe injury as a result of MVCs.<sup>7</sup> A study exploring injuries in adults aged 65 years and older involved in MVCs found that this population experienced a high frequency of bony structure injuries, such as rib cage and sternal fractures, accompanied by increases in morbidity and mortality.<sup>12</sup> These findings may be because of age-related geometric changes occurring in the proportion of rib cage structures, such as the cortical bone and rib slope, which inevitably predispose older adult MVC victims to fractures.<sup>11</sup> Injury Prevention The expected increase in the number of older drivers on the road is certain to lead to increased injuries and deaths unless emergency health care professionals successfully intervene to prevent harm and prepare for the unique care needs of older adults.<sup>13</sup> The main goal of traffic safety and injury prevention in the older adult population is to prevent MVCs and injury. Improvements in vehicle technology, such as side impact protection, lane departure warning, and seat belt design, are helping older drivers walk away from crashes that might have killed their parents or grandparents.<sup>3,14</sup> Seat belt designs found in cars before 2006 were reported to cause rib and other injuries to older drivers.<sup>15</sup> By 2008, all new car models sold in the US were equipped with pretensioners and load limiters, developed with a deeper understanding of biomechanics and human tolerance limits, making seat belts safer and more effective in restricting an occupant's motion within the vehicle to minimize injurious contact with interior vehicle components and other occupants.<sup>15</sup> Seat belt pretensioners retract the seat belt to remove excess seat belt almost instantly on sensing that the vehicle has crashed.<sup>15</sup> When forces on the shoulder belt increase compared with the tension in the seat belt above a predetermined level, corresponding to a relatively low risk of injury, load limiters allow the belt to give in or yield while controlling the tension in the belt. Load limiters especially benefit older occupants who are more vulnerable to high belt loads.<sup>15</sup> A simple form of a load limiter is a fold sewn into the seat belt webbing. The stitching holding the fold is designed to pull apart when a certain amount of force is applied to the seat belt; as the stitches are ripped out, the webbing unfolds, allowing the occupant slightly greater forward motion.<sup>15</sup> Although 3-point seat belts are acknowledged to be highly successful countermeasures for reducing risks of death and injury, seat belt injuries are the primary source of chest injury among elderly occupants.<sup>12</sup> The effect of aging is more severe in seat belt loading than in blunt impact force.<sup>12</sup> Seat belt force is concentrated on the bone, rather than on the soft tissue.<sup>11</sup> As a person ages, the bone deteriorates more rapidly than soft tissue.<sup>11</sup> This change does not imply that seat belt use is harmful to older occupants; it just means that seat belts can be a relatively less effective restraint for older adults compared with that for younger occupants.<sup>11</sup> Side airbags with head and torso protections, as well as inflatable seat belts found in the rear seats in some vehicles, provide a better benefit to the older adult occupant.<sup>16</sup> An inflatable seat belt is a

cylindrical bag that stretches from the buckle to approximately the shoulder of an occupant and is designed to provide additional protection to passengers

Table of contents: JEN. (2020). Journal of Emergency Nursing, 46(2) doi:[https://doi.org/10.1016/S0099-1767\(20\)30014-3](https://doi.org/10.1016/S0099-1767(20)30014-3)

Emergency nursing review questions: March 2020: JEN. (2020). Journal of Emergency Nursing, 46(2), 233-234. doi:<https://doi.org/10.1016/j.jen.2020.01.001>

The parents state that the baby was doing well at home until experiencing 45-second episodes of lethargy during 2 breast-feeding attempts over the last 4 hours. Correct answer: B Shingles is an acute localized infection caused by the varicella zoster virus. A patient may also have significant coronary artery disease (B) but would not be diagnosed with only the presence of an S4 heart sound.

