

Journal of
EMERGENCY NURSING

OFFICIAL PUBLICATION OF THE EMERGENCY NURSES ASSOCIATION

- **A CLIMATE: A Tool for Assessment of Climate-Change–Related Health Consequences in the Emergency Department**
- **Alignment of Nurse Practitioner Educational Preparation and Scope of Practice in United States Emergency Departments: A Systematic Review of the Literature**
- **Patient Characteristics of Persons Dead on Arrival Received in a Danish Emergency Department: A Retrospective Review of Health Records**
- **Emergency Nurses' Knowledge, Attitudes, and Practices Related to Blood Sample Hemolysis Prevention: An Exploratory Descriptive Study**
- **Implanted Port Access in the Emergency Department: A Unit-Level Feasibility Study of a Nurse-Led Port Access Algorithm**
- **Pain Medication Administered and Prescribed to Patients With an Ankle Sprain Treated in an Emergency Department: A Record-Based Cohort Study**





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SEARCH STRATEGY

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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.

Case Report Detailing an Inferior Myocardial Infarction, Third-Degree Heart Block, and Cardiogenic Shock: JEN

[ProQuest document link](#)

ABSTRACT (ENGLISH)

An infarction in the right coronary artery affects the inferior wall of the heart and can also cause impedance to the cardiac conduction system. The right coronary artery perfuses the sinoatrial and atrioventricular nodes, and a loss of blood flow contributes to a breakdown in the communication system within the heart, causing associated bradycardias, heart blocks, and arrhythmias. This case report details the prehospital and emergency care of a middle-aged man who experienced an inferior myocardial infarction, concomitant third-degree heart block, and subsequent cardiogenic shock, with successful revascularization. This case is informative for emergency clinicians to review symptoms of acute coronary syndrome, rapid lifesaving diagnostics and intervention, and the unique treatment and monitoring considerations associated with right ventricular involvement and third-degree heart block.

FULL TEXT

Contribution to Emergency Nursing Practice

- What is already known: rapid identification of high-risk cardiovascular clinical conditions and subsequent targeted interventions can improve patient outcomes.
- The main finding: cardiac disease processes can evolve over time and complicate patient care.
- Recommendations for translating the findings of this paper into emergency clinical practice include: remaining up to date on American Heart Association recommendations improve the quality and safety of care for complex, critically ill patients.

Introduction

This case report details the prehospital and emergency care of a middle-aged male patient who experienced an inferior myocardial infarction, concomitant third-degree heart block, and subsequent cardiogenic shock, with successful revascularization. Facility institutional review board policy was followed, and patient consent was obtained by electronic communication.

Case Report

A 56-year-old man with a past medical history of hypercholesteremia, no documented family history of cardiac disease, and no home medications had a syncopal event while at an outdoor recreation facility. After completing a leisure-time driving activity (go-kart racing), the patient sat down and immediately became pale and unconscious. Owing to bystander concern for cardiac arrest, cardiopulmonary resuscitation (CPR) without defibrillation was initiated, and emergency medical services (EMS) was called. On EMS arrival, the patient was pale and diaphoretic but alert and oriented; in addition, the patient was experiencing chest pain, nausea, and vomiting. The initial vital signs were as follows: heart rate 38 beats per minute (bpm), blood pressure 65/37 mm Hg, and respiratory rate 20 breaths per minute; the patient's blood glucose level was 30 mg/dL. A 12-lead electrocardiogram (ECG) was

obtained. EMS identified a third-degree atrioventricular (AV) heart block as well as an inferior myocardial infarction (MI) with ST elevation in leads II, III, and aVF and reciprocal depression in leads I and aVL (Figure 1).

EMS administered a 500-mL normal saline (0.9%) intravenous (IV) bolus and a dose of EPINEPHrine 5 mcg through IV push. After the first dose of EPINEPHrine, the patient's heart rate did not increase, and he became hypertensive to 212/160 mm Hg owing to the vasopressor. Despite an attempt to perform transcutaneous pacing, capture was not achieved, and ultimately pacing was stopped owing to patient intolerance. During transport, repeat vital signs were obtained with a blood pressure reading of 96/68 mm Hg and a heart rate of 38 bpm. Per protocol, EMS administered a second dose of EPINEPHrine 3 mcg IV push for persistent bradycardia and hypotension. Additional medications given by EMS were ondansetron 4 mg IV push, aspirin 324 mg by mouth, fentaNYL 50 mcg IV push, and a dextrose 10% IV infusion for hypoglycemia.

On arrival to the emergency department, the patient complained of left-sided chest pain that radiated to his left arm. His blood pressure was 111/64 mm Hg, and his heart rate was 42 bpm. A second 12-lead ECG was acquired, and the interpretation was unchanged from the initial ECG (Figure 2). Blood laboratory specimens were obtained in the emergency department, and the results outside of normal limits were as follows: potassium 5.9 mmol/L (3.5-5.1 mmol/L), low-density lipoprotein 139 mg/dL (

Emergent cardiac catheterization demonstrated mild nonobstructive disease in the left anterior descending system and 100% occlusion of the proximal right coronary artery (RCA). The interventional cardiologist placed a temporary pacing wire and stented the culprit lesion in the RCA with a single drug-eluting stent. Subsequently, the patient's heart block and signs of cardiogenic shock resolved after successful vessel reperfusion of the RCA with restoration of a normal sinus rhythm (Figures 3 and 4).

Diagnostic Assessment

A 12-lead ECG is one of the most important diagnostic tools for the workup of patients with a suspected MI; however, an ECG is insufficient on its own to diagnose acute myocardial ischemia or MI. Elevation of the ST segment in 2 contiguous leads is required to diagnose an ST-elevated MI (STEMI).¹ To diagnose an inferior MI, the trained clinician would look for an ST-segment elevation in leads II, III, and aVF; reciprocal changes may be seen in lead aVL.² See Figure 5 for diagnostic criteria suggestive of an inferior STEMI and third-degree AV block. When an inferior MI is identified, a right-sided 12-lead ECG should also be acquired to examine the right ventricle because studies have demonstrated that up to 40% of the inferior wall MIs have associated right ventricular (RV) involvement that predicts a worse outcome.³

Additional criteria to inform a diagnosis of an acute MI can be a rise in the cardiac troponin blood levels above the 99th percentile.¹ The high-sensitivity troponin blood test administered (Beckman Coulter hsTnl) has a 99th percentile cutoff of 19.8 ng/L for males.⁴ The patient had a maximum troponin level of 14 492 ng/L 12 hours after symptom onset, which represents a significant rise above the 99th percentile.

Pathophysiology

The blood supply to the heart is provided by the coronary circulatory system. The RCA originates at the anterior aortic sinus and supplies blood to the right atrium, right ventricle, sinoatrial (SA) node, AV node, and posterior aspects of the left ventricle.⁵ A blockage in the RCA stops the flow of oxygenated blood to the inferior wall of the heart,² leading to myocardial ischemia and eventually MI. When MI occurs, it can also cause impedance to the cardiac conduction system. The RCA perfuses the SA and AV nodes, and a loss of blood flow contributes to a breakdown in the communication system within the heart, causing associated bradycardias, heart blocks, and arrhythmias.³ With open communication systems and adequate perfusion, the SA node starts an impulse that travels to the AV node. This impulse travels through the bundle of His, down the bundle branches, and through the Purkinje

fibers causing the ventricles to contract.⁶ In the setting of third-degree heart block, the SA node continues to send the impulse, but the AV node does not receive the message. This contributes to a clinical finding of bradycardia where the heart rate may only be 45 to 50 bpm.⁷

Further complicating the patient's clinical course was the cardiogenic shock that was identified in the prehospital setting on the basis of hypotension secondary to the acute MI and third-degree heart block. Cardiogenic shock is the result of a cardiac injury that leads to a decrease in cardiac contractility.⁸ This progresses to a cycle of reduced cardiac output and low blood pressure, which further worsens cardiac ischemia.⁸ Clinically observed as the inability to maintain a systolic blood pressure of 90 mm Hg or more for 30 minutes or longer, cardiogenic shock may also manifest as altered mental status; oliguria; and cold, clammy skin.⁸

Discussion REVASCULARIZATION

Treatment of an inferior STEMI and third-degree heart block involves a reperfusion strategy, either mechanical or medicinal, to restore optimal blood flow and cardiac function. The preferred reperfusion strategy is a percutaneous coronary intervention (PCI). Compared with fibrinolytic therapy, PCI has been shown to improve outcomes, including higher rates of vessel patency and lower rates of intracranial hemorrhage and death.⁹ In addition, the American College of Cardiologists and the American Heart Association (AHA) recommend a drug-eluting stent with primary PCI so long as the patient is willing to comply with a prolonged course of dual antiplatelet therapy. For a third-degree heart block, initial treatment includes application of transcutaneous or transvenous pacing, which allows for rhythm stabilization; definitive treatment is an implanted pacemaker or PCI if the heart block is caused by an MI.⁷

COMPLICATED BRADYCARDIA

The AHA Advanced Cardiac Life Support 2020 guidelines for the treatment of adult bradycardia recommend atropine 1 mg through IV push every 3 to 5 minutes (maximum dose of 3 mg) as the initial treatment until the desired effect is achieved.¹⁰ However, the guidelines caution clinicians on the use of atropine in bradycardia due to a third-degree heart block because it may not be responsive to the reversal of the cholinergic effects of atropine.¹¹ Atropine is not recommended as first-line treatment for bradycardia secondary to third-degree heart block because it acts on the AV node, not the SA node, and therefore is rarely effective in raising the heart rate.¹² If a third-degree heart block is identified on an ECG, the clinician should initiate transcutaneous pacing.

For this patient, pacing was not successful; per the EMS report, capture was not achieved, and the patient was unable to tolerate the intervention. In a clinical setting, if pacing is no longer an option for initial treatment, other options for symptomatic bradycardia are treatment of the underlying medical condition (eg, dialysis), IV medications (either DOPamine or EPINEPHrine), PCI, or pacemaker implantation.¹³ Therefore, EMS proceeded to secondary interventions for treatment of third-degree heart block using EPINEPHrine. Because EPINEPHrine is a sympathomimetic catecholamine and acts on both alpha- and beta-adrenergic receptors, it acts on all pacemaker sites of the heart to cause vasoconstriction and can restore hemodynamic stability while awaiting definitive treatment. An additional clinical advantage of the use of EPINEPHrine in this patient's case was the improvement of diastolic blood pressure and coronary artery perfusion pressure

HYPOGLYCEMIA IN MI

The patient had an initial fingerstick blood glucose level of 30 mg/dL per the EMS report. During transport, the EMS personnel administered a 10% dextrose infusion per their protocol. Owing to an increased risk of extravasation, the local EMS agency does not stock 50% dextrose in its ambulances. A possible cause of the patient's initial low blood glucose is "silent hypoglycemia," which is defined as a blood glucose level of less than 70 mg/dL without typical symptoms of hypoglycemia.¹⁴ Hypoglycemia was found to be frequently occurring in patients without diabetes diagnosed with an acute MI.¹⁴ On arrival to the emergency department, the patient's blood glucose level was 285

mg/dL. During hospitalization, the patient's hemoglobin A_{1c} level was evaluated and found to be 5.8% (5.7%-6.5%), which is in the prediabetes range.¹⁵ There was no follow-up on discharge for the patient's hemoglobin A_{1c} level.

BYSTANDER CPR IN SUSPECTED CARDIAC ARREST

It is highly probable that this patient did not lose pulses during his suspected cardiac arrest but instead had a syncopal event caused by low cardiac output and decreased peripheral resistance, resulting in hypotension and cerebral hypoperfusion.¹⁶ The patient did receive bystander CPR. Retrospective cohort reviews have revealed the benefit of bystander CPR on 30-day survival rate and overall mortality rate for out-of-hospital cardiac arrests; it is well known that there is a positive correlation between early CPR and survival rates.^{10,17} Furthermore, layperson-initiated CPR is endorsed by the AHA because the risk of harm to the patient is low if the patient is not in cardiac arrest.¹⁰ Ultimately, the patient was taken to the cardiac catheterization laboratory for PCI with stent placement in 61 minutes from first medical contact (goal of 90 minutes).⁹ Figure 6 outlines the event timeline.

Implications for Emergency Nursing

For an emergency nurse, it is important to be aware of the symptoms of acute coronary syndrome: typical symptoms include chest pain associated with nausea, dyspnea, diaphoresis, or syncope, and atypical symptoms may include fatigue and upper abdominal pain. This patient group classified as high risk needs rapid assessment and intervention, including an ECG within 10 minutes of arrival.¹¹ The trained emergency nurse is knowledgeable on evidence-based care of patients experiencing an STEMI and associated progression of disease. When an inferior MI is identified on an ECG by an ED provider or cardiologist, the emergency nurse should perform a right-sided ECG by reversing the precordial leads to the right side of the chest (create a mirror image of the traditional precordial leads) to determine RV involvement.³ If the right ventricle is involved, the patient's treatment pathway should differ in that vasodilators and nitrates should be avoided to maintain RV preload and adequate cardiac output while awaiting intervention.¹⁸ For patients who arrive with symptoms of acute coronary syndrome without ST elevation on their ECG, the emergency nurse should follow their facility protocols for serial cardiac enzyme testing. The emergency nurse should be aware of the time intervals between repeat ECG tracings and serial troponin levels, as well as hospital processes and protocols for the care of cardiac patients.

When a third-degree heart block is identified, transcutaneous pacing is indicated for initial treatment until the cause of the heart block can be reversed or a permanent pacemaker can be inserted. Because temporary transvenous pacing may be done in the emergency department, the emergency nurse should remain up to date on the procedure steps as well as complications that may occur. In addition, the nurse should observe the patient for expected and adverse outcomes as a patient with bradycardia due to a heart block; the patient will likely experience decreased perfusion and decreased cardiac output. A sedative, if ordered, should be administered before the pacing attempt because the patient may experience discomfort. Vital signs, skin color, level of consciousness, and peripheral pulses should be monitored to evaluate the effectiveness of the paced heart rhythm.⁵ Potential adverse events include failure to capture, patient discomfort, arrhythmias, and skin breakdown.⁵ Documentation of the procedure should include the date and time of pacer initiation, pacemaker settings, and the patient's response. A 12-lead ECG should be obtained before and after pacing is initiated. Finally, the emergency nurse should be knowledgeable about other treatment modalities for third-degree heart block when pacing is not an option, such as pharmacologic management.

Case Conclusion

The patient was admitted to the cardiac intensive care unit and discharged to home after 2 days. As follow-up, the patient had a virtual visit with the cardiology team in which the patient reported no recurrence of chest discomfort. In addition, the patient was able to return to work. This case demonstrates the importance of prehospital communication and notification protocols, especially in the setting of a complicated MI.

Author Disclosures

Conflicts of interest: none to report.

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The Story of a Broken Heart: Takotsubo Cardiomyopathy: JEN

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ABSTRACT (ENGLISH)

Licensed independent practitioners in emergency clinical practice are tasked with differentiating acute cardiac presentations. Despite its similarity in clinical presentation to acute coronary syndrome, Takotsubo cardiomyopathy is a unique cardiac disorder characterized by a stress-induced ballooning of the myocardium. Also known as the broken heart syndrome, Takotsubo cardiomyopathy most frequently occurs after an overwhelming emotional or physical stressor. The subsequent impaired contractility of the heart places the patient at risk of complications, including acute heart failure, cardiogenic shock, thromboembolism, arrhythmias, and left ventricular outflow obstruction. Takotsubo cardiomyopathy is similar in presentation to other cardiac disorders; therefore, clinicians in emergency settings must be efficient and effective in their diagnosis of this disorder on the basis of its distinct criteria. The current article uses most recent evidence to describe the etiology, pathophysiology, diagnosis, and recommended treatment for Takotsubo cardiomyopathy to support licensed independent practitioners in emergency departments in improving patient outcomes and reducing morbidity.

