JULY 2020 • VOLUME 46, NUMBER 4

EMERGENCY NURSES ASSOCIATION

Journal of EMERGENCY NURSING

OFFICIAL PUBLICATION OF THE EMERGENCY NURSES ASSOCIATION

ELSEVIER

WWW.JENONLINE.ORG

Report Information from ProQuest

27 September 2023 07:42

TABLE OF CONTENTS

TABLE OF CONTENTS

SEARCH STRATEGY

Set No.	Searched for	Databases	Results
S1	Journal of Emergency Nursing: JEN	Ebook Central, Public Health Database, Publicly Available Content Database	3455°

° Duplicates are removed from your search and from your result count.

Salt Toxicity: A Systematic Review and Case Reports: JEN

ABSTRACT (ENGLISH)

Introduction

Salt toxicity is a rare form of hypernatremia that typically occurs after a single massive ingestion of salt over a short period of time (minutes/hours). It is a dangerous imbalance capable of causing significant neurological injury; quick recognition of salt toxicity is crucial to allow treatment before permanent brain injury occurs. The purpose of this review is to assist emergency nurses in gaining knowledge on the causes, pathophysiology, symptoms, and treatment of salt toxicity.

Methods

A systematic search for case reports of hypernatremia due to salt toxicity was conducted in the PubMed and Scopus electronic databases. The search terms used were *salt, sodium, hypernatremia, toxicity, poisoning, case reports, case series,* and *cases.* The following were the inclusion criteria: publication dates between January 1, 2000, and September 30, 2019; evidence of an acute large oral or gastric tube ingestion of salt over a short period of time (minutes/hours); admission for treatment within hours of the event; laboratory verification of hypernatremia; and full-text article available electronically in English. The following were the exclusion criteria: an unclear history, high salt consumption over a period of days, high sodium intake via the intravenous route, and breast feeding.

Results

Only 15 cases met the inclusion criteria for the review. Patients described in the case reports ranged in age from 5 days to 73 years. Forty percent of the patients were children less than 15 years old. Of the 14 cases with known outcomes, 50% were fatal. The most frequent causes of salt toxicity were salt water emetics, intentional administration of large quantities of salt to a child by a caregiver, and suicide attempts. Among the other causes were unintentional salt overload in infant formula, an exorcism ritual, and a college prank.

Discussion

Findings from this review of 15 case reports in which a large salt load was ingested over a short period of time suggest that salt toxicity is a rare condition associated with high mortality. In addition, salt toxicity can occur in patients of all ages for a variety of reasons; the most frequently identified reasons in this review were use of salt water as an emetic and child abuse by the intentional administration of a high salt load by a caregiver. For patients whose massive exposure to salt is recent (such as minutes to hours), rapidly reducing the serum sodium concentration may prevent irreversible neurological injury.

FULL TEXT

Contribution to Emergency Nursing Practice

••The current literature on acute salt toxicity indicates that the condition is rare; however, it is associated with high morbidity and mortality.

••This article contributes the finding that early recognition and treatment of acute salt toxicity can be lifesaving.

••Key implications for emergency nursing practice found in this article are being aware that salt poisoning by caregivers is 1 of the more common forms of child abuse; therefore, it is important to consider the possibility of salt toxicity when a child is admitted with unexplained hypernatremia. In addition, close monitoring of intravenous fluid

replacement and plasma sodium concentrations is vital during the treatment of acute salt toxicity.

Background Problem

Hypernatremia is 1 of the most frequent electrolyte imbalances encountered in emergency departments.[1] Although hypernatremia is usually due to a water deficit, it can also be caused by an acute ingestion of a large quantity of salt (referred to as salt poisoning or salt toxicity). Although thought to be rare, the true incidence of salt toxicity is unknown because the diagnosis is likely missed in some cases.[2,3] Clearly, salt toxicity is a dangerous condition capable of causing significant neurological injury. For example, mortality was greater than 50% in a review of 30 salt toxicity cases that included children and adults.[4] Quick recognition of salt toxicity is crucial to allow treatment before permanent brain injury occurs. Because patients with salt toxicity are typically first seen in emergency departments, it is important that emergency nurses be alert for this imbalance.

Purpose

To assist emergency nurses in gaining knowledge on salt toxicity, we describe in this article the causes, symptoms, and treatment of this condition and review case reports published between January 1, 2000, and September 30, 2019.

Overview of Salt Toxicity Definition

Salt toxicity is a rare form of hypernatremia that typically occurs after a single massive exposure to salt (sodium chloride) over a short period of time, such as minutes to hours.[5-7] The information regarding salt toxicity is gathered largely from anecdotal case reports. For this reason, it is difficult to determine the specific levels of salt intake capable of causing salt toxicity. Using data from 2 children, Campbell et al[8] estimated that the lethal dose of salt in children was less than 5 teaspoons, and using data from 4 adults, they estimated that the lethal dose in adults was less than 4 tablespoons. See Table 1 for the approximate sodium content in a teaspoon and tablespoon of table salt. In children, mortality in salt toxicity is especially high when the plasma sodium level exceeds 190 mEq/L.[5,9] In a report of 2 adults who died from salt toxicity, the plasma sodium levels were 175 mEq/L and 196 mEq/L, respectively.[10]

Pathophysiology

A massive ingestion of salt causes the plasma sodium concentration to elevate within minutes and peak within hours.[5,11] As a result, the cells shrink because fluid is drawn osmotically from the intracellular spaces; this process is particularly dangerous in brain cells. Irreversible neurological injury can result; intracranial hemorrhages are found commonly during the autopsy of salt toxicity victims and are believed to result from shearing forces in the brain due to osmotic fluid shifts.[11-13] In an effort to correct the fluid shift from the cells, the brain cells pump in electrolytes and endogenous osmolytes to regulate cell size.[6,14] Brain volume is largely restored within a period of 2 to 3 days.[15] Although brain injury in salt toxicity is attributed generally to osmotic fluid shifts, Blohm et al[5] point out that cerebral edema may develop in response to diffuse cellular injury, as evidenced in case reports in which cerebral edema occurred in patients before treatment.

Risk Factors

A number of risk factors for salt toxicity have been identified. Among these are renal impairment and an inability to communicate the need for fluids and/or to obtain them independently (as in infants and disabled persons).[16] Renal impairment may increase the risk by interfering with sodium elimination.[8,17]

Distinguishing Hypernatremia Due to Salt Toxicity From Hypernatremia Due to Water Loss

Making an accurate distinction between hypernatremia due to acute salt toxicity and hypernatremia due to water loss is extremely important because the treatment differs greatly for these conditions.

The factors to consider are as follows:

History/Symptoms

During the examination and history, an attempt should be made to determine the underlying cause of hypernatremia. For example, salt toxicity typically involves an event in which a recent massive salt consumption occurred, whereas hypernatremia from fluid loss is usually preceded by several days of fluid loss (as in diarrhea, vomiting, or sweating).[5] The gastrointestinal symptoms associated with a large oral intake of salt include nausea, vomiting, abdominal cramps, and diarrhea, presumably due to the mucosal irritation and fluid shifts associated with the hypertonic solution. These symptoms need to be evaluated in conjunction with other findings because they may cause clinicians to erroneously believe that the fluid loss is the cause for hypernatremia. The neurological symptoms may include lethargy, weakness, twitching, seizures, and coma.[16] Hyperthermia may occur simultaneously with seizures and leads clinicians to suspect meningitis or encephalitis.[5] Unless clear by history, it may be difficult to distinguish salt toxicity from hypernatremia due to excessive water loss.[5]

Weight Changes

A patient's weight can provide a valuable clue in distinguishing between hypernatremia due to water loss and hypernatremia due to excess salt gain. Hypernatremia due to a water deficit is characteristically associated with weight loss. In contrast, hypernatremia due to salt toxicity is usually associated with weight gain because the high sodium load stimulates thirst with an increased fluid intake (provided the patient is able to secure fluids and drink) as well as an increased release of antidiuretic hormone to conserve water.[16] The weight gain may be slower in very young children who cannot regulate their fluid intake.[18] Weight gain may not occur in a neonate because of immaturity of the antidiuretic hormone receptors in the kidney (thus preventing water conservation).[19] Observing for weight changes is not helpful when the patient's baseline weight is not known.[3]

Fractional Excretion of Sodium (FENa)

A method sometimes used to distinguish between hypernatremia due to salt gain and hypernatremia due to water loss in children is FENa. A value ≥2% is suggestive of salt poisoning in infants and young children with hypernatremia and normal renal function.[15,16,18] FENa is difficult to interpret in patients with abnormal glomerular filtration rates.[18]

Treatment

One treatment goal is to reduce the possibility of further sodium absorption; therefore, if there is an indication that the ingested salt is still in the stomach, a nasogastric tube may be inserted and connected to suction.[5]

Another treatment goal is to reduce the plasma sodium concentration safely to prevent irreversible neurological injury from the hypernatremia; aggressive therapy may be lifesaving in patients with acute salt poisoning.[15] Carlberg [11] has recommended that emergency providers consider rapidly lowering the plasma sodium level with hypotonic intravenous fluids as a potential management strategy for severe hypernatremia caused by massive salt ingestion. The plasma sodium concentration can be safely lowered more quickly when salt toxicity has been present for less than 24 hours than when it has been present for a longer period.[15] When the duration of salt toxicity is less than 24 hours, the brain's adaptation to hypernatremia is incomplete, minimizing the risk of neurological injury from rapid correction of the hypernatremia.[15] For this reason, Blohm et al[5] recommend rapid correction of the plasma sodium concentration in pediatric patients who present within 24 hours of the high salt ingestion. When hypernatremia has been present for a longer period, the therapeutic goal is a more gradual reduction in the plasma sodium concentration; too rapid a reduction of the plasma sodium concentration after brain adaptation has been completed can cause severe neurological injury due to an osmotic shift of fluid into the cells.[5,11,15,16] Given the complexity of safely lowering the plasma sodium concentration in a salt toxicity patient, Blohm et al[5] recommend obtaining a

nephrology consultation early in the patient's clinical course to optimize the outcome. During the treatment, the plasma sodium levels should be monitored frequently to ensure that the sodium level is decreasing at the desired rate.[15]

In addition to hypotonic intravenous fluids (such as 5% dextrose in water), water is sometimes administered via a nasogastric tube.[11] Any comorbid condition that could limit large-volume fluid intake, such as a cardiopulmonary problem, should be considered.[5,11] Loop diuretics may be employed to reduce the fluid burden while also hastening the excretion of sodium via the kidneys.[5]

Occasionally, patients with acute salt poisoning may develop acute kidney injury and oliguria; in such patients, dialysis is indicated.[4] Because considerable time is needed to initiate dialysis, this treatment should be used in concert with other therapies.[5] In addition, seizure prophylaxis is important because seizures are commonly present in patients with salt toxicity.[5]

Cultural Issues

Reports of use of salt water as an emetic have originated from multiple countries (eg, the United States, Israel, Germany, and Poland) over the past 20 years.[7,10,20,21] This home remedy is referred to in a Chinese medical textbook published in 2017.[22] Salt water ingestion was a traditional method of suicide in ancient China; more recently, suicides by the ingestion of Japanese soy sauce have been reported.[12,13] In addition, salt water has been used for symptom relief. For example, a report from the Korean literature describes the use of bamboo salt as a home remedy for indigestion.[23] It has been suggested that a cultural gender difference in dealing with emotional disorders results in a greater incidence of voluntary salt intake among females.[7] In Taiwan, concentrated infant formula is suggested as a method to relieve constipation, presumably by acting as an osmotic stool softener.[24] Although oral rehydrating solutions are used around the world, salt toxicity from the improper use of these solutions is most significant in countries where people have little knowledge or insufficient information regarding their proper reconstitution.[25]

Method for Identification of Case Reports

A systematic search for case reports of hypernatremia due to salt toxicity was conducted in the PubMed and Scopus electronic databases. The search terms used were *salt, sodium, hypernatremia, toxicity, poisoning, case reports, case series,* and *cases*. We independently examined the titles and abstracts of retrieved citations for inclusion, and the discrepancies were resolved by consensus. Seventy-eight full-text articles were reviewed, and the reference lists were hand-searched for additional studies. (See PRISMA diagram [Figure]). The inclusion criteria were publication dates between January 1, 2000, and September 30, 2019; evidence of an acute large oral or gastric tube ingestion of salt over a short period of time (minutes to hours); admission for treatment within hours of the event; laboratory verification of hypernatremia; and full-text article available electronically in English. The exclusion criteria were an unclear history, high salt consumption over a period of days, high sodium intake via the intravenous route, and breastfeeding.

Discussion of Case Reports

Only 15 cases met the inclusion criteria for the review (see Table 2). It is likely that the actual number of cases is higher because of missed diagnoses.[2,3] In addition, it is reasonable to assume that not all cases of salt toxicity are published. The patients described in the case reports ranged in age from 5 days to 73 years. Forty percent of the patients were children less than 15 years of age, and one third were adults between 19 and 34 years of age; older patients (55 to 73 years of age) constituted the remaining 26.7% of the cases. Of the 14 cases with known outcomes, 50% were fatal. Serious morbidity was often present in the nonfatal cases. Multiple causes of salt toxicity were identified in the review.

Salt Water as Emetic

Although the use of salt water as an emetic was recommended commonly in the 1960s and 1970s, reports of harm from this practice have led to the withdrawal of the recommendation.[7,10] Yet, case reports of the use of salt water emetics continue; see case numbers 1, 2, 4, 5, and 11 in Table 2. Four of the 7 fatalities identified in Table 2 were due to salt water emetics (numbers 1, 2, 4, and 5). Parents administered salt water emetics to their children in case numbers 1 and 2; in contrast, salt water emetics were administered by caregivers of institutionalized patients in case numbers 4 and 5. Given the danger associated with salt water as an emetic, it is surprising that the practice persists. Perhaps contributing to the problem are internet sites that continue to recommend salt water to induce vomiting.[26-28] In addition, as indicated earlier, the use of salt water as an emetic is described in a recent Chinese medical textbook.[22]

Intentional Salt Administration by Caregiver

Intentional salt poisoning by caregivers is 1 of the more common forms of child abuse.[15,29] Three of the cases reported in Table 2 involved the intentional administration of a high salt load to a young child by a caregiver (case numbers 12, 13, and 14). It is possible that the incidence of intentional salt toxicity is higher than reported owing to underdiagnosis or lack of publication of the cases.[2] When a pediatric patient presents with salt toxicity, the possibility of criminal poisoning by a caregiver should be considered; this is particularly true when there is a history of multiple admissions for unexplained hypernatremia.[3,30] Because wrongfully accusing a caregiver of intentional salt poisoning may have serious ramifications, it is important to have evidence before raising the possibility.[3] When nonaccidental salt toxicity is suspected strongly, the involvement of local child protection services and the police should be considered.[3,5] It is helpful to secure the feeding and save any gastric content obtained by suction for sodium analysis.[3]

Unintentional Salt Overload in Formula

In case number 8, a parent accidentally administered a formula that was twice as concentrated as intended. This occurred because the mother changed to a different formula after the infant was discharged from the hospital. The spoon size of the second formula was larger than that of the previous formula; yet, the powder was mixed with the volume of water intended for the original formula.

Suicide

Oral ingestion of a large quantity of salt is resisted by healthy adults owing to its foul taste.[7] Therefore, excessive salt ingestion is more likely in patients with cognitive or mental health issues. Three of the patients described in Table 2 used soy sauce in an attempt to commit suicide (case numbers 6, 7, and 14). The women described in case numbers 6 and 7 drank shoyu (Japanese soy sauce) and died, whereas the man described in case number 14 also drank soy sauce in a suicide attempt but survived after seeking treatment 12 hours later. Although the amount of salt in soy sauce sources is variable, it was reported that the liter bottle used in 1 of the cases contained approximately 160 g of sodium chloride (case number 7).

Other Causes

Among other causes of salt toxicity reported in Table 2 are an exorcism ritual (case number 3), a college prank (case number 8), and an attempt to lose weight and obtain symptom relief from indigestion (case number 10). The young woman described in case number 3 died after undergoing an exorcism in which she was required to drink 6 glasses of a concentrated salt solution. She suffered from depression, and it was postulated that this may have dampened her recognition of the disagreeable taste of the salt water.[5] The teenager described in case number 9 who drank a quart of soy sauce on a dare made a full recovery after the rapid administration of hypotonic fluids to reduce his profound hypernatremia.[11]

Limitations

The search protocol for this review was not registered. The review was limited to cases in which the large ingestion of salt occurred over a short period (minutes to hours). In addition, only reports published between January 1, 2000, and September 30, 2019, were included in the review.

Conclusion

The findings from this review of 15 case reports in which a large salt load was ingested over a short period of time suggest that salt toxicity is a rare condition associated with high mortality. In addition, salt toxicity can occur in patients of all ages for a variety of reasons; the most frequently identified reasons in this review were the use of salt water as an emetic, child abuse by the intentional administration of a high salt load by a caregiver, and suicide attempts. It is especially important that emergency nurses be alert for intentional salt administration by a caregiver when a young child presents with unexplained hypernatremia. For patients whose massive exposure to salt is recent (such as minutes to hours), rapidly reducing the serum sodium concentration may prevent irreversible neurological injury.[15]

Author Disclosures

Conflicts of interest: none to report.

Spoon size	Grams of salt	Amount of sodium (mg)	Milliequivalents of sodium
Teaspoon	6	2,400	104*
Tablespoon	18	7,200	308

Fatal cases (accidental)						
Case number	Reference	Age (sex)	Cause	Brief scenario	Serum sodium level	Outcome

1	Turk[1]	4 years (female)	Salt solution administered by parents to induce emesis	•Parents reported giving several glasses of saturated NaCl solution to child to induce vomiting after she drank bathing foam during her bath.•Vomiting occurred within minutes and child became very sleepy.•Found 2 hours later unresponsive and seizing.•Admitted to the hospital. Hypernatremia was found by laboratory analysis.•Immediate resuscitation was not successful.	245 mEq/L	Death
2	Casavant[2]	14 years (male)	Salt solution administered by parents to induce emesis	•Teenager admitted to a community hospital with seizures after ingestion of a salt water emetic given to him by his parents after being told he may have taken pills at a party.•Estimated that he ingested at least “45 g (5 tbsp) of salt.”•Collapsed 30 minutes after drinking the solution.•Arrived at emergency department approximately 30 minutes later; he was noted to have had 2 seizures with posturing. Body temperature 40.4 °C (104.8° F).•Normal saline (3,500 ml) administered along with a variety of medications. Gastric lavage performed. Intubated and transferred to a tertiary facility.•Despite treatment, his condition continued to deteriorate.	195 mEq/L at the time of admission to emergency department 178 mEq/L at the time of admission to tertiary facility	Death

3	Ofran[7]	20 years (female)	Exorcism ritual	•Previously healthy young woman suffered from postpartum depression for 2 weeks after her first child's delivery.•In addition to antidepressive therapy, she followed her family's advice to undergo an exorcism. Required to drink 6 glasses of a concentrated mixture of table salt and water.•Lethargy and a general convulsive episode developed 11 hours later.•Deeply unconscious at time of admission to emergency department.•Hypernatremia identified by laboratory analysis.•Intubated and admitted to the ICU where aggressive hypotonic fluid resuscitation was unsuccessful.	255 mEq/L at the time of admission	Death a few hours after arrival at hospital
4	Turk[10]	34 years (female)	Salt solution administered by nurse to induce vomiting	•Nursing home resident ate 2 cigarette ends and was given 2 glasses of salt water by a nurse to induce vomiting (which occurred 30 minutes later).•Developed seizures and was found somnolent without a detectable pulse 4 hours later.•Transferred to hospital immediately; severe hypernatremia was diagnosed on admission to the hospital.•Treatment included hypotonic infusions to lower the sodium level.•Resuscitation was not successful.	196 mEq/L	Declared brain dead 4.5 hours after admission to hospital

5	Tu [k[1] [0]	69 years (male)	Salt solution given as emetic by caregivers	•Psychiatric facility inhabitant given 4 glasses of salt solution (each containing 3 tablespoons of table salt) as an emetic after he ingested his roommate's medication. No emesis occurred.•After a period of hours, he developed fever, drowsiness, and seizures. Admitted to hospital approximately 6 hours after the initial symptoms.•Hypernatremia found by laboratory analysis. After treatment, the serum sodium level normalized. However, there was severe damage to the brain.	175 mEq/L at time of admission 140 mEq/L after treatment	Declared brain dead after 36 hours in hospital

DETAILS

Subject:	Salt; Emergency medical care; Plasma; Serum; Databases; Exorcism; Breastfeeding &lactation; Infants; Mortality; Sodium; Brain injuries; Nurses; Caregivers; Fluids; Poisoning; Pathophysiology; Infant formula; Water; Patients; Systematic review; Imbalance; Verification; Edema; Kidneys; Injuries; Traumatic brain injury; Emergency services; Child abuse &neglect; Hypernatremia; Suicide; Suicides &suicide attempts
Publication title:	Journal of Emergency Nursing:; JEN; Philadelphia
Volume:	46
Issue:	4
Pages:	428-439
Publication year:	2020
Publication date:	Jul 2020
Section:	Clinical
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:	Evidence Based Healthcare, Journal Article
DOI:	https://doi.org/10.1016/j.jen.2020.02.011
ProQuest document ID:	2487206106
Document URL:	https://www.proquest.com/scholarly-journals/salt-toxicity-systematic-review-case-reports/docview/2487206106/se-2?accountid=211160
Copyright:	©2020. The Authors
Last updated:	2023-03-20
Database:	Public Health Database

Document 2 of 28

Mental Well-Being of Nursing Staff During the Coronavirus Disease 2019 Outbreak: A Cultural Perspective: JEN

ProQuest document link

ABSTRACT (ENGLISH)

Evidence-based mental health services, efficacy of psychological care, and assessment of psychological care needs are necessary for nursing staff.3 Continuous mental health care services are essential for even mild psychological reactions during this pandemic to attenuate the possibility of escalating psychological health problems.4 The number of medical health care professionals (doctors, nurses, and paramedics) suffering mental health effects after epidemics and pandemics is often greater than the physical injury.5 Although the mental health effects of such events last longer, psychological health interventions capture much less attention.6 Psychological counseling and psychotherapeutic guidance could demonstrate the effectiveness of psychological protection and awareness for nursing staff through print media (manuals) and electronic media (television) resources. The mental health of nursing staff can be effectively addressed and managed through psychological counseling, group meeting sessions, and management of stress caused by infectious disease pandemics.2 Psychological counseling sessions for nursing

staff could help in depersonalization, modifying one's perspective of life, understanding the meaning of one's work, and managing psychological reactions in an adversity.7 Professional knowledge about the risk of exposure and transmission of infectious diseases could offer cautionary control over the situation, which in the case of COVID-19, is markedly different owing to the pernicious characteristics of the novel coronavirus pandemic outbreak. Many individuals exhibit minimal symptoms while contagious and, indirectly through skin contact, present a substantial risk of exposure and transmission for all medical, nursing, and paramedic professionals.8 The resultant stress in this particular situation is evidently dissimilar to that in other epidemics, and thus this infection risk indiscriminately affects a large number of medical health care professionals both physically and psychologically.

FULL TEXT

Dear Editor:

The mental health of health care professionals in general, and nursing staff in particular, has been challenged in the wake of the coronavirus disease 2019 (COVID-19) pandemic outbreak throughout the world. During previous outbreaks such as severe acute respiratory syndrome, psychological distress in frontline emergency nursing staff appeared gradually. Fear, anxiety, depression, psychological symptoms, post-traumatic symptoms, and a general decrease in overall well-being were observed.[1] Isolation, high-risk working conditions, and direct contact with infected individuals could now become immediate factors of mental health problems in frontline emergency nursing staff. The intense experience of an infectious pandemic disease could have short-term and long-term impact on the mental health of nursing staff in the absence of effective support and timely training. The Pakistani government has made various attempts to reduce the pressure on the nursing staff, such as reducing the workload by implementing a shift-system, introducing more nursing staff to manage work pressure, recommending infection control measures, and advising the use of personal protective equipment and adherence to practical guidelines and standards. In addition, the Pakistani government should establish psychological crisis intervention teams to provide psychological services that include psychological counseling and psychotherapy, reading and listening materials, and informative manuals.[2] In Pakistan, television news and online media are prevalent and are highly influential forms of entertainment in the lives of the community. Information dissemination through these mediums about coping mechanisms and psychological help would be effective. Evidence-based mental health services, efficacy of psychological care, and assessment of psychological care needs are necessary for nursing staff.[3] Continuous mental health care services are essential for even mild psychological reactions during this pandemic to attenuate the possibility of escalating psychological health problems.[4] The number of medical health care professionals (doctors, nurses, and paramedics) suffering mental health effects after epidemics and pandemics is often greater than the physical injury.[5] Although the mental health effects of such events last longer, psychological health interventions capture much less attention.[6] Psychological counseling and psychotherapeutic guidance could demonstrate the effectiveness of psychological protection and awareness for nursing staff through print media (manuals) and electronic media (television) resources. The mental health of nursing staff can be effectively addressed and managed through psychological counseling, group meeting sessions, and management of stress caused by infectious disease pandemics.[2] Psychological counseling sessions for nursing staff could help in depersonalization, modifying one's perspective of life, understanding the meaning of one's work, and managing psychological reactions in an adversity.[7] Professional knowledge about the risk of exposure and transmission of infectious diseases could offer cautionary control over the situation, which in the case of COVID-19, is markedly different owing to the pernicious characteristics of the novel coronavirus pandemic outbreak.

Many individuals exhibit minimal symptoms while contagious and, indirectly through skin contact, present a substantial risk of exposure and transmission for all medical, nursing, and paramedic professionals.[8] The resultant stress in this particular situation is evidently dissimilar to that in other epidemics, and thus this infection risk indiscriminately affects a large number of medical health care professionals both physically and psychologically. In Pakistan, the immediate need of addressing and recognizing mental health issues in nursing staff emerged from mobilizing a psychological crisis intervention team. This team provided a large scale therapeutic response for

psychological support for frontline nurses to relieve stress, reduce fear and anxiety of infection, and minimize psychosocial and behavioral changes brought by isolation.[4] Local nursing staff—at the epicenter of the COVID-19 pandemic outbreak crisis—are pivotal to the effective working of the health care system; therefore, resources should be mobilized to ensure its sound mental health. The training included self-protection, infectious disease pandemic knowledge (epidemiological characteristics, transmission route of COVID-19, and clinical diagnostic criteria and treatment), professional knowledge and skills, and preventive psychological counseling (coping mechanisms and emotional distress management) and training (videos, manuals, and online guidance).

Pakistan is on the threshold of being understaffed, with staff shortages across all workplaces due to people practicing self-isolation. This raises the question about the State's approach to medical health care with departments functioning with fewer nursing staff and untrained junior nursing staff, as well as staff working with minimal personal protective equipment. Ensuring sound mental health would prevent a culture of learned helplessness in the nursing staff. Pakistan's government and hospital administration should make every effort to manage and distribute personal protective equipment to doctors and nurses alike to ensure their safety on the frontline. Adequate personal protective equipment (eg, protective gowns, goggles, N95 masks, latex gloves, and isolation gowns) would safeguard security, confidence, and motivation among clinical nurses. Professional psychological crisis intervention (for psychological coping strategies and a psychosocial support platform) would reduce fear, anxiety, panic, and insecurity among nursing staff. Personal activities, such as encouraging colleagues through writing positive reinforcement messages and actively listening to each other's concerns, could also enhance emotional well-being.

—Sonia Mukhtar, MS, Counseling Psychologist, University of Management and Technology, Lahore, Pakistan; E-mail: sonia.mukhtar12@gmail.com

DETAILS

Subject:	Television; Emergency medical care; Adversity; Paramedics; Psychiatric nurses; Psychotherapy; Newspapers; Health problems; Nursing; Efficacy; Mental health services; COVID-19; Evidence-based medicine; Professional knowledge; Electronic media; Group counseling; Pandemics; Epidemics; Medical personnel; Depersonalization; Infectious diseases; Coronaviruses; Injuries; Mental health care; Needs analysis
Location:	Pakistan
Publication title:	Journal of Emergency Nursing:; JEN; Philadelphia
Volume:	46
Issue:	4
Pages:	426-427
Publication year:	2020
Publication date:	Jul 2020
Section:	Letter to the Editor
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:	Letter
DOI:	https://doi.org/10.1016/j.jen.2020.04.003
ProQuest document ID:	2487205971
Document URL:	https://www.proquest.com/scholarly-journals/mental-well-being-nursing-staff-during/docview/2487205971/se-2?accountid=211160
Copyright:	©2020. Emergency Nurses Association
Last updated:	2023-07-28
Database:	Public H ealth Database

Predictors of Nonurgent Emergency Visits at a Midsize Community-Based Hospital System: Secondary Analysis of Administrative Health Care Data: JEN

ABSTRACT (ENGLISH)

Introduction

Nonurgent visits to the emergency department compromise efficiency in treating patients with urgent conditions and inversely influence the satisfaction of patients and staff. There is inconclusive evidence of the factors associated with nonurgent ED visits. Therefore, the purpose of this study was to explore the independent factors associated with nonurgent ED visits in a midsize community-based Canadian hospital system.

Methods

This was a retrospective, secondary analysis of data from 2 community hospitals in southwestern Ontario, Canada. We included ED patients in the analysis if they were local residents from the city or the surrounding county.

Results

Nonurgent visits constituted approximately 27% of all ED visits and were more likely to be associated with patients with a primary care provider referral (odds ratio = 2.87; 95% confidence interval, 2.75-2.99) and with patients who had no primary care provider (odds ratio = 1.10; 95% confidence interval, 1.04-1.16). Other predictors included younger age, season, time of day, ED arrival mode, geographical proximity of residence to the emergency department, and case presentation.

Discussion

The findings of this study may assist health care providers and stakeholders in developing strategies to minimize nonurgent ED visits.

FULL TEXT

Contribution to Emergency Nursing Practice

••The current literature on nonurgent ED visits indicates that some patients and families attend the emergency department for nonurgent health care.

••This article contributes to our understanding of the factors associated with nonurgent ED visits.

••Key implications for emergency nursing practice found in this article suggest that while older people may use the emergency department at a higher volume, they are less likely to visit the emergency department for nonurgent conditions.

Introduction

Although emergency departments serve the primary purpose of providing urgent care for a wide range of health problems, they are often misused for the care of nonurgent health conditions.[1-3] Health Quality Ontario has reported that an estimated 1 in 5 visits to the emergency department in Canada are for nonurgent health conditions that could be treated by a primary care practitioner.[4] These numbers are especially concerning given that the patients who use the emergency department for nonurgent reasons are often aware of the low acuity of their conditions.[5] Furthermore, Health Quality Ontario has reported that 41.6% of the surveyed individuals believed that their most recent visit to the emergency department was for a condition that could have been treated by their primary health care practitioner.[4] Emergency department use for nonurgent conditions is a practice that compromises efficiency in treating emergency patients and inversely affects the satisfaction of the patients and emergency staff.[6,7] The unnecessary crowding of emergency departments can result in long ED wait times, strained hospital resources, decreased quality of care,[1,8] diversion of ambulance services,[9] poor health outcomes, and increased risk of death.[10-13] These consequences are compounded by the fact that emergency departments in Ontario were heavily used, with an estimated 5.7 million annual visits in 2016-2017, as opposed to 5.2 million annual visits in 2011-2012.[4] Whereas the overall average wait time in Ontario emergency departments for patients who were hospitalized was 16.6 hours,[14] the cost of the total number of ED visits in 2011-2012 was approximately $1.1 billion, as opposed to $960 million in 2009-2010.[15] Whereas the wait time for admitted patients was a little more than 16 hours, the average wait times for patients with low urgency and those with high urgency who were not admitted were 2.7 and 4.0 hours, respectively.[14]

Several factors may contribute to the use of emergency departments for nonurgent health problems.[16-18] These factors may include, but are not limited to, receiving faster care and diagnostic procedures,[7,19-22] poor hospital discharge planning,[4] practitioner referral,[19] convenience of round-the-clock care,[1,5,23] and the perception that emergency care providers are more qualified than primary care providers.[8,24]

Moreover, the patient demographics and prognostic factors such as age, gender, and diagnosis have been reported to be associated with ED use for nonurgent conditions. Whereas several studies have suggested that ED use for nonurgent conditions was higher among younger and middle-aged adults,[9,16,25-27] others have reported that such visits were higher among older adults.[28-30] Similarly, whereas some studies have suggested that nonurgent ED visits were higher among female patients,[3,25,28,31-33] others have suggested that they were higher among male patients.[30,34] Patients with diabetes and heart diseases were reported to be less likely to visit the emergency department for nonurgent purposes,[34] whereas patients with musculoskeletal problems were the most common visitors to the emergency department for nonurgent conditions.[1,7,16,30] Hodgins and Wuest[35] have reported that injury and upper respiratory problems were the most common complaints for nonurgent visits, a finding that was later supported by Idil et al.[7]

Whereas the literature discussed above highlights the significance of the cost and systemic problems that arise from ED visits for nonurgent care, it also demonstrates that the evidence pertaining to the factors that are associated with such use is inconclusive. Furthermore, most of these studies reported their findings within the context of basic descriptive statistics but without adjustment for variables that might have confounded the reported relationships, raising concerns regarding the validity of these findings. Therefore, the purpose of this study was to explore the independent factors associated with nonurgent ED visits in a midsize community-based hospital system ([Figure]). This is especially important considering that most existing literature has examined nonurgent ED visits in large urban settings whereas our study explored this issue within the context of a midsize community-based hospital setting.

Methods Design

On approval of the study by the Research Ethics Board at the University of Windsor, a retrospective, secondary analysis of archived administrative health care data was completed to explore the predictors of nonurgent ED visits at 2 hospitals that make up a midsize community-based hospital system in southwestern Ontario. The 2 hospitals are among the largest community-based nonacademic hospitals in Ontario, servicing approximately 120,000 ED visits a year.[36] After receiving the ethical clearance, the data on all primary ED visits during a 12-month period were obtained in the form of an encrypted Excel (Microsoft Corporation, Redmond, WA) file from the regional health authority, known as the Erie Saint Clair Local Health Integrated Network (LHIN). The 2 hospitals have a combined capacity of approximately 576 inpatient beds with 76 ED beds and stretchers. Patients from all age groups were included in the study if they were local residents from the city or surrounding suburbs and county. The Canadian health care system gives residents access to primary care practitioners who they can seek out for nonurgent care issues. The patients who are outside of the geographical region (eg, travelers and out-of-area visitors) would not have access to their usual primary care providers and would, therefore, be left with limited options but to visit the emergency department for their health care concerns, be it urgent or nonurgent. As a result, these patients, who are not part of the target patient population, were excluded from the study.

Measurements and Variable Definitions

An ED visit was defined as the arrival of a patient at the emergency department for a specific illness or complaint. The level of acuity was measured using the Canadian Triage Acuity Scale (CTAS) that is mandated for use in all Canadian emergency departments. The CTAS levels are designed such that level 1 represents the sickest patients (emergent) and level 5 represents the least ill (nonurgent). In this study, the CTAS levels were collapsed into a binary variable (urgent vs nonurgent) in which levels 1 (resuscitation), 2 (emergent), and 3 (urgent) were coded as urgent cases requiring ED visits, and levels 4 (semiurgent) and 5 (nonurgent) were coded as nonurgent cases that do not require ED visits. Our decision to include the semiurgent level 4 CTAS-coded patients in the nonurgent category was driven by the fact that patients with semiurgent conditions (eg, fracture, lacerations, occupational

exposure to blood-borne pathogens, unusual diarrhea, etc) could be treated at urgent care facilities. Therefore, it is important that our readers be cognizant that our nonurgent category incorporates patients whose level of acuity requires timely care but who are not necessarily urgent. The proximity to the emergency department was defined as the relative distance between the patient's residence and the emergency department they visited. Specifically, those living within the city's boundaries were deemed "proximal," those living in the surrounding city suburbs were deemed "moderately distant," and those who lived in the region but outside the boundaries of the city and its suburbs (known as the county) were deemed "distant." Access to primary health care was identified at the time of registration at the emergency department by the patient. Specifically, it was defined on the basis of whether the individual had documented access to a primary health care practitioner (eg, a family physician or nurse practitioner). The mode of arrival was defined as the method used by a patient to arrive at the emergency department (eg, self versus emergency medical services [EMS]). The case presentation or the chief complaint in the initial data file was based on the World Health Organization's International Classification of Diseases-10 (ICD-10) criteria. Given that the ICD-10 criteria have an extensive list of diagnoses, for meaningful analysis we collapsed the list into 3 categories: trauma/poisoning, physical illness, and mental illness. The mental illness category in our study included patients with diagnoses of mood/affective disorders, alcohol- or substance-induced mental or behavioral disorders, and schizophrenia/delusional disorders, as reported in previous research.[37] A referral source was defined as the person who initiated the process of seeking emergency care.

Data Analysis

The data were analyzed using SPSS version 24.0 (IBM Corp, Armonk, NY). Before conducting the analyses, the data were examined and managed for the violation of bivariate and multivariate statistical assumptions, such as multicollinearity and dummy coding as outlined by Tabachnick and Fidell.[38] Specifically, multicollinearity was judged by a standard error value of 2.0 or more (there were none). Missing data were minimal (39 Patients with urgent and nonurgent ED visits were compared regarding their demographic and visit characteristics using chi-square and *t*-test statistics. Variables with a *P* value of ≤0.25 in bivariate comparisons were considered in the multivariate logistic regression analysis. Given the exploratory nature of our study, we built our regression analysis using a forward stepwise approach. A 95% confidence interval (CI) was used as the criterion to determine statistical significance in the multivariate phase of the analysis. The resulting odds ratios (OR) and their respective CIs were rounded up to 2 decimal places.

Results Sample and ED Visit Characteristics

The data in Table 1 display the sample characteristics as compared between urgent and nonurgent ED visits. The mean age was 48.7 years (SD = 20.2), and women made up 54.3% of the sample. The frequency of ED visits was highest in spring (28.3%), as opposed to summer (26.9%), fall (23.2%), and winter (21.5%). Whereas most patients (85.1%) visited the emergency department without a referral from a primary care provider, 42.6% of those who were referred to the emergency department by a primary care provider were nonurgent patients. Only 19.7% of the patients visited the emergency department because of physical trauma or poisoning as their chief complaint. Whereas more than half of all ED visits (52.7%) occurred during the day shift, the frequency of nonurgent visits during the evening (24.3%) and night (25.9%) shifts was lower than that of the day shift (28.5%).

Predictors of Nonurgent ED Visits

Table 2 displays the logistic regression results, which suggest that for every year of increase in age, the likelihood of visiting the emergency department for nonurgent causes declines by 1% (OR = 0.99; 95% CI, 0.98-0.99). Nonurgent ED visits were lower in winter (OR = 0.92; 95% CI, 0.88-0.96) and fall (OR = 0.92; 95% CI, 0.88-0.96) than in summer. In addition, nonurgent ED visits were lower during the evening (OR = 0.84; 95% CI, 0.81-0.87) and night

shifts (OR = 0.95; 95% CI, 0.91-0.99) than during the day shift. Those who visited the emergency department on the basis of a referral by a primary health care provider were 2.87 times as likely to be nonurgent as those who arrived without a referral (OR = 2.87; 95% CI, 2.75-2.99). Patients who arrived by EMS were 73% less likely to be nonurgent than those who arrived on their own or by family means of transportation (OR = 0.27; 95% CI, 0.25-0.28). In other words, if we were to invert our reference category for this finding, the results would indicate that a patient who arrived at the emergency department by EMS was 3.7 times more likely to be an urgent than a nonurgent patient. Whereas there was no difference in nonurgent ED visits between those who had a primary care physician and those who had a primary care nurse practitioner (OR = 1.03; 95% CI, 0.84-1.27), those who did not have a primary care provider were 10% more likely to have a nonurgent ED visit (OR = 1.10; 95% CI, 1.04-1.16). The residential distance from the emergency department was associated inversely with nonurgent ED visits for those who resided in the immediate suburbs (OR = 0.95; 95% CI, 0.90-0.99) but not for those who resided in the county (OR = 0.96; 95% CI, 0.93-1.0). Interestingly, those who visited the emergency department for physical and mental illnesses were, respectively, 50% (OR = 0.50; 95% CI, 0.48-0.52) and 12% (OR = 0.88; 95% CI, 0.81-0.95) less likely to be nonurgent than those who visited the emergency department for a traumatic injury or poisoning.