One stop: Examining the reasons patients use the emergency department for nonurgent care and the barriers they face: JEN. (2020). Journal of Emergency Nursing, 46(2), 163-170. doi:<https://doi.org/10.1016/j.jen.2019.08.007>

Introduction Despite the plethora of research on the use of emergency department services for nonurgent primary health care, the vast majority of this research is quantitative in nature. To date, there is little research that reports on the problem from the patients' perspective and/or lived experience, which compromises health care providers' understanding of the essence of the problem as described by the patients. Thus, this study will provide a qualitative description of nonurgent ED visits from the patients' perspective. Specifically, this study answers the following research questions: 1) What are the reasons for patients and/or caregivers visiting the emergency department for nonurgent health conditions? and 2) What are the barriers experienced by patients and/or caregivers when seeking access to health care? Methods A qualitative descriptive design with face-to-face interviews of 33 consenting participants was conducted at 4 emergency departments. All interviewed participants were triaged as nonurgent patients by the ED personnel. Results Three themes surfaced from the data regarding reasons for using the emergency department: 1) Practitioner referral; 2) Efficacy of care; and 3) Time saver. When describing barriers that participants experienced when seeking care outside of the emergency department for their nonurgent conditions, 3 themes that emerged are lack of primary care provider, financial difficulties, and lack of comprehensive care outside the emergency department. Discussion The results of the study can help inform patient-centered care and future policy initiatives that will address the practices and barriers contributing to nonurgent ED visits.

Retrospective diagnosis of congenital long QT syndrome in a patient with febrile syncope: JEN. (2020). Journal of Emergency Nursing, 46(2), 214-219. doi:<https://doi.org/10.1016/j.jen.2020.01.004>

A brief primary survey revealed the following: orbital ecchymosis bilaterally with swelling of the lower lip and small mucosal laceration without active bleeding, c-collar in place, no chest wall tenderness, lungs clear, no heart murmur, mild suprapubic tenderness, and moving all extremities purposefully. Because of his age and head trauma, the patient was quickly expedited to computed tomography where he had his head, cervical spine, and facial bones examined. Follow-up testing concluded that the patient had an underlying congenital long QT syndrome (c-LQTS). Long QT Syndrome Etiology LQTS is a common genetic disorder that predisposes patients to sudden cardiac death, with a prevalence of 1 in 2,000 live births.<sup>1</sup> The pathognomonic feature is a prolonged QT or corrected QT (QTc) interval on an ECG, >470 ms in men, >480 ms in women, and oftentimes much longer.<sup>2</sup> QT prolongation is associated with a number of important illnesses, such as stroke, myocardial infarction, metabolic derangements, renal failure, and hypothyroidism.<sup>3</sup> This prolongation, which functionally represents an elongation of the ventricular repolarization, is common in critically ill patients and is associated with up to a 300% increase in mortality.<sup>3</sup> The common pathway of sudden cardiac death secondary to LQTS is the following: Examples include diuretics, which can deplete stores of potassium, and medications with anorexia side effects, which can prevent adequate potassium repletion through diet. ...]syncope in the elderly may be due to TdP as a result of the medical and social etiology, rather than a genetic mutation. Assessment and Monitoring The case presented in this article demonstrates clinician vigilance and vigor needed for diagnosing LQTS prior to the sentinel event, which is death or fatal ventricular dysrhythmia 50% of the time. The Schwartz score uses a combination of ECG findings (QTc interval,

T-wave alternans, notched T waves, and relative bradycardia) and clinical and family histories.<sup>10</sup> Depending on the level of suspicion, additional clinical testing includes stress ECG testing, provocative drug testing, Holter monitoring, and sometimes genetic testing on the index case.<sup>3</sup> Once a diagnosis is made, molecular genetic testing can be performed to determine the exact abnormality followed by familial cascade screening of first degree relatives. Prevention and Treatment Treatment for LQTS is multimodal and targeted toward both the genotype and phenotype.<sup>11,12</sup> First, there is an emphasis on avoiding known triggers including QT-prolonging medications, electrolyte abnormalities, and extra cautiousness during exercise and illness that increase the risk of fever.<sup>11</sup> Athletes are recommended to seek consultation from an LQTS specialist before returning to sports.<sup>11</sup> Pharmacotherapy includes initiation of a  $\beta$ -blocker, even in most asymptomatic patients, except those with explicit contraindications such as severe asthma, bradycardia, and atrioventricular nodal blockade.<sup>11</sup> The mechanism of  $\beta$ -blocker protection against LQTS is its

Instrucciones de alta por video: Effectiveness of video discharge instructions for spanish-speaking caregivers in the pediatric emergency department: JEN. (2020). Journal of Emergency Nursing, 46(2), 180-187. doi:<https://doi.org/10.1016/j.jen.2019.11.006>