FULL TEXT

Introduction

Takotsubo cardiomyopathy (TTC) is a cardiac disorder characterized by an acute ballooning of the left ventricle during systole, resulting in impaired contraction.¹ Takotsubo, a Japanese term for an octopus trap, refers to the distinct shape of the left ventricle in patients with TTC, often seen on transthoracic-echocardiographic imaging.¹ Known as broken heart syndrome, TTC occurs as an acute state of heart failure in instances of extreme emotional or physical stress as a result of vascular, metabolic, and hormonal changes.¹⁻³ Triggers for TTC vary widely and are highly subjective, with precipitating experiences ranging from an argument or breakup to an aneurysm rupture or natural disaster.⁴ Interestingly, positive emotional triggers may also precede TTC.⁴ Although TTC clinical presentation is similar to that of acute coronary syndrome (ACS) or myocarditis,⁵ TTC occurs in the absence of coronary artery occlusion or plaques.⁶

Licensed independent practitioners (LIPs), including nurse practitioners, physicians, and physician assistants, may face challenges in initially diagnosing TTC owing to its similarity to other cardiac presentations; therefore, an understanding of the distinct diagnostic criteria of TTC is essential in differentiating and appropriately managing the syndrome. A literature search of nursing-specific publications on TTC yielded very few results. Specifically, we

identified a recent review conducted by Abozenah et al⁷ as well as a case report presented by Cantey⁸ that contribute to the gradually growing body of knowledge on TTC. The limited number of nursing publications reflects a critical gap in knowledge dissemination, specifically knowledge that targets advanced nursing practice and LIPs in emergency departments. The goal of this article is to discuss the pathophysiology of TTC and provide evidence-based guidance for its diagnosis and management in emergency clinical practice. With adequate management of acute TTC, complications, including acute heart failure, cardiogenic shock, arrhythmias, left ventricular outflow tract obstruction (LVOTO), and thrombus formation, might be effectively avoided.⁹

Pathophysiology Etiology, Predisposing Factors, and Mechanism of Injury

Several theories have been developed in an effort to understand the etiology of TTC, although a single comprehensive understanding of the syndrome remains unclear. Theories have identified cardiotoxic surges of catecholamines and sympathetic stimulation as risk factors for the syndrome's acute onset (Figure 1). Acute cardiac impairment owing to microvascular dysfunction or vascular spasm has also been postulated as a probable cause of TTC.^{1,4} Recent evidence has established that the mechanism of injury and pathogenesis of TTC, specifically the acute ballooning and impaired contraction of the left ventricle (Figure 2), are attributed to extensive monocyte-mediated myocardial inflammation, with a systemic inflammatory state persisting long after the acute development of TTC.² Evidence from clinical practice guidelines emphasizes hormonal, genetic, neurologic, and psychiatric disorders as predisposing factors (Figure 1) for the development of TTC.⁴ Patients with anxiety and/or depressive disorders are at an increased risk of developing TTC, as well as patients who have experienced stroke, subarachnoid hemorrhage, or seizure.⁴ Owing to the influence of age-related hormonal estrogen changes, women who are postmenopausal experience the highest risk of developing TTC.⁶ In fact, it is anticipated that more than 90% of the TTC cases are experienced by this cohort.¹⁰

Long-Term Prognosis

TTC was once understood to resolve after the disorder's acute management;² however, recent evidence indicates that, contrarily, the long-term effects of TTC are clinically significant.¹¹ The systemic inflammatory response has been noted to persist for up to 5 months after the TTC onset,² resulting in cardiac congestion. In a recent systematic review measuring clinical outcomes in TTC, specifically in-hospital mortality, long-term mortality, and recurrence of TTC, Pelliccia et al determined that patients who had experienced TTC were at an increased risk of both in-hospital and long-term mortality and morbidity.¹¹ Increased risk of mortality was associated with older age, physical stressors, and atypical ballooning pattern. Although considered a relatively uncommon event, a recurrent episode of TTC occurred in approximately 1% of the evaluated patients,¹¹ indicating a need for effective follow-up care planning.

Diagnosis

Accurate diagnosis of TTC in clinical settings relies on the LIP's use of multiple diagnostic tools, including electrocardiogram (ECG), cardiac biomarkers, and coronary angiography to rule out coronary artery occlusion,^{3,12} as well as ventriculography, echocardiography, and magnetic resonance imaging to visualize cardiac pathology.⁶ Ultimately, noninvasive diagnostic testing cannot alone adequately identify TTC; therefore, invasive means are clinically required.⁹ Findings from the international Takotsubo (InterTAK) registry suggest that the presumptive diagnosis of TTC begins with using the InterTAK scoring system (Table 1) to determine its pretest probability. The InterTAK Diagnostic Criteria were developed to create consensus in the differentiation and diagnosis of TTC in clinical settings.⁴ It consists of 7 variables, with 5 of the variables assessing the patient's medical history and 2 variables assessing the patient's ECG. The total score from the tool is then translated into a probability of TTC (InterTAK diagnostic score).¹³

The acute presentation of TTC may lead clinicians to anticipate myocardial infarction or myocarditis. To guide LIPs in diagnosing TTC, Table 2 provides differentiating features of TTC in the context of clinical presentation, ECG findings, echocardiography, and coronary angiography.¹²

For a diagnosis of TTC to be confirmed, there must be evidence of short-term hypokinesis, akinesis, or dyskinesis present within the apex, midventricular, basal, or focal walls.⁹ Although relatively uncommon, right ventricular wall motion abnormalities may be present. Although not an obligatory criterion, an emotional and/or physical stressor is

anticipated as a precipitating factor. Evidence of newly developed ECG abnormalities, including ST elevation, ST depression, QTc prolongation, and/or T-wave inversion, as well as elevated troponin, creatine kinase–myocardial band, and B-type natriuretic peptide, may also be present. The absence of coronary artery disease or occlusive plaques differentiates TTC from myocardial infarction/ischemia, and this must be confirmed through angiogram before diagnosis. The cardiac biomarkers on admission in cases of TTC indicate an elevation of troponin equal to that of ACS and a slight increase in creatine kinase,^{1,13} as well as a significant increase in B-type natriuretic peptide, indicating ventricular distension.^{1,10} Finally, LIPs must rule out underlying myocarditis or pheochromocytoma leading to LV dysfunction.⁴

Visible through echocardiography, the left ventricle will demonstrate wall motion abnormalities, most commonly at the apex.⁹ The abundance of β -adrenergic receptors in the apical myocardium potentially increases its susceptibility to excessive catecholamine stimulation.¹⁴ Therefore, apical rounding or ballooning (^{Figure 2}) and reduced LV ejection fraction (LVEF) are common findings with echocardiography.¹ In patients with apical ballooning, transthoracic echocardiography will detect the presence or absence of LVOTO,¹⁵ a condition that describes the obstruction of forward flow through the left ventricle, resulting in left ventricle hypertrophy secondary to increased afterload and, ultimately, left ventricle failure if left untreated.¹⁶

LIPs should consider assessing risk of thrombus formation as a critical aspect of their initial plan of care in the context of severe LV dysfunction and apical ballooning¹⁷ because thrombus formation remains an adverse complication of TTC that poses a significant risk to the patient who is hemodynamically unstable.^{6,9} Patients who present with apical ballooning and troponin I exceeding 10 ng/mL are at significantly higher risk of thrombus formation owing to akinesia, endothelial damage, and a hypercoagulable state in TTC.¹⁸ LIPs should consider wall motion abnormalities, LVEF, and white blood cell count as critical aspects of their assessment of thrombus risk.¹⁹

Management

Because patients presenting with TTC will often experience chest pain, dyspnea, and ECG abnormalities that closely resemble ACS,⁵ management of acute TTC will often involve ED protocols for ACS before the diagnostic confirmation of TTC.⁶ Once a diagnosis of TTC is confirmed, interventions are recommended on the basis of the degree of the pathologic condition.¹⁷ Standard care for the patient who is hemodynamically stable with TTC and who is understood to be at a relatively low risk of complications involves supportive care and telemetry monitoring for 48 hours.¹⁴ For the patient who is hemodynamically unstable and who is considered at a higher risk of the aforementioned complications, more extensive measures are warranted with monitoring in specialized settings for >72 hours.^{12,20} Treatment must be determined on a per-patient basis, with all pharmacologic interventions individualized on the basis of clinical presentation, hemodynamic status, and risk factors.¹⁸

Hemodynamic Stability

As diagnostic results confirm TTC per the syndrome's distinct criteria with no evidence of complications, the LIP moves to supportive care^{6,14} because a mild presentation of TTC is considered a self-limiting condition. The European Society of Cardiology recommends that a mild presentation of TTC, with no signs of heart failure (LVEF >45%) or complications, requires minimal or no treatment.²⁰

Hemodynamic Instability Heart Failure

For patients presenting with acute heart failure resulting from TTC, characterized by a reduced LVEF of 20 the anticipated course of treatment involves the administration of diuretics and angiotensin-converting enzyme (ACE) inhibitors/angiotensin receptor blockers (ARBs) in the absence of LVOTO, as well as standard oxygenation and respiratory support for heart failure.⁹ In a recent meta-regression analysis study, Brunnetti et al determined lower rates of recurrence of TTC among patients who were prescribed ACE or ARB therapy, whereas there was no significant difference for patients prescribed beta blockers.²¹ In fact, Templin et al determined a significantly higher 1-year survival rate among patients with TTC who received ACE/ARB therapy.²² A goal of treatment in heart failure is to prevent cardiac and pulmonary congestion; therefore, diuretic therapy may be indicated. Recent consensus from the European Society of Cardiology supports the use of furosemide in the acute phase of heart failure to prevent congestion by reducing preload and afterload.²³

Arrhythmias

Patients presenting with TTC may experience an acute onset of arrhythmia, most commonly atrial fibrillation.²⁰ Patients with arrhythmias are considered at higher risk of mortality because a number of more life-threatening rhythms may develop, including atrial or ventricular tachyarrhythmias and ventricular fibrillation.²⁰ Once the diagnosis of TTC is confirmed and an arrhythmia is present during ECG monitoring, the recommended course of treatment is to initiate beta blockers. The LIP should consider adding low molecular weight heparin for patients with atrial fibrillation²⁰ owing to the rhythm's increased incidence of thrombus formation.²⁴

Cardiogenic Shock

Recent evidence suggests that younger age (63 ± 14.9 years), male sex, low LVEF, apical ballooning, atrial fibrillation, and physical triggers are independent factors contributing to a higher risk of developing cardiogenic shock in TTC.²⁵ The patient presenting with cardiogenic shock and poor cardiac output requires standard treatment for shock, including fluid resuscitation to restore euvolemia.⁹ In the absence of LVOTO, inotropic agents, specifically dopamine or dobutamine, may be used temporarily to improve systolic function.^{7,14} If shock persists, the LIP should anticipate the transition of the patient to mechanical cardiac support in consultation with the most responsible health practitioner. After statistical analyses in a recent study ($N = 2078$), patients who underwent intra-aortic balloon pump, Impella ventricular support (Abiomed), and/or extracorporeal mechanical oxygenation ($n = 39$) had a significantly lower risk of in-hospital mortality compared with those who did not receive mechanical cardiac support.²⁵

Thromboembolic Risk

On the basis of the LIP's assessment of the patient's risk of thrombus formation on the basis of the degree of akinesia as well as cardiac and inflammatory biomarkers, the administration of anticoagulation therapy may be indicated.^{6,17} Patients experiencing TTC with higher degrees of akinesia through echocardiography as well as elevated troponin levels should be considered at an increased risk of developing a thromboembolism.¹⁸ In a recent study from a multicenter international registry ($n = 541$), Santoro et al identified enoxaparin 1 mg/kg subcutaneously every 12 hours as an effective treatment for thrombus prevention in patients classified as at risk, specifically those with apical ballooning and troponin I exceeding 10 ng/mL. Warfarin and enoxaparin can be given together before discharge until a therapeutic value of international normalized ratio of 2.0 to 3.0 is reached.¹⁸ On discharge, oral warfarin therapy as a single agent is recommended for a duration of 3 months to ensure long-term survival, with associated frequent monitoring of the international normalized ratio.¹⁸

LVOTO

As previously noted, a critical aspect of the LIP's care is determining the presence of LVOTO through transthoracic echocardiography.¹⁴ Caution is advised in the administration of inotropic and/or vasodilating agents in patients experiencing LVOTO because these agents will likely worsen the obstruction by increasing hypercontractility and are widely contraindicated.^{7,14} It is recommended to proceed with beta blockers in the cohort of patients with LVOTO,⁶ specifically a short-acting beta blocker administered intravenously²⁰ because the medication may reduce the hypercontractile state and potentially clear the obstruction.¹⁴ A recent case control study ($n = 9$) evaluated the efficacy and safety of esmolol, a short-acting selective beta-1 blocker, as an acute treatment for LVOTO in TTC.²⁶ It was determined that a continuous infusion of esmolol at a rate of 0.15 to 0.3 mg/kg/min for 24 hours, followed by 1.5 mg of bisoprolol orally, significantly and safely reduced the intraventricular gradient.²⁶

Long-Term Management of Inflammation

Recent evidence has highlighted chronic persistence of inflammation and higher incidence of morbidity for many patients after the acute management of TTC¹¹ and has been attributed to persistent sympathetic dysfunction.²⁷ The LIP should consider the management of sustained sympathetic dysfunction and inflammation as an essential aspect of their care after an acute episode of TTC. In a recent double-blind randomized controlled trial ($n = 48$), Marfella et al evaluated the efficacy of α -lipoic acid (ALA) in improving adrenergic cardiac innervation as well as decreasing inflammation, oxidative stress, and myocardial damage among patients with TTC over a 12-month study period.²⁷ Of note, the treatment group receiving ALA achieved a statistically significant increase in LV uptake through myocardial scintigraphy compared with the placebo group. In addition, the treatment group experienced a significant reduction

in inflammatory markers, namely plasma C-reactive protein, tumor necrosis factor- α , and nitrotyrosine. Considering the persistence of systemic inflammation after the acute management of TTC,² the LIP may choose to proceed with the prescribing of ALA as a means of managing potential long-term morbidity associated with TTC.²⁷

Implications for Emergency Nurses

Emergency nurses are the first point of contact for patients seeking care through the emergency department; therefore, they have the responsibility of gathering clinical information that contributes to a broad clinical perspective and may lead to a differential diagnosis of TTC. A diagnosis of TTC should remain a possibility for patients presenting with chest pain who are postmenopausal, female, have a confirmed psychiatric diagnosis, and/or have experienced a major stressor. An awareness of TTC's distinct clinical findings is essential for a timely diagnosis, and it is necessary that emergency nurses have access to educational materials inclusive of TTC's clinical findings and anticipated management. Collaboration among emergency nurses, clinical educators, and nursing managers is essential for effective training and education. In addition, support and financial allocation at an administrative level are necessary for continued research and education related to TTC.