Discussion

Although several studies have explored the characteristics of nonurgent ED visits,[3,9,16,25,32] little research has been conducted on the topic within a Canadian context. In Canada, the research has focused mostly on the study of ED visit repeats among older adults[40] and the exploration of the predictors of low acuity ED visits among patients enrolled in a Family Health Team (a Canadian primary health care model).[26] Therefore, we believe that our study was unique with its focus on the exploration of the independent predictors of nonurgent ED visits among the general public, especially in midsize community-based hospital settings. In our study, approximately one-third of all ED visits took place for nonurgent complaints, which is lower than the national average for nonurgent ED use in Canada[41] and the United States.[8]

The findings of our study indicate that age was associated independently with nonurgent ED visits, suggesting that the odds of visiting the emergency department for nonurgent complaints declines by 1.0% for every year of increase in age. Moreover, this finding is supported by other studies that suggested that ED visits for nonurgent complaints were higher among younger and middle-aged individuals than among older adults.[9,16,25-27,32] A possible explanation for this finding is that as individuals age, they become more aware of the expected signs and symptoms of their illnesses and are more likely to make informed decisions regarding their level of acuity. In addition, our previously published qualitative research,[19] conducted on a sample of mostly middle-aged adults, suggests that financial concern (fear of losing work time and income) was one of the reasons they used the emergency department for nonurgent complaints while waiting for primary care appointments. Given that older adults are mostly retired, it is unlikely that loss of work time and income are motivating factors for their use of the emergency department for nonurgent visits.

It is important to mention that our findings on age contradict the notion that older people constitute a major segment of the population using the emergency department for nonurgent purposes.[28-30,42] In fact, in our study, the mean age of urgent patients was significantly higher than that of nonurgent patients. This assumption is supported by the findings that nurse practitioner and physician referrals of long-term care residents to the emergency department were triaged overwhelmingly as high acuity patients (>97%).[43] This discrepancy highlights the importance of realizing that just because a higher percentage of ED care seekers are older people, it does not necessarily mean that older people constitute the largest proportion of nonurgent ED users.

In addition, our findings indicate that nonurgent ED visits did not differ across gender. This finding was not surprising

given the inconclusive evidence surrounding the association between gender and nonurgent ED visits. Whereas some studies have suggested that nonurgent ED visits were higher among female patients,[3,25,28,31-33] others have indicated that they were higher among male patients.[30,34] Although our study was not subject to possible sample size limitations, we recommend that the association between gender and acuity level in the emergency department should continue to be investigated.

Although nonurgent ED visits were less likely to occur during the winter and fall seasons than in summer, visits in spring were comparable to those in summer. These findings were partially consistent with those of a previous study [44] that found that ED visits increase in the summer and fall months. A possible explanation for these findings is that the cold Canadian fall and winter seasons may act as deterrents to nonurgent ED use. In fact, our explanation is supported by the findings of Tai et al,[45] who suggest that cold weather often acts as a deterrent to nonurgent health care. In addition to the season, nonurgent ED visits were less likely to occur during the evening and night shifts than during the day shift. Specifically, ED visits in the evening and night shifts were 16% and 5%, respectively, less likely to be nonurgent than those made during the day shift. Although we do not have a clear explanation for these findings, it is possible that they are the result of convenience. The evening is usually a time of social engagement and activities that may act as a distracter with regard to nonurgent health complaints. In addition, nighttime is often when patients are settling to go to bed and are less likely to visit the emergency department for nonurgent complaints that could wait until morning. These latter findings are not surprising and are consistent with those of other studies that suggest individuals tend to visit the emergency department during the night hours for urgent health problems.[25,30]

Although health care providers are expected to refer patients to the emergency department for urgent conditions, patients with nonurgent ED visits in our study were approximately 3 times more likely to have been referred by a health care provider compared with self or family referral. Results from a previous study indicated that patients who use the emergency department for nonurgent visits were often referred by a health care practitioner.[19] In addition, the research suggests that more than one-third of nonurgent visits are referrals by primary care providers.[5,46] It is possible that such practices are motivated by the fact that primary care in Canada is covered under a universal health care plan that comes at no cost to patients. In addition, it is possible that ED referrals by health care practitioners include patients who arrive for planned hospital admissions and diagnostics. Interestingly, patients without a primary care practitioner in our study were 10% more likely to use the emergency department for nonurgent reasons than those who have a family physician. This finding was not surprising, given that existing literature[8,19,47,48] suggests that patients tend to use the emergency department as a convenient alternative for timely primary care. In addition, failure to get a timely primary care appointment was reported as a common reason for nonurgent ED visits.[19,25]

The findings of our study suggest that the geographical proximity to the emergency department was associated independently with nonurgent ED visits. Specifically, patients who lived in the suburbs and distant areas were less likely to visit the emergency department for nonurgent visits than those who lived within the immediate city boundaries. This is not surprising, given that it is probably more convenient to visit the emergency department for nonurgent conditions when it is proximal to the place of residence. In fact, our finding is consistent with those of other authors who have suggested that the proximity to the emergency department was an independent predictor of nonurgent ED visits.[49-51]

In addition, our findings suggested that the type of diagnosis was a predictor of nonurgent ED use. Patients presenting with physical symptoms (ie, acute and chronic illness) and mental disorders were less likely to use the emergency department for nonurgent visits than patients presenting with trauma. These results are consistent with

those of Davis et al,[34] who reported that patients with diabetes were less likely to present for nonurgent causes. On the other hand, these findings contradict previous reports that anxiety, acute symptoms, and upper respiratory problems were the most common reasons for nonurgent ED visits.[35,52] Given that the emergency departments in our study served patients within the context of midsize community-based hospitals and considering that we grouped diagnoses, it is important that our findings be interpreted with caution.

The findings of our study provide important information that may be used to inform strategic initiatives with regard to minimizing nonurgent ED visits. It is imperative that insurance companies, governments, and health care payers work with patients and families in a partnership to identify the reasons patients use the emergency department to receive nonurgent care.[19] The priorities of nonurgent ED users may not align with payers wishing only to reduce the costs of care. If payers prioritize reducing costs to eliminate nonurgent ED visits without including the voices of the patients and their families, the educational initiatives designed by payers might not be supported successfully by the patients and their families.[19,44]

Previous studies, including the systematic review by Uscher-Pines et al[8] on ED visits, did not clarify the acuity level of older adults visiting the emergency department. On the basis of the well-established CTAS, our findings indicate that the use of the emergency department for nonurgent visits was inversely associated with age. Therefore, when planning educational programs or strategic initiatives to reduce nonurgent ED use, it is important to recognize that although older ED care seekers constitute a higher proportion, they do not constitute the largest proportion of nonurgent ED visitors. Educational initiatives to divert people from ED use for nonurgent care should target all age groups, especially young and middle-aged adults.

Limitations

It is important to acknowledge that despite the significantly large sample, our study was conducted within the context of a retrospective review of archived data. Therefore, our findings are limited by our inability to verify the quality of the analyzed data and by the fact that our database did not include potentially important socioeconomic factors such as gross annual income, ethnicity, living arrangements, and level of education. In addition, urgent versus nonurgent visits were decided on the basis of the CTAS, which is known to be limited in terms of its accuracy of patient classification beyond that of the initial triage; however, it is the mandated approach to acuity measurement in Canadian emergency departments.

Implications for Emergency Nurses

The findings of our study contribute to a better understanding of the predictors of nonurgent ED visits, especially in midsize community-based hospital settings. The predictors such as time of day, season, and proximity of residence to the emergency department suggest that ED use for nonurgent visits carries a degree of convenience. Therefore, it is important that nurses and other health care providers keep that in mind as they plan solutions to this increasingly concerning phenomenon. Recognizing that season, time of day, and geographical proximity to the emergency department can impact whether patients use the emergency department for nonurgent care can assist policy makers to strategize how best to divert nonurgent patients during these times. Perhaps opening more clinics that have access to timely lab and diagnostic results during the spring and summer months and during the daytime hours could help alleviate ED use for nonurgent care. Additional studies that explore community-based primary care services may be required before making any changes to the current system. Providing data on ED use for nonurgent visits and access to primary care within the Canadian context is important given the health care system and cultural differences that exist between Canada and other countries. Canada implements a universal health care system that is provided at no cost to patients, and therefore may be associated with increased ED use for nonurgent care. Furthermore, Canada has a sizable immigrant population that is culturally and socioeconomically diverse, all factors

that could be associated with the patterns of ED use.

The fact that older adults were less likely to use the emergency department for nonurgent visits carries an important implication in debunking the myth that emergency departments are crowded because of overuse by older adults. Nurses need to be cognizant that just because older adults constitute a considerable percentage of ED users, that does not necessarily mean that they visit the emergency department for nonurgent care the most. The finding that patients with nonurgent ED visits in our study were approximately 3 times more likely to have been referred by a health care provider compared with self or family referral carries an important implication for emergency nurses and other health care providers. Specifically, communication between the ED personnel and primary care providers in the community, including nurse practitioners, may lead to better awareness of the burden that this practice imposes on emergency departments and the entire health care system.

Conclusions

Our study contributes to the understanding of the factors associated with the use of emergency departments for nonurgent conditions, especially within the context of midsize communities. The findings from our study could be used to inform future strategic planning to overcome the issue of ED use for nonurgent conditions in midsize communities. Furthermore, the factors identified in our study could be used to inform a better understanding of ED use for nonurgent conditions.

Acknowledgments

This work was supported by funding from the Erie St. Clair Local Health Integration Network (LHIN). The LHIN did not influence any part of the data collection or analysis of the data, or manuscript preparation.

Author Disclosures

Conflicts of interest: none to report.

Variable	Groups		Column total (N = 92,497)	χ^2/t	P
Urgent (n = 67,687)	Nonurgent (n = 24,810)	Age, mean (SD)	50.7 (20.45)	43.1 (18.57)	48.7 (20.2)
53.5	< 0.001	Gender, n (%)			
4.7	0.03	Male	30,807 (45.5)	11,491 (27.2)	42,298 (45.7)
		Female	36,880 (73.5)	13,319 (26.5)	50,199 (54.3)

		Seasons, n (%)			
32.97	< 0.001	Winter	14,759 (74.1)	5,147 (25.9)	19,906 (21.52)
		Spring	19,190 (73.2)	7,025 (26.8)	26,215 (28.34)
		Summer	17,907 (71.9)	6,994 (28.1)	24,901 (26.92)
		Fall	15,831 (73.7)	5,644 (26.3)	21,475 (23.22)
		Patient referral source, n (%)			
2,061	< 0.001	Self/family/caretaker	59,790 (75.9)	18,940 (24.1)	78,730 (85.1)
Health care provider	7,897 (57.4)	5,870 (42.6)	13,767 (14.9)	Cause of ED visit, n (%)	
		1,016	< 0.001	Trauma/poisoning	11,676 (64.1)
6,527 (35.9)	18,203 (19.7)			Mental illness	2,625 (69.4))

1,160 (30.6)	3,785 (4.1)			Physical illness	53,386 (75.7)
17,123 (24.3)	70,509 (76.2)			Shift of the day, n (%)	
		167	< 0.001	Day	34,844 (71.5)
13,914 (28.5)	48,758 (52.7)			Evening	20,914 (75.7)
6,730 (24.3)	27,644 (29.9)			Night	11,929 (74.1)
4,166 (25.9)	16,095 (17.4)			Access to primary care, n (%)	
		123	< 0.001	No	5,014 (67.7)
2,393 (32.3)	7,407 (8.0)			Yes	62,673 (73.7)
22,417 (26.3)	85,090 (92)			Proximity to emergency department, n (%)	

		9.8	0.01	City boundaries	44,469 (73.2)
16,322 (26.8)	60,971 (65.9)			Surrounding suburbs	8,308 (74.1)
2,902 (25.9)	11,210 (12.1)			County	14,730 (72.5)
5,586 (27.5)	20,316 (22.0)			ED arrival mode	
		3,833	< 0.011	Self/family	48,886 (68.3)
22,688 (31.7)	71,574 (77.4)			EMS	18,801 (89.9)

Variable	B	SE	OR	P	95% CI	
Age in years	-0.015	< .001	0.99	< 0.001	0.98	0.99
Gender (vs female)	0.015	.016	1.02	0.362	0.98	1.05
Seasons						
Winter	-0.088	.023	0.92	< 0.001	0.88	0.96
Spring	-0.026	.021	0.97	0.212	0.94	1.02
Fall	-0.086	.022	0.92	< 0.001	0.88	0.96
Summer (reference)	-	-	1.0	-	-	-
Shift of the day						

Evening	-0.181	.018	0.84	< 0.001	0.81	0.87
Night	-0.047	.022	0.95	0.032	0.91	0.99
Day (reference)	-	-	1.0	-	-	-
Referral by health care provider	1.053	.021	2.87	< 0.001	2.75	2.99
Arrival mode (EMS)	-1.321	.026	0.27	< 0.001	0.25	0.28
Primary care provider						
Nurse practitioner	0.031	.105	1.03	0.767	0.84	1.27
None	0.092	.028	1.10	0.001	1.04	1.16
Family physician (reference)	-	-	1.0	-	-	-
Proximity to emergency department						
Surrounding suburbs	-0.054	.025	0.95	0.028	0.90	0.99
County	-0.036	.019	0.96	0.058	0.93	1.00
City boundaries (reference)	-	-	1.0	-	-	-
Case presentation						
Physical illness	-0.690	.019	0.50	< 0.001	0.48	0.52
Mental illness	-0.132	.041	0.88	0.001	0.81	0.95
Trauma (reference)	-	-	1.0	-	-	-

DETAILS

Subject:	Health care access; Patients; Emergency medical care; Health care; Visits; Mental disorders; Hospitals; Confidence intervals; Variables; Primary care; Community hospitals; Proximity; Medical personnel; Older people; Departments; Residence; Time of day; Hospital systems; Emergency services; Community health services
Identifier / keyword:	Emergency department; Nonurgent visits; Predictors; Proximity to the emergency department; Primary care

Publication title:	Journal of Emergency Nursing:; JEN; Philadelphia
Volume:	46
Issue:	4
Pages:	478-487
Publication year:	2020
Publication date:	Jul 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.2020.02.002
ProQuest document ID:	2487205934
Document URL:	https://www.proquest.com/scholarly-journals/predictors-nonurgent-emergency-visits-at-midsize/docview/2487205934/se-2?accountid=211160
Copyright:	Copyright Elsevier Limited Jul 2020
Last updated:	2022-08-23
Database:	Public Health Database

Document 4 of 28

Concise Review of the Clinical Approach to the Exclusion and Diagnosis of Pulmonary Embolism in

2020: JEN

ABSTRACT (ENGLISH)

Pulmonary embolism has extremely varied clinical presentations and can be difficult to diagnose. Clinical decision rules can help determine the probability of pulmonary embolism by assessment of the clinical presentation. After the diagnosis, several prognostic rules can be used to risk-stratify and facilitate outpatient treatment of pulmonary embolism. This review addresses the utility of clinical decision rules, biomarkers in the diagnosis of pulmonary emoblism, high-risk patient phenotypes, the use of this data to make disposition decisions for patients with a diagnosis of PE, and recent shifts in the management of pulmonary embolism in the clinical setting.

FULL TEXT

Contribution to Emergency Nursing Practice

••The current literature on pulmonary embolism diagnosis, emerging biomarkers, clinical decision rules, and treatment in the emergency department indicates there is a rapidly evolving field of study.

••This article contributes a synthesis of recent advances addressing the use of age-adjusted D-dimers, YEARS criteria and use in pregnancy, and anticoagulation with a focus on who can be treated as an outpatient for pulmonary embolism.

••Key implications for emergency nursing practice found in this article are that PE is difficult to diagnose. The use of clinical decision rules can help with appropriate workup, limit resource use, and provide optimal care for patients.

Introduction

Pulmonary embolism (PE) is relatively common in the United States with an estimated incidence of 71 to 117 per 100,000 persons per year.[1-3] Recent estimates project that more than 300,000 Americans will be diagnosed with PE each year; however, the true incidence is likely higher because for every nonfatal PE, there are 2.5 cases of fatal PE only diagnosed postmortem.[4] Untreated PE has a high morbidity and a 30-day mortality rate estimated to be 30%.[5] Anticoagulation therapy significantly decreases mortality. The 30-day mortality rate of treated PE is reduced to 4%, and 1-year mortality rate to 13%.[6] This makes PE 1 of the leading causes of preventable mortality.

PE is difficult to diagnose because it has a wide range of clinical presentation; therefore, clinical presentation cannot be characterized accurately by any 1 standard evaluated phenotype. Tables 1-3 show the varied clinical presentation of PE as well as its associated risk factors. Although the population-based incidence peaks in the sixth to seventh decade of life,[2] PE affects patients of all ages. PE occurs throughout life and in children, adding to the unpredictability in clinical presentation.[7] Data from the PIOPED II study[8] have shown that the most common presenting symptoms in patients diagnosed with PE were dyspnea or tachypnea (92%), and the most common presenting sign on physical examination was tachypnea (54%).[8] Other common presenting signs and symptoms, and their relative effect on the probability of a PE diagnosis in symptomatic patients in the emergency department, are shown in Tables 2 and 3. This only further demonstrates the difficulty in diagnosing PE because of the varied signs and symptoms.

There is a large volume of information to consider when making a PE diagnosis. It is the intention of the authors to help providers identify the patients who may need a further diagnostic evaluation for PE and pinpoint the key factors

that may make a diagnosis of PE more likely. This review will discuss existing clinical decision rules and how these guidelines, in conjunction with indicated additional testing, can reduce the number of computed tomography angiographies (CTAs) obtained while maintaining high-quality care for patients with suspected PE. Finally, we will discuss the emerging treatment options, including catheter-directed thrombolysis, and indications for oral anticoagulant use in the outpatient setting.

Both the 12-lead electrocardiogram (ECG) and the chest x-ray (CXR) also have a role in the early evaluation of PE. ECG abnormalities in patients with PE are often nonspecific, with the most common findings being sinus tachycardia and nonspecific ST-segment and T-wave changes.[8] However, findings of acute pulmonary hypertension increase the probability of PE,[9] and alternative diagnoses such as left ventricular ischemia or atrial fibrillation tend to point away from PE.[10] Findings of acute pulmonary hypertension on the ECG include T-wave inversions in leads V1-V4, a QR pattern in V1, and the classic S1Q3T3 pattern.[11] These changes are indicative of right heart strain and are seen in up to 34% of patients with PE.[11] Incomplete or complete right bundle branch block are also patterns seen in PE on the ECG and are associated with increased mortality.[11]

On a CXR, the most common findings are nonspecific abnormalities such as atelectasis and effusion; in some data sets, normal radiography was seen in most patients with PE.[12,13] In 1 dataset, the most common CXR finding was cardiomegaly (27%), followed closely by normal interpretations (24%).[13] Moreover, when performed on the same patients, plain film CXR failed to reveal more than one half of pulmonary infiltrates observed on computed tomography pulmonary angiography.[14] On the basis of this information, CXR on its own is not helpful in the diagnosis of PE in the clinical setting and often fails to display pneumonia, which is a key differential diagnosis (Tables 1-3).

Decision Rules

Decision rules are chosen by statistical selection from large data samples to yield criteria that can aid clinical judgment in the exclusion and diagnostic choices for PE. The Figure characterizes how a few of these rules can be integrated into a diagnostic pathway for PE.

When considering the diagnosis of PE, the pulmonary embolism rule-out criteria provides a useful start because it helps to rule out PE in patients who have a gestalt low pretest probability (defined as Table 4) are negative.[15,16] If any of the criteria are positive, then PE cannot be ruled out, and further testing, usually a D-dimer, is warranted to risk-stratify if PE is present in the patient (Table 4).

Wells' Criteria for Pulmonary Embolism is a widely validated pretest probability instrument used to determine whether D-dimer or pulmonary vascular imaging is needed (Table 5).[17,18] If the Wells score is less than 5, the clinician may proceed to rule out PE with D-dimer; if the score is more than 4, the clinician may proceed with CTA. When the original article defining Wells' criteria was published, the mainstay of diagnostic imaging was a ventilation-perfusion scan, which has been largely replaced by CTA to evaluate for PE (Table 5).[17]

Recently, studies such as the YEARS trial have validated the long-held notion that the D-dimer threshold can be doubled for low pretest probability. The standard cutoff for all D-dimers is set to maximize sensitivity. However, clinicians need to remain aware that the exclusionary power of any diagnostic test depends upon both sensitivity and specificity, which is used to calculate the posttest probability. This requires calculating the negative likelihood ratio (LR[–] = sensitivity/[1 – specificity]), which is multiplied by the pretest odds ratio (OR = probability/1 – probability), and the resulting posttest odds ratio is converted back to probability (*P* = odds/1 + odds) to yield posttest probability, which is essentially the probability of being wrong or failing to diagnose PE. With an increasing threshold for abnormal, for example, increasing the definition of an abnormal D-dimer from 500 ng/mL to 1,000 ng/mL, the sensitivity drops approximately 5% (from approximately 97% to approximately 92%), but the specificity increases

from approximately 50% to approximately 60%. Therefore, the LR(–) remains less than 0.1. Moreover, the D-dimer increases with many diseases, as seen in Table 6, and also with normal aging.[19,20] Recent research has found that higher thresholds for abnormal can exclude PE safely in 2 clinically important situations: for patients aged more than 50 years and for patients with a clinically low pretest probability. The best validated method for age adjustment for D-dimer, assuming a standard cutoff of 500 ng/mL, is age in years × 10.[21] With this adjustment, a D-dimer of 799 ng/mL is normal for an 80-year-old patient. The YEARS trial, which reported an adaptation of the Wells score (no suspected deep vein thrombosis [DVT], no hemoptysis, and an alternative diagnosis more likely than PE) to predict the diagnosis of PE to be unlikely, followed by the use of D-dimer with a “twice normal” threshold (1,000 ng/mL), found an extremely low false-negative rate while reducing the CTA rate by 10%.[22,23] Recently, a multicenter adaptation study of the YEARS criteria reinforced the view that doubling the D-dimer is a safe and efficient strategy for patients with low pretest probability for PE (Table 6).[24]

In addition, the YEARS clinical decision tool was applied to pregnant patients. PE is 1 of the leading causes of maternal death in the Western world.[25] With the application of the YEARS criteria to pregnant patients across all trimesters, CTA was avoided in 32% to 65% of patients.[26] In the pregnancy-adapted YEARS decision tool, the criteria include clinical signs of DVT, hemoptysis, PE as the most likely diagnosis, and D-dimer less than 1,000 ng/mL. If all criteria were absent, PE was considered excluded in pregnant patients. In addition, if 1 or more of the 3 criteria were positive and the D-dimer was less than 500 ng/mL, then PE was considered to be ruled out.[26] These advances further help with the diagnostic evaluation of PE in pregnant patients in the emergency department.

Patients with PE present with abnormal blood concentrations of many biomarkers of coagulation, inflammation, and platelet reactivity. Only the D-dimer has been validated as a biomarker to aid in the decision to exclude PE. However, and this is important to daily practice, practitioners should be aware that acute PE can elevate markers of myocardial injury and strain, including both troponin T and I concentrations as well as brain natriuretic peptide and N-terminal pro-brain natriuretic peptide levels. Although these biomarkers are more useful to predict the severity of PE after its diagnosis, it is imperative that clinicians not reflexively exclude or diagnose PE solely because 1 or both biomarkers are abnormal.[27-30]

Management

Current management guidelines in PE split patient treatment into 2 categories: those who are hemodynamically stable and those who are hemodynamically unstable. Hemodynamic instability is defined as hypotension (systolic blood pressure [SBP] 31 For patients who are hemodynamically stable, the current standard of care is therapeutic anticoagulation for those without a contraindication to anticoagulation and for those whose risk of serious bleeding is imminent.[32] Anticoagulation should begin as soon as possible and continue for 6 months. In some patients, it should be continued indefinitely. In the emergency department, anticoagulation should be initiated with low-molecular-weight heparin (eg, 1 mg/kg of enoxaparin, administered subcutaneously or intravenously). A discussion with inpatient teams for the management of long-term anticoagulation should also occur. In recent years, the standard of care management of low-risk PE has shifted from automatic admission to the hospital toward home treatment. This concept has been facilitated by the availability of monotherapy anticoagulation with either apixaban or rivaroxaban. Outpatient anticoagulation has been shown to be safe and effective in those patients with low risk of death defined as Pulmonary Embolism Severity Index (PESI) class I or II, a negative simplified PESI score, or negative Hestia criteria, as shown in Table 7 and Table 8.[33-40]

An isolated subsegmental PE (a filling defect seen on a pulmonary artery 41 However, in the absence of any controlled clinical trial, the evidence regarding the treatment effect for subsegmental PE is highly inferential, and no firm recommendation can be made regarding whether to anticoagulate or continue without treatment with

observation.

For patients who are hemodynamically unstable (SBP 42 Whether or not lower-dose systemic fibrinolysis can retain clinical benefits with decreased bleeding risk compared with full-dose fibrinolysis remains uncertain.[43-45] Recently, catheter-directed thrombolysis was employed, although without high-quality evidence of benefit.[46] Nevertheless, the decision regarding reperfusion therapy, with the exception of the patient at the highest risk for bleeding (eg, known hemorrhagic stroke or active gastrointestinal hemorrhage), all patients with PE and hypotension should receive immediate systemic anticoagulation with either low-molecular-weight or unfractionated heparin.[47,48]

Patients with unstable PE and higher bleeding risk should be considered for catheter-directed treatment, as the doses of thrombolytics can be reduced 10-fold compared with systemic administration, and new suction catheters can be used to aspirate a proximal clot from the pulmonary arteries.[49-53] Another option for catastrophic PE with profound and refractory hypotension or cardiac arrest with return of circulation is the use of venoarterial extracorporeal membrane oxygenation (VA ECMO), sometimes followed by surgical embolectomy.[54] The use of catheter-directed therapies, VA ECMO, or surgical embolectomy requires consultation or patient transfer, preferably to a hospital with an organized multidisciplinary PE response team.[55,56]

For patients with high suspicion of PE and hemodynamic instability that precludes transport for pulmonary vascular imaging, bedside echocardiography demonstrating right ventricular (RV) dilation (eg, RV diameter > left ventricular [LV] diameter in the apical 4-chamber view) can be used to significantly increase the probability of PE (LR[+] of 2.0 to 3.0). Occasionally, a bedside cardiac ultrasound will show intracardiac echogenic mass, representing the so-called clot in transit (PE traveling through the heart), which confirms the diagnosis of PE. Patients with a high pretest probability (eg, Wells score > 6), and an RV dilation greater than LV dilation observed in a bedside ultrasound should receive empiric systemic anticoagulation.

Disposition

For patients with PE at low risk of deterioration, as determined by the simplified PESI or Hestia criteria, home treatment with apixaban or rivaroxaban is a safe and preferred method, potentially improving outcomes.[57-59] Any patient with hypotension, with a clot in transit, or who has received or may receive thrombolytic therapy should be hospitalized at the intensive care level.

Implications for Emergency Clinical Practice

These recent changes in the decision rules bring to light the nuances of recognizing and treating PE in the emergency department. The recent changes in care include the use of age-adjusted and pretest-probability–adjusted D-dimer[60] and a shift toward the discharge of low-risk patients for monotherapy oral anticoagulation at home. For higher-risk patients, the reperfusion therapies include systemic and catheter-directed thrombolysis. For front-door assessment being done by triage nursing, this is an especially difficult task given the limited ability to gain additional information. As with most diagnostic uncertainty, we recommend that triage nurses note the vital abnormalities and triage patients according to standard protocols. At all stages of emergency nursing care (triage, the emergency department, or observation unit), patients who should raise suspicion for PE include those with unexplained dyspnea, a pulse oximetry reading lower than 95% in the absence of a smoking history or known lung disease, and a pulse rate of more than 100 beats per minute with other risk factors, as stated in Table 1.

Limitations

Many clinically important questions remain poorly defined owing to a dearth of high-quality data. These questions include the following: What are the clinical features of “missed PE?” What is the time frame after PE that the D-dimer concentration decreases to normal in the absence of anticoagulation? Can the D-dimer threshold be increased for other populations, notably pregnant patients? What is the true number needed to treat and the true number needed

to harm regarding anticoagulation for small (subsegmental) PE? What is the dose of systemic fibrinolysis that produces the highest therapeutic index?

Conclusions

PE can be a difficult disease to diagnose because it can present in many different patient populations with a wide variety of symptoms. Untreated PE can cause rapid death, but in the absence of arterial hypotension, timely anticoagulation of PE is associated with a mortality rate of less than 5%.[4,5] The use of clinical decision rules and associated biomarkers can standardize care, lower the rate of low-value pulmonary vascular imaging, and make affordable the option of home treatment for low-risk PE. For more severe or catastrophic PE, the new options include catheter-directed treatments, and VA ECMO represents an option to prevent death.

Author Disclosures

Conflicts of interest: none to report.

Risk factor	Risk implication	Associated risk
Age	Increased risk starting after the age of 50 years until the age of 80 years.	Increased risk with each year of life. The “apparent” decrease in incidence after the age of 80 years likely reflects lowered surveillance.
Gender	No clear risk on the basis of gender, although the transgender effect remains uncertain.	No clear change in risk.
Immobilization	Risk increases with immobilization of a major joint for more than 2 weeks.	Increases risk 2- to 3-fold.
Recent surgery	Increased risk in the first 10 days after endotracheal intubation and continues for 4 weeks after. Increased risk with more invasive procedures.	Increases risk 3- to 5-fold.
Prior VTE	Confers the greatest risk 1.5- to 2-fold of recurrence for unprovoked VTE and increases risk if there is also an elevated D-dimer.	Increases risk 1.5- to 2-fold.
Cancers	Increased risk in active cancers, specifically adenocarcinomas, metastatic disease, acute leukemias, and myelomas. A history of remote and inactive cancer likely does not increase the risk for PE.	Solid cancers increase risk 2- to 3-fold. Hematologic cancers increase risk 3- to 6-fold.

Exogenous hormone use	Higher risk in the first few months of onset of use; all formulations of contraceptives containing estrogen increase VTE risk, including transvaginal and transdermal delivery.	Increases risk 2.5- to 3.5-fold.
Travel	There is an increased risk in travel with immobility in a seated position for more than 6 hours; however, in the ED population this association is less clear.	Unlikely to affect probability of PE diagnosis in symptomatic patients in the emergency department.
Indwelling catheters	Increased risk of upper extremity VTE, but not usually associated with PE.	Unlikely to affect risk of diagnosed PE.
Thrombophilia	The strongest risks of PE are conferred from non-O blood type, lupus anticoagulant, shortened aPTT, Factor 5 Leiden, familial protein C, S, and antithrombin deficiency.	Increased risk for PE differs for each, but each confers an increased risk.
Smoking	Increased risk in the population but not a factor that increases VTE in the emergency department—more likely to point toward an airway cause of symptoms.	Likely to decrease probability of PE diagnosis in symptomatic ED populations.
Congestive heart failure	At-risk population but not as much of a factor in the ED setting.	Likely no effect in ED population.
Stroke	Increased risk with severe stroke and flaccid paralysis, greatest risk the first month after the initial stroke.	Increased risk especially in the first month.
Obesity/metabolic syndrome	In general population, BMI greater than 35 kg/m^2 has a greater risk but there is not enough data to suggest that BMI increases risk for PE in the emergency department.	Not enough studied information in ED populations.
Pregnancy/postpartum state	70% of peripartum PE are postpartum, risk for PE increases with each trimester; however, in the emergency department, the overall risk for PE in patients who are ambulatory remains low throughout pregnancy.	Increases risk 1- to 2-fold.

Noninfectious inflammatory conditions	Risk of VTE increases in proportion to the severity of the underlying disease, such as inflammatory bowel disease, lupus with lupus anticoagulant, and nephrotic syndrome.	Unclear but likely increases risk with worsened disease burden.

Sign	Presentation with PE
Tachypnea (RR >20 breaths/min)	Defined as more than 20 breaths/min—this number is difficult to quantify, and multiple studies have found varying levels—tachypnea is present most often in patients with PE.
Tachycardia (HR >100 BPM)	Present in one fourth of the patients with PE and should increase suspicion.
Diaphoresis	Not often associated, does not help in diagnosis.
Cyanosis	Not usually present in PE.
Temperature (Temperature >38.5°C [101.3°F])	Not usually increased in PE.
Cardiac examination	Most often, there is a nonspecific abnormality in up to 22% of cases with increased P2 sounds on auscultation and JVD cited most often.
Lung examination	Abnormal in 29% to 37% of cases with the most common abnormality being crackles followed by decreased breath sounds.
DVT signs	Defined as calf or thigh swelling, present in 47% of cases, and if present there is a significant increased risk of PE.

Symptoms in PE	Association and amount present in PE
Dyspnea	Dyspnea at rest or exertion is present in 79% of people with PE and is the most prevalent symptom of PE and should increase clinical suspicion when the dyspnea cannot be explained by pre-exisiting cardiopulmonary disease.

Orthopnea (propped up in bed with more than 2 pillows)	Present in 28% to 36% of patients with PE and is not significantly different from orthopnea in those without PE. Difficult to ascertain if this is helpful in the ED population.
Pleuritic pain	Present in 44% to 47% of PE and is significantly different from pleuritic pain in those without PE. Tends to increase probability of PE in studies done on ED populations but does not preclude use of the PERC rule.
Chest pain (not pleuritic)	Present in 17% to 19% of PE and not different from chest pain in those without PE and is not as helpful in ED populations.
Cough	Present in 34% to 43% of patients with PE and not significantly different from cough in those without PE and is not as helpful in ED populations.
Wheezing	Present in 21% to 31% of patients with PE and not significantly different from wheezing in those without PE and is not as helpful in ED populations.
Calf or thigh swelling	Present in 39% to 41% of PE and is significantly different from calf or thigh swelling in those without PE. This finding consistently increases risk of PE in studies done on ED patients.
Calf or thigh pain	Present in 16% to 17% of PE and is significantly different from calf or thigh pain in those without PE. This finding is not as strong as swelling, but still increases probability of DVT and therefore PE.

PERC rule*
1.Clinical low probability (< 15% probability of PE on the basis of a gestalt assessment)
2.Age <50 years
3.Pulse <100 BPM during entire stay in the emergency department
4.Pulse oximetry N = 94% at near sea level (> 92% at altitudes near 5,000 feet above sea level)
5.No hemoptysis
6.No prior VTE history
7.No surgery or trauma requiring endotracheal or epidural anesthesia within the last 4 weeks

8.No estrogen use[†]
9.No unilateral leg swelling[‡]

Wells score for PE	
Factor	Points[*]
Suspected deep vein thrombosis	3
Alternative diagnosis less likely than PE	3
Heart rate >100 BPM	1.5
Prior venous thromboembolism	1.5
Immobilization within the previous 4 weeks	1.5
Active malignancy	1
Hemoptysis	1

False positives	False negatives
•Increasing age with each decade after 60 years leading to an increase in the D-dimer	•Concomitant anticoagulation
•Cocaine use	•Symptoms lasting more than 5 days
•Immobility in general; greater the immobility (general, limb, neurologic), greater the odds of false elevation	•Subsegmental PE
•Hemoptysis	•Isolated pulmonary infarction
•Hemodialysis	•Chronic PE
•Active malignancy	•Wrong samples

•Systemic lupus erythematosus	•Severe lipemia or hemolysis
•Sickle cell disease	•Protein degradation by proteolysis that can occur with prolonged time period from sample draw to analysis
•Pregnancy and postpartum state and increase with trimester	
•Surgery	

PESI	Simplified PESI
Age: 1 point per year	Age >80 years: 1 point
Male sex: 10	
History of cancer: 30	History of cancer: 1
History of heart failure: 10	History of heart failure or chronic lung disease: 1
History of chronic lung disease: 10	
Pulse >110 BPM: 20	Pulse >110 BPM: 1
Systolic BP <100 mmHg: 30	Systolic BP <100 mmHg: 1
RR ≥ 30: 20	
Body temperature <36°C (96.8°F): 20	
Altered mental status: 60	
SaO2 <90%: 20	SaO2 <90%: 1
Risk	Risk
Class I: <65 points: very low risk Class II: 66-85 points: low risk Class III: 86-105 points: intermediate risk Class IV: 106-125 points: high risk Class V: >125 points: very high risk	0 points: low risk ≥ 0 points: high risk

Hestia criteria
Hemodynamically stable (SBP <100 mmHg, HR >100 BPM, needing ICU care, or by clinician's judgment)
Thrombolysis or embolectomy needed
Active bleeding or high risk for bleeding (GI bleeding or surgery within 2 weeks, stroke within 1 month, bleeding disorder or thrombocytopenia [platelet count <75 × 10^9/L], uncontrolled HTN [SBP >180 mmHg or DBP >110 mmHg], or by clinician's judgment)
> 24 hours on supplemental oxygen required to maintain SaO2 >90%
PE diagnosed while on anticoagulation
Severe pain needing IV pain medication >24 hours
Medical or social reason for admission >24 hours (infection, malignancy, no support system)
Creatinine clearance <30 mL/min by Cockcroft-Gault formula
Severe liver impairment (by clinician's judgment)
Pregnancy
Documented history of HIT
Risk
0 points: Low (0% mortality, 2% VTE recurrence) > 0 points: Not low risk

DETAILS

Subject:	Patients; Emergency medical care; Hemoptysis; Clinical decision making; Medical diagnosis; Pulmonary embolisms; Biological markers; Mortality; Outpatient treatment; Electrocardiography; High risk; Biomarkers; Phenotypes; Peptides; Pulmonary hypertension; Clinical assessment
Identifier / keyword:	Pulmonary embolism; Clinical decision rules; Biomarkers in pulmonary embolism; Contribution to emergency nursing practice

Publication title:	Journal of Emergency Nursing:; JEN; Philadelphia
Volume:	46
Issue:	4
Pages:	527-538
Publication year:	2020
Publication date:	Jul 2020
Section:	Clinical Science Translation 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:	https://doi.org/10.1016/j.jen.2020.02.018
ProQuest document ID:	2487205917
Document URL:	https://www.proquest.com/scholarly-journals/concise-review-clinical-approach-exclusion/docview/2487205917/se-2?accountid=211160
Copyright:	©2020. Emergency Nurses Association
Last updated:	2022-09-26
Database:	Public Health Database

Document 5 of 28

Ozone Alerts and Respiratory Emergencies: The Environmental Protection Agency's Potential

Biological Pathways for Respiratory Effects: JEN

ABSTRACT (ENGLISH)

The purpose of this editorial is to review the broad relevance of environmental health in contemporary emergency nursing, introduce the Environmental Protection Agency's (EPA) 2020 Integrated Science Assessment (ISA) potential biological pathways for respiratory effects following ozone exposure,1 and provide an introduction to select manuscripts that appear in this issue of the *Journal of Emergency Nursing* (*JEN*). To function as an expert in the emergency nursing specialty, we need to acquire a substantial breadth and depth of knowledge in environmental health. Our specialty knowledge includes the emergency management of exposure to thermal extremes, environmental and occupational poisoning, venomous bites and stings, vector-borne disease, animal bites, diving decompression, drowning, altitude sickness, wilderness emergencies, and all-hazard disaster preparedness and response.2,3 Emergency nursing interventions include therapeutic environmental controls from maintaining body temperature through warmed intravenous fluids to reducing edema and pain in musculoskeletal injury through cryotherapy.4 Emergency nurse leaders also influence the broader environment by making decisions on hospital architecture, sustainable health care purchasing, water and air quality policies, medical waste disposal, and global climate change mitigation efforts.5,6

FULL TEXT

The purpose of this editorial is to review the broad relevance of environmental health in contemporary emergency nursing, introduce the Environmental Protection Agency's (EPA) 2020 Integrated Science Assessment (ISA) potential biological pathways for respiratory effects following ozone exposure,[1] and provide an introduction to select manuscripts that appear in this issue of the *Journal of Emergency Nursing* (*JEN*). To function as an expert in the emergency nursing specialty, we need to acquire a substantial breadth and depth of knowledge in environmental health. Our specialty knowledge includes the emergency management of exposure to thermal extremes, environmental and occupational poisoning, venomous bites and stings, vector-borne disease, animal bites, diving decompression, drowning, altitude sickness, wilderness emergencies, and all-hazard disaster preparedness and response.[2,3] Emergency nursing interventions include therapeutic environmental controls from maintaining body temperature through warmed intravenous fluids to reducing edema and pain in musculoskeletal injury through cryotherapy.[4] Emergency nurse leaders also influence the broader environment by making decisions on hospital architecture, sustainable health care purchasing, water and air quality policies, medical waste disposal, and global climate change mitigation efforts.[5,6]

The coronavirus disease pandemic has opened and accelerated new frontiers for environmental health and environmentally sustainable practices in emergency nursing. Pandemic telehealth opportunities have been exponentially fueled by public health officials discouraging patients from seeking emergency care for nonurgent reasons, while innovative telecommuting environmental controls to reduce infectious hazards are implemented. Teletriage and poison control consultation are well established telenursing interventions, but there is a substantial gap in the literature on the concept, intervention development, and efficiency or effectiveness testing of disaster or general emergency telenursing.[7] Telenursing aligns with United States national goals to improve outdoor air quality; one of the federal government's Healthy People 2020 objectives is to "increase the proportion of persons who telecommute."[8] Unexpectedly, emergency nurses are in a key position to redefine and expand their roles in remote patient monitoring through telehealth in urgent and emergent conditions, patient self-management education, and ensuring the interdisciplinary quality and safety of emergency telemedicine care delivery. We, at *JEN,* welcome manuscripts to accelerate the dissemination and reach of novel emergency telenursing ideas, interventions, and service lines in the US and globally.