Introduction Although evidence supports the addition of video discharge instructions to improve caregiver knowledge among English-speaking caregivers of children in the pediatric emergency department, there is no evidence about the effectiveness of videos for Spanish-speaking caregivers. The purpose of this study was to test whether Spanish video discharge instructions added to standard written and oral discharge instructions would result in improved knowledge and satisfaction among caregivers compared with written and oral instructions alone. Methods Spanish videos were created for fever, gastroenteritis, and bronchiolitis. A quasi-experimental, consecutive-sample, pre-post-test design was used with an audio computer-assisted survey platform to provide surveys in Spanish. The intervention group received written and oral instructions + video, whereas the comparison group received written and oral instructions alone. Results Data were collected from 150 caregivers. Caregivers who were given written and oral instructions + video showed significant knowledge improvement regarding their child's diagnosis and treatment (+19.3% and +23.6%, respectively, among standard participants;  $P < 0.001$ ). Moreover, videos did not significantly improve caregivers' knowledge regarding illness duration and when to seek further care. Regardless of the discharge instruction format, no significant difference was observed in the helpfulness of the instructions (-1%; pre vs post, 84% vs 80%;  $\chi^2 = 0.35$ ;  $P = 0.58$ ). Discussion Study results demonstrate that when tailored to reflect diagnosis-specific education, video discharge instructions can improve Spanish-speaking caregiver knowledge about discharge education compared with written and oral instructions alone. Videos can be integrated to standardize the ED discharge process as an adjunct to nurse-provided written and oral instructions with an interpreter for Spanish-speaking families.

Finding funding support for your dissertation research or clinical practice project: JEN. (2020). Journal of Emergency Nursing, 46(2), 263-265. doi:<https://doi.org/10.1016/j.jen.2019.11.002>

...]other industry partners provide grant opportunities, and many of these can be contacted directly for guidance. ...]industry partners may provide alternative means of research and clinical practice support, such as datasets, devices, or therapeutic products free of charge. NIH's federal grants to support student research training are typically labeled as F and T followed by 2 numbers (eg, F31 or T32).<sup>5</sup> The F31 or Ruth L. Kirschstein National Research Service Award has a variable budget, which covers student stipends, tuitions, fees and other expenses such as health insurance and professional conference attendance.<sup>6</sup> Although the F31 mechanism will not directly cover the expenses for dissertation research, the stipend received, if awarded, could be allocated to fund the dissertation. Funder Type Description Maximum funding Maximum duration ENAF Seed grants Small research projects to provide pilot data for larger projects \$500 1 year Research grants Small research projects to advance emergency nursing practice \$6,000 1 year ANF Nursing research grants Research projects by new or experienced researchers in clinical practice or academia to enhance patient care or advance nursing science \$25,000 1 year AACN Impact research grants Research focused on critical-care clinical research and priority areas such as nurse certification and healthy work environments \$50,000 2 years NSF Special programs for graduate students Dissertation research projects from an array of scientific disciplines \$16,000 2 years AHRQ Health Services

Research Dissertation Program Projects conducted by PhD candidates to support health services' dissertations aligning with the mission of AHRQ \$40,000 17 months IIR Medical education grants Projects focused on medical and health care-related educational activities Not listed Not listed Table Select nursing foundation research and clinical practice project grant opportunities

CE earn up to 7.5 contact hours: JEN. (2020). *Journal of Emergency Nursing*, 46(2), 266.  
doi:[https://doi.org/10.1016/S0099-1767\(20\)30040-4](https://doi.org/10.1016/S0099-1767(20)30040-4)

Development of the national early warning score-calcium model for predicting adverse outcomes in patients with acute pancreatitis: JEN. (2020). *Journal of Emergency Nursing*, 46(2), 171-179.  
doi:<https://doi.org/10.1016/j.jen.2019.11.003>