Implications for Emergency Clinical Practice

Female sex and previous overwhelming stressor as well as psychiatric and/or neurologic disorders are predisposing factors that may lead clinicians to suspect a diagnosis of TTC in emergency settings when presenting with chest pain. TTC is similar to an acute myocardial infarction or myocarditis in its acute presentation; however, the LIP's prompt evaluation through ECG, echocardiography, and angiography will provide an accurate diagnosis. A timely differential diagnosis of TTC in the emergency department is imperative to ensure optimal patient outcomes. Patients presenting without complications require supportive care and telemetry monitoring for 48 hours. Patients presenting with, or those who develop, complications will require extensive measures and admission for >72 hours. Managing complications: (1) acute heart failure warrants treatment with ACE inhibitors/ARBs and furosemide; (2) patients with atrial fibrillation require prophylactic low molecular weight heparin; (3) standard treatment protocol for cardiogenic shock should be observed, including fluid resuscitation and inotropes in the absence of LVOTO; (4) enoxaparin is effective in the acute management and prevention of a thromboembolism, followed by oral warfarin; (5) esmolol is effective in reducing pressure gradient among patients with acute LVOTO; (6) ALA may be effective in reducing serum inflammatory markers that remain elevated after the acute management of TTC.

Conclusion

TTC poses a unique challenge to clinicians owing to its ambiguous presentation and elusive etiology. The LIP must balance the necessity of prompt intervention in the context of an ACS presentation, with the required patience in awaiting diagnostic confirmation of TTC. Research continues to explore the intricacies and highly subjective nature of this syndrome, although impactful clinical guidance has supported practitioners with evidence-based comprehensive diagnostic criteria.^{13,14} This article fills a very necessary gap in the literature and clinical awareness of TTC by targeting LIPs in emergency settings and offering evidence-based diagnostic criteria and treatment protocols. In the context of TTC, the LIP has the unique role of gathering the whole clinical picture, one in which emotional, physical, and mental well-being intersect to influence one's health status. With a comprehensive assessment of each individual patient's precipitating events and predisposing factors, as well as a thorough understanding of the diagnostic criteria, LIPs can feel supported in diagnosing and properly managing an acute episode of TTC. By applying evidence-based practice, the LIP can work efficiently and effectively, ultimately ensuring best patient outcomes.

Author Disclosures

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Diagnostic criteria	Points
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Female sex	25
Emotional stressor	24
Physical stressor	13
No evidence of ST depression on ECG	12
Psychiatric disorder	11
Neurologic disorder	9
Prolonged QTc interval	6
Diagnosis based on points accrued	
≥50 points Diagnose Takotsubo cardiomyopathy	≤31 points Diagnose acute coronary syndrome

Clinical presentation	Signs and symptoms	Diagnostic findings
TTC	•Chest pain, dyspnea, arrhythmias •Potential sudden cardiac death •May be preceded by emotional/physical stressor	ECG:•ST elevation, ST depression, QTc prolongation, and/or T-wave inversion Echocardiogram:•Hypokinesia or akinesia at apical, midventricular, basal, or focal sites Coronary angiography:•No evidence of obstructive CAD or plaque rupture
Myocardial infarction	•Chest pain, dyspnea, arrhythmias •Potential sudden cardiac death	ECG:•ST elevation or depression; T-wave inversion Echocardiogram:•Regional wall motion abnormalities Coronary angiography:•Evidence of CAD with plaque rupture, thrombus, and coronary dissection
Myocarditis	•Chest pain, dyspnea, acute heart failure •Potential sudden cardiac death •May be preceded by upper respiratory tract infection or enteritis	ECG:•Nonspecific ST–T-wave changes Echocardiogram:•Global systolic abnormalities Coronary angiography:•No evidence of obstructive CAD or plaque rupture

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Migrating Swollen Joint and Lyme Disease: A Case Report: JEN

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ABSTRACT (ENGLISH)

This article discusses a case involving a pediatric patient who presented to a large urban children's hospital in the Northeastern United States with complaints of migratory monoarticular joint swelling. The patient had presented with a swollen and painful left knee but with no other associated symptoms. He was nontoxic appearing, afebrile, and had normal vital signs. On examination, he was noted to have a tender and swollen left knee that was not erythematous, bruised, or warm to the touch. There was a history of fevers over the summer after returning home from a camping trip in a park located in the northeastern United States. A plain film knee x-ray showed signs of joint effusion but no osseous abnormalities. A bedside ultrasonography of the knee showed a pocket of fluid in the joint space. With parental consent, the left knee joint was aspirated under direct ultrasound guidance, with collection of dark yellow synovial fluid. This was sent for analysis that included cultures, Gram stain, crystal analysis, and Lyme antigens. The patient was admitted, and his symptoms improved during his hospitalization. The results were positive for Lyme and he was discharged home on a 3-week course of Amoxicillin with complete resolution of his symptoms.

FULL TEXT

Contribution to Emergency Nursing Practice

- The current literature on Lyme disease indicates that early treatment can help prevent progression to early and late disseminated disease, which often lead to conditions such as heart block, Bell palsy, and arthritis.
- This case report highlights the importance of prompt diagnosis of Lyme disease and the different diagnostic modalities that can assist providers in establishing a diagnosis.
- Key implications for emergency nursing practice found in this article are remembering to keep tick-borne illnesses high on the differential in patients presenting with a history of joint pain/swelling, rash, and influenza-like symptoms.

Introduction

A 9-year-old boy was brought into the children's hospital emergency department for evaluation of left knee pain and swelling for the past 2 days. The patient was seen ambulating with the assistance of crutches to his room. His parents had been giving him ibuprofen and Tylenol with mild relief of symptoms. He was afebrile with normal vital signs. Of note, he had been dealing with intermittent pain and swelling of the right knee for nearly 2 weeks, which had spontaneously resolved the day before the onset of his left knee swelling. He denied any antecedent trauma or injury to either knee. He also denied having any other symptoms such as fever, chills, nausea, vomiting, cough, or a rash in the recent past. He was an otherwise healthy boy with up-to-date vaccinations and no known medical problems.

From the history provided by his mother, the patient spontaneously developed right knee pain and swelling nearly 2

weeks ago. He had been in his usual state of health and had no recent illnesses or infections. Other than his knee, no other joints were affected. He was not involved in any sports or any recent bicycle or motor vehicle accidents. One week prior, he was evaluated at an outpatient orthopedic clinic for the right knee pain and swelling. At that facility, the staff obtained knee x-rays that were reportedly unremarkable. He was sent home with a plan in place for him to return to the clinic for a magnetic resonance imaging scan of the right knee if his symptoms persisted. There was no family history of rheumatoid arthritis, juvenile idiopathic arthritis (JIA), or any other rheumatologic or autoimmune disease. No recent travel outside the country or visits to parks within the past few weeks were reported. It was noted that he did go camping with his father approximately 2 months before the onset of symptoms. They went on a 3- to 4-day trip to a local state park. Shortly after returning home, he developed intermittent fevers with no associated rash, cough, chest pain, vomiting, or diarrhea. He denied any tick or bug bites.

On physical examination, the patient's left knee was visibly swollen compared with his right. It was not erythematous or warm to the touch. There was no obvious bruising or deformity of the knee. He had mild pain on active and passive motion of the knee joint. He had no significant pain on valgus or varus stress of the knee and no laxity, clicks, or obvious knee dislocation. Overall, the patient was noted to have normal strength, tone, and reflexes. Lower extremity pulses were normal, and capillary refill was less than 2 seconds. The rest of his physical examination was unremarkable, with no murmurs auscultated, rashes appreciated, or erythema of the tympanic membranes or adenoids detected.

The Painful and Swollen Knee

The etiology of a painful or swollen knee in any pediatric patient is largely broken down into 2 categories: traumatic or atraumatic. With traumatic knee injuries, the signs and symptoms can be obvious or subtle, depending on the clinical presentation and physical examination. Although a small compartment, the knee is associated with multiple bony, ligamentous, and muscular components.¹ Among many other things, the pain and swelling could be a result of a patellar fracture or dislocation; distal femur, proximal tibia, and/or fibula fracture or contusion; or a complete/incomplete medial, lateral, or anterior collateral ligament tear. Workup and management generally involve imaging, pain relief, provision of assistive devices, and possible orthopedic follow-up. A subgroup may need admission for operative repair. With atraumatic injuries, the history and associated symptoms play a large role in establishing a diagnosis. The differential can be vast and may include diseases such as septic arthritis, JIA, rheumatoid arthritis, and Lyme disease. There can be a family history component, particularly with many of the autoimmune diseases. It can also be a consequence of a medical condition such as lupus or rheumatic fever. These results, however, do not indicate whether this is an acute or past infection. At presentation, the patient was afebrile and did not exhibit symptoms of strep throat, such as sore throat, swelling, or exudates.

Lyme Disease

Lyme disease is a tick-borne illness that is caused by the *Borrelia burgdorferi* bacterium. Multiple ticks carry and transmit the disease, but in the United States the most common Lyme-carrying tick is *Ixodes scapularis*.² The tick itself is normally carried by deer and mice and, as a result, can spread over long distances.^{2,3} This disease-carrying tick is endemic to the Northeast, and there are more than 300 000 people affected yearly, although only a small percentage of the affected individuals go on to develop symptoms.³ When symptomatic, the disease has a broad spectrum of clinical manifestations that can vary in severity and length.

For an individual to develop Lyme disease, the tick must be latched onto their body for approximately 36 to 48 hours. If the tick is present for less time, the likelihood of transmission is low.⁴ Those at greatest risk are typically campers or hikers in the Northeastern portions of the United States who are not wearing protective long-sleeve clothing or approved repellents. Spring and summer tend to be the most common seasons when people are affected. Once

infected, most people tend to develop symptoms within 1 to 2 weeks.^{1,5} The most common sign and presenting symptom of Lyme disease is a rash called erythema migrans, which is also known as a bull's-eye rash owing to its appearance on the skin. This is the presenting feature in approximately 70% to 80% of those affected by Lyme disease.^{4,6} The rash itself does not tend to be pruritic or painful in nature and does not develop associated vesicles or bullae. It is found wherever the tick bite occurred, a bite that most of those affected do not remember getting or one that was attributed to being caused by another insect such as a mosquito. From here forward, the clinical manifestations of Lyme are broken into 3 categories: early localized, early disseminated, and late disseminated disease.^{4,7}

Early localized disease is defined by a constellation of relatively nonspecific symptoms. Although the appearance of erythema migrans at the bite site is pathognomonic, it is not always present. The most common areas affected are the arms, legs, and skin folds. With the development of the rash come influenza-like symptoms such as fever, chills, fatigue, myalgias, and headaches.⁵ A prospective study involving 79 patients with known Lyme disease found that fatigue was the most common complaint at 54%, followed by myalgias and headaches, at 42% and 44%, respectively.⁴ The presence of upper respiratory or gastrointestinal symptoms is rare and could suggest a different etiology. Early disseminated disease tends to occur weeks to months after the initial infection. It is characterized by a multitude of neurologic manifestations. These include meningitis, peripheral neuropathy, and facial palsies. A small percentage of patients will present to the hospital with bilateral facial palsy. Early disseminated disease may also manifest with cardiac complications, the most well known being atrioventricular nodal heart block.⁸ Late disseminated disease tends to occur months to years later. In this group of patients, identifying Lyme as a possible cause of their symptoms can be difficult because a subset of individuals lack the earlier manifestations of Lyme disease. Approximately 50% to 60% of those untreated for Lyme disease will go on to develop migratory arthritis, as in our patient.^{1,4} On presentation to the emergency department, the patient had developed these symptoms nearly 2 months after the suspected time of infection. The more commonly affected joints include the hip, knee, and elbow. Other manifestations of late disseminated disease include peripheral neuropathy, encephalopathy, and cutaneous rashes.⁴

The diagnosis of Lyme disease requires analysis of body fluids for antigens specific for Lyme. The use of Western blot and enzyme-linked immunosorbent assay is the most common method in establishing the diagnosis of Lyme because these tests have both high sensitivity and specificity.^{2,9} The accepted protocol at most institutions involves a two-step confirmation process. The first step is to start with the enzyme-linked immunosorbent assay and then move on to the Western blot if the initial test is positive or equivocal. The Centers for Disease Control and Prevention, which focuses on infectious disease control and prevention, emphasizes this 2-step process. Because it takes time for the body to make antibodies, it is suggested that Lyme testing should occur 3 to 4 weeks after the presumed exposure.⁴

In confirmed cases of Lyme disease, it is imperative to treat the patients with antibiotics to prevent the progression of the condition. The first-line antibiotic for the treatment of early Lyme disease is doxycycline. Doxycycline is not only useful for Lyme, but also for other diseases carried by these ticks. It is highly effective against the disease but should be avoided in children aged below 8 years and women who are pregnant or breastfeeding owing to the risk of permanent teeth discoloration. The alternatives include Amoxicillin, Augmentin, and Azithromycin.^{5,10} In those with disseminated or late-stage Lyme disease, intravenous cefTRIAXone is first-line treatment, with doxycycline and cephalosporins such as Cefotaxime serving as second-line alternatives. On average, the length of treatment will be between 2 and 4 weeks. Those who present with severe disease such as meningitis or encephalitis will require admission and intravenous antibiotics.¹ The antibiotics of choice include cefTRIAXone and Cefotaxime. Adjunct

therapies include Tylenol and ibuprofen for joint pain and potentially a pacemaker in those who develop second-degree type 2 or complete heart block.⁸ The use of corticosteroids should be avoided even in those who develop neurologic complications because they have not shown benefit in prior studies.³

Other Considerations

Not all ticks cause Lyme disease, and it is important to be able to distinguish erythema migrans from other rashes when considering the diagnosis of Lyme disease. Cellulitis, viral rash, or bites from other organisms can lead providers down inaccurate diagnostic pathways. Cellulitis tends to be more confluent in nature and lacks the central clearing of erythema migrans. Bites from spiders, for example, tend to be more pruritic, painful, and likely have a necrotic center compared with what is seen in Lyme disease. In addition, it is imperative to rule out conditions such as septic arthritis and osteomyelitis. The following are a few of the many conditions one must consider when a patient with a similar story to this case seeks treatment in the emergency department. It is the physical examination, history, symptoms, laboratory tests, and location that will help providers make the proper diagnosis.

JIA is a condition that generally affects younger children and is characterized by swelling and pain of multiple joints.^{11,12} It tends to occur unexpectedly and is noticed by the parents when they see the child limping. Many of these patients have pain and swelling that are noted earlier in the day but later completely resolve on their own.¹¹ Although the joint may feel warm and be swollen as well as tender to touch, these patients rarely have the constitutional symptoms one would expect with Lyme disease.¹² No specific markers are available to test for JIA, although inflammatory markers such as erythrocyte sedimentation rate (ESR) may be useful. The diagnosis is more likely to be one of exclusion.¹¹ There are subsets of JIA, such as systemic JIA and polyarticular JIA, that can make it more difficult to form a diagnosis because these can have systemic symptoms associated.¹¹ This is where obtaining Lyme titers can help the provider not to miss the diagnosis.

Southern tick-associated rash illness (STARI) is a disease caused by another common tick, in this case the lone star tick. Like Lyme, STARI is characterized by the appearance of erythema migrans and influenza-like symptoms.¹³ Its distribution is usually in the Southern and Midwestern states compared with the Eastern and Northeastern states where Lyme is endemic.¹³ Unlike Lyme, there are no specific tests to confirm the diagnosis, and the presence of Lyme titers is very useful in ruling in Lyme as the etiology. Overall, the rash and symptoms that accompany STARI are less significant than those that accompany Lyme. There are rarely any long-term consequences such as arthritis and heart block. Of note, STARI can be treated with the same antibiotics as Lyme disease.