"Why Should We Adrenaline Junkie Emergency Clinicians Care About This?"

Environmental health was a crucial component of each stage of my own nursing career. For me, environmental influences of individual emergency cases and clusters became my burning questions to motivate quality improvement and research projects. As a nursing assistant in Milwaukee, Wisconsin, I cared for patients who suffered from cryptosporidium contamination of the public water supply. This was also when I first learned about air quality measures. At that time, an estimated 43% of the US population was exposed to harmful amounts of ground-level ozone, with a higher proportion in children under 9 years and those who self-identified their race as black, African American, or Latinx.[9] As a home health nurse, I witnessed substantial racial disparities in both housing quality and outdoor environmental exposure sources next to residential housing. Heat stroke and heat illnesses became routine diagnoses in the summer months in my emergency nursing practice in Las Vegas, Nevada. Extra fluoride in the water supply in rural New Mexico resulted in brown and brittle teeth and bones in a condition called fluorosis, where I cared for larger numbers of younger people presenting with fractures than I had seen in my practice in other geographic locations. In a small-town hospital downwind of a large industrial sector in the Midwest, we had seemingly unrelated and unexplained clusters of patients with cardiac arrhythmias in 1 night, and then we did not see the same diagnosis again for months. On the basis of my experiences when I practiced in emergency departments in several industrial urban environments, I would drive into the start of my shift on hot, humid, air quality alert days anticipating crowded ED hallways packed with patients struggling to breath as their chronic obstructive pulmonary disease or asthma exacerbated beyond their control. In all emergency care settings, we prepared for environmental disasters and routinely responded to a wide variety of occupational exposure and inhalation toxicology emergencies.

By the time I was actively engaged in research projects on the emergency health effects of outdoor air quality levels, the proportion of the US population exposed to harmful amounts of ground-level ozone had fallen to 36%.[9] Although this was an overall improvement from previous years, it was still a harmful exposure that affected more than 1 in 3 people living in the US. One of my well-respected, senior emergency nurse clinical colleagues would bluntly question me, "Look, we have 6 patients hanging in on the verge of death right here, right now in this department. How are you not bored with your air quality work? Why should we adrenaline junkie emergency clinicians care about this?" Undoubtedly, there is a tremendous thrill in solving clinical problems to rescue the massively bleeding trauma patient or bring the cardiac arrest patient back to life. However, my scientific curiosity and passion was drawn to tackling the emergency care sector problems of patient volume spikes and crowding with environmentally-associated, and potentially preventable, dyspnea. I was also moved by the profound suffering I witnessed in my patients with severe dyspnea, especially when the pathology was linked to occupational and environmental causes outside of their control. In addition to the profound individual suffering, the national scope and scale of harmful air pollutant exposures compelled me to action. This journey to integrate an environmental health research focus with emergency nursing has led to tremendous interdisciplinary collaboration and leadership opportunities to inform national and international policy.[1,10–13]

Ozone

Health care providers and patients tend to hear more about ozone during periods of hot, sunny weather in the spring and summer, with some exceptions at high altitude in the winter months. We experience this seasonal timing because ground-level ozone is formed by a chemical reaction of nitrogen oxides, volatile organic compounds, methane and/or carbon monoxide precursors in the presence of solar radiation, with temperature- and sunlight-dependent conditions.[1] Whereas ozone and these precursors can be naturally occurring, the most common human-activity–related sources include petroleum and related industry, fuel combustion, and highway vehicle traffic. In the US, the most susceptible regions to high levels of health-harming ozone include the Southwest US, Texas, the Midwestern Lake Michigan region, and in the densely populated area of Washington DC to Boston, Massachusetts.[1] Over time, the regulatory standard has been strengthened from 80 parts per billion (ppb) to 75 ppb in 2008, and again to 70 ppb in 2015. In Canada, this standard is currently set at 62 ppb and scheduled to decrease to 60 ppb in 2025.[14] The concentration of ground-level ozone has improved over the last few decades.[1] However, there can still

be detrimental health effects at exposure levels below the regulatory standard, especially for vulnerable populations. In the long term, climate change threatens to introduce new dynamics to elevate future ozone levels and harmful health effects.

Ozone demonstrates inconsistent germicidal properties, with a mechanism of action similar to chlorine and peroxide disinfectants.[15-17] The same reactions that harm germs and microbes also harm the human cell, and there is no established level at which ozone exposure is considered harmless to human health.

At the cellular level, harmful oxidants are created when ozone interacts with the fluid-bathed epithelial cells that line mucus membranes, including those of the respiratory tract.[1,18] Patients may experience symptoms related to the direct irritant action of ozone, including cough, pain on deep inspiration, and acute tissue soreness.[1] Subsequently, tissues and organs may be affected by ozone- and oxidant-induced inflammatory, immune, autonomic, and endocrine signaling. Research evidence on the health effects of ozone is periodically and comprehensively reviewed by the US EPA. The most recent review, published in April 2020 includes human, animal, and molecular mechanistic research studies across the bench-to-bedside-to-population continuum. Whereas there are varying levels of evidence that ozone exerts health-harming cardiovascular, metabolic, central nervous system, reproductive, and oncologic effects, and that ozone exposure is linked to increased total mortality, the strongest evidence supports that short-term exposure to ozone results in detrimental respiratory effects.

Potential Biologic Pathways for Respiratory Effects After Ozone Exposure

The Figure and Supplementary Figure 1 present the original and corrected EPA potential biological pathway for respiratory effects after short-term ozone exposure from the 2020 ISA for ozone and related photochemical oxidants (Barbara Buckley, PhD and Tom Luben, PhD, Center for Public Health and Environmental Assessment, Office of Research and Development, U.S. Environmental Protection Agency, personal communication, June 1, 2020).[1] This depicts the pathways supported by well-designed research evidence that link ozone exposure to health-harming respiratory effects. Note that the outcomes in the figures include airway obstruction, increased respiratory symptoms, decreased lung function, and ED visits and hospital admissions for asthma exacerbation. Emergency nurses have in-depth understanding of how these relationships manifest in human health and translate to clinical practice.

Briefly, the figures synthesize the evidence in the EPA ISA.[1] The airway obstruction in asthma pathophysiology is caused by increased mucus production, increased bronchoconstriction, and/or airway inflammation. Short-term increases in ozone exposure trigger this pathophysiology through autonomic nervous system activation, direct respiratory tract injury, inflammation, and oxidant formation. This triad of respiratory tract injury, inflammation, and oxidative stress is also associated with increased allergic response, impaired immune system defenses, and observable pathological changes in lung tissue histology (microscopic anatomy). Research demonstrates that oxidative stress enhances allergic responses, which is also a potential pathway to increased airway mucus production, inflammation, and bronchoconstriction. At the population level, there are associations between short-term increases in ozone and ED visits and hospitalizations for respiratory infections. Because ozone alters the host defense through immune system effects, this is a plausible relationship.

More research is needed at low levels of ozone exposure (≤40 ppb) in which there is little evidence on the health effects and there is more uncertainty inherent in the current research evidence. At low levels, the shape of ozone's dose-response curve with population health effects such as hospitalizations can appear more like a skewed arc or tipped "J" shape where health-harming risks associated with increasing ozone might actually decrease at very low levels of exposure (0-20 ppb). Owing to the uncertainty about health effects at these low levels, there is little direct application yet to clinical practice until more high-quality research evidence is available. Hypothetically, a decreasing dose-response shape at very low levels of exposure may be due to ozone's germicidal properties.[17,19] Of course, any of ozone's germicidal potential to decrease the transmission of infection must be carefully balanced with any direct impairment in human host defenses and direct human tissue damage when planning or interpreting ozone exposure research.

The EPA ISA determined that there were more uncertainties in the strength and consistency of the evidence linking long-term ozone exposure to respiratory health effects, compared with short-term ozone exposure.[1] Even with

the greater uncertainty, the potential biological pathway (Supplementary Figure 2) can serve as an important critical thinking tool to inform emergency nursing practice. In addition to many of the same underlying mechanisms by which short-term ozone exposure exerts harmful respiratory health effects, there is evidence that long-term exposure may increase the severity of influenza, interfere with optimal lung development in children, and increase the risk of permanent alveolar damage, airway remodeling, and fibrosis that manifests in chronic lung disease development and exacerbation. It is still largely unknown if short- or long-term ozone exposure increases the severity of severe acute respiratory syndrome coronavirus 2 infection, which appears to be a biologically plausible hypothesis, given the current evidence on influenza infections.

What Do These Ozone Exposure Biologically Plausible Pathways Mean for Emergency Nursing Care?

Knowledge about the potential biological pathways for respiratory effects after ozone exposure can inform emergency nursing practice in patient education, referral, policy, and advocacy.[6,20,21] The nurse can assess if the patient with asthma uses public air quality alerts or ozone action day warnings to modify behavior and reduce potential triggers. Integrating critical thinking and pathophysiology of hazardous pollution exposure enrich patient education on lung disease development and education. In addition to providing behavior modification resources, such as those for smoking cessation, practical individualized patient counseling can include avoiding outdoor activities on air quality alert days or late afternoon high-risk times when conditions favor outdoor ozone formation. The Table (following the Figure) provides links to patient education material and handouts that can be used in individual patient education or as part of facility libraries or education kiosks. Interdisciplinary team leadership to integrate social and public health services promises to improve patient outcomes as well. For example, the emergency nurse practicing in a high-poverty area with poor outdoor air quality can facilitate connections to social or public health programs that support patient access to cooling centers or financial vouchers or provision of air filters or home air conditioners.

On the departmental level, emergency leaders can measure and anticipate patient volume changes and seasonal clusters of patient presentations linked to environmental conditions to plan accordingly. Unit level planning would include sensitivity to adequate staffing and ensuring adequate supplies of chronic respiratory disease treatments, rescue medications, and equipment. Quality improvement or continuing education for staff can address opportunities to integrate environmental health and asthma education into the unit culture. For example, interdisciplinary professional development courses and certification as an asthma educator, which include content on reducing environmental triggers, is open to emergency nurses by the National Asthma Educator Certification Board. If available, emergency leaders can establish referrals and collaborations with local respiratory disease–focused coalitions or support groups to connect patients with community resources and ongoing self-management education. Last, emergency care expertise is needed to inform policymakers or advocate for environmental or climate change policies that affect emergency health outcomes from the local to international level.

Manuscripts in the *Journal of Emergency Nursing*

The remaining issues in 2020 will include collections of manuscripts addressing disaster, environmental health, and infectious disease topics in emergency nursing. We have several high-quality manuscripts in this current issue that address a wide breadth of emergency care topics. Here, I'd like to take the opportunity to highlight a selection of our current issue manuscripts addressing fluid and electrolyte management, respiratory assessment, and 2 environment topics.

Fluid and Electrolyte Management

Dr Metheny is the nursing discipline's expert on fluid and electrolyte balance.[22] In this issue of *JEN*, Metheny and Krieger[23] provide a systematic review of salt toxicity from case reports of ingestion through accidental overdose poisoning, suicide, prank, religious ritual, and child maltreatment. A rarely seen emergency, it is important for emergency nurses to recognize hypernatremia from salt toxicity because it can be fatal. Fluid and electrolyte imbalance may be one of the causes for migraine, weakness, and dizziness presentations to the emergency department. Two of our sections provide evidence-based updates to enhance clinical reasoning and critical thinking about these presentations. Oliver's Advanced Practice Clinician's Corner manuscript[24] provides an update on

migraine management whereas Somes' Geriatric Update section[25] provides an overview of dehydration and poor nutrition in the older adult who presents with weakness or dizziness. Further, end stage renal disease is a comorbidity with fluid and electrolyte derangement aftermath that is frequently treated in the emergency setting, particularly when the required dialysis treatments are missed or delayed. The case review by Adams and Osman[26] presents the signs and symptoms of a rare complication of dialysis access, dialysis access steel syndrome. Contextualized with environmental health, hypernatremia, headache and migraine, older adult dehydration, and management of patients with end stage renal disease can all be complicated and worsened in conditions with extreme heat or severe weather.

Basic to Advanced Respiratory Assessment

Harry et al[27] bring us back to applying clinical excellence in the most basic of nursing skills by testing the accuracy of respiratory rate assessments in 78 emergency nurses. Although the nurses consistently assessed normal respiratory rate using a formal or spot-checking method, the accuracy of correctly identifying bradypnea fell to an unsafe 60% to 75% accuracy. The potential to miss important changes of conditions by short-cutting respiratory rate and vital assessment are concerning, and the article is an excellent reminder of the need to adhere to best practices in our fundamental skills, even as we acquire and apply complex, advanced clinical procedural abilities.

Shortness of breath is one of the most common presenting symptoms that brings patients to the emergency department.[28] Although triage is often pragmatically used as the point of hospital intake where health care leaders are often tempted to require mandatory and population health screening activities, priority must be placed on clinical vigilance and attention to nuanced presentations that might be immediately life threatening. Pulmonary embolism (PE) is one of these potentially rapidly fatal but subtle and easy to miss patient presentations. In this issue of *JEN*, Tomkiewicz and Kline[29] provide clinical decision rules to an evidence-based guide to assessing, diagnosing, and prognosing PE in the emergency setting. Continued updated knowledge in this area is needed to integrate the emergency nursing implications on how severe acute respiratory syndrome coronavirus 2 infection leads to deadly PE complications. Finally, our newest section, Images, debuts with X-ray and computed tomography images accompanied by a brief case description of a patient with coronavirus disease from Gleyzer and Milman.[30]

Environment

Tindle et al[31] provide fascinating insights using a novel application of geospatial analysis methods to study the ED unit architecture's associations with clinician communication. This research points to a tremendous gap in the science about how unit architecture and built environment decisions could be enhanced with a stronger evidence-based and better understanding of built environment impact on clinician and patient outcomes.

Mutlu and Yilmaz[4] studied a classic cold-pack cryotherapy emergency nursing intervention for soft tissue injury. Their randomized clinical trial to test 10-, 20-, or 30-minute cold-pack application duration with 105 participants reinforces the continuation of the common best practice of a 20-minute duration with sound clinical evidence and rationale.

Conclusion and Next Issue

The September 2020 issue of *JEN* will include a collection of papers focused on disaster nursing around the globe. We've foreshadowed this theme with our 50th anniversary celebration reprint in this current issue of the 1990 manuscript, "A disaster that can happen anywhere—The Palm Bay massacre."[32] We look forward to continued dissemination of environmental health and disaster nursing topics relevant to emergency nursing care.

Supplemental Material

Supplementary Data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.jen.2020.05.008.

Patient education on ozone	Links

EPA Patient Education Tools	https://www.epa.gov/ozone-pollution-and-your-patients-health/patient-education-tools-ozone-pollution-and-your-patients
American Lung Association Clean Air	https://www.lung.org/clean-air

DETAILS

Subject:	Emergency medical care; Intervention; Ozone; Emergency preparedness; Public health; Telemedicine; Consultation; Nervous system; Nursing; Short term; Conceptual development; Outdoor air quality; Central nervous system; Air quality; Research &development--R &D; Environmental protection; Environmental health; Emergency services; Vector-borne diseases
Location:	United States--US
Publication title:	Journal of Emergency Nursing:; JEN; Philadelphia
Volume:	46
Issue:	4
Pages:	413-419.e2
Publication year:	2020
Publication date:	Jul 2020
Section:	Editorial
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:	Editorial
DOI:	https://doi.org/10.1016/j.jen.2020.05.008

Dialysis Access Steal Syndrome: JEN

ABSTRACT (ENGLISH)

The syndrome is caused by a decrease or even a reversal of blood flow through the arterial segment distal to the vascular device.5 These changes occur because the blood circulates preferentially through the low-resistance fistula at the expense of distal circulation.6 The syndrome is characterized by a decrease in distal perfusion pressure.7 Dialysis access steal syndrome is a limb-threatening condition that can lead to permanent damage if left untreated. If the condition is left untreated, the chronic symptoms can include nail bed changes, ulcers, gangrene, and muscle/tissue atrophy.7 Undiagnosed dialysis access steal syndrome can result in irreversible damage to the nerves and muscles distal to the fistula and even tissue necrosis.6 Recognizing the condition and quickly intervening leads to increased salvage and use of the fistula.6 Moreover, quick intervention and treatment may reduce health care costs. Some common treatment options include angioplasty, revascularization techniques, banding techniques, and ligation.7 Angioplasty and revascularization techniques are the preferred methods of treatment owing to the increased risk of complications associated with developing a new dialysis access site.Case Report Conclusion The patient was admitted to the hospital for a surgical removal of the AV fistula because of the significant decrease in perfusion distal to the dialysis access site.

FULL TEXT

Contribution to Emergency Nursing Practice

••The current literature on dialysis access steal syndrome indicates the importance of early recognition of the signs and symptoms of the condition to prevent severe complications and promote optimal outcomes.

••This article contributes to the understanding of dialysis access steal syndrome, a rare complication of dialysis access that emergency nurses need to recognize to prevent patient complications.

••Key implications for emergency nursing practice found in this article include the signs and symptoms of dialysis access steal syndrome to encourage rapid treatment and promote optimal outcomes for patients presenting with this unusual condition.

The current literature indicates that patients who are dependent on dialysis are more frequent users of ED services, with patients on dialysis presenting 8.5 times more frequently than the general population.[1] Patients on dialysis are at risk for a variety of medical emergencies related to the complications of chronic renal disease and dialysis treatment. It is important for emergency nurses to recognize abnormalities upon assessment to promote optimal outcomes for these patients. One serious complication, although uncommon (6% incidence), is dialysis access steal syndrome.[2] There are approximately 468,000 patients in the United States currently maintained on hemodialysis, with the number steadily increasing.[3] Therefore, it is necessary for emergency nurses to remain up to date on any potential complications of dialysis treatment.

Case Report

A 63-year-old male presented to the emergency department with the chief complaint of numbness and pain in the left hand. In addition, the patient reported decreased sensation in the left hand and left fingers for 2-3 weeks. The patient reported that he had undergone a surgical amputation of the left ring finger 1 month before presenting to the emergency department. The patient reported the symptoms to his home health nurse, who then recommended that he seek treatment in the emergency department. The patient's history revealed type 1 diabetes, hypertension, hyperlipidemia, and end-stage renal disease with dialysis treatment 3 days a week.

The initial vital signs were as follows: blood pressure, 144/77 mm Hg; heart rate, 90 beats/min; respiratory rate, 19 breaths/min; and temperature, 37.5°C (99.5°F) orally, with a reported pain level of "10 out of 10" on a 0 to 10 pain scale. A thorough physical examination found the patient to be awake, alert, and oriented to person, place, time, and situation with a Glasgow Coma Scale of 15. The patient was calm and cooperative. The patient reported severe pain in the left upper extremity, with paresthesia and numbness to the left hand. An assessment of the left upper extremity revealed a previous surgical amputation of the left ring finger and reduced mobility of the left hand with absent pulses to the left radial artery. The patient was able to move his left arm, hand, and fingers but reported discomfort with movement. Discoloration was present in the dorsal aspect of the left middle finger and dorsum of the left hand. The patient had an arteriovenous (AV) fistula in the left upper extremity, with thrill present and bruit absent. The laboratory tests performed included a complete blood count, serum chemistry, prothrombin time and partial thromboplastin time, and a type and screen. All laboratory test results were within normal limits. The initial diagnostic tests included a hand radiograph and an ultrasound of the left upper extremity. The hand radiograph did not show any trauma or abnormalities except for the previous surgical amputation of the left ring finger. The ultrasound detected decreased perfusion to the left upper extremity.

After the abnormal ultrasound result, the patient was transported to the interventional radiology department for a left upper extremity arteriogram with a left arm AV fistulogram. The fistulogram is a fluoroscopy exam used to view the fistula and identify any problems with the dialysis catheter, including blockages, narrowing, or areas of enlargement.[4] The fistulogram revealed extensive stealing of the arterial flow from the left brachial artery into the AV fistula, with no blood flow below the elbow to the left forearm or left hand. On the basis of the results, the patient was diagnosed with dialysis access steal syndrome.

Dialysis Access Steal Syndrome

Dialysis access steal syndrome is a potential serious complication of AV access devices for patients needing hemodialysis. The syndrome is caused by a decrease or even a reversal of blood flow through the arterial segment distal to the vascular device.[5] These changes occur because the blood circulates preferentially through the low-resistance fistula at the expense of distal circulation.[6] The syndrome is characterized by a decrease in distal perfusion pressure.[7] Dialysis access steal syndrome is a limb-threatening condition that can lead to permanent damage if left untreated.

The syndrome can present with different signs and symptoms depending on the severity and duration. These signs and symptoms include diminished or absent pulses distal to the AV fistula, relief of the symptoms upon compression of the AV access, coolness, pallor, pain, tingling, and numbness.[7] Moreover, the presence of the AV fistula bruit and thrill can vary depending on the severity and duration but should be assessed. If the condition is left untreated, the chronic symptoms can include nail bed changes, ulcers, gangrene, and muscle/tissue atrophy.[7] Undiagnosed dialysis access steal syndrome can result in irreversible damage to the nerves and muscles distal to the fistula and even tissue necrosis.[6] Recognizing the condition and quickly intervening leads to increased salvage and use of the fistula.[6] Moreover, quick intervention and treatment may reduce health care costs. The average duration of stay at the hospital for patients with dialysis access failures is 5.30 ±4.64 days, with estimated treatment costs of $55,456 ±$23,779.[8]

The treatment and management of dialysis access steal syndrome is based on the severity and duration of the symptoms. Some common treatment options include angioplasty, revascularization techniques, banding techniques, and ligation.[7] Angioplasty and revascularization techniques are the preferred methods of treatment owing to the increased risk of complications associated with developing a new dialysis access site.

Case Report Conclusion

The patient was admitted to the hospital for a surgical removal of the AV fistula because of the significant decrease in perfusion distal to the dialysis access site. A new AV fistula was placed in the upper right arm for the patient to continue dialysis treatment. Two months after his visit to the emergency department, the patient has not had any complications with the new AV fistula and has not had any residual problems with the left upper extremity. The patient now has normal neurovascular functioning in the left arm, left hand, and left fingers.

Summary

Although vascular steal syndrome is rarely seen in the emergency department, if it is not quickly recognized, neurovascular compromise and tissue necrosis of the affected extremity are the likely outcomes. Patients who are dependent on dialysis should be educated on the importance of quickly seeking treatment if they experience symptoms of dialysis access steal syndrome, such as changes in sensation, pallor, and/or pain below the dialysis access site ([Table]). Emergency nurses should pay close attention to patients with an increased risk of developing dialysis access steal syndrome. These include patients who are above 60 years of age, who are smokers, and who have other comorbidities such as peripheral vascular disease, coronary artery disease, and diabetes.[7] The syndrome is more common in patients with upper extremity access, other than in those with forearm access.[5] Emergency nurses should be knowledgeable regarding dialysis access steal syndrome when working with patients who are dependent on dialysis. This case highlights the clinical signs and symptoms to assist emergency nurses working in the emergency department in recognizing this syndrome to improve patients' outcomes.

Author Disclosures

Conflicts of interest: none to report.

Supplementary Data

Video

Supplementary Data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.jen.2020.01.009.

Risk factors	Common signs and symptoms
•Diabetes•Peripheral vascular disease/coronary artery disease•Smoking•Age above 60 years•Type of fistula-increased risk with brachial artery fistula	•Hand pain•Numbness (altered sensation)•Discoloration of hand•Diminished or absent pulses•Poor capillary filling•Weakness of extremity•Loss of function to extremity•Gangrene

DETAILS

Subject:	Fistula; Laboratories; Hemodialysis; Emergency medical care; Diabetes; Health care expenditures; Nerves; Ulcers; Kidney diseases; Gangrene; Revascularization; Blood flow; Undiagnosed; Nurses; Angioplasty; Access; Dialysis; Patients; Amputation; Coronary vessels; Cardiovascular disease; Pain; Patient admissions; Conditions; Ultrasonic imaging; Muscles; Necrosis
Publication title:	Journal of Emergency Nursing:; JEN; Philadelphia
Volume:	46
Issue:	4
Pages:	524-526
Publication year:	2020
Publication date:	Jul 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:	https://doi.org/10.1016/j.jen.2020.01.009

Migraine Management in the Emergency Department: JEN

ABSTRACT (ENGLISH)

Migraine headaches are classified as a primary headache syndrome.Migraine Headache Migraine headaches are the fourth to fifth most common complaint in the emergency department, accounting for 3 million to 5 million ED visits annually.1,4 Although tension headaches are the most common primary headache disorder, migraines tend to be the most disabling and are more likely to present to the emergency department.1 Migraines have a 3:1 female to male ratio.5 Currently, there are several different treatment combinations available, which will be discussed further.Diagnostic Criteria The diagnostic criteria for migraines include those detailed in Table 1.5 Of note, the International Headache Society 2019 update further distinguishes migraines into aura and nonaura.6 According to the American College of Emergency Physicians 2019 Clinical Policy regarding evaluation and management of adult patients presenting to the emergency department with acute headache, subarachnoid hemorrhage should be ruled out using the Ottawa Subarachnoid Hemorrhage Rule (Table 2).7 Additional clinical findings such as pregnancy, postpartum women, fever, trauma, and severe back pain may warrant further evaluation before considering a migraine diagnosis.7Treatment Options Several different treatment combinations are available for migraines, including triptans, dihydroergotamine mesylate (DHE), 100% oxygen inhalation, ergotamine tartrate, opioids, nonsteroidal anti-inflammatory drugs (NSAIDs), antihistamines, acetaminophen, dexamethasone, ketorolac, and metoclopramide, to name a few.5,8 These treatments can be used as solitary treatments or in conjunction with other treatments listed, as appropriate. The adverse effects include increased blood pressure, chest pressure, dizziness, flushing, neck tightness, tingling, and limb heaviness.9,10 The contraindications to triptans are pregnancy, vascular disease, coronary artery disease, and uncontrolled hypertension.Dihydroergotamine Mesylate DHE can be given through several different routes, such as intramuscular (IM), intravenous (IV), subcutaneous, or intranasal. The contraindications include pregnancy, hypertension, angina, peripheral vascular disease or poor circulation, liver or kidney disease, serious infection, and arteriosclerosis.Opioids Opioids are certainly an option for treatment of migraines, although, considering the opioid epidemic, the American College of Emergency Physicians recommends preferentially using nonopioid medications for migraine treatment in the emergency department.7 Opioids should not be considered as first-line treatment. The contraindications include hypersensitivity to this class of medications and latex allergy; it has not been studied in pregnant or pediatric patients.Botox Injections Onabotulinum A (Botox) is thought to relax musculature secondary to blocking acetylcholine release at the neuromuscular junction, which reduces inflammation of the meninges and blocks pain signals coming from the brain.19 It was approved by the

Food and Drug Administration in 2010 as a prophylactic therapy for chronic migraines in adults.18 Botox is given as an injection for migraines and is divided into 31 different sites approximately every 3 to 6 months.20 The adverse effects include toxin-effect spread, hypersensitivity reaction, anaphylaxis, injection-site reaction, and muscle weakness.

FULL TEXT

Headache is one of the most common complaints seen in the emergency department, accounting for more than 5 million visits annually.[1] Headache is consistently the fourth to fifth leading cause of visits to the emergency department, accounting for approximately 3% of all ED visits annually.[2] Many treatment options are available for headache, but the advanced practice provider must be aware of the different types of headaches to treat them effectively. Life-threatening neurologic conditions such as subarachnoid hemorrhage or meningitis should be ruled out before treatment. This article will focus on non–life-threatening headache syndromes, primarily migraine headaches, along with different treatment modalities, including emerging treatments.

Types of Headaches

According to the International Headache Society, headaches can be classified into one of 2 types: primary or secondary.[3] Primary headaches cannot be attributed to another cause or disorder, whereas secondary headaches can be attributed to another cause.[4] For the purposes of this article, migraine headaches and treatment options will be discussed for the adult population, excluding pregnant and postpartum patients for whom there are additional considerations. Migraine headaches are classified as a primary headache syndrome.

Migraine Headache

Migraine headaches are the fourth to fifth most common complaint in the emergency department, accounting for 3 million to 5 million ED visits annually.[1,4] Although tension headaches are the most common primary headache disorder, migraines tend to be the most disabling and are more likely to present to the emergency department.[1] Migraines have a 3:1 female to male ratio.[5] Currently, there are several different treatment combinations available, which will be discussed further.

Diagnostic Criteria

The diagnostic criteria for migraines include those detailed in [Table 1].[5] Of note, the International Headache Society 2019 update further distinguishes migraines into aura and nonaura.[6] According to the American College of Emergency Physicians 2019 Clinical Policy regarding evaluation and management of adult patients presenting to the emergency department with acute headache, subarachnoid hemorrhage should be ruled out using the Ottawa Subarachnoid Hemorrhage Rule ([Table 2]).[7] Additional clinical findings such as pregnancy, postpartum women, fever, trauma, and severe back pain may warrant further evaluation before considering a migraine diagnosis.[7]

Treatment Options

Several different treatment combinations are available for migraines, including triptans, dihydroergotamine mesylate (DHE), 100% oxygen inhalation, ergotamine tartrate, opioids, nonsteroidal anti-inflammatory drugs (NSAIDs), antihistamines, acetaminophen, dexamethasone, ketorolac, and metoclopramide, to name a few.[5,8] These treatments can be used as solitary treatments or in conjunction with other treatments listed, as appropriate. Each of these treatments will be discussed briefly in relation to its advantages and disadvantages, adverse effects, and contraindications. Newer and alternative treatment options will also be discussed.

Triptans

Triptans can be given orally (PO), subcutaneously, or intranasally. Evidence supports that they are safe and effective for acute migraines.[9] The triptans work by constricting blood vessels and inhibiting the release of inflammatory peptides in the meninges. The adverse effects include increased blood pressure, chest pressure, dizziness, flushing, neck tightness, tingling, and limb heaviness.[9,10] The contraindications to triptans are pregnancy, vascular disease, coronary artery disease, and uncontrolled hypertension.

Dihydroergotamine Mesylate

DHE can be given through several different routes, such as intramuscular (IM), intravenous (IV), subcutaneous, or

intranasal. This medication is generally nonsedating and is associated with a low headache-recurrence rate.[9] DHE blocks prostaglandin release from the glia. The adverse effects are abdominal cramping, increased blood pressure, leg pain, nausea, vomiting, diarrhea, and vasoconstriction. The contraindications to using DHE are pregnancy, vascular disease, and uncontrolled hypertension.

100% Oxygen

One hundred percent oxygen inhalation has an excellent safety profile, is inexpensive, and is widely available.[11] An investigational trial has shown vasoconstrictive effects with hyperoxia. Oxygen reduces inflammation and blood-brain–barrier damage and helps with headache and visual symptoms.[11] The adverse effects are minimal and include drying of mucous membranes. There are no contraindications to oxygen therapy, although caution should be used in patients with acute respiratory failure, patients with chronic obstructive pulmonary disease, and those awaiting lung transplant.[12]

Ergotamine Tartrate

Ergotamine tartrate can be given PO or rectally (only in certain countries). Concurrent administration of caffeine improves absorption but can increase blood pressure for up to 3 hours after administration.[13] The adverse effects of ergotamine are weakness, coldness, increased blood pressure, nausea and vomiting, and pain in arms, legs, hands, or feet. The contraindications include pregnancy, hypertension, angina, peripheral vascular disease or poor circulation, liver or kidney disease, serious infection, and arteriosclerosis.

Opioids

Opioids are certainly an option for treatment of migraines, although, considering the opioid epidemic, the American College of Emergency Physicians recommends preferentially using nonopioid medications for migraine treatment in the emergency department.[7] Opioids should not be considered as first-line treatment. The most studied opioid for ED migraine treatment is meperidine.[14] Opioids can be given PO, IM, IV, or intranasally. They can modulate nociceptive input to the trigeminocervical complex, but they do not affect inflammatory changes or neurovascular processes that occur in migraines. The adverse effects of opioids are increased risk of medication-overuse headache, increased risk of dependency, sedation, respiratory and cardiac depression, and dizziness. Contraindications to opioids are paralytic ileus, monoamine oxidase inhibitor use in the past 2 weeks, and severe respiratory depression with previous use.

Nonsteroidal Anti-Inflammatory Drugs

NSAIDs have been used to treat and decrease prolongation of migraines.[14] NSAIDs are thought to impede platelet aggregation, prostaglandin synthesis, and the neuroinflammatory cascade associated with migraine. The cyclooxegenase (COX1/COX2) inhibitors in the NSAID class can decrease activation of the nociceptive neurons in the spinal trigeminal nucleus through prostaglandin inhibition. The adverse effects include gastrointestinal bleeding, nephrotoxicity, hepatotoxicity, headache exacerbation (with use >10 days per month), nausea, and cardiovascular thrombotic events. The contraindications include pregnancy, severe renal or hepatic impairment, previous cardiovascular events, and elderly patients.

Antihistamines

Antihistamines can be given PO, IV, or IM and are typically used in combination with another agent. They have both sedative and antiemetic properties and can be used to prevent akathisia and dystonic reactions.[15] Antihistamines have been shown to boost the headache-relieving properties of analgesics. The adverse effects are ataxia, weakness, dizziness, impaired coordination, a feeling of heaviness, and dizziness. The contraindications are QT prolongation and concurrent use of central nervous system depressants.

Acetaminophen

Acetaminophen can be given PO, rectally, and IV, although the IV form is costly. The analgesic mechanism of acetaminophen is unknown, but it is thought to reduce production of prostaglandins in the brain.[14,16] The adverse effects include rebound headache, nausea, and hepatotoxicity and nephrotoxicity with chronic use. The contraindications are chronic alcohol use, hepatic impairment, and renal impairment.

Dexamethasone

Dexamethasone can be administered PO, IV, and IM, and is used to reduce the frequency of headache recurrence.[8, 14] The medication can act to suppress the sterile inflammation underlying migraine headaches.[17] The adverse effects are dizziness, drowsiness, emotional lability, nausea, adrenal insufficiency, and restlessness. The contraindications include renal impairment, systemic fungal infection, and immunosuppression.

Ketorolac

Ketorolac can be given PO, IV, and IM. It can inhibit the release of prostaglandins that activate the nociceptive neurons in the spinal trigeminal nucleus as well as the neuroinflammatory cascade, prostaglandin synthesis, and platelet aggregation associated with the release of vasoactive substances.[14] The adverse effects include renal impairment, hypertension, nausea, dizziness, tinnitus, photosensitivity, and somnolence.

Metoclopramide

Metoclopramide can be delivered PO, IM, or IV. It produces antiemetic effects by antagonizing the central and peripheral dopamine receptors and stimulates upper gastrointestinal tract motility.[14] The adverse effects are confusion, bradycardia, drowsiness, fatigue, hypertension, dizziness, and restlessness. The contraindications are seizure disorder, history of tardive dyskinesia, Parkinson disease, and pheochromocytoma.

Newer Treatment Modalities

Newer treatment modalities for migraines include anti–calcitonin gene-related peptide (CGRP) treatment, Botox injections, sphenopalatine ganglion (SPG) nerve block, and prochlorperazine. Each will be discussed further in this section.

Anti–Calcitonin Gene-Related Peptide Treatment

CGRP is a protein released around the brain. Studies have shown that CGRP causes inflammation of the meninges and subsequent vasodilation, causing migraine pain.[18] The development of antibodies against CGRP and the receptors to which CGRP binds have been shown to be effective in both treating and preventing migraines (anti-CGRP monoclonal antibodies). These medications are given subcutaneously or IV, monthly to quarterly. The adverse effects include upper respiratory tract infections, nasopharyngitis, and injection site pain. The contraindications include hypersensitivity to this class of medications and latex allergy; it has not been studied in pregnant or pediatric patients.

Botox Injections

Onabotulinum A (Botox) is thought to relax musculature secondary to blocking acetylcholine release at the neuromuscular junction, which reduces inflammation of the meninges and blocks pain signals coming from the brain.[19] It was approved by the Food and Drug Administration in 2010 as a prophylactic therapy for chronic migraines in adults.[18] Botox is given as an injection for migraines and is divided into 31 different sites approximately every 3 to 6 months.[20] The adverse effects include toxin-effect spread, hypersensitivity reaction, anaphylaxis, injection-site reaction, and muscle weakness. The contraindications are neuromuscular disorders and inflammation, atrophy, or infection at the injection site.

Sphenopalatine Ganglion Nerve Block

The SPG is a parasympathetic ganglion comprising autonomic and sensory nerves. Activation of the SPG results in vasodilation, activation of meningeal nociceptors, and neurogenic inflammation, causing a headache. The blockade of the SPG has demonstrated rapid onset and efficacy and symptomatic relief of migraine attacks by blocking the connection to the meninges and trigeminal nerve to stop the pain signals.[21] The SPG blockade is administered intranasally or transnasally with either lidocaine or bupivacaine. The adverse effects include sinus drainage, lacrimation, low blood pressure, nausea, and oral numbness.

Prochlorperazine

Prochlorperazine is a dopamine receptor antagonist that works on the nervous system in the brain. It has been found to be useful for nausea in certain conditions and has antipsychotic properties. It has more recently been studied for the acute treatment of migraines and has been found to be effective.[22] The adverse effects include akathisia, orthostatic hypotension, neuroleptic malignant syndrome, tardive dyskinesia, hepatotoxicity, ECG abnormalities, and priapism. The contraindications include blood dyscrasias, bone marrow depression, pediatrics,

and comatose patients.

Alternative Treatments

Pharmacotherapies are effective for the treatment of migraines, but most are associated with adverse effects. Because of this, many migraine sufferers opt for nonpharmacologic therapies such as complementary treatments that include acupuncture, transcutaneous electrical nerve stimulation (TENS), and marijuana. Each will be described in more detail in this section.

Acupuncture

Acupuncture has been used for analgesia since the mid-1970s and is one of the most popular complementary and alternative treatment modalities for migraines.[23] Acupuncture is postulated to unblock the flow of energy throughout the body and restore balance. The process involves the insertion of thin needles throughout the skin at strategic points and is thought to stimulate the release of neurohormones and neurotransmitters, causing analgesia. The adverse effects include pain, bruising, or bleeding at the acupuncture site, anxiety, lightheadedness, depression, and fatigue.

Transcutaneous Electrical Nerve Stimulation

TENS uses low-voltage electrical currents transcutaneously to incite the peripheral nerves primarily for the alleviation of pain.[24] In 2014, the Food and Drug Administration approved a medical TENS unit as a prophylactic treatment for episodic migraine, and since that time more devices have been approved for both acute and prophylactic treatment of migraines. The adverse effects include insomnia, sleepiness, tension-type headache, nausea, photosensitivity, skin irritation, muscle twitching, and pain. The contraindications include presence of a pacemaker, cardiac problems, open wounds around the electrode sites, seizure disorder, pregnancy, and lymphedema.

Marijuana

To date, few clinical trials are available regarding the use of medical marijuana and its effectiveness on migraine headaches. The recent upsurge in marijuana's legal status in many states for medicinal purposes has led to an increase in research on the subject. The evidence suggests that marijuana has anti-inflammatory, serotonergic, and dopaminergic effects.[25] There are several different routes of administration, including inhalation, ingestion, and topical. Dosages and routes for standardization will require more research. The adverse effects include somnolence, seizures, jitteriness, vomiting, and memory loss.

Focus on Migraine Triggers

Many patients with migraines report certain "triggers" that precede the headache, and it is important for health care providers to be aware of these during their assessment. Some conveyed triggers include stress, sleep disturbances (too little or too much), bright lights, loud noises, cigarette smoke, certain alcohols, caffeine, chocolate, nitrates, menstruation, and weather.[26] A thorough assessment of these and other factors preceding the migraine can help both the provider and patient in selecting the right treatment options and avoiding the identified triggers.

Conclusion

Headaches are one of the most common complaints presenting to the emergency department. Several different types of headaches exist, and it is important to be able to differentiate between the types because treatment modalities vary. This article has discussed the incidence of headaches presenting to the emergency department and illustrated the most recent evidence for treating migraine headaches in the emergency department.

Author Disclosures

Conflicts of interest: none to report.