**Introduction**This study aimed to develop a new model on the basis of the National Early Warning Score to predict intensive care unit admission and the mortality of patients with acute pancreatitis.**Methods**Patients diagnosed with acute pancreatitis in the emergency department were enrolled. The values of the National Early Warning Score, Modified Early Warning Score, and Bedside Index of Severity in Acute Pancreatitis in predicting intensive care unit admission and mortality of patients with acute pancreatitis were evaluated.**Results**A total of 379 patients with acute pancreatitis were enrolled; 77 patients (20.3%) were admitted to the intensive care unit and 14 (3.7%) died. The National Early Warning Score and calcium level were identified as independent risk factors of intensive care unit admission. Serum calcium exhibited a moderate correlation with National Early Warning Score ( $r = -0.46$ ;  $P < 0.001$ ), Modified Early Warning Score ( $r = -0.37$ ;  $P < 0.001$ ), and Bedside Index of Severity in Acute Pancreatitis ( $r = -0.39$ ;  $P < 0.001$ ). A new model called National Early Warning Score-calcium was developed by combining National Early Warning Score and calcium blood test result, which had larger areas under the curve for predicting intensive care unit admission and mortality than the other 3 scoring systems.**Discussion**A new model developed by combining National Early Warning Score and calcium exhibited better value in predicting the prognosis of acute pancreatitis than the models involving National Early Warning Score, Modified Early Warning Score, and Bedside Index of Severity in Acute Pancreatitis alone.

Call to action: The need for best practices for boarding the pediatric intensive care patient in the emergency department: JEN. (2020). *Journal of Emergency Nursing*, 46(2), 150-153.  
doi:<https://doi.org/10.1016/j.jen.2019.10.009>

**Introduction** In 2015, children presented to emergency departments in the United States more than 30 million times, accounting for more than 20% of all ED episodes.<sup>1,2</sup> Increases in critically ill patients and the overall population of children with special health care needs (CSHCN) who reside at home have led to a subsequent rise in patient acuity.<sup>3</sup> The current status of crowding in emergency departments and hospitals directly affects the care of these pediatric patients, leading to boarding of those requiring intensive care unit (ICU)-level care in the emergency department until appropriate beds become available.<sup>4</sup> Leading experts and governing bodies have identified this boarding and crowding as a major public health concern and a threat to patient safety.<sup>3,5</sup> These experts and government bodies call for research to address both these concerns and other deficiencies that may exist in pediatric emergency care.<sup>3,5</sup> Boarding the ICU patient, or the act of keeping a patient who requires critical care in the emergency department beyond the time of disposition (admit or transfer), reduces the quality of care and potentially increases mortality in adults.<sup>3,4,6</sup> With only 4,044 available pediatric ICU (PICU) beds and 90% of tertiary hospitals in the US reporting crowding, resources for children requiring critical care after presentation to the emergency department are in short supply. ...]it is important to examine the impact, outcomes, and potential improvements for pediatric boarders requiring ICU-level care.**Clinical Concerns** Little is known about the outcomes of pediatric boarders, and the data currently available show conflicting results because of the variations in study design and limitations of observational and case studies.<sup>6,7</sup> Some previous studies have suggested commonalities between the effects of both inpatient and ED crowding on ED occupancy rates, the number of pediatric patients boarding in the emergency department, and the overall ED boarding time.<sup>1,7</sup> Additionally, limited studies in mixed adult and pediatric emergency departments have demonstrated increased mortality in patients with longer lengths of stay, including those requiring admission.<sup>8,9</sup> Although this has not been thoroughly examined in dedicated pediatric



emergency departments and could be influenced by adult ED boarding populations, as the majority of children are cared for by general community emergency departments, pediatric mortality warrants further attention.<sup>10,11</sup> Given the limited pediatric literature, evaluation of current adult data demonstrates potential outcome-based impacts and clinical concerns for the PICU boarder. Adult patients who meet the ICU criteria are best cared for within the physical ICU itself.<sup>12</sup> Associations can be seen between delays to ICU admissions (particularly more than 6 hours) and increased hospital length of stay and ICU mortality.<sup>12</sup> Increased costs of care and rates of invasive procedures such as insertion of central lines and mechanical ventilation have also been observed.<sup>3,12</sup> Additional clinical concerns focus on the overall safety and risk for decreased quality of care while in the emergency department. ...]crowding also increases the number of patients who leave without being seen (LWBS) by a physician. ...]LWBS rates can be used to measure the consequences of ED crowding.<sup>7</sup> In pediatrics, for every percent increase in LWBS, an associated 9-fold increase in PICU admissions has been reported in recent literature; possible explanations include both the negative effects of crowding on patient outcomes and increased resource devotion to ICU-level patients impacting the LWBS rates.<sup>6</sup> Potential Mitigating Strategies The American Academy of Pediatrics' Committee on Pediatric Emergency Medicine noted that solutions to ED boarding are complex, expensive, and resource intensive.<sup>4</sup> The Emergency Nurses Association acknowledged that there is no single set of solutions to ED boarding because of the vast differences between facilities;<sup>18</sup> however, numerous potential alleviating factors are offered by governing bodies and described in the literature. Emergency providers, emergency nursing leadership, and appropriate inpatient stakeholders must be actively engaged in examining flow processes both within the emergency department and in inpatient wards to determine opportunities for improvement.<sup>18,20</sup> Flow metrics and goals should be established and accompanied by focused quality projects to address any identified inefficient practices.<sup>19</sup> The known best practices for ED patient flow that should be considered for implementation include immediate bedding, quick registration, split flow (a process aimed at quickly facilitating the care of both emergency and urgent patients), integration of ordering providers in triage, and use of electronic tracking systems.<sup>19,20</sup> Inpatient capacity management must be assessed, and early discharge, specialized operating room, and bed management techniques that optimize flow should be considered.<sup>19</sup> Use of daily hospital-wide, multidisciplinary operational huddles aimed at safely maximizing patient flow has also been described in the literature to positively affect flow.<sup>21</sup> When considering hospital diversion, the American College of Emergency Physicians has suggested that it should be utilized only when internal resources are exhausted but known outside resources may be available.<sup>20</sup> Adequately addressing patient flow issues takes time and, therefore, requires simultaneous efforts to improve the care of PICU ED boarders while they are still in the emergency department.