Babesiosis is a disease caused by protozoa, most commonly *Babesia microti*, that are carried by certain ticks in the US.¹⁴ It is most endemic to the Midwestern US, although there are documented cases in the Northeast as well.¹⁴ Generally, people who are affected are asymptomatic. Otherwise, the most common symptoms are fever and hemolytic anemia. The incubation period is generally 2 to 4 weeks before the onset of symptoms. The patients otherwise develop generalized influenza-like symptoms and recover within 1 to 2 weeks. A small percentage can go on to develop high fevers, severe anemia, and multiorgan failure, leading to death.¹⁵ Unlike in the case of Lyme, a rash is rare, and the appearance of a rash should heighten suspicion of Lyme co-infection or another etiology. Diagnosis is obtained by identification on a blood smear and looking for the pathognomonic Maltese cross formation.^{14,15} Certain laboratories may also perform serologic and polymerase chain reaction testing for babesiosis. Treatment is usually successful after 1 to 2 weeks of antibiotics. The treatment of choice is a combination of Azithromycin and Atovaquone.^{14,15}

Rocky Mountain spotted fever (RMSF) is a disease caused by the *Rickettsia rickettsii* bacterium that is primarily found in the tick *Dermacentor variabilis*.^{16,17} The incidence of RMSF is most common during the summer months, and although it is present throughout most of the United States, the highest incidence occurs in the Central,

Southeastern, and Northern United States.¹⁶ Once the disease has been transmitted from the tick to the human host, the severity of illness is broad, ranging from a mild influenza-like illness to death. The average incubation period is between 5 and 14 days.¹⁸ The current death rate for the disease is approximately 0.5%. As in the case of Lyme disease, the hallmark of RMSF is a rash. Unlike individuals affected with Lyme, those affected with RMSF do not develop erythema migrans. The rash is a blanching erythematous rash that usually begins on the wrist and ankles and then spreads to the trunk.^{17,18} This helps in aiding providers to distinguish the 2 rashes, but it is important to remember that not all cases feature a rash. Laboratory tests may aid in the diagnosis, with notable hyponatremia, thrombocytopenia, and elevated liver function enzymes.^{16,17} Treatment is similar to that for other tick-borne illnesses, with doxycycline being the first-line antibiotic even for children and pregnant women.¹⁸

Return to the Case

A plain film knee x-ray was obtained that showed a joint effusion but no osseous abnormalities. A bedside ultrasonography of the left knee was performed and demonstrated a moderate-sized knee effusion. After parental consent was obtained, knee arthrocentesis under direct ultrasound guidance was performed, and approximately 7 to 8 cc of dark yellow fluid was obtained and sent for laboratory analysis. Figures 2 through 4 are images of the bedside ultrasonography showing a collection of fluid in the patient's left knee joint space.

Owing to concern regarding an infectious or autoimmune etiology, laboratory tests were obtained that included complete blood count, comprehensive metabolic panel, ESR, and C-reactive protein. The synovial fluid was sent for culture, cell count, Lyme, and crystal analysis. During this time the patient was given ibuprofen, which, combined with the removal of synovial fluid from the left knee, significantly improved the patient's pain. The patient was admitted while laboratory test results were still pending. At that time, the orthopedics service staff were consulted for their recommendations in this case. In addition to what had already been done, they recommended an infectious disease consult. The patient was found to have positive antistreptolysin and anti-DNase antibodies, which are indicative of a prior streptococcal infection such as streptococcal pharyngitis or rheumatic fever.^{1,5}

While admitted, the patient's clinical course was unremarkable, and he remained stable. The laboratory test results indicated no significant leukocytosis or bandemia and a normal ESR but an elevated C-reactive protein level. Additional laboratory tests were performed, and these showed a negative rheumatoid factor, positive antinuclear antibodies with low titers, and positive antistreptolysin and anti-DNase antibodies. His synovial fluid analysis showed 37 000 white blood cells but no growth or organisms, and it was negative for crystals but positive for Lyme disease. In addition, he was noted to have high Lyme titers. He was sent home after 1 day in the hospital on a 3-week course of Amoxicillin 500 mg 3 times a day. The patient did well on the antibiotics with no complications or adverse effects. His symptoms resolved, and he did not develop any other clinical manifestations of Lyme disease.

Discussion

Lyme disease is an infectious disease caused by the *Borrelia burgdorferi* bacterium. The *Ixodes scapularis* tick is the most common vector that carries this bacterium and helps its spread. These ticks are most commonly found in the Eastern and Northeastern United States and are normally found on animals such as deer. Those at the highest risk of infection include hikers and campers who do not wear or use protective gear. This includes using repellents and wearing long-sleeve clothing. For one to develop Lyme disease, the tick must be attached for a period of at least 36 hours after which the patient will begin to manifest symptoms within the next 1 to 2 weeks.

The early stages of Lyme disease are characterized by influenza-like symptoms and, at times, the distinctive bull's-eye rash known as erythema migrans. Not making a diagnosis soon enough or patients not presenting early enough for treatment puts patients at risk of developing early and late disseminated disease. This leads to the possible development of heart block, Bell palsy, and other conditions. The presence of migratory arthritis, rash, unexplained

fevers, and influenza-like symptoms should prompt exploration of possible Lyme disease infection, especially in areas where the incidence is high. When there is a suspicion of Lyme, it is essential to explore and extract the right history and risk factors during history taking. Other tick-borne illnesses and rashes must be excluded as much as possible through the history and physical examination. One must then rely on modalities of examination such as x-rays and laboratory tests. The use of ultrasound is useful in evaluating swollen joints and in obtaining fluid samples when performing joint aspiration, as was the case with our patient. The treatment of choice is doxycycline in all patients, except for children aged below 8 years and pregnant women. Many of the other tick-borne illnesses that can mimic Lyme disease or make the diagnosis difficult are conveniently treated with the same antibiotics.

Implications for Emergency Clinical Care

Emergency nurses play a vital role in assisting providers with a differential diagnosis and executing the plan of care. They are usually the first ones to see the patient and overall spend more time than the providers with the patient and their family. Once triaged and brought into a room, it is important that any patient with complaints of rash or influenza-like symptoms be undressed and placed in a gown. Emergency nurses are astute at asking the right questions and identifying any abnormalities on physical examination. They may identify information or findings that were missed on the provider's physical examination. It is important that open lines of communication are maintained between emergency nurses and providers to assist in establishing an accurate diagnosis.

The differential in a case like this is broad. Patients and families may not remember a tick bite that occurred a few weeks before the onset of their symptoms. It is important to identify the small clues provided by patients and families. In cases of atraumatic joint pain and swelling, rheumatologic and infectious conditions should be at the top of the list of differential diagnoses. It is critical to promptly diagnose Lyme disease or other tick-borne illnesses to prevent severe or lifelong consequences.

Conclusion

Overall, this patient's presentation was a classic example of the manifestation and disease progression of Lyme disease. The patient's presentation, combined with his symptoms, helped to broaden the differential and lead us to our diagnosis. The history of camping during the summertime along with what the family thought were innocuous fevers further gave rise to the suspicion that Lyme disease could potentially be the culprit. A thorough physical examination and use of ultrasonography allowed us to hone in on these suspicions and execute the appropriate plan of care. This plan included laboratory workup and a knee arthrocentesis. The results showed Lyme titers, and the patient was placed on appropriate antibiotics, which led to a resolution of symptoms and avoidance of further complications. Depending on the geographic location, the differential may change. A provider in Arizona will have Rocky Mountain Spotted Fever higher up in their differential than one who is seeing patients in New Hampshire. It is important to have some knowledge of the epidemiology of tick-borne illnesses and their overall distribution across the United States to provide the best possible care and prevent lifelong health consequences.

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Conflicts of interest: none to report.

Ethical statement of consent: Parental consent was obtained for the publication of the case and images. There is no identifying information in the case report, nor is there any identifying information in the ultrasound images published. This case adheres to Elsevier's patient consent policy.

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Adolescent With von Willebrand Disease Type 3 Spontaneous Abdominal Hemorrhage: JEN

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ABSTRACT (ENGLISH)

An adolescent female classified as unstable with a spontaneous abdominal hemorrhage was transferred to a level 1 pediatric trauma tertiary emergency department. Pertinent medical history included von Willebrand disease type 3, menorrhagia, and obesity. Preparation before patient arrival included mobilization of multidisciplinary medical team experts in hematology, pharmacy, blood bank, radiology, and nursing who provided lifesaving interventions. The administration of factor products, blood products, interventional radiology, emergent hepatic angiography, and embolization coordination resulted in a successful outcome. After an 18-day intensive hospital course, the patient returned home close to her baseline health status.

FULL TEXT

Contribution to Emergency Nursing Practice

- The current literature on nursing care of patients with von Willebrand disease type 3 recognizes that it is rare, and patients may present with severe bleeding from the skin, mucous membranes, gastrointestinal tract, or during menstruation.
- This article contributes a case example to improve the treatment of, and provide effective nursing care to, patients with this rare disorder. It highlights the importance of collaborating with hematology and pharmacy in providing critical and timely factor products to stop hemorrhage.
- Key implications for emergency clinical practice found in this article include the importance of a multidisciplinary approach in administering lifesaving interventions that control bleeding with factor products, obtaining diagnostic imaging, and preparing for interventional radiology and surgical interventions.

Case Introduction

An adolescent female with abdominal pain and uncontrolled abdominal hemorrhage was transferred to a level 1 pediatric trauma tertiary hospital for a higher level of emergency services. The patient had a history of abdominal

pain for 1 day but denied history of trauma, fever, chills, vomiting or diarrhea. Pertinent medical history included von Willebrand disease type 3 (VWD3), obesity, and menorrhagia. Despite multiple blood products, antifibrinolytics, and vasopressor administration before arrival, internal abdominal hemorrhage continued. The outside hospital administered 3 L of intravenous (IV) 0.9% sodium chloride, IV piperacillin and tazobactam, 4 units of fresh frozen plasma (FFP) IV, 840 mg IV tranexamic acid, 2 units of packed red blood cells (PRBC) IV, desmopressin 25 mcg IV, and norepinephrine IV infusion at 15 mcg/min.

Although the outside hospital administered desmopressin, it is not typically successful in stopping hemorrhage for patients with VWD3.¹ Desmopressin action depends on the endogenous synthesis of von Willebrand factor (VWF) from endothelial cells, which is impaired in VWD3.¹⁻⁴ However, the outside hospital did not have VWF products, and a small subset of patients with VWD3 have been reported to respond to desmopressin.¹⁻⁴

Prearrival Preparation

The hospital team understood that prearrival preparation was crucial for the best possible patient outcome. Of note, all digital diagnostic images from the outside hospital had been electronically transferred before the patient's arrival. A computed tomography (CT) scan of the abdomen and pelvis at the outside hospital showed bleeding from intrahepatic hematoma and hemoperitoneum (Figure 1). Consultations occurred with pediatric hematology, pediatric surgery team, anesthesia, interventional radiology (IR), pharmacy, blood bank, and pediatric critical care nurses in anticipation of the patient's arrival. Pediatric hematology recommended administration of weight-based Humate-P (Antihemophilic Factor/VWF Complex [Human]; CSL Behring GmbH). The ED physician contacted the pharmacist who brought 6800 units of Humate-P to the emergency department. The patient care plan included the incorporation of personal protective equipment for staff safety because this transfer happened in May 2020 during the coronavirus disease (COVID-19) pandemic.

Arrival to the Emergency Department

The patient's airway was patent, color pale, skin diaphoretic, and behavior anxious on arrival to the emergency department. Vital signs included hypotension, blood pressure 79/50 mm Hg, sinus tachycardia, heart rate 110 to 160 beats per minute, and altered mental status. The patient's Glasgow Coma Scale score fluctuated from 15 when blood was administered by pressure bags to 12; when the blood infusion stopped, the patient's level of consciousness decreased such that she could open her eyes to verbal command, her words became incomprehensible, and she obeyed all motor commands. The abdominal examination revealed distension and diffuse pain in all quadrants. Pulses were palpable at the femoral site but not at the radial, deep popliteal, or posterior tibial sites. The patient was able to move all extremities. Repeat blood hemoglobin test demonstrated a decrease in the level to 8.5 g/dL despite 2 units of PRBC blood transfusions given before her arrival (Table 1). Norepinephrine IV was titrated to 20 mcg/min, 3 L of 0.9% sodium chloride IV bolus was given by pressure bag, and 2 units of PRBC were given by pressure bags to improve hemodynamics. IV Humate-P 6800 units (80 units of VWF:ristocetin cofactor [RCo] units per kg per dose of Humate-P)¹⁻³ were given per pediatric hematology recommendation to control bleeding. The patient only required 1 dose of Humate-P. Blood pressure and level of consciousness improved after administering Humate-P, IV fluids, and PRBC boluses. Humate-P was the required treatment to control VWD3 hemorrhage.⁴ Other antifibrinolytic agents do not stop VWD3 hemorrhage.⁴ Once Humate-P and other medications were administered, the patient became stabilized to transfer to IR. On the way to IR, the family was given a brief visit with the patient and an update. The patient was brought to IR for angiography and embolization. Anesthesia intubated the patient in IR. The surgical team arranged for an operating room to be kept available in case surgical intervention was required. The success of the IR procedures eliminated the need for surgical intervention.

Hospitalization Course of Events

As previously mentioned, the patient was transferred from the emergency department to IR for arteriography and embolization. Anesthesia performed intubation in IR. The right hepatic arterial vascular hemorrhage was successfully embolized in IR (Figures 2 and 3). Intermittent hypotension was noted, which required IV vasopressor medication during the 48 hours of intubation in the pediatric intensive care unit. After extubation, the hypotension resolved. Neurologically, the patient remained stable. A chest CT scan demonstrated fluid overload from pleural effusions, which resolved after treatment. Hypotension resolved after extubation owing to compression on the vena cava. The patient's hypotension resolved after extubation due to the discontinuation of sedation medication. A cardiac echocardiogram identified possible thrombosis in the inferior vena cava and superior vena cava from the hepatic adenomas. Prophylactic heparin IV was started on hospital day 4 for the thrombosis concern. IV heparin was converted to prophylactic enoxaparin subcutaneous after 11 days.

The hepatic adenomas noted in the diagnostic studies necessitated serial abdominal pressure measurements that monitored for compartment syndrome. Abdominal pressure measurements remained within normal limits throughout the hospitalization. IV morphine was effective for abdominal pain management when the patient was intubated. Acetaminophen and heat packs provided sufficient pain relief after the patient was extubated. Gastric output was monitored with a nasogastric tube until the output was resolved. IV pantoprazole helped resolve gastric output. After the nasogastric tube was removed, the patient resumed a regular diet without issues. Repeat CT angiography of the abdomen was performed to monitor hepatic adenomas, which showed no further active bleeding, but hepatic lesions of unclear etiology. The differential diagnosis included hepatocellular carcinoma, which was ruled out because the alpha-fetoprotein and beta-human chorionic gonadotropin were at normal limits. The consensus was that contraceptive use led to the hepatic adenomas. Previous case reports had reported hepatic adenomas in adolescent women treated with norethindrone acetate.⁵ The plan for this patient was to follow up with gastroenterology as an outpatient and frequently perform radiologic monitoring of the lesions. A CT scan of the abdomen/pelvis showed a right common femoral arterial pseudoaneurysm, which was monitored during the hospital course but did not require intervention. Fevers, rising inflammatory markers, and changes in clinical status indicated the need to obtain multiple sepsis evaluations. All blood cultures taken on hospital days 2, 5, and 7 remained negative. Urine and stool cultures taken on hospital day 6 remained negative. Nasal swabs for respiratory viral panel and COVID-19 produced negative results. Appropriate antibiotic coverage included a 7-day course of cefEPIME. The patient's right lower extremity maintained adequate perfusion after the right femoral artery was cannulated during embolization. Although the COVID-19 nasal swab was negative, staff wore proper personal protective equipment during aerosolizing procedures per hospital policy. During the hospital stay, the patient received a total of 8 units of PRBC and 4 units of FFP. Two units of PRBC were given at the outside hospital, 2 units during transport, 2 units in the emergency department, and 2 units in IR.