□Duration of 4 hours to 72 hours□Must have at least 2 of the following:○Unilateral location: can be lateralized or generalized○Throbbing or pulsating quality○Moderate to severe intensity○Interferes with routine activities of daily living○Aggravated by routine physical activity□At least 1 of the following:○Nausea or vomiting○Phonophobia, osmophobia, and/or photophobia□At least 2 attacks that meet the preceding criteria□No evidence of organic disease□Can be heralded by at least one of the following, which gradually develops over 5 minutes to 60 minutes (aura):○Visual symptoms○Somatosensory disturbance of the arms or face

□Further evaluation is required if the patient has 1 or more of the following:○Neck pain or stiffness○≥40 years of age○Witnessed loss of consciousness○Onset during exertion○Thunderclap headache (immediate peak intensity)○Limited neck flexion on examination

DETAILS

Subject:	Infections; Dizziness; Pregnancy; Medical diagnosis; Hemorrhage; Anaphylaxis; Oxygen; Antihistamine drugs; Histamine; Female to male; Side effects; Physicians; Hypersensitivity; Angina; Inflammation; Peptides; Narcotics; Analgesics; Hypertension; Blood pressure; Nausea; Migraine; Headaches; Chest; Blocking; Arteriosclerosis; Cardiovascular disease; Nonsteroidal anti-inflammatory drugs; Epidemics; Pain; Back pain; Chronic pain; Flushing; Antithistamine drugs; Botulinum toxin; Contraindications; Emergency medical care; Emergency services; Pediatrics; Coronary artery disease
Publication title:	Journal of Emergency Nursing:; JEN; Philadelphia
Volume:	46
Issue:	4
Pages:	518-523
Publication year:	2020
Publication date:	Jul 2020
Section:	Advanced Emergency Clinicians' Corner
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.2020.04.002
ProQuest document ID:	2487205855
Document URL:	https://www.proquest.com/scholarly-journals/migraine-management-emergency-department/docview/2487205855/se-2?accountid=211160
Copyright:	©2020. Emergency Nurses Association
Last updated:	2023-08-31
Database:	Public Health Database

Information for Readers: JEN

FULL TEXT

TVM:UNDEFINED

DETAILS

Publication title:	Journal of Emergency Nursing:; JEN; Philadelphia
Volume:	46
Issue:	4
First page:	A12
Publication year:	2020
Publication date:	Jul 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:	https://doi.org/10.1016/S0099-1767(20)30178-1
ProQuest document ID:	2487205814
Document URL:	https://www.proquest.com/scholarly-journals/information-readers/docview/2487205814/se-2?accountid=211160
Copyright:	Copyright Elsevier Limited Jul 2020
Last updated:	2021-02-14
Database:	Public Health Database

Quality Improvement in the Emergency Department: A Project to Reduce Door-to-Electrocardiography Times for Patients Presenting With Chest Pain: JEN

ABSTRACT (ENGLISH)

Introduction

The American Heart Association/American College of Cardiology guidelines recommend obtaining electrocardiography for patients who present to the emergency department with chest pain in less than 10 minutes of arrival. Reducing door-to-electrocardiography time is an important step in adhering to the recommended door-to-balloon times (≤ 90 minutes) for patients who present with ST-segment elevation myocardial infarction.

Methods

Based on lean sigma principles, a protocol was implemented in an adult emergency department that included deferring nurse triage for patients with complaints of chest pain, chest tightness, and chest pressure and providing

them with a red heart symbol as an indicator for clinical technicians to prioritize their electrocardiography order. Pre- and postintervention data were collected over a 12-month period.

Results

Before the intervention, the mean door-to-electrocardiography time was 17 minutes for patients with chest pain (n = 893). After the intervention, the mean door-to-electrocardiography time for patients with chest pain significantly decreased to 7 minutes (n = 1,057) (t = 10.47, $P \leq 0.001$). Initially, the percentage of compliance with door-to-electrocardiography standard of 10 minutes was 31% and improved to 83% after implementation of the new protocol.

Discussion

Implementation of the optimized door-to-electrocardiography protocol decreased the time for obtaining diagnostics and improved compliance with the American Heart Association/American College of Cardiology guidelines, potentially decreasing door-to-balloon times for patients who presented with ST-segment elevation myocardial infarction.

FULL TEXT

Contributions to Emergency Nursing Practice

••The current literature demonstrates cardiovascular disease and associated myocardial infarction are major contributors to morbidity and mortality in the United States. The American Heart Association recommends obtaining an electrocardiogram for patients presenting to the emergency department with complaints of chest pain within 10 minutes of arrival.

••This article contributes strategies to employ interdisciplinary quality improvement methodologies to improve the process measure related to door-to-electrocardiography times in an adult emergency settings.

••Key implications for emergency nursing practice found in this article are that process improvements can be made to obtain timely diagnostics but may not translate to improved patient outcomes. Additionally, much consideration should be given scope of practice implications as well as consequences of modified workflows in a busy emergency setting.

Introduction

Globally, cardiovascular disease is a growing problem accounting for 17.3 million deaths in 2013 and projected to increase to 23.6 million by 2030.[1,2] Coronary heart disease remains a leading cause of morbidity and mortality in the United States. More than 600,000 Americans die of heart disease each year, and around 47% have at least 1 of the 3 key risk factors for coronary artery disease: high blood pressure, hyperlipidemia, and smoking. Myocardial infarction (MI) remains the most common complication of heart disease, which is experienced by an estimated 735,000 Americans each year. ST-segment elevation myocardial infarction (STEMI) is the most complex type of MI, often requiring aggressive and rapid medical treatment.[3–5]

Early diagnosis of and timely intervention for a STEMI is essential in the provision of quality care within the emergency department.[4,6] The American College of Cardiology (ACC) and the American Heart Association (AHA) recommend performing a diagnostic electrocardiography (ECG) within the first 10 minutes of a patient arriving at the emergency department with complaints of chest pain or other signs of acute coronary syndrome (ACS).[7] The ACC/AHA Guidelines and the Joint Commission Core Measures have set a benchmark for all STEMI patients to receive treatment in the cardiac catheterization lab within 90 minutes of arrival to the emergency department to reduce the probability of damage to the heart muscle and decrease morbidity and mortality.[6,8] The speed at which an initial ECG is performed can directly affect the length of time it takes a patient with STEMI to be escalated to the

cardiac catheterization lab.[9] Shorter door-to-balloon (DTB) times are associated with improved patient outcomes as there are 6.3 fewer deaths per 1,000 people for each 15-minute increment of DTB time improvement.[10] It is well known that among emergency departments, including our own, there are operational barriers to reaching the AHA/ACC 10-minute goal for obtaining ECGs. Barriers to successfully meeting this standard include crowding, inadequate triage workflows, lack of knowledge regarding the 10-minute door-to-ECG (DTE) rule, and large numbers of patients presenting with chest pain at one time.[9] The purpose of this quality improvement (QI) project was to analyze and address the barriers preventing completion of ECGs within 10 minutes of arrival in our adult emergency department.

Methods Context

This QI project was conducted from March 1, 2016, to August 31, 2016, at a Level-1 urban academic medical center that provides services to more than 5,000 patients a month and up to 68,000 patients a year. Typically, of the patients seen in this emergency department, about 20% arrive with complaints of chest pain, chest tightness, or chest pressure. For this project, we examined the DTE times for patients arriving to the emergency department by self-transport (considered “walk-ins”--approximately 75% of this patient population). Patients arriving via ambulance were excluded because of the additional factors and logistics associated with emergency medical services transport.

Framework

Lean Six Sigma Prescription for Health Care was the framework for the execution of this QI project. The goals of Lean include a team-based approach to optimize flow, increase speed, and reduce waste to ensure patient safety through the Six Sigma tools. This was achieved by following a 5-phase process of defining, measuring, analyzing, improving, and controlling a problem.[11]

Interventions

In accordance with the Lean Sigma principles, we completed a project charter and an A3. An A3 is a living document emblematic of the QI process that provides a concise summary of the problem and possible solutions on 1 sheet of paper (so named because of the size A3 paper the document is traditionally printed on).[12] We solicited feedback on barriers to completing timely ECGs from the certified nursing assistants (CNAs, who are typically delegated the responsibility of completing preliminary ECGs in our setting and having them reviewed and signed by an attending physician). A flow-chart that listed barriers was created and used to inform the finalized charter and process map (Figure 1). Multiple time study cycles were collected to assess the current workflow. Among other items, these observations revealed that the CNAs were often watching the computer screen and waiting for an ECG order to be placed while the patient waited. The pilot workflow included deferring formal triage intake for patients presenting to registration with chest pain, chest tightness, or chest pressure until an ECG could be obtained, providing these patients with a red heart symbol to hold to give a visual cue to the staff of their priority, and allowing the CNAs to begin their ECG assignment while the triage nurse physically input the order. Patients with atypical ACS complaints such as shortness of breath were evaluated by the triage nurse and expedited for an ECG per the nurse’s assessment as this evaluation was outside of the registration staff’s scope of practice. Continuous data collection was used to monitor trends and promote ongoing improvements, for example, providing the CNAs with a dedicated phone to facilitate team communication. The team involved in the work included registered nurses, medical residents, medical attendings, clinical technicians, CNAs, and registration staff. Process control was assured with monthly data validation and monitoring for compliance with departmental standards. A project timeline is displayed in Supplementary Figure 1 .

Study of the Intervention

For the intervention, DTE was defined as the time the patient presented to the registration desk with the specified

chief complaint related to ACS (chest pain, pressure, or discomfort) until the time an ECG was performed. Patients who did not report ACS symptoms upon registration did not fall under this workflow and were therefore not included in the analysis. In order to assess the impact of the intervention we performed continuous monitoring of our electronic health record (Epic) reports of DTE times and hand-collected time studies. To establish if the observed outcomes were because of our intervention we collected other data points, including overall ED volume and the number of patients presenting with chest pain. In addition, no other changes were made to this specific process outside of our QI project.

Measures

The study process measure consisted of time studies of the individual components of completing an ECG. Activities are listed in Supplementary Table 1. This was chosen to give greater insight into barriers to all steps of the process and identify areas that could be streamlined or improved. Reliability was promoted by training and auditing the timekeepers to decrease variability across users. In addition, listed activities were objective and concrete to minimize inconsistencies across various observations.[13] The observations were considered to have face validity as the time studies were specifically tailored to our ED setting by experts in the process. The outcome measure was defined as DTE time (time from arrival in Epic to time stamped on ECG). This measure was identified because it corresponds to the AHA/ACC standard. Reliability and validity threats were minimized by performing initial chart audits to ensure that Epic-generated reports were pulling the correct information from the electronic health record and were built by our internal departmental informatics nurse. Owing to a great amount of variability and difficulty in comparing the groups, patients arriving by ambulance were excluded from this study.

Data was collected over a 1-year period. Baseline data were collected for 6 months prior to intervention (September 2015–February 28, 2016) through a report generated by Epic. Criteria for this report included all walk-in patients entering the adult emergency department with an arrival complaint of chest pain regardless of age. These data were then compared to a report generated by the MUSE system, an internal cardiology information system to track ECG data. The 2 reports were merged, data verified for correctness, and DTE times were calculated by subtracting the arrival time from the ECG time.

Postintervention data was collected for 6 months after implementation (March 1, 2016–August 31, 2016) of the pilot using the same criteria for identifying patients with arrival complaints associated with ACS. In the postcollection phase, we had the ability to run the data for patients with ACS-related complaints and their ECG times within our continuous data collection and analysis software, Tableau. Data were verified for accuracy in this new report format.

Data Analysis

DTE times for the duration of the study period were examined and means were calculated using Microsoft Excel. Additional quantitative data analysis was performed using these means in the Statistical Package for Social Sciences (SPSS) (version 20; IBM Corporation, Armonk, NY). Normality of the data was confirmed by assuring a skewness value less than 2 times the standard error and an independent *t* test was performed to determine differences between preintervention and postintervention mean DTE times. The proportion of patients with DTE times of less than 10 minutes was also calculated for the pre- and postintervention periods.

In addition, regularly collected data on door-to-cardiac catheter placement was retrospectively analyzed 6 months before and 6 months after project initiation using SPSS to determine descriptive statistics, including mean, standard deviation median, and skewness.

Ethical Considerations

Per our institution's policy, QI projects of this nature do not require approval by the institutional review board. Therefore, this study did not undergo review.

Results

In the 1-year study period, DTE times were examined for (N = 1,950) walk-in patients who presented with ACS-related complaints of chest pain, pressure, or discomfort. Pre- and postdata were both found to be normally distributed (preskewness -1.27 and standard error .85, postskewness -.84 and standard error .85). DTE times decreased significantly (t = 10.47, $P \leq 0.001$) in the 6 months following the implementation of the QI project with a preintervention mean of 17 minutes (95% CI, 16.09-19.5) and postintervention mean of 7 minutes (95% CI, 5.13-9.20). Pre- and postintervention mean times are displayed in Table 1. Initially, the percentage of compliance with DTE standard of 10 minutes was 31% and improved to 83% after implementation of the new protocol. This surpassed the institutional goal of 80% of ECGs be completed within 10 minutes. Monthly times and percent of ECGs completed in less than or equal to 10 minutes are displayed in Figure 2.

Time of presentation to cardiac catheterization did not show improvement with a total (n = 7) patients during the entire data collection period. Times are displayed in Supplementary Table 2.

Discussion

This emergency nurse-led intervention included a multidisciplinary intervention that resulted in significant improvement in compliance with obtaining ECGs in less than 10 minutes with no added costs. Both visual cues and reprioritized patient flow had a clinically and statistically significant impact. Results from this QI project contribute to the ongoing scientific discussion about the evidence-based importance of reducing DTE to promote positive patient outcomes.[4] Our results are similar to those of previous studies that have shown that these DTE reduction programs can be successfully executed by effectively identifying barriers, and implementing simple, cost-effective interventions to reduce DTE in emergency departments.[14,15]

Although this project positively influenced patient diagnostics, it also required careful consideration of patient safety, scopes of practice, and unintended consequences, such as interrupted triage of other patients. Consideration of the American Nurses Association 5 Rights of Delegation ensured appropriate assignment of tasks and each member of the team was performing within their scope of practice. Scope of practice and delegation considerations related to the National Council of State Boards of Nursing's "Five Rights of Delegation" are displayed in Table 2. Specifically, using the patient's stated chief complaint as the trigger for the new protocol ensured that registration staff were not performing a patient assessment but rather following a designated workflow for this patient population. The importance of the triage nurses' assessment and clinical judgment was also ensured by the physical layout of the intake area, which required the patient to walk past the triage nurse on their way to the ECG booth. As registration staff escorted the patient, they alerted the nurse to the patient's presentation. This allowed the nurse to perform a primary survey, also known as an across the room assessment, or "quick look."[16] This type of assessment allowed the nurse to reliably evaluate for airway, breathing or circulatory compromise while expediting patient care.[16,17] A "quick look" assessment did not replace a full nursing triage; however, it did allow for rapid detection of life- or limb-threatening emergency that could require immediate intervention before performing any diagnostic tests without adding additional nurse staffing. Upon completing this assessment, the triage nurse would enter the order for the ECG to be completed.

The interruption of the nurses' triage workflow of other patients was also an important consideration. A study completed in 2013 in our Adult and Pediatric Departments found that 38% of all observed nursing tasks were subject to at least 1 interruption, which demonstrates the pervasiveness of multitasking in this busy environment.[18] Other triage-specific studies have found a high prevalence of triage interruptions (35.9%-57% of triage cases); however, the true impact on the accuracy of triage is less understood.[19,20] Johnson et al[21] found 100% accuracy in interrupted simulated triage cases compared to the uninterrupted (66.7%).[21] Although research has been done regarding the

impact of interruptions on nursing in general, and more specifically medication administration and communication, the concrete effects on patient safety remain unclear.[22] Hopkinson and Jennings[22] found in a 2013 state-of-the-science review, that despite the Joint Commission and the Institute of Medicine's focus on interruption-related errors, studies have focused more on the presence of interruption than the effect on patient outcomes, calling into question the use of interruption as a proxy for errors.[22–24] No known related incidents were reported to the hospital's safety network during the project.

Although DTE times improved, DTB were not improved as a whole. This may have occurred because of the low number of "walk-in" STEMI patients (N = 7). In addition, 1 case in the postgroup was especially lengthy because of changes in the patient's status and stability. Kelly et al[15] in addition to Coyne et al[25] were able to reduce DTB time with the use of QI methodologies; however, other teams have found that the reduction in DTB time can be influenced by factors external to the patient triage process, such as arrival of the catheterization team.[14] Given the variety of factors contributing to the metrics of each cardiac catheterization case, the timeliness of an ECG is frequently only a small factor in the cascade of care. For example, chest pain algorithms primarily affect patients with typical ACS presentations and may miss those without traditional signs of cardiac emergency, specifically women.[26] Alnsasra et al[27] found more than 60% of patients had delays in primary percutaneous coronary intervention. Among these patients, atypical chest pain, diabetes, and night presentation were independently associated with delays. Although continued prioritization of emergency diagnostics is supported by the AHA/ACC guidelines, targeting DTE time is only 1 piece of the puzzle. Nurse-driven ECG protocols increase the number of tests ordered, without necessarily improving detection.[28] Performing an ECG for all patients presenting with chest pain and other ACS symptoms is highly sensitive but increasing screening also increased workloads.

Limitations

There were several limitations in this project. First, this was a nonrandomized sample without a control group. Second, all data were retrieved via retrospective chart review in 1 adult emergency department at a single site. While longitudinal, ongoing data monitoring, analysis and dissemination continue in the clinical setting, they have not been included in this report. Another limitation is that not all patients ultimately diagnosed with MI presented to the emergency department with a chief complaint of chest pain. Records for patients arriving to the emergency department with complaints of chest pressure, discomfort, or pain were included in this audit; however, it is likely that records for patients who presented with atypical symptoms of MI were excluded. Finally, the data was collected over a 1-year period over different seasons and was not adjusted for the seasonal fluctuations that are expected in volumes and chief complaints. This may be of particular importance in the colder winter months when coronary events have been found to be more prevalent, or the summer and winter seasons that see higher ED volumes.[29-31] A prospective power analysis was not completed as all patients who met the inclusion criteria for 1 full year at the site were included without stopping criteria.

Implications for Emergency Nursing

This project showed that addressing barriers and implementing simple changes in usual ED workflows can make drastic improvements in DTE times for patients presenting with complaints of chest pain or discomfort. Emergency nurses can lead practice changes such as this by engaging multidisciplinary teams in implementing innovative, cost-effective methods for reducing DTE time and improving patient outcomes in the adult emergency department.

Conclusion

By implementing a DTE protocol, we made significant improvements in DTE times for ED walk-in patients with chest pain. Further investigation is warranted to evaluate DTB times over a longer period of time, for development of strategies to improve DTE times for patients arriving via ambulance and to assess workflow burden versus patient

outcomes. ECGs are a powerful and low-risk tool to diagnose cardiac emergencies and DTE should continue to be prioritized and optimized through QI methodologies.

Author Disclosures

Conflicts of interest: none to report.

All co-authors have contributed substantially to the paper and have approved the final version.

Appendix

Supplementary Figure 1 Timeline of interventions. CNA, certified nursing assistant; ECG, electrocardiogram.

Task	Activity
1	Measure arrive in Epic to placing the identification armband
2	Walk patient to triage RN to drop off sticker
3	Walk patient to open ECG booth and alert technician
4	Walk patient to ECG yellow chair and alert technician
5	Length of time patient is waiting to have ECG completed (need available staff/ECG chair)
6	Recognize ECG order needs to be done, patient wait time to get ECG
7	Get patient
8	Identify patient, explain procedure, scan armband, get patient undressed, prep chest (if necessary), place stickers, connect leads
9	Perform ECG tracing
10	Disconnect leads (if applicable), remove stickers (if applicable). Get patient dressed (if applicable)
11	Bring patient to waiting room/triage or new location
12	Show ECG to attending physician and obtain signature
13	Time to walk back to ECG area after showing attending ECG
14	Document procedure

Phase	N	Average time in minutes/SD	Median in minutes	Skewness	Standard Error
Preintervention (Sep 2015-Feb 2016)	4	77.75/18.26	75.5	.48	1.01
Postintervention Mar 2016-Sep 2016)	3	96.33/26.27	87.00	1.40	1.23

Supplementary Material

Supplementary material related to this article can be found https://doi.org/10.1016/j.jen.2020.03.004.

	Preintervention n = 893 M (SD)	95% CI	Postintervention n = 1,057 M (SD)	95% CI	t (df)	P
Door-to-ECG time in min	17 (1.51)	16.09–19.25	7 (1.94)	5.13–9.20	10.47 (10)	< 0.001

Five rights of delegation	ECG project considerations
Right task: the activity falls within the delegate's job description or is included as part of the established written policies and procedures of the nursing practice setting	Registration staff is tasked with inputting basic patient information on presentation, including chief complaint. This regularly collected information was used as a trigger for the new workflow. Collection and obtaining proper sign-off of ECGs is a core part of the CNA job description. The procedure is well established and part of routine training. Assessing patients is outside of their scope of practice and therefore not delegated
Right circumstance: the health condition of the patient must be stable	Each nurse was responsible for performing a primary survey on patients identified for the workflow. This was completed by the registration staff alerting the nurse to the patient's chief complaint and walking the patient through the triage nursing area to the ECG area for a "quick look" assessment
Right person: licensed nurse along with the employer and the delegate is responsible for ensuring that the delegate possesses the appropriate skills and knowledge to perform the activity	All CNAs undergo yearly training on correctly obtaining an ECG. In addition, each ECG is immediately presented to an attending physician who provides immediate feedback if the imaging is insufficient. No patient assessment is delegated

Right directions and communication: each delegation situation should be specific to the patient, the licensed nurse and the delegate. The license nurse is expected to communication specific instructions for the delegated activity	The workflow associated with this project was specific to patient's presenting with chest pain and the role of the registration staff, CNA and licensed nurse clearly delineated. Instructions for the process were communicated via workflow charts. Delegation of obtaining the ECG was communicated by the "red heart" as well as an order placed in the EHR
Right supervision and evaluation: the licensed nurse is responsible for monitoring the delegated activity, following up with the delegate at the completion of the activity and evaluation patient outcomes	Registration staff inputs patient information which populates on the triage nurses computer "to be triaged" dashboard. This allows them to place the ECG order as well as track the patient to ensure they return to have a complete triage assessment. In the rare occasion the ECG necessitated immediate evaluation in the critical care bay, the original triage nurse communicated with the critical care nurse to ensure triage was completed fully

DETAILS

Subject:	Emergency medical care; Quality management; Intervention; Electrocardiography; Cardiology; Patient satisfaction; Mortality; Complaints; Triage; Cardiovascular disease; Compliance; Myocardial infarction; Chest pain; Quality of care; Emergency services; Quality control; Quality improvement; Heart attacks
Business indexing term:	Subject: Quality control Quality improvement
Location:	United States--US
Identifier / keyword:	Myocardial infarction; Electrocardiography; Chest pain; Emergency medicine; Emergency nursing
Publication title:	Journal of Emergency Nursing:; JEN; Philadelphia
Volume:	46
Issue:	4
Pages:	497-504.e2
Publication year:	2020
Publication date:	Jul 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:	https://doi.org/10.1016/j.jen.2020.03.004
ProQuest document ID:	2487205809
Document URL:	https://www.proquest.com/scholarly-journals/quality-improvement-emergency-department-project/docview/2487205809/se-2?accountid=211160
Copyright:	©2020. Emergency Nurses Association
Last updated:	2022-11-14
Database:	Public Health Database

Pathway to Implementing a Program of Nursing Research: JEN

ABSTRACT (ENGLISH)

When I embarked on a research pathway there were limited research and clinical practice guidelines focused on acute care, patient care management, and outcomes. The direction for research can also evolve from interactions and collaborations with other nurse researchers and colleagues who help to vision the gaps and needs in clinical practice to inform a program of research.Building a Meaningful Research Trajectory One of the strategies that nurse scientists use to build their program of research is an individual development plan. Sequential, interrelated self-management intervention studies used telehealth technology to obtain outcome measures (eg, accelerometry-measured physical activity) and to deliver the intervention components (eg, education, coaching, and support) for self-management by patients (eg, recognition and management of symptoms, and secondary risk–factor modification such as weight management).7-16 The use of various telehealth platforms enabled research by our

team to be conducted across multiple sites and settings, which included underserved patients residing in rural communities. By staying in touch with bedside care of patients and having close ties with colleagues at the bedside, we can conduct relevant research for more rapid translation of research to practice.18 In this regard, the nurse-scientist can play a role as a knowledge broker.

FULL TEXT

Know Your Passion

Whether we have been in nursing for less than a year or have been practicing for many years, each of us will have a unique path in our nursing career. Our paths will differ from one another's. Some of us will have clear signs on our path guiding us more directly toward the specific goals we want to achieve in nursing, whereas others among us will have a less clearly marked path guided by the discovery of new opportunities that redirect our nursing career path toward our goal.

There are so many opportunities in nursing. Often, we start nursing practice without giving much thought to the direction our nursing career path will take. However, at some point there are seminal events or experiences that spark our passion for nursing[1] and become the beacon that lights the direction for our career path. I will share my journey of implementing a program of research.

Early in my nursing career, I worked in critical care and emergency nursing. I enjoyed providing direct patient care; however, I recognized the difference I could make to a greater number of patients by combining clinical work and research. Nurses are in a unique position to assess and identify the needs of patients and the opportunities to improve patient care and outcomes.

When I embarked on a research pathway there were limited research and clinical practice guidelines focused on acute care, patient care management, and outcomes. Given the relative paucity of research, this sparked my pursuit of graduate education. I launched my program of research while continuing to work in nursing practice. The focus of my doctoral study was determining cardiac surgical patient teaching outcomes, with the study findings disseminated as my first publication. Although I was a clinical nurse specialist for critical care and emergency services after the completion of my master's degree, my doctoral studies further reinforced the need and urgency to conduct research to inform and improve patient care.

An Environment to Support a Research Trajectory

New opportunities often present themselves when we least expect them. After the completion of my doctoral degree, I had an opportunity to teach in a graduate nursing program. This was a great opportunity to be in a supportive research environment[2] and launch a program of research as part of the tripartite mission of the college of nursing. The direction and shaping of a program of research often is informed by your own passion and interest in nursing practice. The direction for research can also evolve from interactions and collaborations with other nurse researchers and colleagues who help to vision the gaps and needs in clinical practice to inform a program of research.

Building a Meaningful Research Trajectory

One of the strategies that nurse scientists use to build their program of research is an individual development plan. This is a tool useful for identifying professional growth and competencies to achieve research career goals.[3] The individual development plan can be applied to your career development regardless of your focus; it is not limited to being used only to develop a research trajectory.

If scientific knowledge is going to be useful, nurse scientists need to be knowledgeable in the effective translation and use of research.[4] This is an important guidepost for shaping a research trajectory that I applied in my initial research, which was focused on the needs of patients with cardiovascular diseases and cardiac revascularization. My early research involved the development, testing, and dissemination of survey instruments to assess and provide a basis to measure patient outcomes. The instruments that were developed—the Barnason Efficacy Expectation Scale[5] and the Cardiac Symptom Survey[6]—filled the gaps associated with the lack of cardiac-specific assessment tools.

My research program evolved strategically, designed to develop and implement nurse-led telehealth interventions to improve self-management by cardiac patients after hospitalization. Sequential, interrelated self-management intervention studies used telehealth technology to obtain outcome measures (eg, accelerometry-measured physical activity) and to deliver the intervention components (eg, education, coaching, and support) for self-management by patients (eg, recognition and management of symptoms, and secondary risk–factor modification such as weight management).[7-16] The use of various telehealth platforms enabled research by our team to be conducted across multiple sites and settings, which included underserved patients residing in rural communities.

Recognizing that cardiac patients often have other comorbid conditions, my research trajectory has evolved to a broader focus on interventions for patients with multimorbidities after hospitalization to incorporate care transition and chronic disease self-management. Over time, my research has advanced understanding in the field of emergency nursing because chronic disease exacerbation is the leading reason individuals seek emergency care.

Research Trajectory Cycles

The research process is not necessarily linear; it is an iterative process. There are many personal and professional benefits of being a nurse scientist. I have been able to pursue my own research and focus on the basis of what I believe is important to improve nursing practice and patient outcomes. Conducting research is a cyclic process. Once a study is completed, the study results are disseminated at conferences and through publications. However, the cycle is also a repetitive process[1] because a researcher repeatedly thinks about the research findings, focusing on how 1 study lays the foundation for the next study or reveals the need to refocus the next steps for the research on the basis of making sense of the new knowledge evolving from the study.

Direct Pathway

Even when you have a clear vision of the direction of your research program, you may find that the path changes course. This may occur as your network of professional colleagues expands. The dissemination of your research often expands your network of other researchers with similar research interests, leading to new collaborative opportunities. Interwoven within my program of research has been participation in professional nursing organizations interrelated to my expertise in cardiovascular nursing, critical care, and emergency nursing. I have served on committees in several professional organizations to develop professional publications and resources (eg, scientific papers, clinical practice guidelines, and textbooks). As a member of the Emergency Nurses Association, I have participated in the Institute for Emergency Nursing Research and Clinical Practice Guidelines committee. These opportunities contributed to my research goals of improving patient care through research and evidence-based practice. These experiences afforded me further opportunities to expand my network of nursing and interprofessional colleagues who shared common aspirations to enhance clinical practice. Exploring opportunities beyond the confines of your research does not need to be a detour from your research path.[17] Consideration should be given to how new opportunities in professional organizations or other research initiatives interplay with your overall program of research to avoid veering from your research pathway.

Be a Knowledge Broker

The stretch of our influence in nursing is unique for each of us. Our span of influence can range from collaboration with other nurses in the care of patients to the broader reach we may have when conducting nursing research that informs nursing practice and improves patient outcomes. We need to be cognizant of the relevance of the research and the potential for its application to practice. By staying in touch with bedside care of patients and having close ties with colleagues at the bedside, we can conduct relevant research for more rapid translation of research to practice.[18] In this regard, the nurse-scientist can play a role as a knowledge broker. This entails connecting science to society or translating science into practice and policy.[4]

The seminal contribution of my research includes developing, implementing, and disseminating interventions to support self-care by cardiovascular patients during early recovery and transition to home. I have been able to conduct original research and widely disseminate the findings through publications and presentations, and I have collaborated in the development of evidence-based practice guidelines to bring research to the bedside. These research accomplishments would not have been possible without a collaborative interdisciplinary research team.

Every individual in a research team makes unique contributions to successfully complete and disseminate each research study. As my research evolves, I will focus the next phase of my research on using dissemination and implementation science to promote the adoption of research and evidence-based practice in emergency and critical care.

In summary, my goal is to share the lessons learned in the implementation of a program of research. It is important that you consider the opportunities you have to inform and improve clinical practice no matter what your career pathway. Reflecting on my program of research, I had a vision as a new graduate nurse to improve patient care. Little did I know at the time that I would achieve this as a nurse-scientist. Sometimes a research trajectory has clear markers on the pathway, although most of the time I discovered that other indicators appeared and revealed another direction, moving me to the next iteration of my research. The lesson is very clear: we each create our own reality for our nursing career. The path you take is unique to you, but you create a lot of what you want with intention and some visioning. Enjoy the journey of shaping your nursing career path and follow your passion; it may lead you to consider becoming a nurse-scientist.

DETAILS

Subject:	Research; Emergency medical care; Intervention; Scientists; Collaboration; Careers; Coaching; Telemedicine; Patients; Selfmanagement; Weight loss; Clinical research; Chronic illnesses; Evidence-based practice; Teams; Acute services; Nurses; Clinical outcomes; Publications; Multiple sites; Physical activity; Evidence-based nursing; Rural communities; Technology; Critical care; Translation; Colleagues; Career development planning; Health care management; Clinical practice guidelines
Business indexing term:	Subject: Careers Career development planning
Publication title:	Journal of Emergency Nursing:; JEN; Philadelphia
Volume:	46
Issue:	4
Pages:	410-412
Publication year:	2020
Publication date:	Jul 2020
Section:	Guest Editorial
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:	Editorial
DOI:	https://doi.org/10.1016/j.jen.2020.05.011
ProQuest document ID:	2487205800
Document URL:	https://www.proquest.com/scholarly-journals/pathway-implementing-program-nursing-research/docview/2487205800/se-2?accountid=211160
Copyright:	©2020. Emergency Nurses Association
Last updated:	2023-07-28
Database:	Public Health Database

Radiological Presentation of Coronavirus Disease: JEN

ABSTRACT (ENGLISH)

A male in his mid-80s presented to the emergency department with complaints of fever and cough for 6 days. On presentation, the patient was febrile to 38.7°C (101.6°F), tachypneic to 26 breaths per minute, and coughing. A portable chest X-ray was done (Figure 1) that revealed bilateral peripheral infiltrates. Chest computed tomography was performed as well and it confirmed multiple areas of peripheral bilateral infiltrate (Figure 2). The patient was ultimately diagnosed with coronavirus disease.

FULL TEXT

A male in his mid-80s presented to the emergency department with complaints of fever and cough for 6 days. On presentation, the patient was febrile to 38.7°C (101.6°F), tachypneic to 26 breaths per minute, and coughing. A portable chest X-ray was done ([Figure 1]) that revealed bilateral peripheral infiltrates. Chest computed tomography was performed as well and it confirmed multiple areas of peripheral bilateral infiltrate ([Figure 2]). The patient was ultimately diagnosed with coronavirus disease.

The figures show a classical radiological presentation of the viral pneumonia caused by a novel severe acute respiratory syndrome coronavirus 2.[1,2] The findings include peripheral ground-glass opacities, consolidations, and solid nodules. In some cases, pleural thickening, air bronchograms, and interlobar septal thickening can be present as well.[2] During the current coronavirus disease outbreak, together with an appropriate clinical presentation,

radiological imaging can assist with an appropriate diagnosis, so that appropriate management can be initiated before obtaining confirmatory laboratory tests.

Author Disclosures

Conflicts of interest: none to report

DETAILS

Subject:	Severe acute respiratory syndrome; Severe acute respiratory syndrome coronavirus 2; Coronaviruses; Radiology; Medical diagnosis; Emergency medical care; X-rays; Case reports
Publication title:	Journal of Emergency Nursing:; JEN; Philadelphia
Volume:	46
Issue:	4
Pages:	546-547
Publication year:	2020
Publication date:	Jul 2020
Section:	Images
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:	Case Study, Journal Article
DOI:	https://doi.org/10.1016/j.jen.2020.04.008
ProQuest document ID:	2487205799
Document URL:	https://www.proquest.com/scholarly-journals/radiological-presentation-coronavirus-disease/docview/2487205799/se-2?accountid=211160

The Quality of Care in the Emergency Management of Cancer Patients With Febrile Neutropenia: A Records-Based Cohort: JEN

ABSTRACT (ENGLISH)

Introduction

Febrile neutropenia is one of the most severe oncological emergencies associated with the treatment of cancer. Patients with febrile neutropenia are at grave risk of developing life-threatening sepsis unless there is rapid initiation of treatment. The aim of this study was to evaluate the quality of ED care of patients with febrile neutropenia using the 3 quality dimensions of safety, effectiveness, and timeliness of care.

Methods

A retrospective review of all available records of adult cancer patients with febrile neutropenia who presented to 1 urban emergency department in Atlantic Canada was conducted over 5 years.

Results

Examining the 9 quality indicators of the 431 patients included in the study identified areas for improvement in each of the 3 dimensions. More than one third of the participants were unsafely discharged from the emergency department despite the severity of their conditions. Patients in the study were not seen promptly by the physician and did not receive timely treatment during different phases of their visit. Most importantly, the delay in antibiotic administration presented a major risk for this population.

Discussion

Aspects of care provided to this cohort of febrile neutropenia patients were inconsistent with the recommended evidence. Strengthening ED care is necessary to reduce the gap between evidence-based and actual care. Quality initiatives can be implemented to improve care to become safer, effective, and timely. Nurses who are in direct contact with the patients and who are actively involved in every single process of the health care system are well positioned to lead this change.

FULL TEXT

Contribution to Emergency Nursing Practice

••The current literature on cancer patients with febrile neutropenia indicates that febrile neutropenia is a potentially life-threatening condition requiring timely treatment in the emergency department.

••This article contributes to help emergency nurses identifying the aspects of care that can be inconsistent with the recommended evidence.

••Key implications for emergency nursing practice found in this article are in strengthening emergency department care to reduce the gap between evidence-based and actual care.

Introduction

Febrile neutropenia (FN) is the most common side effect related to cancer treatment.[1] FN is a potentially life-threatening condition as patients can suffer a profound bone marrow suppression leaving them susceptible to severe infections.[2] Infection because of neutropenia is associated with significant morbidity and mortality in patients receiving chemotherapy.[2-4] For example, FN is a predisposing factor for sepsis, and therefore prevention of FN is a crucial strategy to reduce the disease burden.[5]

The emergency department remains an accessible place for patients with FN to receive timely treatment, and until more focus is given to prevention of this complication, it should be anticipated by the emergency department personnel.[6,7] The standard of care is for individuals with FN to be seen by the emergency physician within 15 minutes of triage[8] and to commence antibiotics within 1 hour.[9] The time to initiation of effective antimicrobial therapy was reported as the single most reliable predictor of outcome among patients with early signs of sepsis.[10] Delayed ED care and increased wait times are associated with adverse outcomes among patients with FN,[11-13] and earlier administration of antibiotics is associated with fewer complications in terms of infection, sepsis, and prolonged length of stay (LOS).[14] Morneau et al[15] found that each hour of delay in the administration of antibiotic therapy increased the odds of in-hospital mortality by 16% and earlier management significantly reduced the mortality odds by 33%.[16] However, delayed emergency care and prolonged time to antibiotics (TTA) have been reported in a number of epidemiologic studies where antibiotics were administered from 3.5 to 5 hours after ED presentation.[17-19] The aim of this study was to evaluate the quality of ED care of patients with FN in terms of 3 quality dimensions: safety, effectiveness, and timeliness of care. In particular, we were interested in whether patients were treated according to the benchmarked time for treatment as specified in the triage and FN guidelines.[20]

Methods

The research design was a retrospective review of available records of adult cancer patients undergoing active treatment for cancer. The targeted population included all cancer patients in the provincial cancer registry with a first presentation of fever to 1 emergency department that occurred on a date after the time of their cancer diagnosis. The provincial cancer registry contains information on all individuals diagnosed with cancer in the province and is maintained by the provincial cancer program. Patients were included in the study if they were (1) aged at least 18 years, (2) undergoing active cancer treatment (were on chemotherapy treatment within a month of ED presentation), and (3) came to the emergency department with a presentation of fever between April 1, 2011, and March 31, 2016. Patient data from the cancer registry were directly and securely transferred to the province's health information agency. There, the registry data were linked with the identified hospital's ED patient information system using the inclusion criteria. After the data linkage, 444 patient health records were provided to the researchers. A review of the files identified 13 that were ineligible as the presenting complaint at the emergency department was not related to fever. To facilitate accurate data collection from the patient health record, the first author engaged in a 2-week, informal orientation to the study setting to observe and understand the context and flow of care in the emergency department. These observations also helped to understand the language and the abbreviations that were documented in the patient health records.

Data were collected by conducting chart reviews using a standardized chart review form (CRF). A pilot test of the CRF was performed, and changes were made as necessary to enhance the rigor and minimize biases. For example, items on the CRF were rearranged to match the arrangement of data in the patient health records. In addition, a

random selection of 176 cases (40% of the sample) was checked to ensure proper data coding and entry. Furthermore, we verified the collected data by comparing the nursing sheets with physician sheets, nursing notes, physician progress reports, order sheets, pharmacy sheets, and transfer notes. Patients were assigned a unique study code to protect the confidentiality of their information. The provincial health research ethics board approved the study (reference: #2018.155).

Measures

The ED quality of care was evaluated in terms of 3 quality dimensions: safety, effectiveness, and timeliness of care. These domains were operationalized using 9 measures. There is national consensus on the use of these measures, which are included as part of the Canadian ED national benchmarks.[20]

Safety

The first domain, safety, was measured by 3 variables: (1) the frequency of patients who left without being seen (LWBS), (2) time to triage reassessment while waiting to be seen, and (3) appropriate ED disposition based on stratification of the severity of FN using the Multinational Association for Supportive Care in Cancer (MASCC) score as per the FN guidelines.[21] The MASCC score is used to assess the seriousness of FN and inform a decision about patient discharge. The calculated MASCC score categorizes patients with FN into low- and high-risk based on a scoring system. Low-risk FN patients (MASCC score of ≥21) were considered stable and eligible for outpatient management with oral antibiotics.[5] High-risk patients should be admitted to the hospital with an immediate intravenous broad-spectrum antibiotic administered in the emergency department. Table 1 summarizes the MASCC criteria used to calculate the severity of FN. We rated each patient based on these criteria to decide on the appropriate disposition of patients from the emergency department.