Optimizing patient outcomes in emergency cardiac care through advances in technology: Nurse scientists in action: JEN. (2020). *Journal of Emergency Nursing*, 46(2), 136-138. doi:<https://doi.org/10.1016/j.jen.2020.01.007>

Cardiovascular disease is the top killer in the United States and worldwide, and cardiovascular emergencies account for approximately 10% of all ED visits in the US.<sup>1,2</sup> More than 8 million patients with chest pain and/or anginal equivalent symptoms (eg, shortness of breath and diaphoresis) present to emergency departments each year, accounting for the second most common cause of ED visits for adults.<sup>2</sup> In 2019 alone, it was estimated that every 40 seconds, 1 American would suffer from an acute myocardial infarction, nearly 720,000 would suffer from a new coronary event, and approximately 335,000 would have a recurrent cardiac event.<sup>3</sup> Emergency nurses are often the first point of contact for individuals presenting with cardiac symptoms. AF is the most frequent arrhythmia seen in the emergency department, and if left untreated, individuals are at increased risk of mortality, stroke, left ventricular dysfunction, and heart failure.<sup>19</sup> AF is treated with beta blockers or calcium channel blockers; yet, patients in the emergency department often receive doses exceeding guideline-recommended doses. ...]the number of nonactionable alarms decreased with no reports of adverse patient outcomes.

Creating the future: Collaborative practice between emergency and critical care nurses: JEN. (2020). *Journal of Emergency Nursing*, 46(2), 147-149. doi:<https://doi.org/10.1016/j.jen.2019.12.012>

In a classic multihospital study in which the outcomes of intensive care were evaluated,<sup>1</sup> important differences were found between predicted and observed death rates. Additional outcomes associated with collaboration among health care providers included decreased patient complaints, fewer errors in patient care, increased patient

satisfaction, possible decreased patient care costs, improved job stability and satisfaction, and improved quality of patient care.<sup>2,3</sup> We are aware of the repercussions of lack of collaboration. Emergency nursing is characterized by patients of diverse ages and acuity levels with unpredictable health problems. The emergency nurse often focuses on prevention—the ED visit may be the patient’s only encounter with the health care system.

Editorial board: JEN. (2020). *Journal of Emergency Nursing*, 46(2), A7-A8. doi:[https://doi.org/10.1016/S0099-1767\(20\)30015-5](https://doi.org/10.1016/S0099-1767(20)30015-5)

Knowledge translation of science advances into emergency nursing practice with the reach, effectiveness, adoption, implementation, and maintenance framework: JEN. (2020). *Journal of Emergency Nursing*, 46(2), 141-146.e2. doi:<https://doi.org/10.1016/j.jen.2020.01.006>