Medical staff monitored diagnostic laboratory studies during hospitalization because massive blood transfusions were required during initial stabilization and because of the history of a bleeding disorder. The physician ordered blood transfusion of the patient to maintain hemoglobin level >8 g/dL and fibrinogen level >150 mg/dL. Mild hyponatremia required monitoring, which resolved with IV fluid adjustments. Antifactor Xa assay diagnostic studies monitored plasma heparin levels with the goal of maintaining 0.1 units/mL to 0.3 units/mL levels, which was successfully done throughout hospitalization. Hematology wanted the goal trough of H antigen expression per unit vWF activity to be at least 50% of normal FVII:C plasma levels. The general population has a H antigen expression per unit vWF normal range between 50 and 200 IU per dL. Results of the factor VIII level test performed during admission showed an increase in the level by more than 200%. Hematology coordinated with pharmacy to switch

the patient to IV Vonvendi (VWF recombinant; Baxalta US Inc) for VWF replacement on hospital day 8. At that time, the hospital pharmacy had enough Vonvendi as nonformulary stock for the patient.⁶ The hospital pharmacy added Vonvendi as stock formulary in December 2020. Vonvendi is a recombinant, which means it does not have human blood or plasma, only VWF concentrate, and it does not contain factor VIII.⁶ It is approved for the control of bleeding and perioperative management in adults aged 18 years or older.⁶ This patient was aged below 18 years, but her weight was 85 kg, which was considered an adult weight, and the need to decrease the risk of thrombosis from high factor VIII levels outweighed the risk concerning her age. The administration of Vonvendi infusions occurred every other day during hospitalization with a positive effect.

The enoxaparin therapy caused the factor VIII level to start coming down. The patient was eventually discharged home on lower doses of Vonvendi as well as enoxaparin. A repeat echocardiogram before discharge remained unchanged. Duplex abdominal ultrasonography showed resolution of hepatic adenomas before discharge. Before this admission, the patient had been on a hormonal implant to control menorrhagia. Discontinuation of the norethindrone acetate and etonorgestrel subdermal implant took place owing to the concern that these hormones caused hepatic adenomas.⁷ An intrauterine device containing levonorgestrel, which limits systemic hormone exposure, was initially placed by the gynecology team but was displaced 2 days later. A single dose of medroxy PROGESTER one acetate was chosen as a short-term measure to control menorrhagia until another intrauterine device could be placed.

The patient was discharged home close to her baseline after 18 days. Visiting Nurse Association services administered Vonvendi infusion through a peripherally inserted central catheter every other day. The patient was eventually tapered off Vonvendi. Hematology followed outpatient echocardiograms that started to normalize, and enoxaparin was discontinued. The patient maintained close follow-up contact with hematology, gastroenterology, cardiology, and gynecology after discharge.

Humate-P (Antihemophilic Factor/VWF Complex [Human])

Humate-P²⁻⁴ IV administration was approved for all types of VWD, the treatment of spontaneous or traumatic bleeding, and patients with VWD3 when desmopressin cannot be used. The Humate-P manufacturers included VWF:RCo and factor VIII when developing the medication.^{3,4} Patients with VWD3 lack VWF, which made the treatment different from other types of VWD. Commercially available vials of Humate-P are manufactured with 3 different doses of VWF:RCo per vial: 600 units, 1200 units, and 2400 units; however, each lot was derived from human plasma, which contains varied amounts of VWF:RCo and factor VIII.²⁻⁴

Humate-P administration guidelines advise to not refrigerate the medication after reconstitution and administer within 3 hours of reconstitution.^{2,3} To reconstitute, use the Mix2Vial filter transfer set provided with Humate-P to mix the warm dried concentrate and room temperature diluent. Health care providers who prepare Humate-P should only use plastic disposable syringes because the protein solution adheres to the ground glass surface of glass syringes. Gently swirl after adding diluent or rotate vial. Remove filter spike before administration. Infuse the solution at a rate not exceeding 4 mL/min. Discard any unused portion. See Humate-P^{2,3} manufacturer administration instructions for complete administration guidelines at <https://www.humate-p.com/hcp>.

VWD

VWD was first described in 1926 by Dr Erik von Willebrand.² Hemophilia is a sex-linked recessive pattern disease, which is different from VWD.² An assay discovered in the 1950s demonstrated that patients with VWD had decreased levels of factor VIII in plasma that could be corrected with plasma transfusions of partially purified preparations of factor VIII. Now, these preparations also contain VWF. In the 1980s, advances in molecular genetics made it possible to distinguish VWF, which led to the classifications of different types of VWD.⁸⁻¹⁰ The physiology of

VWF is extremely complex and beyond the intent of this article.⁴ Briefly, VWF is required to maintain hematologic homeostasis by binding both platelets and vascular endothelial components at the sites where endothelial injury occur⁸⁻¹⁰ (Figure 4).

VWD clinical symptoms can present at any age, and the disease affects people from all ethnic backgrounds.^{4,10} Individuals with VWD can be asymptomatic or have many varied bleeding symptom presentations.^{4,8,9} Asymptomatic persons with VWD may only be diagnosed after a family member is diagnosed.⁴ Typical bleeding in VWD type 1 ranges from asymptomatic to serious bleeding, dependent on the degree of reduction in VWF levels. Most VWD type 1 cases involve mild to moderate mucocutaneous involvement.⁴ Individuals with VWD type 2 and VWD3 commonly have severe bleeding.^{4,8,9} Individuals with VWD3 have a combination of absent or very low VWF levels and reduced factor VIII levels, which results in significant bleeding when teeth erupt, minor childhood trauma when walking and crawling begin, or major life-threatening hemorrhage with menarche.⁴

Although acquired von Willebrand syndrome is rare, clinicians need to be aware that it occurs with some disease states and medications.^{4,10} Conditions that commonly cause acquired von Willebrand syndrome in children are Wilms tumor, congenital heart disease, and autoimmunity.⁴ Medications that have been linked to acquired von Willebrand syndrome include anticoagulants, antiplatelet agents, nonsteroidal anti-inflammatory drugs, glucocorticoids, antibiotics, alcohol, valproic acid, selective serotonin reuptake inhibitor medications, vitamin E, ciprofloxacin, hydroxyethyl starch, griseofulvin, and dextrans.⁴

Implications for Emergency Nurses

A gap in nursing education exists in the field of bleeding disorders and clotting disorders.¹¹ It is recommended that emergency nurse educators and administrators provide evidence-based nursing education for all nurses to instill skills, knowledge, and confidence in treating bleeding disorders and clotting disorders.¹¹ Emergency nurses who have a gap in skills, knowledge, or confidence in the care of patients with bleeding disorders or clotting disorders should seek out evidence-based education themselves.

Emergency nurses who care for patients with VWD need to consider providing patient education before discharge. They must consider having an open dialogue with patients on their understanding of how to avoid known triggers for bleeding, treatment, and prevention measures. If any gaps in knowledge are identified, appropriate education should be provided. Medications to avoid that can affect blood clotting should be reviewed before discharge. Patients with VWD should avoid aspirin as well as medications that contain aspirin; blood-thinning medications that include warfarin and heparin; fish oil capsules with omega 3; and nonsteroidal anti-inflammatory medications (Centers for Disease Control and Prevention: Von Willebrand Disease Guidelines, ^{Table 3}). Encourage patients with VWD to consult their primary health provider to determine which vitamins are safe. The National Organization for Rare Disorders is an excellent resource for patients with VWD and their families (^{Table 3}). Self-care educational recommendations to patients with VWD are to maintain adequate water intake, make healthy food choices, and keep an ideal body weight. Local and international resources provide information for health care providers and patients with VWD (^{Table 3}).

Patients with VWD should be taught self-management strategies to promptly treat all bruises and bleeding. Standard first aid measures should be taught to patients and families with regard to any bleeding or bruising regarding applying pressure, elevation, or applying ice as indicated by their health care provider. The patient should be advised to sit upright, remain calm, and apply direct pressure on the bridge of the nose if a nosebleed occurs. Medical attention should be sought when patients with VWD have a nosebleed that is severe or one that does not stop after 20 to 30 minutes after applying pressure; blood in urine or stools; bleeding that lasts for hours or is excessive; broken bones; cuts that require stitches or will not stop bleeding; injury to the head; bleeding in joint or

muscle; or severe pain (A Guide for People Living with von Willebrand Disorder, ^{Table 3}).

Conclusion

Every emergency health care organization should develop a multidisciplinary plan of care for patients who arrive with sudden atraumatic hemorrhage. Clinicians must consider undiagnosed, acquired, or inherited bleeding disorders and treat them accordingly. Health care providers who have access to appropriate intervention measures to control life-threatening hemorrhage would improve patient outcomes.^{9,12} It should be standard practice for administrators of health care facilities to have Humate-P available in preparation for treatment for a life-threatening hemorrhagic event.¹²

Author Disclosures

Conflicts of interest: none to report.

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Laboratory test	Prearrival laboratory results	Normal laboratory results
White blood cell count, K/ μ L	14.1	4.0–11.0
Hemoglobin, g/dL	12.5	13.5–16.0
Hematocrit, %	37.5	37–47.0
Platelets, K/ μ L	596	150–400
Sodium, mEq/L	136	135–145
Potassium, mEq/L	3.5	3.6–5.1
Chloride, mEq/L	105	98–110
Carbon dioxide, mEq/L	21	20–30
Blood urea nitrogen, mg/dL	6	6–240
Serum creatinine, mg/dL	0.75	0.57–1.30
Glucose, mg/dL	167	70–139
Lactate, mmol/L	2.4	0.5–1

Timeline	Prearrival and ED care
5:24 am	Hospital received a call to transfer patient PICU attending accepted the transfer Pediatric ED physician notified patient to arrive by critical care transport helicopter
7:08 am	Pediatric ED physician discussed case with IR resident
7:16 am	Report from OSH to ED physician: Adolescent female with VWD3 received IV DDAVP 25 mcg, FFP 4 units, TXA 840 mg, and 2 units of PRBC. Plan was start norepinephrine infusion at 15 mcg/min for hypotension Transport team was on the scene, blood pressure 79/50, heart rate 110 beats per minute. Three peripheral IV access catheters in place Patient weight 85 kg
7:20 am	Pediatric surgery paged Hospital Massive Transfusion Protocol activated
7:32 am	Emergent consult was requested with pediatric surgery
7:34 am	Case discussed with on-call pediatric hematology attending Recommendation for 80 units of VWF:RCo units per kg per dose of Humate-P (CSL Behring GmbH) IV
7:37 am	Pharmacy was called to prepare Humate-P and bring to the emergency department
7:41 am	PICU attending called and given an update
7:43 am	Updated report: ETA 7 minutes per transport team. Patient awake, alert, oriented x 3, GCS score of 14, heart rate 116 beats per minute, oxygen saturation 98% on room air
7:46 am	Pharmacy arrived with 6800 units of Humate-P (80 units of VWF:RCo units per kg per dose of Humate-P)
7:52 am	IR resident in emergency department, IR attending aware of patient but not in hospital yet
7:59 am	Patient arrived at emergency department Pediatric ED attending and nursing staff at bedside Pediatric surgery attending and residents in emergency department at bedside IR resident in emergency department at bedside Pharmacy in emergency department at bedside IV Humate-P 6800 units given (80 units of VWF:RCo units per kg per dose of Humate-P) Anesthesia consult requested by surgery
8:09 am	Anesthesia at bedside

8:39 am	<p>Summation of prearrival and ED care</p> <p>PICU attending updated: adolescent female with medical history of VWD3 transferred to emergency department for evaluation of hemorrhagic shock, hemoperitoneum, bleeding from hepatic hemangioma. Received DDAVP, TXA, FFP, PRBC on norepinephrine infusion at 15 mcg. During the ED evaluation, IR and surgical consultation were at the bedside. The patient was given 80 units of VWF:RCo units per kg per dose of Humate-P. Blood pressure transiently dropped to systolic 90s during which norepinephrine infusion was increased to 20 mcg/min. Patient received 2 units of PRBC in emergency department.</p> <p>Family saw patient briefly on the way to IR</p> <p>Family updated on patient status and care plan</p> <p>Patient transferred to IR</p>
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Resource	Website address
Canadian Hemophilia Society	https://www.hemophilia.ca/von-willebrand-disease/
Centers for Disease Control and Prevention: Von Willebrand Disease	https://www.cdc.gov/ncbddd/vwd/index.html
A Guide for People Living with von Willebrand Disorder	https://www.haemophilia.org.au/HFA/media/Documents/von%20Willebrand%20Disorder/A-guide-for-people-living-with-von-Willebrand-disorder.pdf
Haemophilia Foundation Australia	http://www.haemophilia.org.au
The Haemophilia Society (United Kingdom)	http://www.haemophilia.org.uk
Humate-P health care professional site	https://www.humate-p.com/hcp
The National Organization for Rare Disorders	https://rarediseases.org/rare-diseases/von-willebrand-disease/
Vonvendi patient and health care provider resources	https://www.vonvendi.com/

DETAILS

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Implanted Port Access in the Emergency Department: A Unit-Level Feasibility Study of a



Nurse-Led Port Access Algorithm: JEN

[ProQuest document link](#)

ABSTRACT (ENGLISH)

Introduction

The objective of this study was to determine the impact of an emergency nurse-led implanted port access algorithm for ED patients with implanted ports admitted to the hospital.

Methods

A feasibility study evaluated the implementation of a central line-associated bloodstream infection algorithm in the emergency department over a 1-month study period. Emergency nurses received central line-associated bloodstream infection education and training for port access algorithm implementation. Pre- and postimplementation surveys measured the nurses' knowledge, attitudes, and behaviors regarding central line-associated bloodstream infections. The nurses' perceptions of the algorithm were assessed pre- and postimplementation. ED patient port access and central line-associated bloodstream infection rates were compared with preimplementation rates.

Results

Emergency nurses (N = 32) received central line-associated bloodstream infection education and algorithm training. Pre- and postimplementation as well as knowledge, attitude, and behavior surveys were completed by 59% (n = 19) of the nursing staff. Knowledge regarding central line-associated bloodstream infections significantly improved, $t(19) = -4.8$, $P < .001$. The nurses' pre- and postimplementation attitude and behavior scores did not differ significantly. They expressed no concerns regarding implementation of the algorithm; 89% (n = 17) reported that the algorithm "fit well" with the ED workflow, and 21% (n = 4) integrated the patient's decision regarding venous access into their shift report. The ED port access incidence during the study period was 17.6% (n = 3), compared with 83.3% (n = 15) in the month before the study.

Discussion

The emergency nurse-led port access algorithm decreased ED port access rates. The nurses' pre- and postimplementation knowledge of central line-associated bloodstream infections increased. The emergency nurse-led port access algorithm empowered emergency nurses to educate their patients on implanted port access and decreased central line use.