Effectiveness

The effectiveness of care was the second domain and was evaluated by the fractile response rate (FRR), which assesses the proportion of patients in each triage level seen within the guidelines' time objective. The Canadian Triage and Acuity Scale (CTAS) guidelines recommend that 95% of patients with FN be seen within 15 minutes (be assigned a triage score of 2).

Timeliness

The final dimension, timeliness, was evaluated by 5 variables: (1) time to physician initial assessment (PIA), (2) TTA, (3) sorting time, (4) boarding time, and (5) ED LOS. Operational definitions of these measures are provided in Table 2. In Table 3, we summarized the essential elements of the different guideline to which the observed care was benchmarked against.

Data Analysis

We used a 1 sample *t* test to examine the observed versus the expected PIA, TTA, and ED LOS among admitted and discharged patients (15 minutes, 60 minutes, and 4 and 8 hours for admitted and discharged, respectively). The remaining variables were analyzed and summarized using descriptive statistics. The analysis was done using the SAS software (version 9.4; SAS Institute Inc, Cary, NC, USA).

Sample size calculation was conducted using the *t* test sample size equation of the TTA administration variable. Patients with FN are expected to start empiric antibiotics administration within 60 minutes (previous studies reported 180-300 minutes). The estimated effect size range can be calculated as the difference in the value of the observed against the expected TTA between the exposed versus unexposed group (E = 300-60 = 240; E = 180-60 = 120; E[range]:120-240). The variance of time from door to needle was estimated from a previous study of patients with FN where time range from ED triage to TTA was 1.23 to 22.8 hours (SD= [22.8-1.23]/4*60 = 324 minutes).[19] The standardized effect size range (E/S) can now be calculated by dividing the effect size by the SD of the outcome

variable (TTA) (E/S = 120/324 = 0.37 ≈0.40; E/S = 240/324 = 0.74 ≈0.70). At a 2-sided hypothesis (α = 0.05) and β = 0.20 assuming a standardized effect size of 0.40 and 0.70, it would require a minimum sample size of 100 and 34 participants, respectively.[23]

Results Characteristics of Patients

We identified 431 oncology patients from the provincial cancer registry who presented to 1 emergency department in Atlantic Canada with an episode of FN over the study period. About half of patients (51.5 %) were male with a mean age of 60 years (range = 20-91). Most of the visits (56.0%) occurred during the evening hours (15:00-22:59) with 13.0% arriving by ambulance. Most patients (68%) were diagnosed with a solid tumor and two thirds had advanced malignancy (stage III or VI). Table 4 shows the patient demographics and their cancer characteristics.

Quality Care Measures

This quality evaluation provided evidence of needed improvements in 3 quality dimensions: safety, effectiveness, and timeliness of care.

Safety

Examining the 3 indicators within the domain of safety identified a small number of patients who left the emergency department after triage, but before being seen by the physician. Six patients (1.4%) left the emergency department without being seen. In addition, most of the patients who waited at triage were not reassessed by the triage nurse at the intervals recommended in the CTAS guidelines. The 7 patients (1.6%) who had a documented triage reassessment in their ED record waited an average of 98 minutes before being reassessed. Results for the safety indicators are summarized in Table 5.

The final safety indicator, disposition, revealed that 154 patients (36%) were discharged home. Of note were the 53 (34%) high-risk patients who went home in violation of the FN guidelines because the seriousness of their condition was considered too risky for outpatient management. A small number of discharged patients (n = 7, 5%) were found to suffer profound neutropenia with an absolute neutrophil count of less than 500.

Effectiveness

This domain was evaluated using the FRR of triage implementation, which is an indication of how well the organization is meeting the time objectives of the CTAS guidelines. Only 11% of patients in both triage categories of 2 and 3 were seen by a physician in a time that was consistent with the CTAS recommendations.

Timeliness of Care

Five time-sensitive indicators were measured to assess if patients with FN received the appropriate ED treatment that was responsive to their potentially life-threatening condition. The time from triage to PIA is a critical indicator in the timely initiation of required treatment. In the emergency department, the mean waiting time from triage to PIA was 81 minutes, which was significantly longer than the benchmark of 15 minutes (t [424] = 19.54, P = 0.001). On average, patients had to wait for 228 minutes before the administration of antibiotics, which was significantly longer than the benchmark of 60 minutes (t [333] = 16.173, P = 0.001). Only 4.0% of the patients in our sample received antibiotics within the time frame of 1 hour as recommended in the FN guidelines. On average, it took more than 5.4 hours (SD = 3.2) for the health care team to decide on admission or discharge (sorting time). After the decision was made to admit the patient, there was an average wait time of 10.6 hours in the emergency department before being moved to an inpatient bed. Among the admitted patients, the mean ED LOS was 21.9 hours (SD = 15.1), which was significantly longer than the Health Quality Ontario and the United Kingdom (UK) National Health Service benchmark of 8 hours (t [270] = 15.14, P = 0.001). Among the discharged patients, the mean ED LOS was 4.4 hours (SD = 2.6), which was significantly longer than the Health Quality Ontario and UK National Health Service benchmark of 4 hours (t [153] = 2.24, P = 0.02). Treatment times of the FN patients are summarized in Table 6. Results from the 1 sample *t*

test are reported in Table 7.

Discussion

Limited information is available to determine if appropriate and timely emergency care is provided for cancer patients with FN. Previous studies were limited to the examination of the benchmarked time for the administration of antibiotics only. This evaluation can inform the adoption of evidence-based policies to enhance the efficiency and effectiveness of ED processes for more positive patient outcomes.

The Institute of Medicine of America published a report in 2000 titled “To Err is Human” that highlighted many safety and quality problems with current health care practices.[22,24] Similarly, the “Canadian Adverse Events Study” reported that 13.5% of the 2.5 million annual hospital admissions in Canada involved at least 1 adverse event with 1 in 5 patients experiencing permanent disability or death.[25] These reports demystified the concept of quality of care as taken for granted, recentered the focus on patient safety, and demanded a redesign of the health care system to improve quality and safety.[26] In this study, we evaluated the quality of care on 3 of the 6 dimensions of quality according to the Institute of Medicine to include safety, effectiveness, efficiency, equity, patient-centeredness, and timeliness of care.

The Safety of Care

Safety was operationalized by measuring 3 indicators. The frequency of patients who LWBS was 1.4%, which represented the proportion of patients with a failed attempt to access the emergency department. Previous studies suggest that a rate of less than 5.0% for patients who LWBS is deemed to be safe for patients with a low acuity rating.[27] Nevertheless, this cannot apply to patients with FN as delayed emergency care is associated with severe adverse consequences.[11] FN patients cannot afford not to receive emergency care; this rate should be 0 for the safety of FN patients.

Another indicator of potentially unsafe care is the absence of reassessment while waiting at triage. This evaluation is part of the triage process because the patients are expected to be continuously monitored until their initial assessment. Only 7 patients (1.6%) had documentation in their ED record that they were reassessed while waiting at triage. This contradicts the Canadian triage guidelines because re-evaluation of patients who are waiting is necessary to ensure that their status is stable, and their waiting remains safe. Moreover, the small number who were reassessed did not meet the recommended time for reassessment.

Finally, safety was evaluated by the appropriate ED disposition after stratification of the severity of FN. The standard of care for patients with FN is to be admitted for protective isolation for prophylactic antibiotics until neutropenia is resolved.[28] Accumulated evidence suggests that the ED visits by individuals with FN are both unavoidable, and necessary, as seen by most of the patients being urgently admitted.[17,18] However, some patients can be considered for initial management of FN in the emergency department with the possibility of discharge if certain conditions were met. In our sample of patients with FN, 36.0% were discharged home but over half of those discharged (59.0%) did not receive antibiotics in the emergency department. Of note, were the 53 (34%) high-risk, discharged patients who were not eligible for outpatient management based on the guidelines.[5] In addition, 7 patients (4.5%) of those high-risk discharged patients were found to suffer from a profound neutropenia with an absolute neutrophil count of less than 500. Among the high-risk discharged FN patients with profound neutropenia were those 5 patients (3.3%) who were not given antibiotics in the emergency department. Although such stratification of patients’ risk is clinically revealing, it does not appear to have been used in making the clinical decision to discharge these patients.

Many researchers and clinicians oppose the outpatient management of low-risk FN, considering it unsafe, especially with its reduced sensitivity and specificity.[5,29] The rationale behind this opposition is that a high number of adverse events were documented when low-risk patients were treated as outpatients. Evidence indicates that one third of ED

patients who were identified as low-risk by MASCC scores were found to have severe complications such as extended LOS, upgrade in level of care, clinical deterioration, and death.[21] Other organizations continue to allow outpatient management, but clear conditions are applied.[30] The Nova Scotia Guidelines recommend that patients receive empirical antibacterial therapy within 1 hour of triage and be monitored for 4 hours before being discharged. Patients who do not get well after 2 to 3 days should be re-evaluated and considered for inpatient treatment. Patients with acute leukemia are never regarded as low-risk patients. In addition, individuals in Nova Scotia who are managed as outpatients must have prescription coverage, reside within 60 minutes of the emergency department, have telephone access, and have 24-hour live-in support. They should also be able to return to the facility for follow-up.[30]

The Effectiveness of Care

The effectiveness indicator was the FRR, which provided information about patient flow as it measures the adequacy of triage implementation suggesting ineffective triage implementation in 89% of the patients with FN. The CTAS guidelines mandate organizations to tailor different resources to meet this quality indicator because FRR is based on the urgency and acuity of the presenting complaint and is related to patient outcomes.[8]

The Timeliness of Care

Patients in our sample were not seen promptly, nor did they receive timely treatment in different phases of their ED visit. The average time to see a physician was 81 minutes (95% confidence interval [74, 88]), which was significantly longer than recommended for patients with FN (the expected PIA = 15 minutes). The average time to receive antibiotics was 228 minutes (95% confidence interval [207, 248]), which was significantly longer than that recommended for patients with FN (the expected TTA = 60 minutes). Our results were consistent with previous studies where ED wait times of cancer patients with FN were far from ideal benchmarks. Patients were found to experience at least between 180 and 300 minutes of waiting before the administration of antibiotics.[17,19,31] Untimely care was also demonstrated by the long period of time that study participants spent in the emergency department waiting to receive necessary services. In Canada and UK, the expected benchmark for ED LOS for patients who are discharged is 4 hours. For individuals who require inpatient admission, the ED LOS benchmark is 8 hours.[32,33] Patients in our study experienced longer ED stays than recommended. Discharged patients spent an average of 4.5 hours in the ED and admitted patients were in the emergency department for an average of 22 hours.

Limitations

This study has some inherent limitations demonstrated in the employed retrospective design where the validity of the results will be dependent upon the accuracy of the reviewed medical records. Also, this observational design shares the common limitations in that unknown confounders often muddy the observed effect. Finally, we were not able to enroll patients who had recent visits to emergency department because there was a two-year delay in entering new individuals with a cancer diagnosis in the cancer registry. Therefore, care could have improved.

Implications for Emergency Nurses

Quality is about changing the behavior of health care providers by using evidence to drive their decisions.[22] This review of quality indicators in the emergency department revealed that aspects of the care provided for this sample of patients with FN was not based on evidence nor was it consistent with the guidelines. There was a considerable gap in the care proposed by the guidelines and the actual care that was received by patients in the emergency department. Quality initiatives are needed to improve care to be safer, more effective, patient-centered, and timely.[34] However, this study was academic-led and focused on a specific patient population with a particular clinical condition (FN). This approach to quality improvement cannot be sustainable and could contribute to fragmented ED quality measurement and improvement. It is also time-consuming and can be challenging for most conditions

because the conventional treatment, timeliness of the intervention, and prognosis can vary significantly among different conditions and across different illnesses. Hospitals need to establish ways to inspect quality in a way that is faster, easier, and cost effective. Investment could be made in health care information technology and health databases which turn data into information and then into knowledge that the caregivers can use to both deliver and improve care.[26] This will make the health workers aware of their performance and continuously improve the quality of the delivered care. Nurses who are in direct contact with the patients and who are actively involved in every single process of the health care system are well positioned to lead this change.

Conclusions

In evaluating the quality of emergency care of patients with FN, the results of this study provide evidence that additional improvements in a number of the quality dimensions have potential to greatly enhance the care provided to individuals with FN. Strengthening the effectiveness of the care delivered to patients with FN will reduce the gap between the recommended evidence-based care and actual care.

Author Disclosures

Conflicts of interest: none to report.

Ethical statement: Health ethics approval was obtained by the provincial health research ethics board (Ref #: 20190499).

Acknowledgments

This work was supported by Memorial University of Newfoundland.

Characteristic	Score
The burden of FN with no or mild symptoms	5
No hypotension (ie, systolic blood pressure >90 mm Hg)	5
No chronic obstructive pulmonary disease	4
Solid tumor or hematologic malignancy with no previous fungal infection	4
No dehydration requiring parenteral fluids	3
Outpatient status	3
Age <60 y	2

Quality dimension	Measures of the quality dimension	Measurement

Safety	1. Left without being seen	ED patients who leave the emergency department on their own without proper discharge by the emergency physician or nurse
2. Time to reassessment at triage	The time from initial assessment at triage to the secondary assessment at triage when the observed wait time has passed the expected wait time	3. ED disposition
The final destination in the emergency department. Patients can be admitted, discharged, or be deceased	Effectiveness	4. Fractile Response Rate
The proportions of patients in each triage level seen by a physician within the CTAS time objective for that level	Timeliness	5. Physician initial assessment
The time from ED triage assessment to the time to be seen by an emergency physician	6. Time to antibiotics	The time from ED triage assessment to the time of the administration of antibiotics
7. Sorting time	The time from ED triage assessment until the decision on admission or discharge is made	8. Boarding time
The time spent in the emergency department after the decision to admit until a hospital bed became available		9. ED length of stay

Variable	Guidelines name	Guidelines recommendations
Time to physician	CTAS	15 min
Time to antibiotics	IDSA &NSG	60 min
ED LOS admitted	HQO &NHS	8 h
ED LOS discharged	HQO &NHS	4 h
ED disposition	IDSA &NSG	Admission for high-risk FN (MASCC <21)
FRR	CTAS	95% of patients with FN should be seen within 15 min (be assigned a triage score of 2)

Characteristic	n (%)
Sex	
Female	209 (48.5)
Male	222 (51.5)
Age (y)	
< 60	174 (40.0)
60-70	158 (37.0)
>70	99 (23.0)
Arrival time	
Day	110 (25.0)
Evening	240 (56.0)
Night	81 (19.0)
Day of arrival	

Weekday	293 (68.0)
Weekend	138 (32.0)
Arrival mode	
Walk-In	374 (87.0)
Ambulance	57 (13.0)
Type of cancer	
Solid	293 (68.0)
Hematological	138 (32.0)
Cancer stage	
1+2	121 (37.0)
3	99 (31.0)
4	104 (32.0)

Safety domain	n	%	Effectiveness domain	n	%
Indicator			Indicator		
Left without being seen	6	1.4	Fractile response rate		
Reassessment at triage (mean = 98 min)	7	1.6	CTAS level of 2 (15 min)	17	10.8
Disposition			CTAS level of 3 (30 min)	27	10.5
Admitted	271	64.0	Low-risk FN (MASCC ≥21)	31	11.4
Distribution of CTAS scores			Discharged	154	36.0
Level 1: Resuscitation	1	0.2	High-risk FN (MASCC <21)	53	34
Level 2: Emergent	158	36.7	ANC <500	7	4.5

Level 3: Urgent	258	59.9	Profound and high-risk FN with no antibiotics	5	3.3
Level 4: Less urgent	13	3	Level 5: Non-urgent	1	0.2

Event	Mean (SD)	Median (IQR)	Percentiles				
5%	25%	50%	75%	90%	Min until physician initial assessment	81.0 (69.6)	60.0 (67.0)
15.0	37.0	60.0	104.0	158.0	Min until administration of antibiotics	228.0 (189.0)	175.0 (158.0)
63.0	116.0	175.0	274.0	458.0	h until decision for admission or discharge (sorting time)	5.4 (3.2)	4.7 (2.9)

2.0	3.5	4.7	6.5	8.6	Boarding time (h)	10.6 (14.2)	3.7 (17.3)
0.0	0.1	3.7	17.4	27.0	Admitted patients ED LOS (h)	21.9 (15.1)	19.3 (18.0)
5.1	9.8	19.3	27.8	43.8	Discharged patients ED LOS (h)	4.4 (2.6)	3.9 (2.1)

Outcome	t	df	Sig (2-tailed)	Mean difference	95% CI of the difference	
Lower	Upper	PIA (min)*	19.54	424	.001	66.0
59.36	72.64	TTA (min)†	16.17	333	.001	167.54
147.16	187.92	Admitted patients ED LOS (h)‡	15.14	270	.001	13.95

12.13	15.76	Discharged patients ED LOS (h)[§]	2.24	153	.026	.47

DETAILS

Subject:	Patients; Emergency medical care; Quality management; Health care; Neutropenia; Life threatening; Sepsis; Antibiotics; Mortality; Cancer therapies; Cancer; Variables; Nurses; Fever; Quality of care; Nursing; Chemotherapy; Emergency services
Identifier / keyword:	Febrile neutropenia; Quality of care; Timeliness of ED care; Emergency triage; Oncological emergency
Publication title:	Journal of Emergency Nursing:; JEN; Philadelphia
Volume:	46
Issue:	4
Pages:	468-477
Publication year:	2020
Publication date:	Jul 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.2020.03.008
ProQuest document ID:	2487205798
Document URL:	https://www.proquest.com/scholarly-journals/quality-care-emergency-management-cancer-patients/docview/2487205798/se-2?accountid=211160
Copyright:	Copyright Elsevier Limited Jul 2020
Last updated:	2023-08-01
Database:	Public Health Database

Table of Contents: JEN

ProQuest document link

FULL TEXT

TVM:UNDEFINED

DETAILS

Publication title:	Journal of Emergency Nursing:; JEN; Philadelphia
Volume:	46
Issue:	4
First page:	A1
Publication year:	2020
Publication date:	Jul 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(20)30175-6
ProQuest document ID:	2487205797
Document URL:	https://www.proquest.com/scholarly-journals/table-contents/docview/2487205797/se-2?accountid=211160
Copyright:	Copyright Elsevier Limited Jul 2020
Last updated:	2023-05-23
Database:	Public Health Database

Board of Directors: JEN

FULL TEXT

TVM:UNDEFINED

DETAILS

Publication title:	Journal of Emergency Nursing:; JEN; Philadelphia
Volume:	46
Issue:	4
First page:	A10
Publication year:	2020
Publication date:	Jul 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:	https://doi.org/10.1016/S0099-1767(20)30177-X
ProQuest document ID:	2487205791
Document URL:	https://www.proquest.com/scholarly-journals/board-directors/docview/2487205791/se-2?accountid=211160
Copyright:	Copyright Elsevier Limited Jul 2020
Last updated:	2021-03-01
Database:	Public Health Database

Climate Change Impact and the Role of the Emergency Nurse: JEN

ABSTRACT (ENGLISH)

Increased ground-level ozone, which is found during extreme heat waves, can exacerbate respiratory conditions such as asthma or chronic obstructive pulmonary disease.5 Other conditions affected by increased temperature related to climate change that we probably do not think about include our food supply and vector-borne transmission from insects such as mosquitoes that spread malaria, dengue fever, yellow fever, or West Nile virus. Warmer temperatures enhance the breeding climate for such insects (Figure).6 Rodents that proliferate in regions after a mild winter or flooding transmit diseases such as leptospirosis, tularemia, and viral hemorrhagic diseases.6 Increased temperatures have been associated with increased flooding in some areas, droughts in others, increased number and severity of hurricanes, and more frequent wildfires. The Centers for Disease Control and Prevention has several resources, such as Climate Change and Extreme Heat: What You Can Do to Prepare,8 that you can use to

help educate your patients when preparing for a heat event.

FULL TEXT

As emergency nurses on the frontline, we see the impact of environmental factors on patients presenting to us for care. As we move into summertime, we notice some particular impacts of the season. We may think of drownings owing to more people visiting swimming pools, lakes, etc. We might think of increased trauma volumes owing to people being more active. What we also must remember are injuries resulting from exposure to heat. Last summer, many locations around the world were affected by extreme heat. England faced a heat wave that covered all regions of the area, contributing to the death of 900 people.[1] Between June and July 2019, France faced a heat wave killing almost 1,500 people.[2] India faced the fifth deadliest heat wave in May 2019, which killed at least 2,300 people.[3] Extreme heat is the leading cause of death from an environmental perspective after weather events such as hurricanes, lightning, floods, or tornadoes.[4]

Extreme heat events pose risks for the entire population; however, some people are disproportionately affected. When we think of those who might be affected more, we typically think of age categories such as the elderly or pediatric patients. We should also consider socioeconomic factors that put people at risk. Think of those who do not have money for air conditioning or a fan. Think of the population with chronic medical conditions such as diabetes and mental illness whose medications may affect their ability to regulate their body temperatures or may affect their electrolyte balance. Increased ground-level ozone, which is found during extreme heat waves, can exacerbate respiratory conditions such as asthma or chronic obstructive pulmonary disease.[5]

Other conditions affected by increased temperature related to climate change that we probably do not think about include our food supply and vector-borne transmission from insects such as mosquitoes that spread malaria, dengue fever, yellow fever, or West Nile virus. Warmer temperatures enhance the breeding climate for such insects ([Figure]).[6] Rodents that proliferate in regions after a mild winter or flooding transmit diseases such as leptospirosis, tularemia, and viral hemorrhagic diseases.[6]

Increased temperatures have been associated with increased flooding in some areas, droughts in others, increased number and severity of hurricanes, and more frequent wildfires. For each of these weather events, we know that vulnerable populations will be affected disproportionately compared with others in their communities.

Florence Nightingale stated that “The most important practical lesson that can be given to nurses is to teach them what to observe.”[7] As we note the impact that climate change has on the communities and populations we serve, we need to ensure we are doing our part to educate our patients to adapt to and be prepared for extreme weather events. The Centers for Disease Control and Prevention has several resources, such as Climate Change and Extreme Heat: What You Can Do to Prepare,[8] that you can use to help educate your patients when preparing for a heat event. The Emergency Nurses Association has developed an infographic titled Understanding Climate Change ([Figure]), which helps break down some of the basics around climate change and the role of the emergency nurse. This infographic resulted from a resolution that a fellow Emergency Nurses Association member submitted when she observed this resource gap. This is a great example of using one’s voice to make a difference. Remember that “One Person Can Make A Difference!”

DETAILS

Subject:	Leptospirosis; Malaria; Drought; West Nile virus; Chronic respiratory diseases; Chronic asthma; Heat; Yellow fever; Dengue fever; Climate change; Chronic obstructive pulmonary disease; Floods; Nurses; Heat waves; Mosquitoes; Insects; Tropical diseases; Hurricanes; Emergency medical care
Publication title:	Journal of Emergency Nursing:; JEN; Philadelphia

Volume:	46
Issue:	4
Pages:	407-409
Publication year:	2020
Publication date:	Jul 2020
Section:	President's Message
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:	Commentary
DOI:	https://doi.org/10.1016/j.jen.2020.05.007
ProQuest document ID:	2487205786
Document URL:	https://www.proquest.com/scholarly-journals/climate-change-impact-role-emergency-nurse/docview/2487205786/se-2?accountid=211160
Copyright:	Copyright Elsevier Limited Jul 2020
Last updated:	2023-07-28
Database:	Public Health Database

Document 16 of 28

The Effect of Soft Tissue Injury Cold Application Duration on Symptoms, Edema, Joint Mobility, and Patient Satisfaction: A Randomized Controlled Trial:

JEN

ABSTRACT (ENGLISH)

Introduction

The aim of this study was to determine the effect of cold application time on symptoms, edema, and patient satisfaction in soft tissue injuries.

Methods

A randomized controlled trial was conducted with 105 patients who were treated with cold applications of different durations (10, 20, and 30 minutes). Interview-assisted data were collected on symptoms and patient satisfaction. Edema and range of motion were objectively measured in patients with an ankle injury. Data were analyzed using repeated-measures analysis of variance.

Results

Pain reduction was greatest in the 20 minutes of cold application group ($F = 46.35$, $P < 0.05$). Symptoms of discomfort such as tingling ($F = 65.93$, $P < 0.05$), redness ($F = 61.95$, $P < 0.05$), itching ($F = 36.49$, $P < 0.05$), numbness ($F = 57.94$, $P < 0.05$), and burning ($F = 55.40$, $P < 0.05$) were more frequent in the group with 30 minutes of cold application. Both joint mobility ($F = 45.28$, $P < 0.05$) and patient satisfaction ($F = 130.99$, $P < 0.05$) were the highest in the group with 20 minutes of cold application.

Discussion

Our findings suggest that a duration of 20 minutes for cold application for a soft tissue ankle injury is recommended to maximize pain control, joint mobility, and patient satisfaction while decreasing other symptoms of discomfort.

FULL TEXT

DETAILS

Subject:	Control theory; Ankle; Emergency medical care; Cold; Personal information; Pain; Application; Vital signs; Injuries; Skin; Mobility; Ankles; Packaging; Burning; Cryotherapy; Patient satisfaction; Discomfort; Nursing care; Edema; Clinical trials
Location:	Turkey
Identifier / keyword:	Cryotherapy; Pain; Edema; Patient satisfaction
Publication title:	Journal of Emergency Nursing:; JEN; Philadelphia
Volume:	46
Issue:	4
Pages:	449-459
Publication year:	2020
Publication date:	Jul 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, Evidence Based Healthcare
DOI:	https://doi.org/10.1016/j.jen.2020.02.017
ProQuest document ID:	2487205776
Document URL:	https://www.proquest.com/scholarly-journals/effect-soft-tissue-injury-cold-application/docview/2487205776/se-2?accountid=211160
Copyright:	©2020. Emergency Nurses Association
Last updated:	2022-06-15
Database:	Public Health Database

Using a Mobile Phone Application Versus Telephone Assistance During Cardiopulmonary Resuscitation: A Randomized Comparative Study: JEN

ProQuest document link

ABSTRACT (ENGLISH)

Introduction

In recent years, the way CPR instructions are given has changed because of the development of new technology that allows bystanders who witness a cardiac arrest to be guided in performing CPR. This study aimed to compare the effectiveness of using a mobile phone application (app) versus telephone operator assistance in performing

cardiopulmonary resuscitation (CPR) techniques in simulated settings.

Methods

A comparative study was performed with 2 intervention groups: (1) mobile phone app and (2) telephone assistance. A total of 128 students participated and were distributed randomly into each intervention group. A CPR observation checklist and standard CPR quality parameter measurements were used for data collection.

Results

The group that used the app obtained better results than the group that had telephone assistance on 5 items during CPR observation: checking if the area is secure (X2(1) = 26.81; *P* < 0.05), asking for help (X2(1) = 66.07; *P* <0.05), opening of airways (X2(1) = 12.03; *P* <0.05), checking for breathing (X2(1) = 6.10; *P* <0.05), and contacting emergency services (X2(1) = 12.41; *P* <0.05). Regarding the skill level of CPR, no statistically significant differences were found when comparing the 2 intervention groups (X2(1) = 0.91; *P* = 0.33). As for the parameters measured, there were only statistically significant differences found in the item compression fraction (*U* = 1,593.00; Z = −2.16; *P* <0.05), with the group that used the app obtaining better results.

Discussion

Better outcomes were observed in recognizing if the area was safe, asking for help, opening up the airways, checking for breathing, and calling emergency services in the mobile phone app group. However, the results indicated that there were no differences in the CPR parameters, except compression fraction, when the app was used as opposed to being guided by telephone.

FULL TEXT

DETAILS

Subject:	Comparative studies; Emergency medical care; Intervention; Cellular telephones; Students; New technology; Assistance; Sociodemographics; Cardiopulmonary resuscitation--CPR; Emergency services; Parameters; Myocardial infarction; Nursing; Feedback; Breathing; Ventilation; Cardiopulmonary resuscitation; Mobile phones; Bystanders; Heart attacks
Location:	Spain
Identifier / keyword:	Mobile phone application; Telephone assistance; Cardiac arrest; Cardiopulmonary resuscitation; Basic life support
Publication title:	Journal of Emergency Nursing:; JEN; Philadelphia
Volume:	46
Issue:	4
Pages:	460-467.e2
Publication year:	2020
Publication date:	Jul 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:	Evidence Based Healthcare, Journal Article
DOI:	https://doi.org/10.1016/j.jen.2020.03.015
ProQuest document ID:	2487205763
Document URL:	https://www. proquest.com/scholarly-journals/using-mobile-phone-application-versus-telephone/docview/2487205763/se-2?accountid=211160
Copyright:	©2020. Emergency Nurses Association
Last updated:	2022-06-08
Database:	Public Health Database

The Effectiveness of a Time Management Workshop on Job Stress of Nurses Working in Emergency Departments: An Experimental Study: JEN

ABSTRACT (ENGLISH)

Introduction

One of the main risk factors for poor health is a high level of job stress. Time management skills can greatly reduce job stress. The current study aimed to evaluate the effectiveness of a one-time management training workshop on job stress among nurses working in emergency departments.

Methods

This randomized experimental study was carried out with 80 nurses working in emergency departments affiliated with a university of medical sciences. The intervention was an 8-hour workshop on time management. Pre- and posttest data were collected by demographic questionnaire and an occupational stress inventory before and 1 month

after intervention. Data were analyzed using descriptive, chi-square, *t* test, Fisher exact, and analysis of covariance statistics.

Results

The mean of job stress in the intervention group increased after the intervention (186.22, SD = 22.97) from baseline (182.52, SD = 34.39) compared with the mean of job stress in the control group (204.42, SD = 22.42) and (204.35, SD = 22.45). The control group had a significantly higher job stress score before the intervention ($t = -3.37$, $P = 0.001$). There was no statistically significant difference between the intervention and control group in job stress scores after intervention ($t = -3.56$, $P = 0.77$).

Discussion

The time management skills training program did not reduce the moderate-high levels of job stress of nurses in emergency departments. Addressing other sources of job stress, besides time management, is needed.

FULL TEXT

DETAILS

Subject:	Occupational stress; Emergency medical care; Intervention; Management training; Risk factors; Control groups; Time management; Management development programmes; Questionnaires; Hospitals; Health status; Nurses; Professional training; Skill development; Data collection; Nursing; Emergency services
Business indexing term:	Subject: Occupational stress Management training Time management
Location:	Iran
Identifier / keyword:	Job stress; Time management; Nurses; Emergency wards
Publication title:	Journal of Emergency Nursing:; JEN; Philadelphia
Volume:	46
Issue:	4
Pages:	548.e1-548.e11
Publication year:	2020
Publication date:	Jul 2020
Section:	Nurse Educator
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.2020.03.013
ProQuest document ID:	2487205753
Document URL:	https://www.proquest.com/scholarly-journals/effectiveness-time-management-workshop-on-job/docview/2487205753/se-2?accountid=211160
Copyright:	©2020. Emergency Nurses Association
Last updated:	2021-04-09
Database:	Public Health Database

Editorial Board: JEN

FULL TEXT

TVM:UNDEFINED

DETAILS

Publication title:	Journal of Emergency Nursing:; JEN; Philadelphia
Volume:	46
Issue:	4
First page:	A9
Publication year:	2020
Publication date:	Jul 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:	https://doi.org/10.1016/S0099-1767(20)30176-8
ProQuest document ID:	2487205735
Document URL:	https://www.proquest.com/scholarly-journals/editorial-board/docview/2487205735/se-2?accountid=211160
Copyright:	Copyright Elsevier Limited Jul 2020
Last updated:	2021-02-14
Database:	Public Health Database

Emergency Nursing Review Questions: July 2020: JEN

ABSTRACT (ENGLISH)

A positive response to which of the following questions would be most important to report to the physician and the laboratory? A.“Are you taking any vitamins or supplements for your hair, skin, or nails?” B.“Are you taking any blood pressure medications?” C.“Are you taking any hormones?” D.“Are you taking any calcium supplements?” 3. A.Application of a tourniquet to the extremity B.Elevation of the extremity to the level of the heart C.Incision and suction of the bite wound D.Application of cold therapy Answers 1. Correct answer: A In November 2019, the United States Food and Drug Administration released an updated safety warning that biotin (vitamin B7), a dietary supplement often found in multivitamins and in hair, skin, and nail supplements, could interfere with some laboratory tests, causing incorrect results that could go undetected.

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 presents to the emergency department with a 24-hour history of nausea, vomiting, headache, and confusion. The patient has recently started training for a charity race. The weather has been very hot (more than 32.2°C [more than 90°F]), but the family states that the patient has been drinking lots of water after running. Which of the following electrolyte imbalances is this patient at highest risk for?

•**A.**Hypokalemia

•**B.**Hypomagnesemia

•**C.**Hyponatremia

•**D.**Hypocalcemia

2. During triage, the nurse is reconciling medications of a patient presenting with substernal chest pain. A positive response to which of the following questions would be most important to report to the physician and the laboratory?

•**A.**“Are you taking any vitamins or supplements for your hair, skin, or nails?”

•**B.**“Are you taking any blood pressure medications?”

•**C.**“Are you taking any hormones?”

•**D.**“Are you taking any calcium supplements?”

3. An unvaccinated patient presents to the emergency department with fever, cough, conjunctivitis, and rash. When taking a health history of this patient, what is the most important information to obtain and document?

•**A.**“When did the fever start?”

•**B.**“Did you see any white spots in your mouth?”

•**C.**“Did the rash start on your trunk?”

•**D.**“When did the rash start?”

4. A 3-year-old child is brought to the emergency department after being found with an open e-cigarette product. The nurse should anticipate interventions for which common early sign of e-cigarette toxicity?

•**A.**Vomiting

•**B.**Bradycardia

•**C.**Hypotension

•**D.**Seizures

5. A hiker reached into the grass to pick up a dropped item and was bitten by a copperhead snake. Which of the following measures would the emergency nurse anticipate?

•**A.**Application of a tourniquet to the extremity

•**B.**Elevation of the extremity to the level of the heart

•**C.**Incision and suction of the bite wound

•**D.**Application of cold therapy

Answers

1. Correct answer: C

Patients with an excess intake of free water are at a higher risk of hyponatremia. When the serum is diluted by excess water, the water moves from the extracellular space to the intracellular space. The cells will swell because of the excess water. In the brain, the swelling will cause signs of increased intracranial pressure as evidenced by nausea, vomiting, and altered mental status. Signs of hypokalemia (A) include weakness, hyporeflexia, ileus, and flattened t-waves. Hypomagnesemia (B) results in weakness, irritability, and tetany. Hypocalcemia (D) also affects the neuromuscular system with symptoms of facial twitching and muscle spasms.[1,2]

2. Correct answer: A

In November 2019, the United States Food and Drug Administration released an updated safety warning that biotin (vitamin B7), a dietary supplement often found in multivitamins and in hair, skin, and nail supplements, could interfere with some laboratory tests, causing incorrect results that could go undetected. In this situation, biotin has been associated with a falsely low troponin, resulting in a missed or delayed diagnosis. It is important that all medications and supplements be recorded; however, in this situation the patient has chest pain, and a troponin level may be drawn. Both the physician and the laboratory should be made aware because some laboratories may be using assays with biotin technology.[3]

3. Correct answer: D

This patient has signs and symptoms of measles. When measles is suspected, the day and time that the rash began is a critical piece of information to document and report. This marks the infectious period that starts 4 days before the onset of the rash and ends 4 days after the rash starts. Public health investigators will need this information to determine potential exposure to measles. The initial symptoms are typical of upper respiratory infections (A). Koplick spots (B) are irregularly shaped bluish white lesions on the buccal mucosa and posterior pharynx. They appear before the rash and last for a day. The maculopapular rash of measles begins around the hairline or face (C).[4]

4. Correct answer: A

Early signs of nicotine poisoning are nausea and vomiting; therefore, airway protection is the highest priority to prevent aspiration. The other early signs of nicotine toxicity include pallor, dizziness, diaphoresis, excessive salivation, hypertension, and tachycardia. The treatment is supportive, and most symptoms will resolve in 1 to 2 hours. The late signs of severe toxicity from higher doses include bradycardia (B), hypotension (C), seizures (D), and respiratory failure. The amount of nicotine in a prefilled e-cigarette cartridge varies between 6 mg/mL and 62 mg/mL of nicotine. Most calls to poison control centers for nicotine toxicity are for children under 5 years of age.[5]

5. Correct answer: B

The affected extremity should be kept at the level of the heart, and any potential constricting items such as rings, bracelets, or clothing should be removed. Tourniquets (A) are no longer recommended; however, if the patient arrives with a tourniquet, it should be loosened gradually to prevent a venom bolus. Incision and suction of the bite wound (C) and cold therapy (D) are not effective and may further damage tissue.[6]

DETAILS

Subject:	Laboratories; Vomiting; Emergency medical care; Blood pressure; Nausea; Cardiac arrhythmia; Nicotine; Hormones; Hypotension; Measles; Calcium supplement; Hair; Dietary supplements; Core curriculum; Electronic cigarettes; Nursing; Emergency services
Publication title:	Journal of Emergency Nursing:; JEN; Philadelphia
Volume:	46
Issue:	4
Pages:	539-540
Publication year:	2020
Publication date:	Jul 2020
Section:	Emergency Nursing Review Questions
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.2020.03.001
ProQuest document ID:	2487205708
Document URL:	https://www.proquest.com/scholarly-journals/emergency-nursing-review-questions-july-2020/docview/2487205708/se-2?accountid=211160
Copyright:	©2020. Emergency Nurses Association
Last updated:	2023-08-01
Database:	Public Health Database

Integrated Infection Control Strategy to Minimize Hospital-Acquired Infection During Outbreak of Coronavirus Disease 2019 Among ED Health Care Workers: JEN

ABSTRACT (ENGLISH)

In just a short period of 2 months, more than 80, 000 people in China and a total of 12,669 people in 76 countries outside of China became infected.1 Owing to the lack of sufficient understanding of and complete protection from COVID-19 in the early stage, more than 3,000 health care workers (HCWs) have been infected.2,3 The number of infections and deaths have exceeded those of the severe acute respiratory syndrome outbreak in China in 2002.3,4 Patients who complain of fever, cough, and sore throat may come to the emergency department. To protect HCWs and noninfected patients from potential 2019-novel coronavirus infection, the West China Hospital (WCH) and its emergency department took a series of related infection control measures. Nonemergency patients are strictly prohibited from entering the center, no more than 2 people can be accompanied by emergency patients under special conditions, no accompanying and no visitation in the rescue room and intensive care unit is permitted, and the companionship of observation room patients is strictly controlled to 1 person carrying an accompanying certificate.

FULL TEXT

Dear Editor:

On February 11, 2020, the World Health Organization formally named the disease triggered by the 2019-novel coronavirus as coronavirus disease 2019 (COVID-19). As a newly discovered infectious disease, the outbreak and spread of COVID-19 shocked the whole world. In just a short period of 2 months, more than 80, 000 people in China and a total of 12,669 people in 76 countries outside of China became infected.[1] Owing to the lack of sufficient understanding of and complete protection from COVID-19 in the early stage, more than 3,000 health care workers (HCWs) have been infected.[2,3] The number of infections and deaths have exceeded those of the severe acute respiratory syndrome outbreak in China in 2002.[3,4] Patients who complain of fever, cough, and sore throat may come to the emergency department. As a high-risk department for receiving such patients, a large number of diagnostic, therapeutic, and nursing operations will be directly exposed to the patients' respiratory secretions. To protect HCWs and noninfected patients from potential 2019-novel coronavirus infection, the West China Hospital (WCH) and its emergency department took a series of related infection control measures. We summarize the experiences during the outbreak, which might help other emergency departments to formulate personalized infection control programs and prevent the spread of hospital-acquired infection.

••With the development of the outbreak, WCH immediately set up a transdepartment emergency infection control team, which was responsible for infection control and protection management of the entire hospital. All the regulatory requirements were implemented actively by the emergency department.

••Triage strategies were adjusted and optimized. The management process as indicated in the [Figure] was activated.

••The epidemic fever clinic management team was set up. The fever clinic pre-examination process was formulated along with the COVID-19 surveillance report process and disinfection requirements after the disposition of suspected or confirmed patients. Meanwhile the layout and facilities of the fever clinic were adjusted, 4 tents were rapidly set up with emergency medical technicians to expand the space scope of the fever clinic, and an emergency fever rescue room was set up to treat severe fever patients. In addition, the hospital-acquired team of the emergency department conducted a number of related theories and skills training.

••After the evaluation of the existing human resources and job needs, WCH deployed HCWs in the hospital and the emergency department, combined with the internal region and postdeployment of the department. WCH initiated volunteer service on the entire hospital staff (clinical HCWs, administrative logistics department), who are mainly responsible for entrance and exit management and medical guidance.