The themes for this issue include ED flow and crowding,<sup>1,2</sup> critical care,<sup>1,3–8</sup> vascular emergencies,<sup>6,7,9,10</sup> and cultural or organizational patient-centered care.<sup>11,12</sup> Emergency nurses strive to develop and implement evidence-based interventions, which are often pragmatic interventions. ...JEN readers practice in widely diverse emergency settings. To support the consistent spread of effective emergency nursing innovations across these diverse settings, this editorial introduces the Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) Planning and Evaluation Framework for integrating scientific advances with emergency nursing practice.<sup>13,14</sup> All evidence-based guidelines and interventions, however widely adopted in our current time, were born as a single idea. There are no exclusion criteria to receive care in the emergency department. ...]frameworks that fully address generalizability are essential to understand an intervention’s relevance and priority in future emergency care and ongoing prospective research. The RE-AIM Framework is often used with another planning and evaluation tool called the Pragmatic Explanatory Continuum Indicator Summary (PRECIS-2) for insights on how broadly generalizable to emergency nursing practice the project is or will be.<sup>21</sup> As an emergency specialty, we face a timely opportunity to improve the research and evaluation design when testing an intervention with a quality improvement or pragmatic design.<sup>22</sup> Randomized controlled trials of interventions that randomize individual patients or randomize clinical practice sites enhance confidence in the results, but require substantial resources and may limit the real-world clinical practice generalizability.

Commentary on emergency nurses Association’s 2019 “Position statement: Advanced practice registered nurses in the emergency care setting”: JEN. (2020). *Journal of Emergency Nursing*, 46(2), 139-140. doi:<https://doi.org/10.1016/j.jen.2020.01.003>

Rather than viewing the missing elements for acute care across the life span in the current Consensus Model as barriers, the 2019 ENA position supports the Model, thereby recognizing that a wide variety of APRN roles can each contribute to improving the delivery of emergency care in the United States. Other nursing specialties have grappled with this issue and similarly conclude that there is a place for various areas of expertise on the interdisciplinary care team, so long as the APRNs practice within their scope.<sup>7</sup> ENA has taken a bold step by supporting the introduction of a new population in the Consensus Model, should it come open for revision: acute care across the life span.<sup>1</sup> Whereas current options for primary care NPs include family practice, which in most states extends across the life span, the acute care role is divided distinctly into adult-gerontology or pediatric foci. The 2019 position statement on Advanced Practice Registered Nurses in the Emergency Care Setting represents the commitment of ENA in supporting safe and effective practice to the full scope for which these professionals are educated and trained, laying the groundwork for future efforts to support APRN practice through education, advocacy, and leadership. Author Disclosures Conflicts of interest:

Information for readers: JEN. (2020). *Journal of Emergency Nursing*, 46(2) doi:[https://doi.org/10.1016/S0099-1767\(20\)30016-7](https://doi.org/10.1016/S0099-1767(20)30016-7)

Thank you to JEN 2019 reviewers: JEN. (2020). *Journal of Emergency Nursing*, 46(2), A13-A14. doi:[https://doi.org/10.1016/S0099-1767\(20\)30017-9](https://doi.org/10.1016/S0099-1767(20)30017-9)

Assessing the impact of ED triage directives on febrile oncology patient wait times: JEN. (2020). *Journal of Emergency Nursing*, 46(2), 254-262.e1. doi:<https://doi.org/10.1016/j.jen.2019.12.007>

**Introduction**Fever during chemotherapy is a common and potentially severe complication being increasingly evaluated in emergency departments to minimize morbidity and mortality. Streamlining triage of these patients may improve health outcomes and wait times in the health care system.**Methods**A retrospective chart review of febrile patients undergoing chemotherapy was conducted at a local emergency department to assess the impact of nurse-initiated protocols on wait times.**Results**We identified 315 patients undergoing current chemotherapy presenting with fever. Of these, 140 (44%) and 87 (28%) were initiated on the sepsis and febrile neutropenia nurse-initiated protocols, respectively. In total, 197 (63%) were admitted. The febrile neutropenia protocol had a shorter wait time from triage to disposition than the sepsis protocol (403 minutes SD = 23] vs 329 minutes SD = 19],  $t = 1.71$ ,  $P = 0.01$ ). Furthermore, the febrile neutropenia protocol demonstrated shorter times from both triage to lab results reported, in addition to the physician initial assessment in the admitted patient subgroup.**Discussion**Decreased wait times from triage associated with the use of a febrile neutropenia protocol could be accounted for by a lower number of lab results required through this protocol in addition to shorter physician assessment times in the admitted population. This study shows that nurse-initiated protocols may influence door-to-antibiotic time for patients undergoing chemotherapy. By having a targeted protocol for the cancer population, health care centers may be able to demonstrate decreased health care expenditure and increased resource availability. Furthermore, as the current population of patients undergoing chemotherapy is at a high risk for neutropenia, prompt management is crucial to minimize mortality.