FULL TEXT

Contribution to Emergency Nursing Practice

- Current research has not addressed the emergency nurses' role in managing patients with implanted ports to reduce the risk for central line-associated bloodstream infection, such as determining the route for obtaining diagnostic venous sampling as well as administration of medications and intravenous fluids.
- This article contributes evidence-based practice recommendations to guide an emergency nurse's use of implanted ports for ED patients admitted to the hospital.
- Recommendations for translating the findings of this paper into clinical practice include the provision of an implanted port access algorithm used to guide the care of patients in the emergency department on the basis of condition and treatment plan.

Introduction

A central line-associated bloodstream infection (CLABSI) is described by the Centers for Disease Control and Prevention as a preventable infection that results in thousands of deaths and billions of dollars in cost to the United

States health care system each year.¹ Despite the availability of CLABSI prevention bundles and commercially available products to prevent such infections,^{2,3} an estimated 30 100 CLABSIs occur in intensive care units and acute care facilities each year.⁴ Prior CLABSI prevention research has not addressed the frequency or rationale for the use of an implanted port as a mechanism to reduce the incidence of CLABSI. Current research on CLABSI prevention predominantly addresses central venous catheters broadly, not specifically by the type of central catheter included in the study.

Implanted ports pose a unique risk of CLABSI. Although implanted ports are convenient to access, their permanent status increases their interval CLABSI risk. Nurses often access implanted ports for routine health care. Examples of such care may include diagnostic venous sampling as well as administration of medications and intravenous (IV) fluids. Other central venous catheters require an indication for placement and use in the hospital setting.

Interestingly, nurses can access an implanted port at any time; yet, the implanted ports carry the same risk of CLABSI.

A CLABSI is diagnosed when a laboratory confirms a bloodstream infection in a patient with a central line in place within 48 hours preceding the onset of infectious symptoms. The diagnosis of CLABSI is confirmed when a licensed independent provider cannot attribute the BSI to a source other than the central line.⁴ The National Health Safety Network (NHSN) definition of CLABSI states that implanted ports, once accessed during a hospital encounter, remain the attributable infection source throughout the remainder of that hospitalization.⁴ This criterion varies in comparison with other central lines because of the permanent state of an implanted port's reservoir and cannula, which allows bacterial contamination to proliferate within the device even when it is no longer in use. Consequently, an implanted port that is accessed on the first day of a hospital encounter will remain the designated source of any BSI that develops throughout the remainder of the hospitalization.⁴

Implanted ports are marketed as a necessary device for vesicant chemotherapy. They also provide a convenient venous access route for routine infusions and blood draws.⁴ The convenience of implanted ports for both nurse and patient can lead to a culture that minimizes the risks associated with this type of central venous access. Nurses use their clinical judgment when determining the type of venous access needed to care for their patients, and there are no published guidelines to direct the use of implanted ports in the acute care setting.

The current literature focuses on infection prevention (IP) specialists' view of CLABSI prevention initiatives in the context of a quality improvement process, specifically, learning from past mistakes.⁵ The views of IP specialists contrast with those of bedside nurses interested in recurring education, procedure repetition, and the ease of integrating new strategies into their daily workflow.^{5,9} Special attention is necessary to educate emergency nurses and providers regarding new or unfamiliar vascular access devices to reduce the risk of device misidentification and adverse events.¹⁰

Emergency nurses more readily adopt CLABSI reduction initiatives when the workflow steps are convenient, and nurses are accountable for reporting their use of the CLABSI reduction measures in the nurse-to-nurse report.⁸ The recommended strategies for successful CLABSI prevention initiatives include providing nursing staff with a clear understanding of their role in practice change and outcome measurement.^{5,8} Research also identified support from peer leaders, hospital administration, and prescribing providers as a pathway to success.^{5,6,8}

Past research studies have discussed central venous catheters as a group. They have not distinguished an implanted port as a unique device. Still, the NHSN describes how an implanted port's permanent cannula prolongs the interval risk of CLABSI.⁴ Two systematic review articles described the risk factors for CLABSI in people receiving chemotherapy.^{11,12} These studies did not define the types of central lines in their sample. Instead, they concluded that all intravascular devices pose a risk of CLABSI and reported that neutropenia dramatically increases this risk.¹¹

An expert committee developed the Michigan Appropriateness Guide for Intravenous Catheters to guide decisions regarding central venous catheters.¹³ This guideline did not address the routine use of implanted ports after surgical placement, but it discouraged the placement of implanted ports for patients who require frequent phlebotomy. Only 1 published research study addressed the possibility of using central lines in the hospital only for a required indication.¹⁴ This study demonstrated how 1 hospital's policy to obtain blood cultures by peripheral venipuncture, as opposed to the routine practice of sampling from central lines, had a statistically significant impact on blood culture contamination rates and reduced reportable CLABSIs.¹⁴ The study is very relevant and supports the need to integrate this practice for all hospitalized patients, including those patients with implanted ports admitted to the hospital from the emergency department.

The purpose of this feasibility study was to determine the impact of an emergency nurse-led port access algorithm on the rate of implanted port access during the hospital encounter. This study built on current evidence-based practices and vascular access research to mitigate CLABSI^{5,7-9,11-16} by applying the principles to those patients with implanted ports admitted to the hospital through the emergency department. The emergency nurse-led port access algorithm guides emergency nurses through the process of determining whether peripheral or central venous access is necessary for a given clinical situation. The aims of this feasibility study were to (1) evaluate the use of the emergency nurse-led port access clinical algorithm and (2) examine emergency nurses' perceived knowledge, attitudes, and behaviors (KAB) related to CLABSI. The Standards for QUality Improvement Reporting Excellence (SQUIRE), REporting of studies Conducted using Observational Routinely collected health Data (RECORD), and Template for Intervention Description and Replication (TIDieR) guidelines were used to guide the methodology and data reporting for this study.¹⁷⁻¹⁹

Methods Design

A feasibility study of a unit-level education and implementation science intervention was carried out in the emergency department with no contemporaneous control or comparison group. Medical records were reviewed retrospectively.

Setting

The study was conducted at a 156-bed, urban Midwestern, nontrauma-designated hospital with an 18-bed emergency department. The department's 32 emergency nurses had 0.5 to 30 years of nursing experience (mean = 10.97 [SD = 8.96]) (Table 1). The emergency department had an 87.5% 3-month mean implanted port access rate before this unit-level intervention, and the hospital's last CLABSI diagnosis was more than 2 years ago. This study was approved by the university institutional review board (The University of Nebraska Medical Center Institutional Review Board 236-20-EP) as minimal-risk research.

Intervention

An emergency nurse-led port access algorithm was used to guide the appropriate use of implanted ports in the ED setting (Figure). A similar port access algorithm that focused on enhanced patient CLABSI education and guided clinical decision-making regarding the use of implanted ports was implemented on all hospital inpatient units several years before this feasibility study in the emergency department. Inpatients who were directly admitted to the hospital (not passing through the emergency department) were already receiving CLABSI education by nursing staff and a discussion regarding peripheral IV access, rather than implanted port access, when indicated per the inpatient algorithm. The emergency department had not been included in the hospital's original port access algorithm initiative, given concerns regarding the feasibility of implementing the algorithm in the ED setting. A 1-month study period was intentionally used to evaluate the outcomes associated with port access and, more importantly, to assess

the feasibility of integrating the port access algorithm into the ED workflow.

All emergency nurses received CLABSI education and port access algorithm training before the study implementation. Baseline staff perceptions of the port access algorithm were obtained to identify concerns and assess barriers to integrating the algorithm into the ED workflow (Table 2). The KAB survey was also administered before the study implementation. This tool was an adaptation of the knowledge, attitudes, and evidence-based practices questionnaire used in a 2013 European nursing study.⁹ The original tool had 37 items, and the adapted version used in this study had 41 items. Four questions about central line care guidelines were added to the knowledge section to reflect current CLABSI guidelines in the US. The additional questions assessed the nurses' understanding of the scrub time necessary to disinfect an access lumen, the frequency of dressing changes, the frequency of implanted port needle changes, and the duration of time during which an implanted port can result in CLABSI after it is accessed during a hospitalization. All 6 questions to measure nurse attitudes and 22 questions to measure behaviors were retained in their original form.

Education and training related to the port access clinical algorithm and recommendations to guide nurses' discussion of port access with patients and families were conducted by the researchers at either a staff meeting or through one-on-one instruction. Lead emergency nurses championed bedside nurses throughout the study period. The department manager and hospital administration placed an expectation of thorough conversations with ED patients. Lead emergency nurses, IP specialists, and study investigators were available as needed to provide complete education, with a subsequent discussion that satisfied the patient's desire for inclusion and understanding of their treatment process.

A medical record review was performed within 24 hours of each patient's ED visit to capture data related to the port access clinical algorithm's fidelity. Data collection from the medical record included the need for the implanted port, patient mode of transportation to the emergency department, Emergency Severity Index (version 4) level,²⁰ platelet count, white blood cell count, the emergency nurse's clinical decision to access the port vs placement of a peripheral venous catheter, and the emergency nurse's documentation of verbal and written CLABSI education. White blood cell and platelet count data points were only collected if this laboratory testing was performed as part of routine medical care, and no laboratory testing was performed exclusively for the purposes of this study. A daily medical record review was performed on the ED patients admitted to the hospital until their discharge to assess the incidence of implanted port access and incidence of CLABSI diagnosis during hospitalization. A single research investigator conducted a retrospective medical record review to capture data to assess the port access algorithm's implementation fidelity. When there was a lack of medical record documentation, the research nurse contacted the emergency nurse providing care for the patient to ascertain the steps of the algorithm implemented by the emergency nurse.

After the study, the emergency nurses' perceptions of the port access algorithm were collected with an open-ended questionnaire (Table 2). This postperception tool requested information about the use of the algorithm, barriers to integration into the ED workflow, and recommendations to improve the algorithm's functionality. The KAB questionnaire was also readministered after the study, and the results were compared with the preimplementation scores.

Data Analysis

Descriptive statistics were used to summarize the outcome variables, including the preimplementation and postimplementation port access rates, CLABSI rates, and the nurses' KAB scores. A paired-samples *t* test was conducted to compare the emergency nurses' pre- and postimplementation KAB scores.

Results Use of the Emergency Nurse –Led Port Access Algorithm

All emergency nurses (N = 32) received preimplementation study CLABSI education and algorithm training. Implanted port access rates were collected for the 3 months preceding implementation of the nurse-led port access clinical algorithm in the emergency department (see ^{Table 3}). Twenty of the 22 ports were accessed in the first month (90.0%), 14 of 16 in the second month (87.5%), and 15 of 18 in the third month (83.3%). The total 3-month preimplementation port access rate was 87.5% (49 of the 56 adult patients). Seventeen adult patients with implanted ports presented to the emergency department during the 31-day algorithm implementation period, and all were included in the study (^{Table 4}). This sample size (n = 17) was comparable to the number of patients with implanted ports who presented to the emergency department in the preceding 3 months.

During the study period (31 days), 3 of the 17 patients (17.6%) who presented to the emergency department with an implanted port had their port accessed during the ED encounter. The port access algorithm was used correctly in all patient situations, with appropriate nursing documentation to support deviations from the algorithm, such as a patient's decision to have their port accessed when a peripheral IV was indicated. The nurses providing care for the 3 patients who declined peripheral IV access reported that the patients chose to have their ports accessed owing to their perception that their oncologist wanted their port used for all venous access.

Peripheral IVs were placed on 82.3% (n = 14) of the patients who presented to the emergency department with an implanted port. Peripheral venous access was achieved in 1 attempt in 85.7% (n = 12) of the patients or after 2 attempts in 14.2% (n = 2) of the patients. One patient was treated and discharged from the emergency department. The remaining 16 patients (13 with peripheral IVs and 3 with accessed implanted ports) were admitted to the inpatient unit for ongoing treatment. These patients were followed through the remainder of their hospital encounter. Those with peripheral IVs did not require port access during their hospitalization, and those with accessed implanted ports did not develop a CLABSI, under NHSN criteria, during their hospitalization.

Nurses' Perceptions and Clabsi KAB

Baseline and postimplementation KAB questionnaires were completed by 59% (n = 19) of the emergency nurses who received preimplementation study education. The knowledge portion of the KAB questionnaire had a maximum score of 15 points, and a comparison of the preimplementation (mean = 10.84 [SD = 1.72]) and postimplementation (mean = 11.68 [SD = 1.41]) scores demonstrated a significant improvement in the emergency nurses' knowledge regarding CLABSI, $t(19) = -4.8$, P

The baseline nursing staff (n = 19) perceptions of the port access algorithm were that it was easy to understand. Seventy-nine percent (n = 15) reported that the algorithm "fit" into their clinical workflow, and 21% (n = 4) were not sure. An electronic version of the algorithm, integrated into the electronic medical record (EMR), was recommended by 26% (n = 5) of the staff nurses at baseline.

Postimplementation, 17 of the nursing staff (89%) reported that the port access algorithm "fit very well" into their workflow and gave them increased confidence when making decisions about whether to access an implanted port. Two nurses who noted that they did not think that the algorithm "fit" into their workflow also indicated that they had never accessed an implanted port. A preference for integration of the algorithm into the hospital's EMR was expressed by 63% (n = 12) of the staff nurses during the postimplementation assessment. Twenty-one percent (n = 4) of the staff nurses described how they integrated the patient's decision for venous access into their nurse-to-nurse shift report.

During the month preceding this implementation study, no ED nursing documentation was identified to indicate that emergency nurses were providing CLABSI education to ED patients as part of their workflow. The nurse-led port access algorithm includes steps to cue the nurse to provide patient-focused CLABSI education. When the emergency nurses were educated regarding the algorithm, they were provided with written educational resources

and scripting examples to facilitate their conversations about port access in the emergency department. During the algorithm implementation period, CLABSI education was documented on 94% (n = 16) of the patients with an implanted port.

Discussion

The implementation of an emergency nurse-led port access algorithm was a unique endeavor undertaken on the basis of prior research that supports using central venous catheters for medications and treatments that require central venous access.^{13,14} No prior research has focused exclusively on implanted ports or discussed their use in contrast with nonpermanent central venous catheters. This study implemented a port access clinical algorithm in the emergency department to increase CLABSI patient education and initiate a conversation about the necessity of accessing an implanted port for routine medical care.

Before the implementation of this feasibility study, the hospital already had a well-established CLABSI prevention plan in place for inpatients with implanted ports that included addressing the need for port access. All nurses, including emergency nurses, are required to complete a hands-on and written competency assessment of their central line access and maintenance skills, per Infusion Nursing Society guidelines,³ every 6 months. The current practice for inpatients with implanted ports includes providing the option of peripheral IV placement, rather than implanted port access, when clinically appropriate. The laboratory also obtains all blood draws peripherally to reduce the risk of central line contamination, unless directed otherwise by the nursing staff or the patient.

We recognize that implanted ports are different from the temporary central venous catheters commonly seen in an acute care setting such as the emergency department. In response, the hospital's nurse-led port access algorithm was adapted to be used in the ED setting. The recommendations for implementing CLABSI prevention initiatives in the acute care setting served as a guide for the emergency nurse education and training processes.⁵⁻⁹

As central line and CLABSI research continues to evolve, it will be important to further study the use of implanted ports separately from other nonpermanent central venous catheters in the setting of the NHSN definition of CLABSI. The rationale for each patient's implanted port placement is a critical covariate that may affect the study's outcome. Resources for establishing peripheral IV access, such as the portable ultrasound and vein-finding devices available in this hospital's emergency department, may have eased the concerns of patients who received a recommendation for peripheral IV access. This feasibility study focused on the perceptions of the emergency nurses. Collecting patient perceptions is a logical next step that would address concerns about potential harms associated with the port access algorithm.