••The management of protective equipment and materials was improved. All protective materials were managed at the 3 levels of hospital, department, and region, and special personnel of the general nurse was responsible for them. Additionally, the general nurse carefully planned and distributed materials according to the requirements of the post's (fever triage, fever clinic, injection room, rescue room, emergency intensive care unit) protection levels.

••It is key to continue to secure the entrances and exits of the center. To decrease the density of patients and reduce the crowding of the emergency department, we strictly implemented the companionship management system established by our department. Nonemergency patients are strictly prohibited from entering the center, no more than 2 people can be accompanied by emergency patients under special conditions, no accompanying and no visitation in the rescue room and intensive care unit is permitted, and the companionship of observation room patients is strictly controlled to 1 person carrying an accompanying certificate.

As of March 4, 2020, a total of 6,103 fever cases visited our hospital, and 26 cases were finally confirmed as COVID-19. Up to now, no hospital-acquired infection has occurred in WCH and its emergency department. We hope the experiences in infection prevention and control will benefit more HCWs and patients.—*Ling Wang, BSc, Emergency Department of West China Hospital, Sichuan University, Chengdu, China; Xiaoli Chen, MSc, Institute of Disaster Medicine, Sichuan University, Chengdu, China; and Lei Ye, MSc, Emergency Department, West China Hospital, Sichuan University, Chengdu, China; E-mail: yelei1117@126.com*

DETAILS

Subject:	Health surveillance; Health care; Severe acute respiratory syndrome; Cough reflex; Workers; Nosocomial infections; COVID-19; Epidemics; Hospitals; Medical personnel; Fever; Coronaviruses; Intensive care; Disease control; Infections; Emergency services
Location:	China
Company / organization:	Name: Sichuan University; NAICS: 611310
Publication title:	Journal of Emergency Nursing:; JEN; Philadelphia
Volume:	46

Issue:	4
Pages:	424-425
Publication year:	2020
Publication date:	Jul 2020
Section:	Letter to the Editor
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:	Letter
DOI:	https://doi.org/10.1016/j.jen.2 020.03.016
ProQuest document ID:	2487205700
Document URL:	https://www.proquest.com/scholarly-journals/integrated-infection-control-strategy-minimize/docview/2487205700/se-2?accountid=211160
Copyright:	©2020. Emergency Nurses Association
Last updated:	2023-03-27
Database:	Public Health Database

Improving Pain Reassessment and Documentation Rates: A Quality Improvement Project in a Teaching Hospital's Emergency Department: JEN

ABSTRACT (ENGLISH)

Introduction

ED pain score reassessment and documentation rates were drastically low according to sampled data from the St. Margaret Hospital Emergency Department, leading to difficult pain management encounters for clinicians. The purpose of this project was to improve pain score reassessment rates in ED patients who were discharged with extremity pain.

Methods

This project was an 8-month, pre-postinterventional (preintervention: September-November 2018, intervention: December 2018-January 2019, and postintervention: February-April 2019) quality improvement project that took place in a community hospital emergency department. Emergency nurses participated in 6 focus groups, allowing for the creation of focus group-themed interventions at the request of the nursing staff. Daily audits of pain reassessment and documentation rates for individual nurses took place during the month of January 2019. In addition, a weekly newsletter was created and reported the ED pain reassessment and documentation rates.

Results

All patient encounters (581) were reviewed over the 8-month period. Baseline pain score reassessment and documentation rates were 36.2% (confidence interval, 30.3%-42.3%) in the emergency department. Pain reassessment and documentation rates increased to 62.3% (confidence interval, 56.8%-67.6%) during the 3-month postintervention period.

Discussion

Implementing daily audits and weekly newsletters that created transparency of individual and group performances increased pain score reassessment and documentation rates.

FULL TEXT

Contribution to Emergency Nursing Practice

••The current literature on pain reassessment and documentation rates in the emergency department indicates there is a need for improvement of vital processes in successful pain management.

••This article contributes information on processes to improve pain reassessment and documentation rates in the emergency department.

••A key implication for emergency nursing practice found in this article is that conducting focus groups, daily audits, and weekly newsletters can increase emergency nurses' pain reassessment and documentation rates, which can potentially lead to improved patient pain management.

Introduction

The recent opioid epidemic has captured public attention to focus on expanding access to naloxone and effectively treating substance use disorder. Combating the opioid epidemic has revealed many complications and challenges, and proper pain management remains a critical piece to address the underlying crisis.[1] One of the challenges has been to continue providing adequate pain management to those patients who are experiencing significant pain. Regardless of acute or chronic pain, the management of pain in all patients requires proper pain assessment and reassessment to ensure the provision of exceptional pain management.[1,2] In light of this, in 2018, The Joint Commission released revised pain assessment and management standards for hospitals. The standards require hospitals to identify pain assessment and pain management, including safe opioid prescribing, as an organizational

priority; to assess and manage the patient's pain and minimize the risks associated with treatment; to collect data to monitor its performance; and to compile and analyze data.[3] According to the National Hospital Ambulatory Medical Care Survey, there were 145.6 million visits to emergency departments in the United States between December 28, 2015, and December 25, 2016. Of the patients making these visits, adult patients treated for pain received opioid medications approximately 38% to 46% of the time.[4,5]

After reviewing a 1-month sample of ED patients with extremity pain who received analgesia, we discovered that pain score reassessment and documentation occurred only 33% of the time. The goal of this interdisciplinary quality improvement project was to improve the rate of pain score reassessment in emergency departments for patients with extremity pain.

Methods

This project had a pre-post interventional design (preintervention: September-November 2018, intervention: December 2018-January 2019, and postintervention: February-April 2019) and took place in the emergency department of a 26-bed community teaching hospital in Pittsburgh, Pennsylvania, from September 1, 2018, to April 30, 2019 (Figure 1). The University of Pittsburgh Medical Center St. Margaret Hospital Emergency Department cares for approximately 37,000 patients annually with approximately 45 to 60 registered nurses on payroll at any given time throughout the year. The interprofessional quality improvement team consisted of a postgraduate year-1 pharmacy resident, clinical pharmacist, physician assistant, staff nurse, and nurse manager. All patients aged 18 years and older who presented to the emergency department with extremity pain were included. Patients were excluded if they presented with chest pain, received analgesic medication for antipyretic purposes, required hospital admission, or were discharged before the 30- or 60-minute reassessment time point for an intravenous or oral pain medication, respectively.

Three interventions were implemented to improve pain score reassessment and documentation: (1) 6 focus groups with an average of 3 nurses in attendance per group were completed to identify nursing barriers and provide education on the importance of pain reassessment to improve pain management, (2) daily audits were conducted to communicate positive reinforcement and constructive feedback to individual nurses, and (3) weekly newsletters provided a source of ongoing education and continuous staff feedback on the department-wide rates of pain reassessments.

The team conducted focus groups to identify and understand nursing workflow and barriers to completing appropriate pain reassessment and documentation. The most commonly identified barriers were used to design specific interventions that were believed to be the most effective according to the collection of nurse responses. Using this strategy resulted in increased commitment, interest, and participation in improving pain reassessment and documentation among the emergency nurses.

Daily audits were conducted for each individual emergency nurse who worked the previous day. The audits were completed throughout the whole month of January (intervention period). The results of each audit were sent via e-mail to each respective nurse the following day after his or her shift to provide timely feedback to allow for immediate improvement in pain reassessment and documentation. In addition, constructive feedback and educational information on the value and importance of pain reassessment were included in the daily audit e-mails. The nurses reported improved practice habits and enhanced patient care because of an increase in transparency of individual emergency nurse's pain reassessment and documentation rates.

Finally, we added a full-page section in the emergency department's weekly newsletter. We included weekly department reassessment rates in the newsletter coupled with evidence supporting that pain reassessment rates improve pain management for patients. In addition, we highlighted the most common situations in which pain

reassessment and documentation were not being completed.

Successful pain reassessment and documentation were determined through chart abstraction for all patients who met the inclusion criteria. An unsuccessful pain reassessment and documentation encounter was defined as any patient who met inclusion criteria and did not have a pain score documented in his or her electronic medical record 30 minutes after receiving an intravenous or intramuscular analgesic medication or 60 minutes after receiving an oral analgesic. The exact pain reassessment and documentation time requirements were determined by the health system's pain assessment and reassessment policy. Additional information that was collected included medication name, route of administration, strength of medication, time of administration, time of pain reassessment, name of registered nurse administering and reassessing patient pain, rescue analgesic medication name, route of rescue analgesic administration, and strength of rescue analgesic medication.

Descriptive measures (means, medians, percentiles, and variance or SD) were used to describe the basic statistics. Every single chart by every emergency nurse who assessed patients in the emergency department was examined for the reassessment of pain after an analgesic medication was administered. The reassessment of pain (yes or no) was the unit of measure in this project. This measurement was determined through chart abstraction of pain reassessment documentation. Because the number of individual emergency nurses who saw patients in each project period and the number of patients each emergency nurse saw differed, generalized estimating equations were used to estimate the rates of reassessment, determine their standard errors, and calculate 95% confidence intervals (CIs). Generalized estimating equation is an approach for analyzing repeated measures over time (each separate emergency nurse within each period) when the outcome is dichotomized (reassessment yes or no). To determine if any single emergency nurse affected the rates of reassessment, results of statistical models using all emergency nurses versus only those emergency nurses who participated in all 3 periods were compared. The University of Pittsburgh Medical Center Quality Improvement Review Committee approved this project. Statistical analyses were performed using SAS (JMP Pro, version 14) software and R.

Results

A total of 581 patients were seen and reviewed for pain reassessment and documentation rates during the preintervention and postintervention periods. This included every patient who met the project's inclusion and exclusion criteria. In the preintervention 3-month period, 260 patient encounters who met our inclusion criteria were identified ([Figure 1]). Of these 260 patients, 94 had documented pain reassessment scores (36.2% reassessment rate; 95% CI, 30.3%-42.3%). In the postintervention 3-month period, 321 patient met the inclusion criteria. Of these 321 patients, 200 had documented pain reassessment scores (62.3% reassessment rate; 95% CI, 56.8%-67.6%) ([Figure 2]).

A sensitivity analysis was conducted for the preintervention and postintervention periods to examine if the positive increase in pain reassessment and documentation rates were affected by any individual nurses. There were a total of 57 nurses who saw patients in the preintervention period, 52 nurses who examined patients in the intervention period and 59 nurses who examined patients in the postintervention period. The sensitivity analysis examined the pain reassessment rates for all nurses who were employed during all 3 project periods (N = 37 nurses). For this population of nurses, there were 182 patient encounters, with 69 patients having documented pain reassessment scores in the preintervention period (37.9% reassessment rate; 95% CI, 30.8%-45.4%). In the postintervention period, 231 patient encounters were identified, with 139 patients with pain reassessment scores documented (60.1% reassessment rate; 95% CI, 53.5%-66.6%). Owing to the similarities in rates between the overall population and that included in the sensitivity analysis, it was determined that the overall improvement in reassessment rates was not related to individual nurses.

Patients who received opioid medications were twice as likely to receive a rescue pain medication after pain

reassessment scores were documented compared with patients who received nonopioid analgesics (34.7% vs 17.7%). Patients who received a rescue pain medication after pain reassessment scores were documented were more likely to receive intravenously and intramuscularly administered medications compared with oral medications (23.5% vs 19.7%).

Table displays the individual variables that could have affected pain reassessment and documentation rates. Each individual variable consistently had approximately a 25% to 30% increase in pain reassessment and documentation rates from the preintervention to the postintervention periods. These variables were not significant prognostic factors in explaining the increase in reassessment rates.

Discussion

In this 8-month pre-postinterventional, interprofessional quality improvement project using focus groups, daily audits, and weekly newsletter communication, pain reassessment and documentation rates increased by 26% from the preintervention period to the postintervention period. Among the encountered patients with successful documentation of pain reassessment, those who received opioid as the initial analgesic medication were twice as likely to be given a rescue pain medication. It is unclear why this difference occurred, but it is important to address and research this finding.

Changing current practice behaviors can be challenging.[6] Specifically, pain reassessment and documentation habits require a multimodal approach to improve practice habits.[7] This project attempted to determine if completing daily audits for every encountered patient who received analgesic medications during a shorter time frame could have the same effect. It is clear that implementing daily audits and a weekly newsletter can have a rapid and significant impact on current pain reassessment and documentation rates. Future quality improvement projects should monitor a longer postintervention period for sustained improvement in pain reassessment and documentation rates.

This pre-postinterventional quality improvement project had a clear statistical strength to support its results. Common cohort studies use a random sample to represent their population. This project could analyze all patients in the population who met the project's inclusion and exclusion criteria during the project timeline.

Limitations

There are potential limitations of this pre-postinterventional quality improvement project. First, the length of the postintervention period may be too short to determine if the significant increase in pain score reassessment and documentation rates sustained or declined to baseline rates. Second, St. Margaret Hospital Emergency Department has a high attrition rate with only 37 of a total 76 nurses being employed during the entirety of the 8-month project. Knowing this, the department has taken efforts toward specific pain management with pain reassessment and documentation orientation for all newly hired, registered nurses. Pain reassessment and documentation orientation materials include institution-specific pain management policy and procedures, educational documents defining best practices for pain management, and guidance on proper pain reassessment documentation steps in electronic medical records.

Implications for Emergency Nurses

Our protocol for increasing pain reassessment rates and documentations for ED patients can be adapted and used at other emergency departments. It is clear that practice improvement requires commitment from all members involved. Using focus groups is one of the many ways to gain emergency nurses' commitment. Short periods of daily audits and weekly newsletters are effective strategies to improve practice behaviors quickly. Although these strategies are effective, it is still unknown if these results are sustained over an extended period of time. Given this, we recommend other emergency departments conduct a small number of random, weekly pain reassessment audits to sustain the increased pain reassessment rates and documentations at their site. By increasing pain reassessment

rates and documentations, ED patients can be provided improved pain management throughout their stay.

Conclusions

Conducting focus groups, daily audits, and weekly newsletters increases pain reassessment rates completed by emergency nurses. This quality improvement project will be used to promote communication, improve the documentation of pain score reassessment rates, and provide patients with enhanced pain management in the emergency department. It has led to additional projects such as creating a pain management protocol to minimize opioid use and a descriptive research project focusing on patient demographics to determine initial opioid versus nonopioid selections.

Author Disclosures

Conflicts of interest: none to report.

Variable	Preintervention		Postintervention	
Opioid vs nonopioid	Total cases	Frequency (reassessment rate) (%)	Total cases	Frequency (reassessment rate) (%)
Opioid	125	41	140	69
Nonopioid	135	32	181	57

DETAILS

Subject:	Transparency; Emergency medical care; Quality management; Intervention; Pain; Pain management; Documentation; Community hospitals; Nurses; Feedback; Narcotics; Analgesics; Patients; Sensitivity analysis; Focus groups; Teaching; Audits; Confidence intervals; Nursing; Medical records; Teaching hospitals; Quality of care; Nursing care; Emergency services; Quality control; Quality improvement
Business indexing term:	Subject: Quality control Quality improvement
Location:	United States--US
Identifier / keyword:	Pain reassessment; Pain documentation; Practice improvement; Quality improvement; Pain management
Publication title:	Journal of Emergency Nursing:; JEN; Philadelphia
Volume:	46
Issue:	4
Pages:	505-510

Publication year:	2020
Publication date:	Jul 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:	https://doi.org/10.1016/j.jen.2019.12.008
ProQuest document ID:	2487205692
Document URL:	https://www.proquest.com/scholarly-journals/improving-pain-reassessment-documentation-rates/docview/2487205692/se-2?accountid=211160
Copyright:	©2019. Emergency Nurses Association
Last updated:	2022-04-01
Database:	Public Health Database

Understanding Respiratory Rate Assessment by Emergency Nurses: A Health Care Improvement Project: JEN

ABSTRACT (ENGLISH)

Introduction

Respiratory rate is the first sign of patient decline. Monitoring and recording respiratory rate are essential nursing competencies. However, health care system emergency nurses' ability to differentiate normal from abnormal respiratory rates was unknown. We conducted a health care improvement project to assess emergency nurses' accuracy in "spot" and "formal" assessments, understand assessment practices, and determine competency and training needs.

Methods

In an anonymous cross-sectional survey, 78 emergency nurses from 1 health care system viewed 3 "spot" and 3 "formal" mock patient videos and answered questions in REDCap (Vanderbilt University, Nashville, TN). Accuracy (abnormal/normal), systematic error (bias), and random error (imprecision) were assessed. Descriptive statistics, bivariate analyses, and qualitative content analysis of open-ended questions were reported.

Results

Most emergency nurses identified respiration as abnormal in spot and formal assessment videos. Accuracy was lowest for the video displaying 6 breaths per minute. Emergency nurses were more likely to identify abnormal breathing in all formal assessment videos (n = 59, 75.7%) than in all spot assessment videos (n = 41, 52.6%) (McNemar $\chi 2 = 10.32$, $P = 0.001$). Most emergency nurses reported a willingness to use formal assessments and thought that respiratory rate was a good indicator of a patient's condition. The barriers to accurate assessment included time limitations, prior training focusing on assessments lasting less than 30 seconds, and monitor and staff errors.

Discussion

Respiratory rate assessment may be best assessed formally, particularly for bradypnea, where formal checks may outperform spot checks. The results present areas for improving respiratory rate assessment training and clinical practice.

FULL TEXT

Contribution to Emergency Nursing Practice

••The current literature on respiratory rate assessment indicates abnormal respiration is an accurate indicator of clinical decline. However, respiratory rate may not be assessed routinely or accurately.

••This article contributes the finding that most emergency nurses correctly identified respiratory rates as abnormal in mock videos, but formal assessments may be more accurate than spot checks for bradypnea.

••Key implications for emergency nursing practice found in this article are that gauging emergency nurses' ability to differentiate abnormal respiratory rates is an important component of ensuring that emergency nurses can identify patient clinical decline in a fast-paced emergency department. Understanding how emergency nurses calculate respiratory rates and perceive their importance can identify gaps for future training efforts.

Introduction

Respiratory rate (RR), or the number of breaths a person takes per minute, is a clinical sign of the movement of air in and out of the lungs.[1] RR abnormalities are the primary early indicator of clinical deterioration,[2] including in patients in the emergency department.[3] Abnormalities in RR herald the need for additional patient assessment by the clinical care team and rapid intervention to prevent further decline, unexpected cardiac or respiratory arrest, admission to higher levels of care, increased length of stay, and mortality.[2,4,5] It is therefore vital that RR is collected regularly, obtained correctly, and recorded accurately for each patient. The gold standard for RR assessment is to auscultate, or visually observe, breaths for 1 minute, or observe for a minimum of 30 seconds and multiply observed breaths by 2 to obtain breaths per minute (BPM).[5,6] Despite its clinical importance, research has shown that RR may

not be recorded routinely or accurately by medical staff,[3,4,6-11] for reasons including time pressures, nurses' perception of patient acuity, work interruptions, inadequate knowledge regarding respiratory assessment, and rationalized judgments.[3,7,10] A recent qualitative study of 79 Australian emergency nurses found that ED RR observations were often omitted or recorded erroneously, thus compromising patient safety.[3] Although the emergency nurses were aware of the organizational policy regarding RR observations, they still believed that assessment was unnecessary for all patients and wasted valuable time; hence, they just "tick[ed] and flick[ed]" RR on patients' observation charts.[3] Likewise, a study in the United Kingdom found that clinical staff did not have confidence in the accuracy of RR recordings in observation charts, believing the rates to be estimated or even fabricated, and not formally assessed using recommended methods.[10] In addition, the staff reported using "spot" assessment of RR, in which they estimated the rate by looking briefly at the patient.[10]

Specific Aims

Although some studies have been conducted on RR assessment internationally, few are available in the United States. To address this knowledge gap and potentially improve patient care at the health care system, we conducted a health care improvement project that assessed the accuracy of emergency nurses' "spot" and "formal" RR assessments using videos depicting a mock patient breathing at different abnormal RRs, along with postvideo questions.[1011] Our primary aims were 2-fold:

- (1)assess the accuracy (abnormal/normal, range, bias, and imprecision) of emergency nurses' spot and formal RR assessments; and
- (2)understand emergency nurses' self-reported methods used to calculate and record RR, barriers to recording RR accurately and routinely, and perceptions of the importance of RR.A secondary aim tested the hypothesis that the number of years of emergency nursing experience in the health care system's emergency departments would affect RR assessment accuracy.

Materials and Methods Context

This health care improvement project was conducted at all 12 health care system hospital emergency departments in Minnesota, Wisconsin, and North Dakota. All 401 emergency nurses working in the health care system's emergency departments from April 29, 2019, to August 29, 2019, were invited to take part in the project.

Project Design and Measures

In a cross-sectional electronic survey, we assessed the accuracy of emergency nurses' spot and formal visual RR assessments using videos of a mock patient and postvideo questions. The questions were adapted from a staff survey developed by Philip et al[10] and the findings reported in another study by Philip et al[11] that was conducted with doctors practicing in a teaching hospital in London, UK. The videos were developed on the basis of descriptions by Philip et al.[11] The videos and questions were presented to the emergency nurses through REDCap (Vanderbilt University, Nashville, TN), a secure, Web-based software platform designed to support data capture for research studies.[12] Using a digital camera, the project team members recorded the videos in an ED examination room at one of the health care system's hospitals. The videos were hosted on YouTube. Screenshots and YouTube links are presented in the REDCap survey instrument shown in the Supplementary Material. In the videos, a nurse introduced herself to our actor, then proceeded to take his blood pressure while standing back and observing his respiration. The videos included audio for both speaking and breathing sounds. The accuracy of the abnormal breathing in each video was ensured by use of a metronome application on a project team member's cellular phone. The spot assessment videos were 12-second clips extracted from the longer 70-second formal assessment videos.

As shown in the Supplementary Material, the emergency nurses were first asked demographic questions and then presented

with 3 embedded videos of a mock patient breathing at different yet constant RRs considered irregular.[11] As was done in the study by Philip et al with physicians,[11] 1 video showed bradypnea at 6 BPM, and 2 illustrated tachypnea at 30 BPM and 72 BPM. As was also done in the study by Philip et al,[11] the emergency nurses were given 12 seconds to spot-assess the mock patient's RR, a time limit to which they were blinded. After entering RRs for the first 3 videos, the emergency nurses were presented with a second timer within longer versions of the same 3 videos and given 70 seconds to conduct each formal RR assessment.[11] The emergency nurses entered their RR assessments after watching each video. After completing the video RR assessments, the emergency nurses were presented with posttest questions adapted from Philip et al.[10,11] In addition, they were shown the correct RRs for each of the videos, along with their RR assessments. All responses were voluntary and anonymous.

Ethical Considerations

This health care improvement project was deemed "not human subjects research" by the health care system's Human Research Protection Program because it did not meet the definition of research: being a systematic investigation and "designed to develop or contribute to generalizable knowledge."[13] Although the project was a systematic investigation, the results are not generalizable outside of the health care system's emergency departments. As such, review by the health care system's institutional review board, also part of the Human Research Protection Program, was not applicable.

Data Collection

The REDCap survey was administered from April 29, 2019, to August 29, 2019. The emergency medicine clinical nurse specialist, who was the project lead, e-mailed an invitation to the health care system's 12 ED managers asking them to forward the invitation e-mail to all emergency nurses practicing in the respective emergency departments. In addition, 7 follow-up e-mails were sent. The emergency nurses participated by clicking a link to the REDCap survey in the invitation e-mail.

Data Analysis

Descriptive statistics were calculated on demographic data and closed-ended questions following Philip et al.[10,11] Only items with complete data were included in the analyses. Open-ended questions were coded in HyperRESEARCH version 4.0.3 (ResearchWare Inc, Randolph, MA)[14] by the first 2 authors using open and thematic coding, agreeing 100% on the codes. As was the case in the study by Philip et al,[11] we reported both median and interquartile ranges for RR assessment values, as well as the number of emergency nurses who correctly identified RRs as abnormal (typically outside the range of 12-15 BPM for people at rest or, at most, 20 BPM for adults).[15] Furthermore, we reported "bias" and "imprecision." "Bias," also called "systematic error," refers to the mean difference between the measured and known values.[11] "Imprecision," also called "random error," is the SD of the difference between the measured values (respondent answers) and the known value of the BPM in the video (eg, 30 BPM).[11]

Bivariate analyses of nominal data included chi-square cross-tabulations. The McNemar test for paired data was used to assess any significant differences between spot and formal assessments among emergency nurses correctly noting RR.[11] The Cochran-Armitage trends test was employed to assess whether more years of experience in the health care system's emergency departments were associated with emergency nurses correctly assessing RR as abnormal.[11] Quantitative analyses were conducted in IBM SPSS Statistics version 23 (IBM Corp, Armonk, NY).[16] All analyses employed an alpha of P

Results

A total of 208 emergency nurses started the REDCap survey (51.9% response rate). However, only 78 emergency nurses (19.5% of 401 emergency nurses) provided answers for all the videos and were included in the analyses. Most of these respondents were female (n = 68, 87.2%), had between 2 years and 10 years of practice (52.6%, n =

41), and were aged between 25 years and 45 years (62.8%, n = 49) ([Table 1]).

Accuracy of Emergency Nurse Spot and Formal RR Assessments

Most emergency nurses correctly identified the mock patient's breathing as abnormal in spot and formal assessment videos for all 3 BPM rates ([Table 2]). The BPM rates entered were all abnormal for formal assessment Video 1 (30 BPM) and Video 3 (72 BPM) (n = 78, 100%), with slightly fewer emergency nurses correctly identifying the BPM as abnormal for these same 2 videos in the spot assessments (n = 75, 96.2% and n = 74, 94.9%, respectively). Video 2, in which the actor was breathing only at 6 BPM, had the lowest frequency of emergency nurses correctly assessing the BPM as abnormal in spot (n = 47, 60.3%) and formal (n = 59, 75.6%) assessments. The paired proportion between spot and formal assessments being correctly identified as abnormal differed significantly for Video 2 (McNemar $\chi^2 = 4.65$, $P = 0.031$, not statistically significant when the Bonferroni correction was applied), but not for Videos 1 or 3 ([Table 2]). However, the difference in the paired proportion of emergency nurses identifying all spot RR assessments or all formal RR assessments as abnormal was statistically significant (McNemar $\chi^2 = 10.32$, $P = 0.001$), with more emergency nurses correctly identifying all formal assessments as abnormal (n = 59, 75.6%) than all spot assessments (n = 41, 52.6%). The [Figure] illustrates the spread of responses using box plots. As shown in [Table 3], bias (–16.60) was greatest for Video 3 in the spot assessment. This finding meant that, on average, emergency nurses underestimated Video 3 spot RR (72 BPM) by 16.60 BPM. Imprecision was greatest for spot assessment Videos 1 (7.76) and 3 (19.59) and increased with BPM, as was reported by Philip et al.[11] Imprecision was the same (5.24) for all 3 formal assessment videos. However, bias was greatest for Videos 2 (25.41) and 3 (–40.59), with emergency nurses assessing 6 BPM as 25.41 BPM greater than actual, and 72 BPM as 40.59 BPM less than actual. However, most identified 6 BPM as abnormally low and 72 BPM as abnormally high (see [Table 2]).

Understanding Emergency Nurse RR Assessment Practices And Perceptions Of RR

After the emergency nurses were shown the actual RRs in the videos and their own RR assessments, 71 of 77 emergency nurses (91.0%) reported that they would be very or somewhat likely to assess RR formally ([Table 4]). However, 83.3% (n = 65) did not think all ED staff counted patient respiration for a full 30 seconds. The median percentages of RRs counted for a full 30 seconds reported by 63 respondents as charted in the emergency department (25%, interquartile range = 15, 25) or counted by colleagues (25%, interquartile range = 10, 25) were low (not shown in [Table 4]). The qualitative reasons the emergency nurses gave for not counting a full 30 seconds included time limitations (n = 27), training and habits (n = 18), patient presentation (n = 18), interruptions (activity, talking/moving patients) (n = 6), estimating RR (n = 2), using monitor/telemetry rates (n = 2), not having a clock or watch available (n = 1), and not considering RR as important as other vital signs (n = 1) (not shown in [Table 4]). However, a majority of emergency nurses reported thinking that most other people counted respirations for 30 seconds and multiplied the answer by 2 (n = 55, 70.5%). The most frequently reported tools for counting RR were wristwatches (n = 55, 70.5%), followed by wall clocks (n = 49, 62.8%). A total of 56 emergency nurses (71.8%) reported wearing a working wristwatch. In open-ended responses, counting to 15 (n = 4), in many cases then multiplying by 4 (n = 15), was another commonly reported counting method, whereas 1 individual reported counting to 10 then multiplying by 6 (not shown in [Table 4]). All reported manually entering RR into patients' EHR charts. However, although 51 of 77 emergency nurses (66.2%) reported validating RR with the monitor, only 16 of 78 emergency nurses (20.5%) thought that the recording of RR in the patient chart was accurate all the time. The open-ended reasons for inaccuracy were primarily associated with monitor/telemetry errors (n = 24) and staff errors (n = 10), perceptions of staff only estimating RR (n = 12), time limitations (n = 6), and patient movement (n = 6) (not shown in [Table 4]). Finally, most emergency nurses felt that RR was a good or very good (n = 73, 93.6%) marker of a patient who was sick.

Impact of Years of Health Care System ED Experience on RR Assessment

Emergency nurses with 2 years to 10 years of ED experience at the health care system had higher rates of identifying spot and formal RR as abnormal than other groups (Table 5). However, no statistically significant difference was seen for either assessment type on the basis of the number of years of ED experience.

Discussion

RR is a critical component of patients' vital signs and condition deterioration commonly assessed by emergency nurses.[3,4] However, previous research suggests that RR may not be assessed accurately.[3,4,6-11] In this health care improvement project, emergency nurses from an Upper Midwestern health care system were more likely to correctly identify a mock patient in a video as having an irregular RR during 70-second formal assessments than during 12-second spot assessments, although bradypnea RR (6 BPM) was most difficult for the emergency nurses to distinguish in both assessment types, similar to the difficulty experienced by physicians in previous research.[11] Moreover, emergency nurses were significantly more likely to identify correctly all formal assessments as abnormal than all spot assessments. After the exercise, most emergency nurses reported that they would use formal RR assessments, with percentages higher than reported in Philip et al.[11] In addition, the emergency nurses felt that RR assessment was a good or very good method of assessing patients who were sick, as was reported in a previous survey of nursing staff and doctors.[10] Unlike in the study by Philip et al[11] with physicians, the number of years of practice in the health care system's emergency departments was not significantly associated with emergency nurses identifying RR as abnormal.

The results from the survey presented here suggest that emergency nurses report validating RR via monitor while also distrusting monitor RR, a conundrum that may lead emergency nurses to estimate RR. This could result in inaccurate RR measurement, particularly in the case of spot assessments and bradypnea. However, most emergency nurses reported being likely to use formal RR assessments after the exercise. The results of this project will inform staff training and education to improve patient safety by increasing the accuracy of RR assessment at the health care system.

Limitations

The limitations of this project include the potential for survey response bias, the inclusion of only 1 health care system, self-reported answers, and the cross-sectional survey design. In addition, the response rate was low given the number of potential respondents. Moreover, some emergency nurses did not answer all survey questions or provide RR assessments for all of the videos. Furthermore, only emergency nurses were surveyed. Our method of assessing RR accuracy through videos of a mock patient's respiration may have biased or otherwise affected our results as well. Some emergency nurses reported video playback issues with specific workstations, issues that were corrected by project team members. No power analysis was performed to justify the sample size. Finally, emergency nurses using workstations with the volume turned down or in a noisy environment may have been unable to benefit from hearing audible video respiration noises.

Implications for Emergency Nurses

The results of this health care improvement project suggest that the use of spot assessment may lead to incorrect diagnosis and could affect patient safety in the emergency department if RR is misidentified as normal, as abnormal RR (bradypnea or tachypnea) is an early indicator of clinical decline. Patients in ED settings frequently have an undifferentiated status and can deteriorate with rapid physiologic changes. Emergency nurses, as well as nursing assistants, are the clinical care team members most frequently assessing patient RR. Therefore, they may have more occasions than physicians to assess patients for deteriorating conditions and should be trained to assess RR accurately and consistently without resorting to estimation or brief spot assessments. More research is needed with

other emergency nurses to determine if our findings are generalizable or are unique to the health care system. Future studies could also include nurses from different care areas, such as intensive care or medical surgical units. In addition, assessments could be made part of mandatory emergency nursing staff training, which would increase response and reduce issues with response bias. Moreover, future research could test the accuracy of RR assessment for a wider variety of respiratory rates, including normal BPM.

Conclusions

Accurate assessment of RR alerts the clinical team to changes in patients' clinical condition. For patients in the emergency department, who are frequently without differentiated diagnoses, RR may be best obtained by formal assessment. The findings from this health care improvement project suggest that emergency nurses may be most capable of consistently differentiating abnormal from normal respiration when using longer formal RR assessments. In particular, spot assessment of abnormally low RR (eg, 6 BPM) may lead to emergency nurses inaccurately perceiving and recording an abnormally low RR as normal. Although the number of years of nursing practice in the health care system's emergency departments did not affect the emergency nurses' identification of abnormal RR in this project, the survey results suggest that emergency nurses may not perform formal assessments consistently. Research is needed with other populations of nurses and with nonsimulated methods of observation.

Author Disclosures

Conflict of interest: none to report.

Supplementary Data

Supplementary Material

Supplementary Material

Supplementary material related to this article can be found at https://doi.org/10.1016/j.jen.2020.03.012.

Respondent demographics	n	%
Age (years):		
18-24	3	3.8
25-34	23	29.5
35-44	26	33.3
45-54	10	12.8
55-64	13	16.7
≥65	2	2.6
Missing	1	1.3

Gender		
Male	9	11.5
Female	68	87.2
Other	0	0.0
Missing	1	1.3
Years working as an emergency nurse with the health care system:		
0-1	12	15.4
2-5	24	30.8
6-10	17	21.8
11-15	8	10.3
16-20	6	7.7
>20	9	11.5
Missing	2	2.6

Video	Breaths per minute	Spot assessment correctly identified as abnormal?	Formal assessment correctly identified as abnormal?					X^{2*}	P
No		Yes		n	%	n	%	1	
30	No	0	0.0	3	3.8	N/A	0.25		
	Yes	0	0.0	75	96.2			2	
6	No	12	15.4	19	24.4	4.65	0.03		

	Yes	7	8.9	40	51.3			3
72	No	0	0.0	4	5.1	N/A	0.13	
	Yes	0	0.0	74	94.9			All
N/A	No	14	17.9	23	29.5			

Video	Breaths per minute	Spot assessment (12-second assessments)			Formal assessment (70-second assessments)		
Bias	Imprecision	Inaccuracy interval	Bias	Imprecision	Inaccuracy interval	1	30
−2.40	7.76	−24.00 to 30.00	1.41	5.24	−8.00 to 42.00	2	6
3.51	3.68	−5.00 to 12.00	25.41	5.24	16.00 to 66.00	3	72

Survey question	n	Response	n	%
After seeing your respiration rate assessment compared with the actual rates, how likely are you to formally assess respiratory rate?	77	Very likely	48	62.3
Somewhat likely	23	29.9	Not likely	6

7.8	Do you think all staff in your emergency department count patient respirations for at least 30 seconds?	78	Yes	13
16.7	No	65	83.3	What do you use to count respiratory rate? (You may select more than one)

78	Wristwatch	55	70.5	Wallclock
49	62.8	Thermometer	5	6.4
Estimate	17	21.8	Monitor	25
32.1	Do you carry a working watch with a second hand/counter?	78	Yes	56

71.8	No	22	28.2	What method do you think people use most to calculate respiratory rates? (You may select more than one)
78	Count respirations for a full minute	9	11.5	Count respirations for 30 seconds and multiply the answer by 2
55	70.5	Estimate the number based upon how fast the patient looks like they are breathing (without counting)	36	46.2

Record the same number as was last recorded in the observation chart for that patient	4	5.1	Other	21
26.9	Do you manually enter respiratory rate into [the EHR]?	78	Yes	78
100.0	No	0	0.0	Do you validate respiratory rates obtained using the monitor?
77	Yes	51	66.2	No
26	33.8	Do you think the recording of respiratory rate in the patient chart is accurate all the time?	78	Yes
16	20.5	No	62	79.5
In your opinion, how good is respiratory rate as a marker of a sick patient?	78	Very good	32	41.0

Good	41	52.6	Not good	5

Years of experience	n	%	Correctly identified respiratory rate as abnormal			
Spot assessment		Formal assessment		n	%	n
%	0-1	12	15.4	5	41.7	9
75.0	2-10	41	52.6	23	56.1	34
82.9	>10	23	29.5	12	52.2	14
60.9	χ^2			0.18		1.69
P*			0.67		0.19	

DETAILS

Subject:	Emergency medical care; Accuracy; Clinical training; Video recordings; Content analysis; Training needs; Nurses; Competence; Respiration; Recording; Breathing; Bias; Patients; Health care; Professional training; Nursing; Departments; Clinical assessment; Emergency services; Quality control; Quality improvement; Clinical medicine
Business indexing term:	Subject: Quality control Quality improvement
Location:	United Kingdom--UK
Identifier / keyword:	Cross-sectional survey; Health care improvement; Mock patient videos; Quality improvement; Respiratory rate assessment
Publication title:	Journal of Emergency Nursing:; JEN; Philadelphia
Volume:	46
Issue:	4
Pages:	488-496
Publication year:	2020

Publication date:	Jul 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:	https://doi.org/10.1016/j.jen.2020.03.012
ProQuest document ID:	2487205683
Document URL:	https://www.proquest.com/scholarly-journals/understanding-respiratory-rate-assessment/docview/2487205683/se-2?accountid=211160
Copyright:	©2020. Emergency Nurses Association
Last updated:	2023-06-21
Database:	Public Health Database

Incorporating Hourly Rounding to Increase Emergency Department Patient Satisfaction: A Quality Improvement Approach: JEN

ABSTRACT (ENGLISH)

Problem

Patient satisfaction is an important factor that influences the perceived quality of care delivered. In an effort to meet

patient expectations, a process improvement initiative involving hourly rounding was implemented to improve low patient satisfaction scores.

Methods

This project took place over 23 months and consisted of 4 phases (baseline, intervention I, break, and intervention II). During the intervention phases, self-reported hourly rounding was tracked on a daily basis. Compliance with rounding and patient satisfaction results were provided to staff during unit meetings and were displayed on a visual tracker board. Weekly 5-minute customer service training was provided to all staff. During the baseline and break phases, hourly rounding was not tracked. However, patient satisfaction data were still collected through the Interactive Customer Evaluation system. Three variables were measured using a 5-point Likert scale: overall patient satisfaction, patient perception of staff attitude, and whether the health care team answered all patient questions/concerns.

Results

Hourly rounding compliance was 39% during intervention I and 51% during intervention II. Approximately 0.01% of patients submitted satisfaction data. From baseline to conclusion of intervention II, overall patient satisfaction increased from 52% to 73%; perception of staff attitude increased from 70% to 84%; and whether the health care team answered all patient questions/concerns increased from 63% to 81%.

Discussion

There is a positive relationship between hourly rounding and patient satisfaction scores. Despite low compliance with hourly rounding, patient satisfaction increased for all 3 variables measured. To achieve a change in culture with hourly rounding compliance, nurse managers must consistently monitor staff compliance with hourly rounding.

FULL TEXT

Contribution to Emergency Nursing Practice

••The current literature on emergency department patient care indicates that hourly nurse rounding may improve patient satisfaction.

••This article contributes to the literature by demonstrating that incorporating purposeful hourly rounding as part of a practice improvement project had a positive influence on patient satisfaction.

••Key implications for emergency nursing practice found in this article are that hourly rounding is important to incorporate in the daily routine because it will help to keep patients informed and may result in improved satisfaction.

Introduction

In today's competitive health care market, positive consumer experience ratings are an integral component, depicting the community's perception of a medical institution's success. Although positive patient satisfaction scores are not necessarily indicative of quality medical care, the patients' perception of medical services has an impact on a facility's rating. The Hospital Consumer Assessment of Healthcare Providers and Systems survey allows the Centers for Medicare and Medicaid Services to compile and report on the quality of hospital care provided from the patient's perspective.[1] According to a systematic review of literature, the top 3 priorities identified for improving patient satisfaction are communication, wait times, and staff empathy.[2]

The dynamics associated with emergency department care are complex and have the potential to impede the ability to meet the patients' perspective of quality care.[3] A descriptive cross-sectional study on the relationship between patient and nurse perspective of care identified that a positive nurse-patient relationship is important to the experience of care.[4] Furthermore, nurses recognized they may not always be able to provide compassionate care.[4] Although patient satisfaction is multifactorial, elements that negatively affect ED visits include perceived unfair patient flow, unexplained wait times, and a lack of information sharing between staff and patients.[5] To meet patient

expectations, process improvement initiatives involving variations of purposeful rounding have been implemented to alleviate low patient satisfaction ratings.[6–9]

Methods Setting

This process improvement initiative took place in a 49-bed emergency department located in a mid-Atlantic military academic hospital with a monthly census of 5,800 patients. The patient population consists of active duty military personnel, their dependents, military retirees, and civilians of all ages. Out of 35 institutions that provide emergency services within our health care system and use the Interactive Customer Evaluation (ICE) program, our hospital ranked number 17 in patient satisfaction scores.[10] Based on the submission of 91 comment cards from the 6 months before project implementation, the overall patient satisfaction rate was 52%. To enhance the patient experience, a process improvement initiative involving hourly rounding was implemented to increase patient satisfaction scores. This quality improvement project received a waiver of Internal Review Board review requirement, since as a quality improvement project it was deemed exempt from IRB review.