Transcultural health practices of emergency nurses working with indigenous peoples: A descriptive study: JEN. (2020). *Journal of Emergency Nursing*, 46(2), 239-245.e2. doi:<https://doi.org/10.1016/j.jen.2019.10.018>

**Introduction**For decades, health inequalities have persisted among Indigenous peoples. As the Indigenous population is growing in the cities, health care delivery in urban areas can be challenging. Emergency nurses are often the first contact in the health system, and they play a key role in the patient's experience. This study aims to describe the transcultural health practices of Canadian emergency nurses working with Indigenous peoples.**Methods**A descriptive study was conducted among 30 emergency nurses.**Results**Approximately 90% of the nurses who participated in the study had not received specific training about Indigenous health. The most common type of culturally appropriate nursing care was clinical examination (mean = 7.22), and sexuality care was the least frequent (mean = 5.47). The nurses were less confident in their ability to interview Indigenous peoples about the importance of home remedies and folk medicine (mean = 5.38).**Discussion**In summary, emergency nurses had more confidence in their ability to provide technical care than in their knowledge regarding the cultural aspects of providing care. As Indigenous populations face challenges regarding access to health care, specific interventions should be implemented to support better-quality cultural care from emergency nurses.

Improving appropriate dosing of intravenous diltiazem in patients with atrial fibrillation or flutter with rapid ventricular response in the emergency department: JEN. (2020). *Journal of Emergency Nursing*, 46(2), 246-253. doi:<https://doi.org/10.1016/j.jen.2019.10.011>

**Introduction**Atrial fibrillation and atrial flutter are common supraventricular arrhythmias in patients who present to the emergency department. Under the American Heart Association guidelines, diltiazem is the calcium channel blocker frequently used by many practitioners for rate control. Currently, institution-specific data have identified that many patients receiving diltiazem for atrial fibrillation or atrial flutter are given initial doses that exceed the recommended dose by more than 10%, resulting in hypotension in some patients.**Methods**ED personnel were surveyed to determine their current knowledge of appropriate intravenous diltiazem dosing and methods of prescribing intravenous diltiazem to determine the causes of higher dosing. Based on the baseline data, an intervention of adding a text alert when withdrawing diltiazem from the automated medication dispensing cabinet was implemented.**Results**Following the intervention, 29 patients received intravenous diltiazem for rate control of atrial fibrillation or flutter with rapid ventricular response. For the primary outcome, the incidence of high-dose diltiazem decreased by 19% ( $P = 0.03$ ). There was no change in the secondary outcome of a reduction in hypotension ( $P =$

0.3).DiscussionThe interventions of education and medication alerts resulted in a significant increase in the percentage of patients receiving appropriate doses of dilTIAZem and a nonsignificant decrease in the incidence of hypotension. This process-oriented intervention resulted in an improvement in appropriate dilTIAZem doses at our site. Rate control was not statistically significantly different between the 2 groups. Long-term sustainability of this intervention requires further study.

A 55-year-old man with cold agglutinin disease: JEN. (2020). Journal of Emergency Nursing, 46(1), 102-104.  
doi:<https://doi.org/10.1016/j.jen.2018.11.016>

The current literature on cold agglutinin disease (CAD) indicates that failure to recognize and manage CAD could be fatal. This article contributes an actual case study, pathophysiology, and the specialized nursing care required for patients with CAD. For emergency nursing practice, key implications from this article are avoiding exacerbations by warming phlebotomy tubes, infusions, and treatment rooms.

Table of contents: JEN. (2020). Journal of Emergency Nursing, 46(1) doi:[https://doi.org/10.1016/S0099-1767\(19\)30559-8](https://doi.org/10.1016/S0099-1767(19)30559-8)

One person can make a difference: JEN. (2020). Journal of Emergency Nursing, 46(1), 1.  
doi:<https://doi.org/10.1016/j.jen.2019.11.001>

---

Database copyright © 2023 ProQuest LLC. All rights reserved.

[Terms and Conditions](#) [Contact ProQuest](#)