During the study implementation process, the ED charge nurse and ED director were prepared to assist emergency nurses with patient conversations regarding a recommendation for peripheral IV access. This additional support was not requested by any emergency nurse during the study period, and the patient's emergency nurse managed all conversations. After completing the 1-month algorithm implementation period, the emergency nurses expressed a desire to continue using the port access algorithm. The algorithm was continued with support from the ED director and hospital administration.

Neutropenia associated with cancer and cancer therapy is a documented risk factor for CLABSI.^{11,12} All patients in our sample (n = 17) had a cancer diagnosis, and their implanted ports were placed for the purpose of administering anticancer therapy. The nurses providing care for the 3 patients who declined peripheral IV access reported that the patients' oncologist wanted their port used for all venous access. Messaging from the oncology community regarding the role of implanted ports may be a barrier to a patient's acceptance of a peripheral IV in situations where central venous access is not clinically required.

Consistent messaging from the emergency nurse and physician reportedly facilitated positive patient education

interactions and the patient's acceptance of peripheral IV access. Several nurses began including their use of the port access algorithm in their nurse-to-nurse shift report to reinforce its importance and maintain consistent messaging for the patient. A paper version of the port access algorithm was available at all computer stations in the emergency department. The nurses reported that the ease of access to the algorithm aided integration of the algorithm into their daily workflow and expressed that the algorithm would have been more useful if it had been available in the EMR. Future studies may wish to explore the possibility of embedding tools such as the algorithm from this feasibility study into the EMR.

Limitations

Several limitations to the generalizability of the algorithm's implementation were identified. Although there was an improvement in the nurses' knowledge scores on the KAB questionnaire, the emergency nurses' sample was not powered, limiting the generalizability of the study findings. On the basis of a significance level of 0.5, power of .95, and effect size of 0.3, a total of 134 emergency nurse surveys would have been necessary to identify a statistically significant change between the pre- and postintervention KAB questionnaire scores. The convenience sampling in a single ED setting was not adequately powered to determine a significant effect of the nurse-led intervention on KAB questionnaire scores. The fidelity of the port access algorithm was measured by retrospective medical record review and was not directly observed.

This study was implemented in an emergency department of a large, urban tertiary hospital that previously had a well-implemented port access algorithm in place for hospital inpatient units. As a result, emergency nurses in our sample may have been aware of the concept of assessing for central line access indications before accessing a port, thus increasing their acceptance of the algorithm in the ED setting. Another potential limitation of this study is related to the acuity of the patient population. No patients classified as emergent (Emergency Severity Index–1) with an implanted port presented to the emergency department during the algorithm implementation period. A barrier as perceived by the emergency nurses was the time needed to provide CLABSI education and engage the patient in a discussion regarding peripheral IV access.

Implications for Emergency Clinical Care

CLABSI prevention is vital to patient outcomes, and emergency nurses are essential to the prevention of CLABSI in the hospital setting. The emergency nurse-led port access algorithm demonstrated the capacity of 1 hospital's emergency nurses to positively influence the culture of central line use by accessing implanted ports only when clinically necessary. Educating patients to focus on IP was also central to the study. Engaging emergency nurses, patients, and families in the ED setting is an innovative approach to improve patient safety and decrease the routine use of an implanted port in the acute care setting.

Conclusions

The implementation of an emergency nurse-led port access clinical algorithm led to a reduction in the emergency department's implanted port access rate from 87.5% before implementation of the algorithm to 17.6% during the study period. Patients admitted to the hospital from the emergency department did not require port access during their hospitalization. Patients admitted to the hospital with an accessed implanted port had blood cultures drawn on the day of admission, which were negative, and none required repeat blood cultures during their hospitalization. The results of this study suggest that a nurse-driven protocol to guide decisions regarding implanted port access in the emergency department can be effective and may reduce the likelihood of port access during hospitalization, thus decreasing the patient's risk of CLABSI. Future studies are needed to determine whether the algorithm, nursing education, and patient-centered approach used in this study can be replicated and implemented across other organizations.

Author Disclosures

Conflicts of interest: none to report.

Demographics	n	Percentage
Profession		
Full-time	26	81.2
Part-time	6	18.8
Nursing experience, y		
0-5	7	36.9
6-10	4	21
11-15	2	10.5
>16	6	31.6

Survey	Questions
Preimplementation survey of nurses' perceptions of the port access algorithm	<ul style="list-style-type: none"> •Is the nurse-led port access algorithm easy to understand? •Do you believe that the nurse-led port access algorithm will fit into your clinical workflow? •What recommendations do you have to prevent disruptions in your workflow while adhering to the nurse-led port access algorithm?
Postimplementation survey of nurses' perceptions of the port access algorithm	<ul style="list-style-type: none"> •Did you care for a patient with an implanted port since introduction of the nurse-led port access algorithm? ○If yes, did you use the algorithm when caring for your patient? •Do you believe that the nurse-led port access algorithm fits into your clinical workflow? •Have you encountered any difficulties with the nurse-led port access algorithm?

Month	Implanted port present	Implanted ports accessed	Proportion of implanted ports accessed
Pre-implementation			
May 2020	22	20	90.90%
June 2020	16	14	87.50%
July 2020	18	15	83.30%
Total	56	49	87.50%
Postimplementation			
August 2020	17	3	17.60%

Characteristic	n	% of sample
Gender		
Male	8	47
Female	9	53
Age, y		
45-54	3	17.7
55-64	5	29.4
65-74	4	23.5
75-84	5	29.4
Reason for implanted port		
Anticancer therapy	17	100
Reason for ED visit		
Fatigue	5	29.4

Pain	4	23.5
Weakness/fall	3	17.6
Electrolyte imbalance	2	11.8
Fever	2	11.8
Accidental injury	1	5.9
ESI		
ESI-2	3	17.6
ESI-3	11	64.8
ESI-4	3	17.6
Mode of transport to ED		
Private vehicle	16	94.1
Emergency medical transport	1	5.9

DETAILS

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Incorporating End-of-Life Care into the Management of Dead on Arrival Patients in the Emergency Department: Invited Commentary: JEN

ABSTRACT (ENGLISH)

[...]both the Emergency Nurses Association⁸ and American Heart Association⁹ support policies and practices for family presence and family-witnessed resuscitation, as many families find reassurance in the knowledge that all possible steps were taken to revive their loved ones.¹⁰ Although incorporating end-of-life care into the management of DOA patients will undoubtedly improve patient care and family experience, addressing the needs of DOA patients and families is ultimately an ethical issue. Beyond the obvious potential physical harms of resuscitative efforts, from pneumothoraces to survival with devastating neurologic injury, being a bystander to resuscitation has been identified as a potentially traumatic event for those involved.¹¹ Moreover, when the provision of cardiopulmonary resuscitation appears to be medically inappropriate (some would use the word “futile”) by emergency medical personnel, such providers are at risk for moral injury.¹² To this end, advance care planning (ACP) provides an opportunity for the medical and nursing communities not only to align the end-of-life care desired by patients with that delivered but also potentially to prevent distress experienced by families and providers alike. In the United States, for instance, the Centers for Medicare & Medicaid Services instituted regulations in 2016 designed to encourage ACP documentation by specifically reimbursing providers for time spent on such activities.¹⁵ More recently, the emergency department setting has been identified as an underutilized venue for ACP activities, and further efforts are underway to bolster emergency department-based ACP.

FULL TEXT

In this issue of the *Journal of Emergency Nursing*, Bove et al¹ seek to describe the epidemiological characteristics of patients who were dead on arrival (DOA) in the emergency department. Traditionally, DOA patients have been studied by the medical and nursing communities using the term outside-of-hospital cardiac arrest (OHCA). The use of DOA, rather than OHCA, has important implications for how we think about these patients. The focus shifts to patients who arrive in the emergency department and the subsequent impact on care, particularly for emergency nurses who have a critical role in resuscitation and in supporting the families of DOA patients. From this perspective, the authors consider the extent to which emergency departments are meeting the end-of-life care needs of DOA patients. The discussion by Bove et al¹ represents a significant departure from the OHCA literature, which focuses on the interventions (eg, bystander cardiopulmonary resuscitation, airway management, optimal epinephrine dosing) that are meant to improve survival for a population of patients with notoriously poor outcomes.^{2,3} With end-of-life care in mind, Bove et al¹ describe the epidemiology of DOA patients.

In a single, high-volume emergency department in Denmark, Bove et al¹ found that DOA was a common event, occurring daily. The cohort was largely composed of older adults (mean age 71 years) who were found at home by their family members. The authors question whether these deaths were truly unexpected and, more integrally, whether the resuscitation attempts were consistent with the patients' goals and values. Previous research has demonstrated that patients often receive end-of-life care that is discordant with their preferences, resulting in increased suffering and disruptions in closure and grieving for their families.^{4,5} Addressing these gaps in care will require creative solutions and a coordinated approach from nurses, physicians, and advanced practice providers.^{6,7} To start, all resuscitations of DOA patients should prioritize rapid evaluation of prior goals of care conversations when possible. Further, both the Emergency Nurses Association⁸ and American Heart Association⁹ support policies and practices for family presence and family-witnessed resuscitation, as many families find reassurance in the knowledge that all possible steps were taken to revive their loved ones.¹⁰ Although incorporating end-of-life care into the management of DOA patients will undoubtedly improve patient care and family experience, addressing the needs of DOA patients and families is ultimately an ethical issue.

Certainly, the ethical principle of autonomy should spur the medical and nursing communities toward providing end-of-life care concordant with patients' wishes and values. However, the ideals of clinical practice should inspire us to

more than care concordance. The principles of beneficence and nonmaleficence guide us to move past simply delivering care designated by an individual and instead to consider how we might both provide benefit and prevent harm to patients and families at the end of life. Beyond the obvious potential physical harms of resuscitative efforts, from pneumothoraces to survival with devastating neurologic injury, being a bystander to resuscitation has been identified as a potentially traumatic event for those involved.¹¹ Moreover, when the provision of cardiopulmonary resuscitation appears to be medically inappropriate (some would use the word “futile”) by emergency medical personnel, such providers are at risk for moral injury.¹²

To this end, advance care planning (ACP) provides an opportunity for the medical and nursing communities not only to align the end-of-life care desired by patients with that delivered but also potentially to prevent distress experienced by families and providers alike. Rates of ACP documentation completion in the general population are exceptionally low, and access to ACP documents by hospital providers is even worse.^{13,14} Fortunately, a number of tactics are being employed to increase overall ACP rates. In the United States, for instance, the Centers for Medicare & Medicaid Services instituted regulations in 2016 designed to encourage ACP documentation by specifically reimbursing providers for time spent on such activities.¹⁵ More recently, the emergency department setting has been identified as an underutilized venue for ACP activities, and further efforts are underway to bolster emergency department-based ACP. For example, previous studies have demonstrated the efficacy of video decision aids in augmenting patients’ understanding of end-of-life care in a variety of settings,^{16,17} and now such interventions are being explored in the emergency department setting.¹⁸

But even with robust ACP documentation, significant barriers remain with regards to emergency provider access to such documentation –or at the very least to family understanding of patients’ goals of care. For the medical and nursing communities to ensure that potential DOA patients receive care in alignment with their values and goals—as well as to reduce family and provider trauma—we must continue to push for clear and accessible ACP documentation. Beyond this, and possibly more importantly in the time-sensitive circumstances of emergency care, we must continue to work with patients to make their wishes known to loved ones. Empowering families to advocate for the documented/expressed desires of patients will not only prevent end-of-life care that is discordant with patient values but also free families and providers from the morally laborious acts of calling for or calling off resuscitative efforts when patient wishes are unknown.

Author Disclosures

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Pain Medication Administered and Prescribed to Patients With an Ankle Sprain Treated in an Emergency Department: A Record-Based Cohort

Study: JEN

[ProQuest document link](#)

ABSTRACT (ENGLISH)

Introduction

Recent data indicate that patients treated in the emergency department for an ankle sprain receive multiple medications. However, research has not been able to accurately identify all the medications because of study limitations. The primary purpose of this study was to document the type of medication, number of doses, and number of encounters given a prescription at discharge or instructions to take over-the-counter medication. The secondary purpose was to determine if the proportion of encounters given each type of medication varied on the basis of age, sex, race, and year.

Methods

A retrospective record-based cohort study design was used to review the electronic medical records (N = 1740) of encounters reporting to a southeast academic level 1 trauma center and diagnosed with an ankle sprain between 2013 and 2017. All relevant data were extracted for nonsteroidal anti-inflammatory drugs, muscle relaxants, opioids, and nonopioid analgesics.

Results

Fifty-eight percent of the encounters had at least 1 dose of medication administered in the emergency department. Twenty-eight percent received a prescription at discharge, and 54.5% were instructed to take over-the-counter medication. Cumulatively, opioids accounted for most of the medications, but the yearly rates declined from 2013 to 2017. A greater proportion of patients aged ≤ 15 years received nonsteroidal anti-inflammatory drugs or nonopioid analgesics. Most of the patients aged >15 years received opioid medication.

Discussion

Patients are primarily given an opioid or nonsteroidal anti-inflammatory drug in the emergency department. Fewer patients receive a prescription at discharge but are regularly instructed to take over-the-counter medication.

FULL TEXT

DETAILS

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Looking to the 12 Points of the Scout Law as Inspiration: JEN

[ProQuest document link](https://www.proquest.com/scholarly-journals/pain-medication-administered-prescribed-patients/docview/2552049815/se-2?accountid=211160)

ABSTRACT (ENGLISH)

The 12 points of the Scout Law were recited weekly at my Scout meetings as a youth and now as an adult leader. Helpful: Do we take that extra step to help the person in the hospital who looks lost? Do we pick up that piece of trash along the sidewalk when we are out running errands or pick up and recycle the bottle we see on the hiking trail?

FULL TEXT

Here we are halfway through 2021 and my year as president of the Emergency Nurses Association. I got the inspiration for this President's Message topic as I was helping my son complete his Eagle Scout project. This message is written from the lens of my youth, my experience in scouting and some key components that factored into who I am today. I would like to acknowledge that the Scouts organization does have a past history of inequities and want to acknowledge the movement of the organization to be more inclusive. Like many organizations, communities, and individuals, we are all growing to be better around diversity and inclusion. The lessons I learned as a child in the Scouts are still relevant today and hopefully will resonate with you as well. The focus of this message is on the 12 points of the Scout Law.

The 12 points of the Scout Law were recited weekly at my Scout meetings as a youth and now as an adult leader. They are a good reminder and can serve as a compass for life. The 12 points are simple and can be examined more closely. The 12 points are recited, "A Scout is Trustworthy, Loyal, Helpful, Friendly, Courteous, Kind, Obedient, Cheerful, Thrifty, Brave, Clean and Reverent."