During the project development, we identified multiple potential barriers to project success. Barriers consisted of competing institutional initiatives, time spent performing clinical tasks instead of rounding, staffing shortages, departmental renovations, and staff buy-in. As a means to enhance project success, the team focused on obtaining staff buy-in while ensuring project initiatives did not increase current workload. The project was structured to incorporate purposeful rounding components into the already existing hourly rounding policy through scripting, which has been associated with positive outcomes when used in the ED setting.[11]

Intervention

The goal of this patient-centered care process improvement project was to increase patient satisfaction within a 6-month period from a baseline of 52% to 80% by increasing staff and patient interactions. A team of 9 staff members was assembled with nurse manager oversight to champion the project. Of the 9 members, 1 was selected to supervise project progression and collect data, whereas the remaining members were divided into nurse and technician team leaders, who were responsible for implementation within their respective teams. Department leadership and project staff focused on changing the behavior of nurses and technicians by involving patients in their medical care through the use of scripted communication to facilitate status updates and address patient needs in a timely manner (Figure 1).

Measures

Our health care system relies on the ICE tool, which allows customers to submit either electronic or paper comment cards, providing managers with service quality data. Options for electronic comment submissions consist of online entries through the hospital website, an ICE kiosk in patient waiting areas, and a mobile telephone application. The comment cards focus on satisfaction questions and provide a free-text section for comments (Figure 2). All patient submissions are electronically mailed to the departmental leadership to review and take action, as required.

This process improvement project took place over a 23-month period, broken down into 4 phases: baseline, intervention I, break, and intervention II. Measures evaluated consisted of self-reported staff rounding compliance, overall patient satisfaction, perception of staff attitude, and patients' response to whether the health care team answered all patient questions/concerns. The baseline phase consisted of data collection to obtain initial figures from the 6 months before implementing the intervention. During intervention I, data were tracked and collected on a daily basis. Feedback was provided to the staff during unit meetings, and a visual tracker board was developed and prominently displayed outside of the unit conference room. Throughout the break phase, the staff were no longer required to self-report their compliance with hourly rounding. In addition, no feedback was provided, although data were still being analyzed through the ICE tool. The intervention II phase of the project began with a staff

questionnaire designed to identify any perceived barriers the staff thought may have been impeding their ability to perform hourly rounding. The ICE tool was also modified to include specific questions about communication provided from the health care team.

Throughout the intervention I phase, training was provided to all nurses and technicians regarding the importance of taking a patient-centered care approach in the delivery of health care. Weekly 5-minute customer service training sessions were conducted, and the staff was updated on current goals and measures. The second step was to implement a change in culture by initiating nurse/technician hourly rounding on patients throughout the emergency department. To facilitate staff and patient interactions, a script was included within the staff self-reporting tool ([Figure 1]). Updates included current treatment status, planned interventions, pending results, and addressing patient comfort. The third step was to capture patient responses by having the team leaders provide ICE forms to a minimum of 2 patients during the shift. Compliance for each objective was monitored daily via accountability sheets. Results were displayed on the score board and included compliance with hourly rounding per team and overall patient satisfaction for the emergency department. Data were updated on a weekly basis to provide real-time feedback.

The goal of the break phase was to determine if a culture change occurred subsequent to the implementation of the process improvement project. During the break phase, which lasted 6 months, the staff was not required to self-report completion of hourly rounding, and the score board was removed. Leadership continued to monitor patient satisfaction rates, but the unit's patient satisfaction rating was not reported to the staff during team huddles. During the last 2 weeks of the break phase, staff members were issued a 5-question survey designed to elicit perceived barriers to hourly patient rounding.

Intervention II was initiated following a meeting, during which the results of the staff survey were discussed, and the unit's current patient satisfaction rating was revealed. Because patient satisfaction scores declined during the break phase, the process improvement project was reimplemented with the same format used during the intervention I phase of the initial project. Following staff retraining, a new score board was developed, and data were collected for an additional 5 months.

DATA Analysis

Descriptive statistics were used to summarize the data collected. The variables evaluated entailed self-reported staff rounding compliance, overall patient satisfaction, perception of staff attitude, and the patient's response to whether the health care team answered all patient questions/concerns. Questions were answered as yes, no, or not applicable (N/A) except for the question evaluating perception of staff attitude, which was scored using a Likert scale (1 = excellent, 2 = good, 3 = OK, 4 = poor, 5 = awful, and 6 = N/A).

Results

The number of ICE submissions during the baseline phase was 91 out of 35,053 patient encounters (Figure 3. Out of 3,561 accountability sheets distributed to the staff, 3,047 (85%) were returned to the shift team leaders. Of those, 37% were completed correctly, and hourly rounding was conducted 39% of the time. A summary of accountability sheets collected is provided in the [Table].

During the break phase, 269 ICE comments were submitted out of 39,326 patient encounters (12 Staff identified multiple obstacles to accurately completing the accountability sheets. The most commonly reported barriers included increased patient acuity, lack of ancillary support to assist with tasks such as patient transport, performing moderate sedations, and altered nursing assignments for lunch coverage.

Discussion Summary

Patient satisfaction is multifactorial, and may be related to things such as being kept informed of the progress of care, length of stay, and staff attitude. We implemented and monitored patient rounding in an effort to address

patient dissatisfies. Despite there being poor participation and multiple limitations, hourly rounding still improved patient satisfaction metrics.

Limitations

The authors experienced several limitations throughout the process improvement project. Both clinical and managerial staff changed throughout the 4 phases of the project. The change in management may have contributed to decreased oversight during the intervention II phase, during which overall project compliance greatly decreased. Staffing was further affected by the loss of one third of the active duty staff to an unforeseen hospital ship deployment.

During a 16-month time span, the department underwent a massive reconstruction initiative, which encompassed one fifth of the treatment rooms and half of the nurses' station. Staff worked in cramped quarters with limited access to resources such as the nurse call bell system and computer stations for charting. Although alternate routes were developed to traverse through the department, physical layout added to process delays. An additional limitation may have been associated with past process improvement projects not being completed, potentially leading to poor staff buy-in. Although staff continued to receive patient satisfaction training during intervention phases I and II, some perceived the process improvement initiative as "just another task."

Limitations to gathering ICE responses were multifactorial. Although all patient rooms had bins installed to hold paper ICE forms, the bins were not always stocked. Even when patients were provided ICE forms, some left without completing them. Despite having an ICE kiosk in the waiting room, it was frequently out of service, which limited submission options. In addition, posters with a quick response (QR) code were placed in every room, though not every patient had a cellular phone with a QR reader application or knew how to use that function.

Implications for Emergency Nurses

Patient satisfaction is an important aspect of care that is delivered in the ED setting. It is crucial for the nursing staff to take an active role in influencing patient satisfaction, which can be accomplished by providing frequent updates to the patients. Competing priorities can make it challenging for emergency nurses to keep patient satisfaction at the forefront when they become task saturated. Implementing purposeful hourly rounding may make it easier for nurses to complete tasks while also providing updates to patients, which may have a positive impact on the patients' perception of care and increase patient satisfaction ratings. By sharing the current patient satisfaction scores with staff, nursing leadership can reinforce the importance of hourly rounding and its impact on patient satisfaction.

Conclusions

Emergency departments are dynamic in nature, and staff must continuously mitigate unforeseen obstacles. Regardless of the constant state of flux within the emergency department, in today's competitive health care market, managers cannot afford to neglect patient satisfaction scores. Literature indicates a potential benefit associated with the implementation of hourly nurse rounding within the emergency department. Despite project limitations, our process improvement project further supports the implementation and benefits of hourly nurse rounding.

Author Disclosures

Conflicts of interest: none to report.

	Encounters, n	Ice comments, n	Accountability sheets distributed	Accountability sheets returned (%)	Completed correctly, %	Compliance with hourly rounding
Baseline	35,053	91	N/A	N/A	N/A	N/A
Intervention I	31,297	383	3,561	3,047 (85)	37%	39%
Break	39,326	269	N/A	N/A	N/A	N/A
Intervention II	24,510	303	3,096	1,318 (25)	42%	51%

DETAILS

Subject:	Emergency medical care; Quality management; Employee attitude; Intervention; Success; Health care policy; Communication; Professional attitudes; Patients; Patient-centered care; Initiatives; Supervisor-Subordinate interactions; Leadership; Teams; Quality of care; Feedback; Nurses; Patient satisfaction; Accountability; Health care; Perceptions; Nurse managers; Quality of service; Compliance; Attitudes; Emergency services; Quality control; Quality improvement
Business indexing term:	Subject: Leadership Quality control Quality improvement
Identifier / keyword:	Hourly rounding; Patient satisfaction; Performance improvement; Emergency nursing
Publication title:	Journal of Emergency Nursing:; JEN; Philadelphia
Volume:	46
Issue:	4
Pages:	511-517
Publication year:	2020
Publication date:	Jul 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:	https://doi.org/10.1016/j.jen.2019.08.004
ProQuest document ID:	2487205676
Document URL:	https://www.proquest.com/scholarly-journals/incorporating-hourly-rounding-increase-emergency/docview/2487205676/se-2?accountid=211160
Copyright:	Copyright Elsevier Limited Jul 2020
Last updated:	2023-06-12
Database:	Public Health Database

CE Earn Up to 7.5 Contact Hours: JEN

FULL TEXT

TVM:UNDEFINED

DETAILS

Publication title:	Journal of Emergency Nursing:; JEN; Philadelphia
Volume:	46
Issue:	4
First page:	550
Publication year:	2020
Publication date:	Jul 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:	Engli sh
Document type:	Instructional
DOI:	https://doi.org/10.1016/S0099-1767(20)30198-7
ProQuest document ID:	2487205670
Document URL:	https://www.proquest.com/scholarly-journals/ce-earn-up-7-5-contact-hours/docview/2487205670/se-2?accountid=211160
Copyright:	Copyright Elsevier Limited Jul 2020
Last updated:	2021-03-01
Database:	Public Health Database

Weak and Dizzy–Another Explanation to Explore: Poor Nutrition in the Older Adult: JEN

ABSTRACT (ENGLISH)

A lack of these can be linked to dehydration, cardiac irregularity, confusion, increased risk of bone fractures, pressure ulcers, poor healing of skin and bones, decreased muscle mass (sarcopenia), decreased muscle strength (dynapenia) and mobility, falls, frailty, need for hospital admission, and risk of mortality twice that of those with adequate nutrition.1,2,4,5,7 Protein, vitamin D, leucine, omega-3 fatty acids, calcium, and water have been identified as essential parts of a balanced diet required to maintain an active lifestyle in the older adult and stave off frailty.5,7 Investigating and identifying the cause of poor nutritional status might be equated to investigating and diagnosing why the older adult has chest pain, shortness of breath, or any other set of symptom clusters. Patients tended to

avoid eating fruits, vegetables, and meat or simply did not eat, all to avoid the pain of chewing.2 More than 23% of those older than 65 years have not seen a dentist in more than 5 years because Medicare typically has not covered oral health care.10,11 Recent Medicare changes have led to improved dental coverage, which is now often offered through some of the Medicare Advantage plans.2,10,11 The emergency nurse should assess the older adult's mouth to determine if poor oral hygiene should lead them to assisting the patient in obtaining a dental referral, which may lead to correcting their patient's nutritional status. Depression and not feeling sociable or like eating was the third most common reason for poor nutrition found in the Burks et al study.2 Ask the patient about loss of appetite, if they have to eat alone, or if they have suffered the loss of a meal partner to determine if requesting a prescription/order for an evaluation by a psychiatrist, psychologist, or social worker would be appropriate.1,2,5 The patient may require counseling, an antidepressant, or placement in a supportive group environment during meal time to help restore their appetite and encourage eating.1,2,5 Medication was identified as the fourth reason for poor nutrition in the Burks et al study.2,5 Medications have been linked to a bad taste in the mouth for some time.8 Yet, patients often did not realize that it was the medication causing the problem, until specifically asked if food "tasting funny" was the reason they stopped eating. The American Dental Association notes more than 500 medications (including those for high blood pressure, high cholesterol, Parkinson disease, and Alzheimer disease) decrease saliva, which not only makes it hard to swallow but also increases the risk of cavities and broken teeth, making it hard to chew.10,11,13 Chemotherapy drugs often cause an inflammatory response and sores in the mouth, also leading to pain when eating.10 The patient should be advised to consult with their provider and/or dentist if medication-related dry mouth problems are leading to poor nutrition.

FULL TEXT

Your patient complains of feeling dizzy and weak. Would malnutrition be included in your list of differential nursing diagnoses? Recent studies have shown that 12% to 16% of adults older than 65 years suffer from malnutrition, which can cause or contribute to symptoms of weakness, dizziness, and/or syncope.[1,2] Screening for nutritional status in the emergency department has been suggested but is rarely done.[2-4] Asking a few simple questions can help identify a patient at risk of malnutrition. While carrying out prescriptions/orders that treat fluid and electrolyte imbalances, the emergency nurse should also look for obvious causes of poor nutrition, which could lead to obtaining prescriptions/orders for appropriate referrals and providing information about diet and hydration that may prevent malnutrition from recurring and potentially save the patient's life.[1-6]

Aging and Nutrition

Older adults need adequate fluids, nutrients, and protein in their diet. A lack of these can be linked to dehydration, cardiac irregularity, confusion, increased risk of bone fractures, pressure ulcers, poor healing of skin and bones, decreased muscle mass (sarcopenia), decreased muscle strength (dynapenia) and mobility, falls, frailty, need for hospital admission, and risk of mortality twice that of those with adequate nutrition.[1,2,4,5,7] Protein, vitamin D, leucine, omega-3 fatty acids, calcium, and water have been identified as essential parts of a balanced diet required to maintain an active lifestyle in the older adult and stave off frailty.[5,7] Investigating and identifying the cause of poor nutritional status might be equated to investigating and diagnosing why the older adult has chest pain, shortness of breath, or any other set of symptom clusters.

"Anorexia of aging" (decreased appetite and poor nutrition associated with aging) contributes to poor nutritional status.[1,5,8] A decrease in the number of sweet and salty taste buds and sense of smell often leads to the complaint that food "doesn't taste as good," or "eating is not as enjoyable."[5,8] Gastrointestinal motility slows with aging, and the amount of saliva generated decreases, as does the production of digestive hormones (insulin, leptin, and ghrelin). This slowing motility leads to a decreased ease in digesting foods, a sense of fullness in the stomach, and decreased sense of hunger, appetite, and nutritional intake.[1,5,8] Medications used for gastric irritation and reflux (proton pump inhibitors, H2 blockers, etc) also decrease stomach acids (hypochlorhydria) slowing digestion of food.[1,5] Parkinson disease, Alzheimer disease, stroke, and other disease processes that affect the ability to swallow can affect nutrition.[1,5] Chronic medical conditions, such as congestive heart failure, chronic obstructive pulmonary disease, and Parkinson disease, often increase metabolism, resulting in inadequate nutrition for the energy being

expended unless caloric intake is increased.[1,5] A lack of protein (albumin), often owing to poor nutrition, can lead to edema.[6,9] Dehydration is frequently seen in older adults because the sense of thirst decreases with aging.[6] Older adults are also at risk of dehydration because they may restrict the amount of fluid they drink to avoid continence issues, take diuretics, or have been instructed to limit fluid intake.[6] Some are unable to access liquids because of being bedridden or because of mobility issues.[6] The renal system becomes inefficient owing to aging, which alters the ability to concentrate and conserve fluids, which can lead to edema and/or dehydration.[6]

Common Causes of Poor Nutrition in the Older Adult

A recent study by Burks et al investigated reasons why older adults had poor nutrition and identified several causes that could easily be assessed for and addressed by the emergency nurse if malnutrition is included as a differential diagnosis.[2] These factors, discussed in greater detail below, include: 1) oral health, 2) transportation, 3) mood disorders and social interactions, 4) medications, and 5) other factors.

Poorly fitting dentures, bad or missing teeth, and sores in the mouth were the most common causes of poor nutrition in the older adult. Patients tended to avoid eating fruits, vegetables, and meat or simply did not eat, all to avoid the pain of chewing.[2] More than 23% of those older than 65 years have not seen a dentist in more than 5 years because Medicare typically has not covered oral health care.[10,11] Recent Medicare changes have led to improved dental coverage, which is now often offered through some of the Medicare Advantage plans.[2,10,11] The emergency nurse should assess the older adult's mouth to determine if poor oral hygiene should lead them to assisting the patient in obtaining a dental referral, which may lead to correcting their patient's nutritional status.

The second most common reason for poor nutrition was related to a lack of transportation to the store to buy food.[2] Ask the patient how they "get around" to determine if they need information about transportation services or delivery of food to the home. Meals on Wheels, home delivery of groceries, and even mobile grocery stores may be options. Helping the older adult get connected to transportation or food delivery services may require reaching out to the hospital social worker, or county agencies during business hours to learn of these connections.[2] Creating a list of these resources is a proactive step that the nurse can take toward correcting poor nutrition.

Depression and not feeling sociable or like eating was the third most common reason for poor nutrition found in the Burks et al study.[2] Ask the patient about loss of appetite, if they have to eat alone, or if they have suffered the loss of a meal partner to determine if requesting a prescription/order for an evaluation by a psychiatrist, psychologist, or social worker would be appropriate.[1,2,5] The patient may require counseling, an antidepressant, or placement in a supportive group environment during meal time to help restore their appetite and encourage eating.[1,2,5]

Medication was identified as the fourth reason for poor nutrition in the Burks et al study.[2,5] Medications have been linked to a bad taste in the mouth for some time.[8] Yet, patients often did not realize that it was the medication causing the problem, until specifically asked if food "tasting funny" was the reason they stopped eating. Typically, patients describe the taste as metallic (but also bitter or very salty) or say that the food "tastes funny" or "it doesn't taste good."[2,8,12,13] The list of specific drugs affecting taste is too long to include here, but almost every type of medication, including antihistamines, antibiotics, antihypertensives, antiinflammatories, behavioral health, blood-sugar lowering, lipid lowering, and steroids, has a specific drug linked to a "funny taste in the mouth." Even medication patches (nicotine and nitroglycerine) applied to the skin cause altered taste.[5,8,12,13] An extensive list of drugs that cause taste changes is posted on the GP Notebook website as "Drugs Causing Taste Disturbance" (https://gpnotebook.com/simplepage.cfm?ID=228196417).[12] Rather than attempting to remember all the offending drugs, the emergency nurse may wish to consider the following clinical approach to maximize efficiency. Ask the patient with a new onset of a loss of appetite if they recently started any new medications or refilled a prescription. With that information, the emergency nurse can go to their medication reference resource and check out the drug and the manufacturer/brand to determine if "a change in taste" has been reported.[8,12,13] Specific ingredients in some drugs lead to the funny taste, and with substitution of same-name drugs, ingredients may change between prescription/order refills. Competing brands of the same drug may have different ingredients, potentially eliminating the component that caused the taste change.[8,12,13] Switching to a new mediation, different brand, or a similar medication in the same class may eliminate this issue.[8,12,13] If the emergency nurse is able to potentially link the

patient's medication to a bad taste in the mouth, they may want to suggest to the patient that they will report these symptoms to the care provider who wrote that prescription/order and ask if changing medications is an option.[2,5,8,12,13] In addition to altering the taste of food, medications can also lead to dry mouth. The American Dental Association notes more than 500 medications (including those for high blood pressure, high cholesterol, Parkinson disease, and Alzheimer disease) decrease saliva, which not only makes it hard to swallow but also increases the risk of cavities and broken teeth, making it hard to chew.[10,11,13] Chemotherapy drugs often cause an inflammatory response and sores in the mouth, also leading to pain when eating.[10] The patient should be advised to consult with their provider and/or dentist if medication-related dry mouth problems are leading to poor nutrition.

The Burks et al study also identified other reasons for poor nutrition. These included lack of funds to purchase sufficient quantities of healthy foods such as protein, fruits, and vegetables.[2] Food insecurity (eating less to save food/hoarding) owing to fear that there will not be enough to eat later was also identified as a risk factor.[2] The surveyors had anticipated that the inability to move about in the kitchen to prepare food would be a concern but found that this was not identified as an issue as often as expected.[2] However, the authors of the study found that those living alone often snacked (ate cereal, chips, cookies, etc) in front of the television, rather than eating a nutritious meal (meat, vegetables, fruits) at the table, as sitting at a table to eat was considered a social interaction requiring more than 1 person.[2] An interesting finding in the Burks et al study and others was that many older adults, when placed on a specialized diet for their condition or provided with a limited selection of foods, preferred to not eat at all, rather than eat something they did not like or that appeared unappetizing.[1,2,5,6] This was especially seen in institutions where 50% to 70% of older adults left up to 25% of the food on their plate yet were malnourished.[1,2,5] By broadening the older adult's food choices and allowing them to include items not typically allowed on a medically ordered diet, they at least ate something of nutritive value, rather than nothing at all! [1,2,6]

Increasing Protein in the Older Adult's Diet

When an older adult is in the emergency department during mealtime, it is important to offer them a meal, unless there is a medical contraindication.[6] The current recommended daily amount of protein for an older adult is 1.0 g/kg to 1.2 g/kg (approximately 70 g–100 g) of protein per day for an older adult, or 30 g per meal, unless there is a medical contraindication. This amount, higher than the recommended amount for younger patients, is needed because of muscle breakdown, which occurs as part of aging (sarcopenia).[1,5-7] In addition, older adults also need an increased amount of foods containing leucine, omega-3 fatty acids, and vitamin D to repair muscle that is lost as part of the aging process.[1,5,7] Meats, eggs, tofu, soy, quinoa, whey, and dairy products are sources of these nutrients.[5-7] Adding dry powdered milk to drinks, puddings, or mashed potatoes, instant breakfast drinks to milk, or eggs to a meal are ways to increase protein intake.[1,5-7] ED staff may not know how many grams of protein are in each of the hospital's menu selections but including eggs, a protein drink, milk-containing items, or soft or ground meat will help to boost the amount of protein being offered.[5,7] Several sources recommended that older adults be offered smaller and more frequent meals spread throughout the day.[1,2,5,6] Ask the patient about food preferences. Be sure they can chew what is provided or prescribe/order foods high in protein that are soft (browned hamburger, scrambled eggs, puddings, and frozen yogurt were favorites of this author's (J.S.) patients). ED staff can proactively consult with the hospital dietitian if they are unsure of the type of diet to prescribe/order and may want to have contingency plans that will allow them to access nutritious and appealing foods when the kitchen is closed. The dietitian at this author's hospital stored frozen dinners in the dietary department specifically for the older adult ED patients.

When providing discharge instructions to the older adult about eating at home, discuss ways to add more protein into their diet. Suggest dividing the protein across the day, rather than at 1 meal, and eating smaller, more frequent meals, which allows the digestive system to work more efficiently (Box 1).[5,7] Mention the benefits of adding protein drinks, but also caution that relying only on these drinks could lead to diarrhea and ingestion of excess sugar and vitamin supplements.[1,5,6] Remind the patient it is important to read the labels, looking for added sugars, minerals, and vitamins that may not be needed.[1,5-7] Also remind the older adult to drink plenty of water, unless on fluid restriction. Suggest adding herbs or other spices (rather than salt and sugar) to foods to increase the flavor of food.[15] Work with your hospital dietitian to find information about diets and nutrition that can be shared with your patient.

Ask if the patient will accept referrals for nutritional counseling or come talk with the patient.

Look for Medical Conditions

Be on the lookout for medical conditions that can contribute to poor nutrition. These can include stomach and intestinal issues that cause pain, bloating, constipation, diarrhea, or nausea; chest pain that accompanies eating (owing to the diversion of blood flow from the heart to the intestinal tract); or shortness of breath that hinders the ability to eat.[2,5,14] If these conditions cause problems eating, recommend that the patient talk with their provider or obtain a prescription/order for a nutritional consult to work on ways to deal with this cause of poor nutrition.

Laxatives have been linked to malnutrition in the older adult.[1,15] Although anorexia nervosa and bulimia nervosa are more typically associated with younger patients, older adults may also self-prescribe laxatives to treat a distorted perception of body weight.[15] They may have concerns about bowel regularity.[1] If there is suspicion that the patient has an eating disorder leading to malnutrition, it would be appropriate to ask additional questions related to the frequency of laxative use and to obtain a referral to a specialist who focuses on this type of disorder.[15] If the patient is routinely taking or given laxatives to prevent constipation (especially if institutionalized), it is important to recognize that this patient may be malnourished, owing to malabsorption of essential nutrients, minerals, and fluids caused by diarrhea, and be symptomatic.[1,15] Asking about stool quality and frequency could provide useful data to determine if the patient is at risk.

Malnutrition Screening Tools

At the beginning of this article, we noted that the emergency nurse could easily screen for poor nutrition. There are a variety of nutritional screens available to identify the patient at risk of poor nutrition.[16]

The malnutrition screening tool (MST) is a frequently used nutrition screen for general population and outpatient purposes.[4,16] It consists of 3 questions: Have you had any unintended weight loss? How much weight was lost? Has there been a change in appetite?[4] If the patient reports loss of appetite and/or weight loss of more than 13 lb without trying, this places the patient at risk of malnutrition, and a referral to a dietitian is recommended.[16]

An Australian emergency department recently embedded the MST into their routine ED admission questions.[4] The goal was to evaluate the effectiveness of nutritional screening and counseling by a dietitian in the emergency department. Nursing staff asked the 3 MST questions and obtained a fall history for the previous 6 months. Twelve percent of the eligible patients presenting to the emergency department screened positive for risk of malnutrition and almost half as the result of a fall. Patients who received dietary counseling from the dietitian showed improved quality of life, less depression, shorter hospital stays, and fewer returns to the emergency department than those who did not.[4] As a result, the emergency department formally incorporated the MST into the ED screening questions and continues to refer “at risk patients” to a dietitian.[4]

Conclusion

Should emergency nurses gather information about the older patient’s nutritional status? Asking an older adult with weakness or dizziness or who has fallen about weight loss or lack of appetite might seem odd. But if that information is linked to malnutrition risk and the nurse looks for the common reasons for malnutrition (poor oral health care, food tasting funny because of medication, depression, or lack of transportation to the grocery store), it aligns with the type of information gathering conducted in the emergency department all the time.[1,2,4,16] Because approximately 21% of older adults discharged home from the emergency department are malnourished, it is important to be aware of these common causes of poor nutrition and “fixes” that can be initiated by an emergency nurse ([Box 2]).[2] Sometimes it will take requesting a prescription/order for a referral. It may require proactively building a network of resources—especially in facilities that do not have easy access to social workers, registered dietitians, case workers who know resources in the area, and dentists. But, similar to patients who need a referral to cardiology, gastroenterology, or orthopedics, these patients need referrals to those who can deal with their ability to eat and nutritional status.[1,2,4,5] The benefits of identifying and correcting the underlying cause of poor nutrition can lead to a more active, healthy older adult.[1,2,4,5] Thirty-day readmission rates and falls are lower when nutrition is properly addressed, and addressing nutritional status may save the patient’s life.[1,2,4,5] Taking a few moments to identify and correct treatable causes, teach about healthy eating, link the patient with the appropriate social or community

service, and/or get a referral to an appropriate support professional (nutritionist or dietitian, behavioral health therapist, or a dentist) are actions emergency nurses can and should take.

Author Disclosures

Conflicts of interest: none to report.

Acknowledgments

Thanks to Carol Friesen PhD, RDN, LD, a registered dietitian and Professor of Nutrition at Ball State University, for her assistance locating nutritional references and input on current dietary recommendations for older adults. I also want to thank Nancy Stephens Donatelli, MS, RN, CEN (r), NE-BC FAEN, coeditor of the geriatric section since its inception. Before Nancy's retiring in the fall of 2019, she suggested we address this topic. While researching the evidence for this topic, it became obvious she made a good suggestion. Thank you, Nancy, for all the nuggets of learning you have shared with us over the years.

DETAILS

Subject:	Group dynamics; Oral hygiene; Food; Fatty acids; Calcium; Nutrition research; Taste; Hygiene; Mobility; Older people; Prescription drugs; Cholesterol; Malnutrition; Chemotherapy; Chewing; Medicare; Proteins; Fractures; Patients; Hypertension; Blood pressure; Drugs; Dehydration; Bones; Dentists; Parkinsons disease; Aging; Diet; Caries; Edema; Pain; Appetite; Appetite loss; Transportation services; Vegetables; Counseling; Mouth; Confusion; Chest pain; Nutritional status; Motility; Adults; Alzheimers disease; Emergency medical care; Eating behavior; Pressure ulcers
Business indexing term:	Subject: Medicare Transportation services
Publication title:	Journal of Emergency Nursing:; JEN; Philadelphia
Volume:	46
Issue:	4
Pages:	541-545
Publication year:	2020
Publication date:	Jul 2020
Section:	Geriatric 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:	https://doi.org/10.1016/j.jen.2020.02.016
ProQuest document ID:	2487205659
Document URL:	https://www.proquest.com/scholarly-journals/weak-dizzy-another-explanation-explore-poor/docview/2487205659/se-2?accountid=211160
Copyright:	©2020. Emergency Nurses Association
Last updated:	2023-08-31
Database:	Public Health Database

Relationship of the Built Environment on Nursing Communication Patterns in the Emergency Department: A Task Performance and Analysis Time Study: JEN

ABSTRACT (ENGLISH)

Introduction

The physical layout of the emergency department affects the way in which patients and providers move within the space and can cause substantial changes in workflow and, therefore, affect communication patterns between providers. There is no 1 ED design that enables the best patient care, and quantitative studies looking at ED design are limited. The goal of this study was to examine how different ED designs, centralized and decentralized, are associated with communication patterns among health care professionals.

Methods

A task performance, direct observation time study was used. By developing a novel tablet-based digital mapping tool using a cloud-based mapping platform (ArcGIS), data on provider actions and interactions were collected and mapped to a precise location within the emergency department throughout an entire nursing shift.

Results

The difference in the duration of nurse-physician interactions between the 2 ED designs was statistically significant. Within the centralized design, nurse-physician interactions totaled 14 minutes and 38 seconds compared with 30 minutes and 11 seconds in the decentralized design ($t = 2.31$, $P = 0.02$). More conversations between nurses

and physicians occurred inside the patient's room in the decentralized design.

Discussion

Our findings suggest that the ED design affects communication patterns among health care providers and that the design has the potential to affect the quality of patient care.

FULL TEXT

Contribution to Emergency Nursing Practice

••The current literature on ED design indicates that smaller, geographic nursing pods allow nurses and physicians to provide better patient care than traditional, centralized nursing stations.

••This article contributes by demonstrating that smaller, geographic nursing pods lead to increased communication between emergency nurses and physicians, whereas centralized nursing stations allow for more communication between emergency nurse colleagues.

••Key implications for emergency nursing practice found in this article are that ED design does not affect the amount of time nurses spend interacting with patients but that communication between nurses and physicians is increased when nursing stations are placed near patient rooms.

Introduction

The emergency department represents a vital component of the health care system, because it not only provides patients with access to immediate care when needed but also represents the primary portal of entry to hospitals for many patients.[1] With more than 130 million visitors a year,[2] emergency departments across the United States can be hectic environments with countless moving parts that must come together to provide patients with outstanding care. The physical layout of the emergency department affects the way in which patients and providers move within the space and can cause substantial changes in workflow and efficiency depending on the specific design. However, there is no 1 ED design that has been proven to facilitate delivery of the best care by providers. A previous metasynthesis discussed a large variety of layouts found across the United States but emphasized that many ED providers continued to have trouble providing the most efficient care within older, more traditional designs.[3] Our study further explored 2 of the layouts described in the metasynthesis: the geographic zone plan and the cubicle/pod plan.

In such a busy environment, teamwork and communication between health care providers and between providers and their patients are crucial. Miscommunication between health care providers is one of the most frequently cited factors leading to medical error.[4] However, studies that look directly at the frequency, duration, and specific location of communication between health care providers are limited.

Studying the movement and interactions of nurses can provide important insight into ED communication. Nurses are at the core of patient care in the emergency department as they spend a large percentage of their time interacting with and caring for patients,[5] but scientific literature focuses primarily on patient throughput and physician perspective with little empirical research into intradepartmental nurse movement and communication.

There is a growing body of evidence that links the physical environment of hospitals to quality of communication, patient safety, and clinical outcomes.[1] Recent trends in ED design have favored smaller functional units that allow for autonomous emergency nurse–physician teams to care for patients in parallel over the traditional design featuring a single centralized workstation.[6] Placement of these teams into geographic zones has been a widely adopted approach to ED design to improve communication and care delivery. However, there are little empirical data to support these claims.

A recent study showed that the redesign of the physical layout of the emergency department affected perceptions of teamwork and communication between nurses and providers.[6] However, the methodology of this study, and others like it, was qualitative in nature and based on questionnaires. Although questionnaires and interviews can provide important insight into design problems in health care spaces, they often lack empirical evidence. At present, the construction and design of multimillion-dollar emergency departments are largely based on expert opinion or anecdotal evidence. However, ED operations should be approached empirically, and the design should be based on solid scientific data.

Studies taking a more quantitative approach are far more limited and have relied heavily on paper-based tools with a simple stopwatch or have required health care providers to self-report during their shift.[7,8] Some recent advancements in tracking communication patterns using radiofrequency identification technology have been made; however, the design and architecture of the emergency department can affect data quality because of interference with radio signals.[9] Therefore, we used a novel tablet-based digital mapping tool that we had previously developed, refined, and tested[10] to characterize nursing communication patterns in the emergency department and understand how the physical layout of the emergency department affects communication patterns between nurses, physicians, and patients.

Designing a hospital's emergency department is a daunting task. With existing data so limited, there is a paucity of evidence-based ED designs. Our study aimed to address this gap in the body of evidence by characterizing the relationships of the physical environment on nurse interactions and actions through the course of an entire shift, using a novel study instrument. The study compared communication patterns in both a centralized and a decentralized nurse station design, to provide concrete data for the design of future emergency departments. We hypothesized that the time emergency nurses spent communicating with physicians, patients, and other nurses and performing tasks would be the same in a decentralized pod layout and a layout centered around 1 nursing station.

Methods

The study design was a directly observed task performance time study and analysis. All methods for this cross-sectional study were approved by the hospital's institutional review board (Thomas Jefferson University, Protocol 17D.013).

Setting

This study was conducted in the emergency department of a major teaching hospital in the US from July 2017 to August 2017. The department has 54 beds and is split into 2 sides, allowing for 2 naturally occurring separate study environments. One side (A side) houses a centralized nursing station, whereas the other (B side) is broken into 5 separate nursing stations with a centralized physician workspace (Figure 1). The B side was an addition to the department, which led to the division of the physical space. There are 17 rooms on the A side and 21 rooms on the B side. The remaining 16 rooms are located in the triage, fast track, and trauma bays. Both the A and B sides are staffed in the same way, with 1 attending physician, 3-4 residents, and 5 nurses. No nurse practitioner or physician assistant providers work on the A side or B side. The patients on both sides are of a diverse age group and have diverse chief complaints; however, the acuity of their illnesses is similar.

All 16 nurses included in the study worked 12-hour shifts, from 7:00 AM to 7:00 PM, and were involved in direct patient care. They consented verbally at the beginning of their shift to take part in the study. The hospital's emergency department maintains a nurse-to-patient ratio of 1:3 or 1:4, depending on the patient load at any given time. All patients are housed in private rooms, unless the department is saturated, in which case the patients are housed on "hallway" beds. Hallway beds were used in all 16 observed shifts, and an extra 7 beds were added to the A side and 4 beds to the B side.

Procedures

A feasibility study was initially undertaken with 4 nurses, 2 from the A side and 2 from the B side. The results from this initial test were used to refine our methods and data collection techniques.

After the feasibility study was completed, 16 different nurses were selected by simple randomization of patient room assignments and followed for the duration of their 12-hour shift. Sample size was determined by resource constraints. Only the nurse's name was collected and recorded in a secure database. The nurses were then assigned a number that corresponded to a map that the researcher used to track their movements during the shift. The nurses consented verbally before the start of their shift and were reassured that data obtained had no impact on their job performance review. No nurses declined to participate in the study, and they were informed that if they declined participation another nurse would be randomly selected for the study, and there would be no impact on their job or compensation. Sixteen nurses were observed over 12-hour shifts, for a total of 192 hours of observation in the actual study.

Study Instrument

The study instrument and technology were previously described by Grzywinski et al.[10] The survey structure and background maps of the emergency department were generated in ArcGIS (ESRI, Redlands, CA) for each nurse who was observed. The maps were uploaded to ArcOnline, where all data results for all survey instances were stored and processed. A mobile application, Collector for ArcGIS, was accessed on a tablet (iPad, Apple Inc, Cupertino, CA) to execute each instance of the survey, allowing surveyors to record nurses' movement and activities throughout the emergency department. Vectors of the nurses' walking path were drawn, and points were recorded to indicate nursing activity or interaction. Each point was time-stamped and geolocated. In addition, the researcher selected the activity that the nurse was engaged in and up to 2 people with whom the emergency nurse participant was interacting.

Data Collection

The data collection process was the same for the A and B sides of the emergency department. Data were collected via the Collector for ArcGIS.

Collector For ArcGIS

Researchers followed nurses for their entire 12-hour shift and recorded their activities on a map of the emergency department through Collector for ArcGIS. They mapped vectors to record the nurses' path through the emergency department and dropped points to record the nurses' communications and actions. The choices for interactions and actions were selected from a drop-down menu (Table 1), and the time stamp was recorded when the researcher pressed submit.

Researcher Training

All 9 data collectors were medical students or undergraduate students. They completed at least 10 hours of field observation training and 2 hours of training in the use of the mapping software. Inter-rater reliability was supported by multiple meetings with all researchers during the feasibility phase of the study to ask and answer questions regarding how to document different scenarios while observing the nurses. Researchers were assigned to a mix of A side and B side shifts.

Statistical Analysis

Statistical analysis was completed using Excel version 15.20. Descriptive statistics and 95% confidence intervals were calculated for the amount of time spent on various activities and interactions and for the percentage of a shift that that task consumed. *t* tests were used to test the hypothesis that the time spent doing various activities and interacting with various actors on the A side of the emergency department and the B side of the emergency

department was the same, with results being statistically significant at $P \leq 0.05$. A post hoc power analysis was also done to evaluate the power of the study with 16 total nurses observed.

Results Time Breakdown

Time stamps for each interaction and activity were used to calculate the total amount of time spent interacting with different staff members and performing tasks. Totals were averaged between nurses on the 2 sides of the emergency department. Total interaction times are compared between the 2 sides in Table 2. The nurses on the B side spent significantly more time interacting with physicians than the nurses on the A side ($t = -2.85$, $P = 0.02$). In addition, the nurses on the A side spent more time interacting with other nurses than the nurses on the B side ($t = 1.91$, $P = 0.08$). Nurses on both sides of the emergency department spent relatively similar amounts of time interacting with their patients ($t = -0.43$, $P = 0.68$).

The amount of time spent performing tasks is also displayed in Table 2. There was no significant difference in the amount of time spent charting ($t = -1.12$, $P = 0.28$) or doing procedures ($t = -0.01$, $P = 1.00$) between the 2 sides of the emergency department. However, there was a significant difference in the amount of time spent giving patients discharge instructions between the 2 sides. Nurses on the B side spent less time discharging their patients than the nurses on the A side ($t = 2.24$, $P = 0.04$). There were no other significant differences in time spent doing tasks (personal, waiting, other, or moving) between the 2 sides.

Heat Maps

Each point recorded over the course of the 12-hour shift was mapped onto a heat map. Different maps were created from the results and filtered to show only nurse-physician, nurse-patient, and nurse-nurse interactions. The maps for all 16 nurses were then combined to show where specific interactions took place on both sides of the emergency department. Figure 2 shows the density of interactions between nurses and physicians on both the A and B sides of the emergency department. On the A side, these interactions appear to have taken place mainly near the centralized nursing and physician stations. In contrast, nurse-physician interactions on the B side occurred near the main physician workstation and outside patients' rooms near the pod's nursing desk. Figure 3 shows the density of interactions between nurses and patients across the emergency department. Not surprisingly, most of the nurse-patient interactions took place in patient rooms on both the A and B sides of the emergency department. Figure 4 shows the density of interactions between nurses and their peers on both the A and B sides. On the A side, there was a clear pattern of communication occurring at the centralized nursing station with minimal interaction occurring elsewhere. However, on the B side, there was no clear pattern of communication between nurses. It appears that most communication occurred at the decentralized nursing pods and also in the hallways between the patient rooms.

Discussion

In this study, we tested the relationship of 2 different ED designs, a centralized nursing workstation and a decentralized nursing workstation, on communication patterns between health care providers, specifically nurse-physician and nurse-nurse interactions. The results of our study support the results of previous studies that the physical layout of the emergency department affects the duration and location of conversations between health care providers.

Centralized designs are defined by nursing workstations that are placed together in 1 location with the patient rooms surrounding. Decentralized designs are defined by a nursing station located more directly outside the patient's room. We found that the decentralized design resulted in nurses and physicians communicating face-to-face for a longer duration of time and, therefore, for a greater proportion of their shift (6% of their total interaction time as compared with only 3% of their time when working within the centralized design). This result might reflect increased points of

contact between nurses and physicians as physicians enter and exit patient rooms. It is important to note, however, that the duration of communication between nurses and patients was not affected by the design.

Interdisciplinary teams have been defined as teams comprising people with distinct disciplinary training working together for a common purpose because they make different complementary contributions to patient-focused care.[11] Within the past few years, these teams have been rigorously studied within the health care field, and the benefit of different professionals working together toward a common goal of caring for the patient has been established. This collaboration between various health care providers has led to fewer errors and shorter delays, leading to enhanced effectiveness and increased patient safety.[12-14] In addition to the importance of these teams, multiple studies have highlighted the benefits of increased face-to-face communication in medicine for improving patient care.[15] Incorporating this finding directly into ED design would benefit patient care.

Nurses working within the centralized design spent more time communicating with other nurses, which makes sense because their workstations were located adjacent to each other.

A second finding in our study was that on both sides, most conversations between nurses and physicians occurred at or near the physician workspace; however on the decentralized side, more conversations between nurses and physicians occurred directly in the patient's room than on the centralized side. This is important for patient-centered care, a concept that has been shown to improve patient outcomes in previous studies.[11] Having these interactions directly in the patient's room brings together 3 key people involved in the decision-making process regarding health management—the physician, the nurse, and the patient. With the growing importance of having a patient with a vested interest in their health care, it is crucial to design an emergency department that facilitates directly including patients in decisions being made regarding their health management. Having conversations regarding the patients' health care in cooperation with the patients themselves give the patients the opportunity to ask direct questions of their health care team and to have their desires incorporated into the management plan. A previous systematic review looking at engaging patients in health care decisions in the emergency department, an environment that had previously been seen as less conducive to shared decision-making, found that patients might benefit from a shared decision-making process, even within the hectic setting of the emergency department.[12] Our study results indicated that physical design may help facilitate this process.

The difference in the time spent going over the discharge paperwork (discharge instructions) was statistically significant between the sides. On the centralized side, an average of 5 minutes and 3 seconds were spent going over the discharge paperwork versus only 1 minute and 55 seconds on the decentralized side. However, we do not believe that this finding was affected by design but rather by nursing style and preference. In addition, our data collection did not include the number of discharges on both sides of the emergency department, which could account for this result if there were differences in the number of discharges between the sides.

Limitations

Because of the small sample size of nurses in the current study, we must be careful in generalizing the results. The only result in our study that was appropriately powered was the difference in time that nurses spent interacting with physicians on both sides of the emergency department. To appropriately power the results pertaining to interactions between physicians, patients, and other nurses, the sample size would need to be approximately 344 for each group. A feasible suggestion to replicate this study would be to include 20 nurses in each cohort, which would give the results of interactions between nurse and physician, nurse and other nurses, and giving discharge instructions a power greater than 80%.

There is the potential that multiple factors other than ED design contributed to the difference in nursing behavior. It is possible there might have been variations in acuity of patient assignment or the availability of other staff such as

technicians that was asymmetric and could have led to differences in nurse availability or communication. The experiences of the nurses in the 2 sides were not controlled, which also might have influenced the activities. Finally, the waiting room, intake area, and ambulance entrance were geographically located adjacent to the A side (centralized side), which might have affected some of the variables collected by increasing the number of distractors. Despite this, emergency nurses working in the centralized design still had a higher level of team communication.

In addition, although our data collection tool allowed for a vast amount of information to be collected, the tool required a significant amount of manpower. Collectors needed to be trained so that each person collected data in the same manner. Although our researchers underwent more than 10 hours of training on collection, there could still be a large difference in inter-rater reliability that was not empirically tested. In addition, each nurse needed to have an assigned collector track them throughout an entire 12-hour shift and record each of their actions and interactions meticulously for the entire time. As the nurses consented verbally before the shift and knew that they were being observed, the Hawthorne effect might have altered their behavior.

Finally, nurses were only observed during the day shift, from 7:00 AM to 7:00 PM. Therefore, the results of our study cannot be universally applied to a 24-hour emergency department without further research into communication patterns during the overnight shift.

Implications for Emergency Nurses

Our results indicated that nursing stations located directly outside patient rooms increased nurse-physician interactions. This increased interaction might lead to better communication and less medical error.[14,15] In addition, nursing pods led to more interaction occurring between physicians and nurses in the patient's room, which could lead to increased shared decision-making between all 3 parties. Shared decision-making is shown to better engage patients in their health care.[12] However, in the end, the nursing station design did not significantly affect how much total time was spent interacting with patients, potentially highlighting that challenges or barriers to nursing care in the physical environment layout can be overcome to accomplish the goal of caring for patients.

Conclusions

Our findings suggest that the ED design affects communication patterns among health care professionals. Although we did not show that 1 design was necessarily better than the other, we were able to highlight various aspects of each that are important to patient care. When nurses work in decentralized pods, they spend more time interacting with physicians, and communication occurs closer to patients. Our findings add to the limited quantitative data that exists on ED design and can be used to aid in future hospital designs.

Author Disclosures

Conflicts of interest: none to report.

Interaction/Action	Description
Interacting with patient	Anytime the nurse was in a patient's room or interacting with a patient in another location
Interacting with other nurse(s)	Interacting with another registered nurse(s) (RN)

Interacting with physician	Interacting with medical student, resident physician, attending physician, physician's assistant, or nurse practitioner
Interacting with other	Interacting with radiology technician, ED technician, pharmacist, family or friend of patient, etc
Phone call	Phone call with pharmacy, inpatient service, technicians, etc
Action	
Charting	
Procedure	Inserting or removing IV, drawing blood, administering medications, ECG, placing urinary catheter, checking vitals, assisting in other procedure
Giving discharge instructions	Handing discharge paperwork to the patient and providing them with referrals, follow-up instructions, return precautions, etc.
Moving through emergency department	Any amount of time spent walking within the hospital
Personal	Eating lunch, on personal cell phone, checking e-mail, etc
Waiting	Waiting to speak to physician or other member of ED staff
Other	Sending labs, getting medications or supplies, washing hands, cleaning, restocking, moving a patient, giving patient an item necessary for activities of daily living, etc

	A side		B side				
Interaction	Mean	SD	Mean	SD	t	P	Post hoc power analysis, %
Interacting with physician	0:14:28	0:03:08	0:30:11	0:15:17	–2.85	0.02*	82.1
Interacting with patient	4:05:21	1:12:22	4:17:13	0:29:35	–0.43	0.68	6.3
Interacting with nurse(s)	2:20:01	0:56:43	1:37:35	0:26:43	1.91	0.08	48.0
Interacting with other	0:51:26	0:23:34	0:58:33	1:11:06	–0.27	0.79	4.6
Phone call	0:22:39	0:10:52	0:37:03	0:22:31	–1.63	0.13	37.2

Charting	3:22:49	0:44:03	3:48:43	0:48:34	–1.12	0.28	20.0
Procedure	1:56:37	0:47:03	1:56:43	0:16:12	–0.01	1.00	2.5
Discharge instructions	0:05:03	0:03:15	0:01:55	0:02:15	2.24	0.04*	60.3
Personal	1:36:53	1:03:32	1:20:41	0:49:56	0.57	0.58	8.2
Waiting	0:07:11	0:04:55	0:07:56	0:10:10	–0.19	0.85	3.8
Other	1:15:53	0:32:09	1:47:08	0:27:35	–2.09	0.06	55.0
Moving	1:36:40	0:26:19	1:20:34	0:13:20	1.54	0.15	33.8

DETAILS

Subject:	Emergency medical care; Communication; Patients; Decentralization; Physicians; Questionnaires; Interpersonal communication; Task performance; Mapping; Nursing; Nurses; Layout; Time study; Nursing care; Centralization; Built environment; Health education; Data collection; Medical personnel; Departments; Health information; Emergency services; Feasibility studies
Business indexing term:	Subject: Feasibility studies
Location:	United States--US
Identifier / keyword:	Time and motion; Facility design and construction; Communication; Emergency nursing; Task performance and analysis
Publication title:	Journal of Emergency Nursing:; JEN; Philadelphia
Volume:	46
Issue:	4
Pages:	440-448
Publication year:	2020
Publication date:	Jul 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.2020.04.005
ProQuest document ID:	2487205635
Document URL:	https://www.proquest.com/scholarly-journals/relationship-built-environment-on-nursing/docview/2487205635/se-2?accountid=211160
Copyright:	©2020. Emergency Nurses Association
Last updated:	2023-08-30
Database:	Public Health Database

A Disaster That Could Happen Anywhere—The Palm Bay Massacre: JEN

ProQuest document link

ABSTRACT (ENGLISH)

[...]medical units responded on the request of earlier arriving units, and there were delays in the provision of mutual aid by other agencies who first had to obtain authorization. [...]all patients (with the exception of three who were pronounced dead at the scene and a patient suffering chest pain) were taken to a single hospital, Holmee Regional Medical Center (HRMC), a 528-bed hospital located approximately three miles north of the incident. [...]four surgeons (vascular, thoracic, orthopedic, and neurosurgical) were present almost immediately. The number of EMS radio systems has been increased from one to three; the first of equipment trailers specifically designed for a mass casualty incident has been purchased; a mobile communications vehicle is forthcoming; a countywide alerting system has been selected,

FULL TEXT

•This article was originally published in *JEN* in the July/August issue of 1990;16(4):42A-48A.

On April 23, 1987, at approximately 6:20 PM in Palm Bay, Florida, a man began shooting in his neighborhood, then drove to two nearby shopping centers and opened fire again. Thirty minutes later six persons, including two police offers, were dead, and 14 persons, including a paramedic, had been shot or injured. Approximately 7 hours later, the gunman was apprehended without further injuries or loss of life.

The weapon used on all but the initial gunshot victim was a Ruger mini-14 semiautomatic carbine, with 0.223 caliber centerfire cartridge bullets. This combination delivers a bullet at speeds approaching 3000 feet/second with a range of 100 m. These high velocity bullets are likely to tumble when they enter the body, tend to drag more external contaminants, and fracture, creating multiple fragments. Resulting pressure waves injure distant organs and may create a cavity many times the actual size of the bullet. Injuries can range from a single, minor puncture wound to multiple, life-threatening wounds of the chest, abdomen, or head—all of which were seen in the victims ([Table 1]).

It was an incredibly rapid series of events. The extensive danger zone included the parking lots of two mini-malls facing each other across a busy highway, a grocery store where the gunman had taken hostages, and a field in back of the grocery store where the majority of victims were shot as they tried to escape.

Reaching the victims without endangering the lives of rescue personnel became nearly impossible ([Figure 1]). Many acts of heroism accounted for the retrieval of victims, such as the civilian who, under fire, loaded several victims in the back of his pickup truck and sped them away to a waiting ambulance. The actual number of wounded was difficult to ascertain because people were “playing possum” between cars in the parking lots. Initial estimates ran as high as 150 to 200 victims.

At the time of the incident, a committee was developing a mass casualty incident plan (MCIP), but there was no widespread acceptance by all county, municipal, and private organizations of a standard set of written MCIP procedures. There was no mechanism for automatic activation of resources such as ambulances, rescue units, fire engines, and helicopters. As a result medical units responded on the request of earlier arriving units, and there were delays in the provision of mutual aid by other agencies who first had to obtain authorization. Multiple command posts in differing locations resulted in uncoordinated deployment of units.

The task of coordinating law enforcement and rescue operations overwhelmed the existing communication resources, which consisted of only two common radio frequencies to handle both the incident and all other operations. Radio overlap from nearby counties made communication difficult, if not impossible. The ambulance service could not communicate directly with area fire rescue units and paramedics possessed no hand-held radio capability that would have allowed them to transmit while rendering patient care.

On-scene rescue supervisors were unable to maintain direct radio communication with hospital emergency departments. In addition, telephone gridlock seized the entire area, making landline communications impossible. Hospitals were forced to rely on civilian call-ins and media reports for information about the incident.

Rescue workers faced the task of getting the victims out of the danger zone quickly and had no time for triage assessment in the field. In the absence of clear-cut directives, they transported victims to the closest facility, rendering treatment en route. As a result *all* patients (with the exception of three who were pronounced dead at the scene and a patient suffering chest pain) were taken to a single hospital, Holmee Regional Medical Center (HRMC), a 528-bed hospital located approximately three miles north of the incident. HRMC was a level II emergency department according to standards of the Joint Commission on Accreditation of Healthcare Organizations.

The emergency department at HRMC had 23 beds; one was designated as a trauma room. Initially there were six registered nurses and two emergency physicians on duty that day. Ms. Debbie Scholem, RN, BSN, CEN, who was

at that time administrative director of the emergency department, recalls the following sequence of major events:6:20 PM: Shootings started.6:23 PM: Dispatch notified by 911 call-in.6:30 PM: Hospital notified of “shooting” by dispatch.6:32 PM: Unidentified caller reports two police offers down and undetermined number of additional victims. Hospital begins to call in emergency nurses who live closest to hospital.6:33 PM: A “real gun battle” overheard on ambulance radio. Begin to call in all ED staff and to clear emergency department of noncritical patients. Hospital disaster plan level I activated.6:43 PM: Paramedic request overheard on radio that MCIP be upgraded to level II because of ongoing gunfire suggesting as many as 25 to 50 victims.6:50 PM: First victim arrived.7:20 PM: Hospital disaster plan upgraded to level II based on anticipated numbers of patients, according to media reports. Landline communications gridlocked.7:30 PM: Thirteenth patient received.8:15 PM: All patients received so far from incident have been treated/released, admitted to surgery or the floor, or taken to morgue. Emergency department prepares for further arrivals.

Approximately 20 minutes after notification, the emergency department received the first patient. Within 40 minutes the department received a total of 13 patients, all with gunshot or gunshot-related wounds. Incredibly, in less than 1½ hours, all had been discharged from the emergency department: six went to surgery, two were admitted, two were sent to the morgue, and three were treated and released. The emergency department received a total of 17 patients before the event was over.

Many factors contributed to the rapid and successful hospital management of the victims.

At that time of day, staff physicians were closing up nearby offices, coming over to the hospital to eat dinner or make rounds; several were practicing only two blocks away for a hospital variety show. Consequently, four surgeons (vascular, thoracic, orthopedic, and neurosurgical) were present almost immediately. The operating rooms were winding down for the day, thus providing available rooms and sufficient staff for the influx of surgical cases. The chief of emergency medicine was still in the hospital, bringing the total number of ED physicians to three.

On the very afternoon of the incident, key emergency medicine supervisors, including Ms. Scholem, had met to refine the county’s proposed mass casualty plan. Several months earlier a practice drill had been conducted in the county to test the logistics of the plan. Mass casualty was fresh in their minds.

And finally, the people in the community, recognizing the severity of the event, stayed away with their minor illnesses and injuries or sought treatment elsewhere.

But the emergency department did not rest on its laurels. The following problems were identified and solutions implemented:

1. The rapid sequence of events did not allow for full deployment of disaster triage procedures. Instead, a single nurse acted as a patient flow manager, matching each patient on arrival with a physician and primary nurse, and ensuring adequate documentation.

2. The problems of interagency communication, previously addressed, later prompted the installation of a direct landline between area emergency departments and central dispatch, which will enable direct communications in the event that radio communications go down. New hospital radios, with a separate frequency dedicated to disaster communications and separate frequencies for each hospital, were obtained with grant monies.

3. The need for traffic control of large numbers on nonessential personnel brought about changes in the hospital disaster plan to include a staging area for responding physicians away from the emergency department, where they would be called to the department as needed. The duties of hospital security were expanded to include controlling the presence of extraneous personnel, including hospital employees, media representatives, and police reinforcements.

4. Changes were made in central supply procedures to include immediately restocking ED supply carts (i.e., IVs) so that backup carts are available at any time without delay.

5. In spite of recent disaster drills, many ED staff were unsure of their specific responsibilities. A disaster card index was designed, listing very specific responsibilities and assignments for each individual.

6. Other changes in the written policy included the unit nurses' responsibility to come to the emergency department for report and for transporting patients being admitted. A provision was also included specifying that only minimal admitting orders should be written on patients not in critical condition during a disaster.

7. Lengthy radio reports on patients arriving from a mass casualty incident would be eliminated. Instead, the supervisor of the Emergency Medical Service (EMS) command post will call with only numbers and classification (i.e., one class II, two class IIIs).

An extensive evaluation of prehospital activities also was completed with many specific recommendations. Through the diligent efforts of Jeff Money, Captain of Brevard County Fire Rescue, all of these recommendations have been addressed. The number of EMS radio systems has been increased from one to three; the first of equipment trailers specifically designed for a mass casualty incident has been purchased; a mobile communications vehicle is forthcoming; a countywide alerting system has been selected, which can activate individual groups or the entire system within 30 seconds; all ambulances are now equipped with hand-held radios; and questions of on-scene command of EMS operations during a mass casualty incident are resolved. On-scene medical supervisors will now have a direct radio line with hospital emergency departments and backup cellular phone access capabilities are being considered for the event of telephone gridlock.

Captain Money also suggests that hospitals revise "all or nothing" disaster plans and design multiple levels to coordinate with the size of the disaster and with the level of the EMS disaster plan of their area.

In addition, much was learned about the management of the survivors of this devastating occurrence.

Thirteen critical incident stress debriefing (CISD) sessions also became a learning experience. Debriefers directly involved in the incident were never fully debriefed themselves, perhaps making their own recoveries more painful than those they counseled. "It got to the point that we didn't want to talk about it [the shooting] anymore," recalls Ms. Scholem, one of the debriefers. "Even so, I am a big believer in CISD. Those who had the debriefing did better than those who did not." Since then a statewide network of CISD teams has been established in Florida.

Another lesson learned was the importance of keeping the debriefing groups homogenous. Mixing such groups as hostages and emergency personnel demonstrated that each group had different unresolved feelings. As much as possible, debriefing sessions were individualized for police, rescue personnel, hospital staff, and policemen's wives.

The most difficult aspect of this disaster for the ED staff, explains Ms. Scholem, was "waiting for the second wave of patients that never came." Receiving so many patients with such severe injuries in so short a time and not knowing how many more they would receive made it difficult to relax. "We had already seen what he [the gunman] could do. What would the next patients be like?"

When asked whether there was a silver lining to this experience, Ms. Scholem replied immediately, "Those who came to us alive, stayed alive." She added: "In spite of this heartbreaking tragedy, we learned that we could pull together, put aside any differences we might have. Other departments, the community, the police, rescue services—we worked together. Most important, we learned that we could do it."

Fourteen mass shootings have occurred since 1949, coast to coast, in small towns and big cities. Nine of these have

occurred since 1982, perhaps reflecting an increasingly violent society. Such incidents are disasters that, unfortunately, could happen anywhere.

Editor's Note

At the time of publication Ms Curry included the following acknowledgment: Many thanks to Ms. Debbie Scholem, currently a clinical nurse III/preceptor in the emergency department at Indian River Memorial Hospital, for reawakening very painful memories to assist with this article.

Time of arrival	Age	Sex	Class	Nature of injuries	Disposition	Time of disposition	Surgical procedure	Hospitalization (length of stay)
6:50 PM	25 yr	M	III	Glass fragments to left arm and back	Home	8:15 PM	—	—
6:54 PM	19 yr	M	II	Gunshot wound left shoulder and neck, spinal contusion	Surgery	7:30 PM	Removal C-6 and C-7 spinous process	20 days with transfer to rehabilitation facility
6:55 PM	27 yr	M	IV	Fatal gunshot wound head, gunshot wound right hand (police officer)	Medical examiner	—	—	—
6:55 PM	18 yr	M	III	Glass fragments right ear and face	Home	8:15 PM	—	—
6:55 PM	25 yr	M	IV	Fatal gunshot wound chest and abdomen	Medical examiner	—	—	—
7:05 PM	27 yr	M	II	Gunshot wound buttocks	Surgery	7:30 PM	Colon resection, colostomy, incision and drainage abdominal abscess	64 days with transfer to rehabilitation facility

7:05 PM	27 yr	F	II	Gunshot wound abdomen	Surgery	8:20 PM	Repair laceration, liver and pancreas	9 days
7:06 PM	15 mo	M	III	Superficial gunshot wound to chest	Home	8:15 PM	—	—
7:12 PM	23 yr	M	II	Gunshot wound to left mid-back	Admit to floor	7:35 PM	—	4 days
7:13 PM	16 yr	M	II	Gunshot wound right rest, fracture scapula	Surgery	8:15 PM	Right upper lobectomy, resection lower lobe, bronchoscopy	10 days
7:13 PM	14 yr	M	II	Gunshot wound back, left buttocks, and left arm	Admit to floor	7:35 PM	—	3 days
7:15 PM	58 yr	F	II	Gunshot wound right thigh into abdomen	Surgery	7:35 PM	Resection small bowel colostomy/tracheotomy sciatic nerve damage	56 days (33 days in intensive care unit)
7:30 PM	38 yr	F	II	Gunshot wound right upper abdomen	Surgery	8:15 PM	Repair lacerated liver and colon	10 days
10:00 PM	52 yr	M	IV	Fatal gunshot wound	Morgue	—	—	—
10:15 PM	27 yr	M	III	Superficial gunshot wound left chest (paramedic)	Home	11:25 PM	—	—

3:07 AM	25 yr	M	III	Fractured ankle (SWAT officer)	Home	5:00 AM	—	—
3:30 AM	25 yr	F	III	Tear gas exposure/emotional reaction (hostage)	Home	5:00 AM	—	—

DETAILS

Subject:	Radio communications; Patients; Emergency medical care; Fires; Physicians; Equipment; Hospitals; Authorization; Radio; Mass casualty incidents; Chest pain; Nurses; Surgeons; Grocery stores
Business indexing term:	Subject: Grocery stores
Publication title:	Journal of Emergency Nursing:; JEN; Philadelphia
Volume:	46
Issue:	4
Pages:	420-423
Publication year:	2020
Publication date:	Jul 2020
Section:	ENA 50th Anniversary
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

Bibliography

Citation style: APA 6th - Annotated with Abstracts - American Psychological Association, 6th Edition

Salt toxicity: A systematic review and case reports: JEN. (2020). Journal of Emergency Nursing, 46(4), 428-439. doi:https://doi.org/10.1016/j.jen.2020.02.011

IntroductionSalt toxicity is a rare form of hypernatremia that typically occurs after a single massive ingestion of salt over a short period of time (minutes/hours). It is a dangerous imbalance capable of causing significant neurological injury; quick recognition of salt toxicity is crucial to allow treatment before permanent brain injury occurs. The purpose of this review is to assist emergency nurses in gaining knowledge on the causes, pathophysiology, symptoms, and treatment of salt toxicity.MethodsA systematic search for case reports of hypernatremia due to salt toxicity was conducted in the PubMed and Scopus electronic databases. The search terms used were salt, sodium, hypernatremia, toxicity, poisoning, case reports, case series, and cases. The following were the inclusion criteria: publication dates between January 1, 2000, and September 30, 2019; evidence of an acute large oral or gastric tube ingestion of salt over a short period of time (minutes/hours); admission for treatment within hours of the event; laboratory verification of hypernatremia; and full-text article available electronically in English. The following were the exclusion criteria: an unclear history, high salt consumption over a period of days, high sodium intake via the intravenous route, and breast feeding.ResultsOnly 15 cases met the inclusion criteria for the review. Patients described in the case reports ranged in age from 5 days to 73 years. Forty percent of the patients were children less than 15 years old. Of the 14 cases with known outcomes, 50% were fatal. The most frequent causes of salt toxicity were salt water emetics, intentional administration of large quantities of salt to a child by a caregiver, and suicide attempts. Among the other causes were unintentional salt overload in infant formula, an exorcism ritual, and a college prank.DiscussionFindings from this review of 15 case reports in which a large salt load was ingested over a short period of time suggest that salt toxicity is a rare condition associated with high mortality. In addition, salt toxicity can occur in patients of all ages for a variety of reasons; the most frequently identified reasons in this review were use of salt water as an emetic and child abuse by the intentional administration of a high salt load by a caregiver. For patients whose massive exposure to salt is recent (such as minutes to hours), rapidly reducing the serum sodium concentration may prevent irreversible neurological injury.

Mental well-being of nursing staff during the coronavirus disease 2019 outbreak: A cultural perspective: JEN. (2020). Journal of Emergency Nursing, 46(4), 426-427. doi:https://doi.org/10.1016/j.jen.2020.04.003

Evidence-based mental health services, efficacy of psychological care, and assessment of psychological care needs are necessary for nursing staff.3 Continuous mental health care services are essential for even mild psychological reactions during this pandemic to attenuate the possibility of escalating psychological health problems.4 The number of medical health care professionals (doctors, nurses, and paramedics) suffering mental health effects after epidemics and pandemics is often greater than the physical injury.5 Although the mental health effects of such events last longer, psychological health interventions capture much less attention.6 Psychological counseling and psychotherapeutic guidance could demonstrate the effectiveness of psychological protection and awareness for nursing staff through print media (manuals) and electronic media (television) resources. The mental health of nursing staff can be effectively addressed and managed through psychological counseling, group meeting sessions, and management of stress caused by infectious disease pandemics.2 Psychological counseling sessions for nursing staff could help in depersonalization, modifying one's perspective of life, understanding the meaning of one's work, and managing psychological reactions in an adversity.7 Professional knowledge about the risk of exposure and transmission of infectious diseases could offer cautionary control over the situation, which in the case of COVID-19, is markedly different owing to the pernicious characteristics of the novel coronavirus pandemic outbreak. Many individuals exhibit minimal symptoms while contagious and, indirectly through skin contact, present a substantial risk of exposure and transmission for all medical, nursing, and paramedic professionals.8 The resultant stress in this particular situation is evidently dissimilar to that in other epidemics, and thus this infection risk indiscriminately affects a large number of medical health care professionals both physically and psychologically.

Predictors of nonurgent emergency visits at a midsize community-based hospital system: Secondary analysis of administrative health care data: JEN. (2020). Journal of Emergency Nursing, 46(4), 478-487. doi:https://doi.org/10.1016/j.jen.2020.02.002

IntroductionNonurgent visits to the emergency department compromise efficiency in treating patients with urgent conditions and inversely influence the satisfaction of patients and staff. There is inconclusive evidence of the factors associated with nonurgent ED visits. Therefore, the purpose of this study was to explore the independent factors associated with nonurgent ED visits in a midsize community-based Canadian hospital system.MethodsThis was a retrospective, secondary analysis of data from 2 community hospitals in southwestern Ontario, Canada. We included ED patients in the analysis if they were local residents from the city or the surrounding county.ResultsNonurgent visits constituted approximately 27% of all ED visits and were more likely to be associated with patients with a primary care provider referral (odds ratio = 2.87; 95% confidence interval, 2.75-2.99) and with patients who had no primary care provider (odds ratio = 1.10; 95% confidence interval, 1.04-1.16). Other predictors included younger age, season, time of day, ED arrival mode, geographical proximity of residence to the emergency department, and case presentation.DiscussionThe findings of this study may assist health care providers and stakeholders in developing strategies to minimize nonurgent ED visits.

Concise review of the clinical approach to the exclusion and diagnosis of pulmonary embolism in 2020: JEN. (2020). Journal of Emergency Nursing, 46(4), 527-538. doi:https://doi.org/10.1016/j.jen.2020.02.018

Pulmonary embolism has extremely varied clinical presentations and can be difficult to diagnose. Clinical decision rules can help determine the probability of pulmonary embolism by assessment of the clinical presentation. After the diagnosis, several prognostic rules can be used to risk-stratify and facilitate outpatient treatment of pulmonary embolism. This review addresses the utility of clinical decision rules, biomarkers in the diagnosis of pulmonary emoblism, high-risk patient phenotypes, the use of this data to make disposition decisions for patients with a diagnosis of PE, and recent shifts in the management of pulmonary embolism in the clinical setting.

Ozone alerts and respiratory emergencies: The environmental protection Agency’s potential biological pathways for respiratory effects: JEN. (2020). Journal of Emergency Nursing, 46(4), 413-419.e2. doi:https://doi.org/10.1016/j.jen.2020.05.008

The purpose of this editorial is to review the broad relevance of environmental health in contemporary emergency nursing, introduce the Environmental Protection Agency’s (EPA) 2020 Integrated Science Assessment (ISA) potential biological pathways for respiratory effects following ozone exposure,1 and provide an introduction to select manuscripts that appear in this issue of the Journal of Emergency Nursing (JEN). To function as an expert in the emergency nursing specialty, we need to acquire a substantial breadth and depth of knowledge in environmental health. Our specialty knowledge includes the emergency management of exposure to thermal extremes, environmental and occupational poisoning, venomous bites and stings, vector-borne disease, animal bites, diving decompression, drowning, altitude sickness, wilderness emergencies, and all-hazard disaster preparedness and response.2,3 Emergency nursing interventions include therapeutic environmental controls from maintaining body temperature through warmed intravenous fluids to reducing edema and pain in musculoskeletal injury through cryotherapy.4 Emergency nurse leaders also influence the broader environment by making decisions on hospital architecture, sustainable health care purchasing, water and air quality policies, medical waste disposal, and global climate change mitigation efforts.5,6

Dialysis access steal syndrome: JEN. (2020). Journal of Emergency Nursing, 46(4), 524-526. doi:https://doi.org/10.1016/j.jen.2020.01.009

The syndrome is caused by a decrease or even a reversal of blood flow through the arterial segment distal to the vascular device.5 These changes occur because the blood circulates preferentially through the low-resistance fistula at the expense of distal circulation.6 The syndrome is characterized by a decrease in distal perfusion pressure.7 Dialysis access steal syndrome is a limb-threatening condition that can lead to permanent damage if left untreated. If the condition is left untreated, the chronic symptoms can include nail bed changes, ulcers, gangrene, and

muscle/tissue atrophy.7 Undiagnosed dialysis access steal syndrome can result in irreversible damage to the nerves and muscles distal to the fistula and even tissue necrosis.6 Recognizing the condition and quickly intervening leads to increased salvage and use of the fistula.6 Moreover, quick intervention and treatment may reduce health care costs. Some common treatment options include angioplasty, revascularization techniques, banding techniques, and ligation.7 Angioplasty and revascularization techniques are the preferred methods of treatment owing to the increased risk of complications associated with developing a new dialysis access site.Case Report Conclusion The patient was admitted to the hospital for a surgical removal of the AV fistula because of the significant decrease in perfusion distal to the dialysis access site.

Migraine management in the emergency department: JEN. (2020). Journal of Emergency Nursing, 46(4), 518-523. doi:https://doi.org/10.1016/j.jen.2020.04.002

Migraine headaches are classified as a primary headache syndrome.Migraine Headache Migraine headaches are the fourth to fifth most common complaint in the emergency department, accounting for 3 million to 5 million ED visits annually.1,4 Although tension headaches are the most common primary headache disorder, migraines tend to be the most disabling and are more likely to present to the emergency department.1 Migraines have a 3:1 female to male ratio.5 Currently, there are several different treatment combinations available, which will be discussed further.Diagnostic Criteria The diagnostic criteria for migraines include those detailed in Table 1.5 Of note, the International Headache Society 2019 update further distinguishes migraines into aura and nonaura.6 According to the American College of Emergency Physicians 2019 Clinical Policy regarding evaluation and management of adult patients presenting to the emergency department with acute headache, subarachnoid hemorrhage should be ruled out using the Ottawa Subarachnoid Hemorrhage Rule (Table 2).7 Additional clinical findings such as pregnancy, postpartum women, fever, trauma, and severe back pain may warrant further evaluation before considering a migraine diagnosis.7Treatment Options Several different treatment combinations are available for migraines, including triptans, dihydroergotamine mesylate (DHE), 100% oxygen inhalation, ergotamine tartrate, opioids, nonsteroidal anti-inflammatory drugs (NSAIDs), antihistamines, acetaminophen, dexamethasone, ketorolac, and metoclopramide, to name a few.5,8 These treatments can be used as solitary treatments or in conjunction with other treatments listed, as appropriate. The adverse effects include increased blood pressure, chest pressure, dizziness, flushing, neck tightness, tingling, and limb heaviness.9,10 The contraindications to triptans are pregnancy, vascular disease, coronary artery disease, and uncontrolled hypertension.Dihydroergotamine Mesylate DHE can be given through several different routes, such as intramuscular (IM), intravenous (IV), subcutaneous, or intranasal. The contraindications include pregnancy, hypertension, angina, peripheral vascular disease or poor circulation, liver or kidney disease, serious infection, and arteriosclerosis.Opioids Opioids are certainly an option for treatment of migraines, although, considering the opioid epidemic, the American College of Emergency Physicians recommends preferentially using nonopioid medications for migraine treatment in the emergency department.7 Opioids should not be considered as first-line treatment. The contraindications include hypersensitivity to this class of medications and latex allergy; it has not been studied in pregnant or pediatric patients.Botox Injections Onabotulinum A (Botox) is thought to relax musculature secondary to blocking acetylcholine release at the neuromuscular junction, which reduces inflammation of the meninges and blocks pain signals coming from the brain.19 It was approved by the Food and Drug Administration in 2010 as a prophylactic therapy for chronic migraines in adults.18 Botox is given as an injection for migraines and is divided into 31 different sites approximately every 3 to 6 months.20 The adverse effects include toxin-effect spread, hypersensitivity reaction, anaphylaxis, injection-site reaction, and muscle weakness.

Information for readers: JEN. (2020). Journal of Emergency Nursing, 46(4) doi:https://doi.org/10.1016/S0099-1767(20)30178-1

Quality improvement in the emergency department: A project to reduce door-to-electrocardiography times for patients presenting with chest pain: JEN. (2020). Journal of Emergency Nursing, 46(4), 497-504.e2. doi:https://doi.org/10.1016/j.jen.2020.03.004

IntroductionThe American Heart Association/American College of Cardiology guidelines recommend obtaining electrocardiography for patients who present to the emergency department with chest pain in less than 10 minutes of arrival. Reducing door-to-electrocardiography time is an important step in adhering to the recommended door-to-balloon times (≤ 90 minutes) for patients who present with ST-segment elevation myocardial infarction.MethodsBased on lean sigma principles, a protocol was implemented in an adult emergency department that included deferring nurse triage for patients with complaints of chest pain, chest tightness, and chest pressure and providing them with a red heart symbol as an indicator for clinical technicians to prioritize their electrocardiography order. Pre- and postintervention data were collected over a 12-month period.ResultsBefore the intervention, the mean door-to-electrocardiography time was 17 minutes for patients with chest pain (n = 893). After the intervention, the mean door-to-electrocardiography time for patients with chest pain significantly decreased to 7 minutes (n = 1,057) (t = 10.47, P ≤ 0.001). Initially, the percentage of compliance with door-to-electrocardiography standard of 10 minutes was 31% and improved to 83% after implementation of the new protocol.DiscussionImplementation of the optimized door-to-electrocardiography protocol decreased the time for obtaining diagnostics and improved compliance with the American Heart Association/American College of Cardiology guidelines, potentially decreasing door-to-balloon times for patients who presented with ST-segment elevation myocardial infarction.

Pathway to implementing a program of nursing research: JEN. (2020). Journal of Emergency Nursing, 46(4), 410-412. doi:https://doi.org/10.1016/j.jen.2020.05.011

When I embarked on a research pathway there were limited research and clinical practice guidelines focused on acute care, patient care management, and outcomes. The direction for research can also evolve from interactions and collaborations with other nurse researchers and colleagues who help to vision the gaps and needs in clinical practice to inform a program of research.Building a Meaningful Research Trajectory One of the strategies that nurse scientists use to build their program of research is an individual development plan. Sequential, interrelated self-management intervention studies used telehealth technology to obtain outcome measures (eg, accelerometry-measured physical activity) and to deliver the intervention components (eg, education, coaching, and support) for self-management by patients (eg, recognition and management of symptoms, and secondary risk–factor modification such as weight management).7-16 The use of various telehealth platforms enabled research by our team to be conducted across multiple sites and settings, which included underserved patients residing in rural communities. By staying in touch with bedside care of patients and having close ties with colleagues at the bedside, we can conduct relevant research for more rapid translation of research to practice.18 In this regard, the nurse-scientist can play a role as a knowledge broker.

Radiological presentation of coronavirus disease: JEN. (2020). Journal of Emergency Nursing, 46(4), 546-547. doi:https://doi.org/10.1016/j.jen.2020.04.008

A male in his mid-80s presented to the emergency department with complaints of fever and cough for 6 days. On presentation, the patient was febrile to 38.7°C (101.6°F), tachypneic to 26 breaths per minute, and coughing. A portable chest X-ray was done (Figure 1) that revealed bilateral peripheral infiltrates. Chest computed tomography was performed as well and it confirmed multiple areas of peripheral bilateral infiltrate (Figure 2). The patient was ultimately diagnosed with coronavirus disease.

The quality of care in the emergency management of cancer patients with febrile neutropenia: A records-based cohort: JEN. (2020). Journal of Emergency Nursing, 46(4), 468-477. doi:https://doi.org/10.1016/j.jen.2020.03.008

IntroductionFebrile neutropenia is one of the most severe oncological emergencies associated with the treatment of cancer. Patients with febrile neutropenia are at grave risk of developing life-threatening sepsis unless there is rapid initiation of treatment. The aim of this study was to evaluate the quality of ED care of patients with febrile neutropenia using the 3 quality dimensions of safety, effectiveness, and timeliness of care.MethodsA retrospective review of all available records of adult cancer patients with febrile neutropenia who presented to 1 urban emergency department in Atlantic Canada was conducted over 5 years.ResultsExamining the 9 quality indicators of the 431

patients included in the study identified areas for improvement in each of the 3 dimensions. More than one third of the participants were unsafely discharged from the emergency department despite the severity of their conditions. Patients in the study were not seen promptly by the physician and did not receive timely treatment during different phases of their visit. Most importantly, the delay in antibiotic administration presented a major risk for this population.DiscussionAspects of care provided to this cohort of febrile neutropenia patients were inconsistent with the recommended evidence. Strengthening ED care is necessary to reduce the gap between evidence-based and actual care. Quality initiatives can be implemented to improve care to become safer, effective, and timely. Nurses who are in direct contact with the patients and who are actively involved in every single process of the health care system are well positioned to lead this change.

Table of contents: JEN. (2020). Journal of Emergency Nursing, 46(4) doi:https://doi.org/10.1016/S0099-1767(20)30175-6

Board of directors: JEN. (2020). Journal of Emergency Nursing, 46(4) doi:https://doi.org/10.1016/S0099-1767(20)30177-X

Climate change impact and the role of the emergency nurse: JEN. (2020). Journal of Emergency Nursing, 46(4), 407-409. doi:https://doi.org/10.1016/j.jen.2020.05.007

Increased ground-level ozone, which is found during extreme heat waves, can exacerbate respiratory conditions such as asthma or chronic obstructive pulmonary disease.5 Other conditions affected by increased temperature related to climate change that we probably do not think about include our food supply and vector-borne transmission from insects such as mosquitoes that spread malaria, dengue fever, yellow fever, or West Nile virus. Warmer temperatures enhance the breeding climate for such insects (Figure).6 Rodents that proliferate in regions after a mild winter or flooding transmit diseases such as leptospirosis, tularemia, and viral hemorrhagic diseases.6 Increased temperatures have been associated with increased flooding in some areas, droughts in others, increased number and severity of hurricanes, and more frequent wildfires. The Centers for Disease Control and Prevention has several resources, such as Climate Change and Extreme Heat: What You Can Do to Prepare,8 that you can use to help educate your patients when preparing for a heat event.

The effect of soft tissue injury cold application duration on symptoms, edema, joint mobility, and patient satisfaction: A randomized controlled trial: JEN. (2020). Journal of Emergency Nursing, 46(4), 449-459. doi:https://doi.org/10.1016/j.jen.2020.02.017