- Trustworthy*: This one resonates with us as nurses because our profession has been running for 19 years as the most trusted profession.¹ What are we doing to maintain this? Are we always offering our recommendations based on fact? Let us all do our part to keep our profession trustworthy.
- Loyal*: Do we always have each other's back? Do we return the favor for those who were there for us, and are we there for them when needed?
- Helpful*: Do we take that extra step to help the person in the hospital who looks lost? Do we pick up that piece of trash along the sidewalk when we are out running errands or pick up and recycle the bottle we see on the hiking trail?
- Friendly*: How are we at welcoming new members at our meetings? At taking a new nurse under our wing to ensure that they have a good transition into our department?
- Courteous*: A great way to show respect for others. Do we smile and greet people who do not look like us? Do we acknowledge the stranger sitting outside the convenience store? How do we treat staff outside of our department at the hospital?
- Kind*: What are we doing to seek to understand what others may be going through at the moment our paths cross? Kindness goes a long way. Personally, I recall the phrase associated with Maya Angelou, "You may not remember what a person said to you, you may not remember what a person did to you, but you will never forget how a person made you feel!" We see enough unkind things in the world around us. Be the good.
- Obedient*: Are we doing our best to live within the constructs of the law? If we disagree with some laws or norms, how are we respectfully challenging them?
- Cheerful*: Are we doing our best to live with PMA—positive mental attitude? We all face times when it may be difficult to be positive. Strive to build resilience in ourselves to maintain a positive mindset in the face of adversity. It

will make a difference for you and others. Cheerfulness and happiness are contagious. Be infectious.

- Thrifty*: Are we mindful of the resources we use during our shift at work? How are we treating our environment? How are we keeping thrifty with our time and talents? Take an inventory of what we do in a day or a week. Are we being thoughtful and not wasting time? Time check—we cannot get wasted time back.
- Brave*: To be brave, we have to experience fear. This fear can have many forms. Are we being brave to challenge inequities we see? What are we doing to be brave in standing up for what we know is right to make our world a better place?
- Clean*: This is more than a shower. This is clean on the inside and out. Are we doing right? Can we lay our head on the pillow and be okay with our day? Maybe not always—we are human, but we can always strive to be better.
- Reverent*: This can be a belief in a higher being or power. This also relates to showing profound respect. How are we reverent to our patients, our colleagues, strangers, and ourselves?

These 12 points can help us *Elevate* each day as I have challenged all of us this year of 2021. Stay positive, stay focused, and be the good!

ELEVATE

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Mitigating the Effects of Climate Change on Health and Health Care: The Role of the Emergency Nurse: JEN

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ABSTRACT (ENGLISH)

Description Earth's climate is changing more rapidly than at any other point in the history of modern civilization, and it is largely a result of human activity.¹⁻⁷ The impact of climate change is being experienced globally and is projected to intensify in the future.^{4,6,8} Climate change affects communities in many ways: the economy, social systems, quality of water, ecosystems, agriculture and food, infrastructures, oceans and coasts, tourism, human health, and quality of life.^{4,6,7} A major contributor to the warming of the climate system is the health care sector, accounting for 8% of greenhouse gas emissions in the United States and 4.5% globally.⁸⁻¹⁰ The main greenhouse gases responsible for climate change are carbon dioxide, methane, nitrous oxide, and fluorinated gases.¹¹ In conjunction with black carbon, these gases impair the earth's reflective capacity while simultaneously absorbing

solar radiation that is re-emitted to Earth's atmosphere, ultimately leading to surface warming.¹¹ Rising global temperatures are associated with more frequent and severe storms, intense heat, drought, worsening air quality, and changes in the distribution of pathogens.^{8,11-16} Water scarcity, land degradation, and desertification also have accelerated in the past century owing to natural disasters, environmental pollution, and destruction of green space.^{12,17-21} More frequent and intense extreme weather and climate-related events, as well as changes in average climate conditions, are expected to damage infrastructure, ecosystems, and social systems that provide essential benefits to communities. The physical environment where people live, learn, work, and play, which is affected by rising global temperatures, is a social determinant of health.^{22,23} Future climate change is expected to further disrupt many aspects of life, posing challenges to those most vulnerable populations including children, older adults, pregnant women, some communities of color, immigrants, lower-income and under-resourced communities, and those with comorbidities (eg, immunocompromised, allergies, respiratory disease) who have a lower capacity to prepare for and cope with extreme weather and climate-related events.^{1,2,4,6-8,24-26} Ambient air pollution contributes to 4.2 million premature deaths worldwide and is associated with increased morbidity from numerous illnesses.^{27,28} More than 90% of children are subjected to fine particulate matter that exceeds health standards, whereas maternal exposure is associated with an increase in preterm births, low birth weight, and stillbirths.²⁹ Poor air quality also leads to emergency visits for asthma, chronic obstructive pulmonary disease, cardiovascular events, and mental health complaints.^{7,12,26-28,30} In 2018, a record number of older adults (220 million) were exposed to at least 1 heatwave,⁸ with exposure to the stress of extreme heat causing nephropathy, electrolyte disturbances, cerebrovascular events, congestive heart failure, and preterm births.^{8,12,31,32} Psychological stress owing to displacement, socioeconomic consequences, and exposure to trauma is anticipated to rise with the increased prevalence of climate-related natural disasters.¹² Providing education to patients and their families on climate change and disaster readiness may help them prepare and mitigate these consequences. According to the World Health Organization,²⁸ climate change can be mitigated by transitioning to sustainable and efficient energy practices, conserving and protecting resources, designing climate-resilient infrastructure, and adopting methods of sustainable waste disposal and management practices. [...]emergency care settings can upgrade to energy-efficient equipment, replace incandescent light bulbs with LED bulbs, and install lighting control systems such as occupancy sensors.^{16,20,24,59-61} The use of renewable and alternative energy sources (eg, solar-powered photovoltaic, water pumps, wind) are additional means of reducing fossil fuel use.^{9,16,59-62} Combined heat and power technology is another alternative; this technology captures excess heat from electricity generation and uses it for thermal energy.⁹ Energy production is not the only source of carbon emission: more than half of the nitrogen oxides emitted globally are from fuels used for transportation.⁸ Using locally sourced food and on-site food production (eg, rooftop gardens) in hospital cafeterias and catering are methods of reducing emissions from transporting supplies while modeling sustainable food practices.^{8,16,24} Emergency care settings can further reduce transport emissions by supporting staff use of environmentally conscious forms of transport (eg, cycling) and advocating for vehicles (eg, ambulances) that use alternative fuel, are electric, or have zero emissions.^{12,63} Emergency nurse leaders can incorporate climate resilient solutions into facility renovation and future design.^{8,12,59} For example,

FULL TEXT

Description

Earth's climate is changing more rapidly than at any other point in the history of modern civilization, and it is largely a result of human activity.¹⁻⁷ The impact of climate change is being experienced globally and is projected to intensify in the future.^{4,6,8} Climate change affects communities in many ways: the economy, social systems, quality of water, ecosystems, agriculture and food, infrastructures, oceans and coasts, tourism, human health, and quality of life.^{4,6,7} A major contributor to the warming of the climate system is the health care sector, accounting for 8% of greenhouse gas emissions in the United States and 4.5% globally.⁸⁻¹⁰ The main greenhouse gases responsible for climate change are carbon dioxide, methane, nitrous oxide, and fluorinated gases.¹¹ In conjunction with black carbon, these gases impair the earth's reflective capacity while simultaneously absorbing solar radiation that is re-emitted to Earth's atmosphere, ultimately leading to surface warming.¹¹ Rising global temperatures are associated with more frequent and severe storms, intense heat, drought, worsening air quality, and changes in the distribution of

pathogens.^{8,11-16} Water scarcity, land degradation, and desertification also have accelerated in the past century owing to natural disasters, environmental pollution, and destruction of green space.^{12,17-21} More frequent and intense extreme weather and climate-related events, as well as changes in average climate conditions, are expected to damage infrastructure, ecosystems, and social systems that provide essential benefits to communities. The physical environment where people live, learn, work, and play, which is affected by rising global temperatures, is a social determinant of health.^{22,23} Future climate change is expected to further disrupt many aspects of life, posing challenges to those most vulnerable populations including children, older adults, pregnant women, some communities of color, immigrants, lower-income and under-resourced communities, and those with comorbidities (eg, immunocompromised, allergies, respiratory disease) who have a lower capacity to prepare for and cope with extreme weather and climate-related events.^{1,2,4,6-8,24-26}

Ambient air pollution contributes to 4.2 million premature deaths worldwide and is associated with increased morbidity from numerous illnesses.^{27,28} More than 90% of children are subjected to fine particulate matter that exceeds health standards, whereas maternal exposure is associated with an increase in preterm births, low birth weight, and stillbirths.²⁹ Poor air quality also leads to emergency visits for asthma, chronic obstructive pulmonary disease, cardiovascular events, and mental health complaints.^{7,12,26-28,30} In 2018, a record number of older adults (220 million) were exposed to at least 1 heatwave,⁸ with exposure to the stress of extreme heat causing nephropathy, electrolyte disturbances, cerebrovascular events, congestive heart failure, and preterm births.^{8,12,31,32} Psychological stress owing to displacement, socioeconomic consequences, and exposure to trauma is anticipated to rise with the increased prevalence of climate-related natural disasters.¹² Providing education to patients and their families on climate change and disaster readiness may help them prepare and mitigate these consequences. The severity of the impact of future climate change will depend fundamentally on action taken to reduce greenhouse gas emissions and adapt to anticipated changes.^{1,2,4,6} Without proactive action and substantial changes, climate-related risks will continue to grow. According to the World Health Organization,²⁸ climate change can be mitigated by transitioning to sustainable and efficient energy practices, conserving and protecting resources, designing climate-resilient infrastructure, and adopting methods of sustainable waste disposal and management practices. The emergency nurse can serve as a voice to mitigate climate change through advocacy, research, patient education, and community educational programs. In addition, the emergency nurse has various opportunities to engage others to assist in adaptation and mitigation strategies, increase awareness regarding the impact of climate change and health, support climate-friendly practices and initiatives in health care, and join others in the call for immediate action on climate change and policies that support climate adaptation and mitigation.

Emergency Nurses Association Position

It is the position of the Emergency Nurses Association (ENA) that:

1. Climate change is a global public health problem.
2. Global action to significantly reduce greenhouse gas emissions can substantially reduce climate-related risks.
3. Emergency nurses advocate to promote nursing educational opportunities and research regarding the effects of climate change on the environment and human health.
4. Emergency nurses provide evidence-based discharge education to patients and their families on relevant climate change related disaster readiness to increase their awareness of the threats and prevention strategies and reduce chronic disease exacerbations.
5. Emergency nurses and administrators lead initiatives to explore and implement strategies to design and redesign health care facilities to reduce carbon emissions and the environmental impact.
6. Emergency nurses, administrators, and health care facilities seek ways to increase energy efficiency, reduce waste, incorporate renewable energy, and help build collaborative opportunities within the community to address

climate change.

Background

The Intergovernmental Panel on Climate Change defines climate change as a transformation in the state of the climate that continues for an extended period and can be recognized by the variability of its properties.^{6,33} It also can be considered to be any change in climate over time, whether a result of natural changes or a consequence of human activity. Climate change is a global health problem that requires collaboration across various sectors to promote community climate resilience and sustainable, long-term transformation.³⁴ The heat-trapping nature of carbon dioxide and other greenhouse gases has been recognized since the 1800s as being a large contributor to climate change.⁶ Human activities such as the burning of fossil fuels and land use changes such as deforestation have caused a rapid acceleration in the atmospheric concentration of greenhouse gases.^{6,35-42} Scientists continue to observe climbing temperatures over the past century, which are attributed to changes in greenhouse gas concentrations. These effects of a changing climate are linked to fundamental health issues and pose existential risks to everyone.

Heat waves have become more frequent and prolonged, and the number of extreme cold waves has increased. Extreme heat has been associated with an increased risk of morbidity and mortality.^{43,44} Kang et al.⁴⁴ found that heat waves were significantly associated with increased risk of out-of-hospital cardiac arrest events during the afternoon when temperatures were at their highest. Other researchers have shown that thermoregulatory mechanisms are impaired in the elderly, as well as those with chronic illnesses such as diabetes, hypertension, and congestive heart failure.⁴⁴⁻⁴⁶ Globally, there has been a shrinkage of glaciers, decreasing the mass of the Greenland and Antarctic ice sheets. The sea level has risen because of these melting glaciers and the thermal expansion of warmer water.⁴⁷ As the Earth's climate continues to change, helping to adjust the daily health behaviors including mediating effects of risk perception of patients will be an important public health intervention for emergency nurses.

Climate change has led to various temperature anomalies.⁴⁸ Warmer air holds more moisture and contributes to an increase in heavy precipitation in some areas. Conversely, drier regions, such as the US Southwest have experienced drought. Whereas extreme heat and droughts are not uncommon for certain areas such as East Africa, droughts in this region have become drier and much hotter than usual affecting farming, health, humanitarian efforts, and resettlement.⁴⁹ These outcomes remain consistent with projections that wet regions will become wetter and drier regions will become drier.

With the anticipation of more flooding, emergency nurses can expect to see increased drownings, heart attacks, hypothermia, blunt trauma caused by wind-borne objects, vehicle-related crashes, snakebites, electrocutions, wound infections, and water-borne diseases.⁵⁰⁻⁵³ Intensity of hurricanes and frequency of wildfires are both additional examples of the changing climate.⁵⁴ Although the annual number of wildfires varies, the overall number of burned acres is increasing,⁵⁵ which leads to increased air particulates and smoke exposure causing increased respiratory illnesses and ED visits.⁵⁶⁻⁵⁸ In addition, particulate air pollutants released by burning fossil fuels are shortening human life in many regions of the world. Psychological stress, political instability, forced migration, and conflict are other unsettling consequences. Those most vulnerable such as the chronically ill and under-resourced communities will be most affected by the devastating consequences.¹⁰

Emergency nurses can help to increase awareness of and mitigate the effects of climate change through research, education, and community outreach. Energy optimization is 1 strategy for reducing carbon emissions. For example, emergency care settings can upgrade to energy-efficient equipment, replace incandescent light bulbs with LED bulbs, and install lighting control systems such as occupancy sensors.^{16,20,24,59-61} The use of renewable and

alternative energy sources (eg, solar-powered photovoltaic, water pumps, wind) are additional means of reducing fossil fuel use.^{9,16,59-62} Combined heat and power technology is another alternative; this technology captures excess heat from electricity generation and uses it for thermal energy.⁹ Energy production is not the only source of carbon emission: more than half of the nitrogen oxides emitted globally are from fuels used for transportation.⁸ Using locally sourced food and on-site food production (eg, rooftop gardens) in hospital cafeterias and catering are methods of reducing emissions from transporting supplies while modeling sustainable food practices.^{8,16,24}

Emergency care settings can further reduce transport emissions by supporting staff use of environmentally conscious forms of transport (eg, cycling) and advocating for vehicles (eg, ambulances) that use alternative fuel, are electric, or have zero emissions.^{12,63} Emergency nurse leaders can incorporate climate resilient solutions into facility renovation and future design.^{8,12,59} For example, the consideration of landscape features that reduce thermal stresses, use passive cooling and lighting techniques,^{8,19,64} and install green roofs or reflective roofs to reduce the heat-island effect.^{15,16,20,59,65-67} Facilities can protect and conserve water by transitioning to water-efficient equipment (eg, low-flow faucets and toilets), adopting water-recycling procedures (eg, rainwater harvesting for landscape irrigation), and mitigating potential contamination of water sources.^{15-17,19,59,68} Bioswales, aquifer storage and recovery, and desalination are examples of sustainable stormwater management practices.^{17,21,69} Chemicals used interiorly (eg, cleaning supplies) and exteriorly (eg, pesticides and herbicides) also can negatively affect water and soil quality. Adopting integrated groundskeeping practices aimed at reducing the use of environmentally harmful chemicals is 1 approach to mitigating soil and water contamination.^{16,68,70}

Sustainable waste management is necessary to preserve resources and reduce greenhouse gas emissions.⁸ Examples of sustainable approaches include reusing and recycling of industrial materials, composting, using alternative waste management technology (eg, anaerobic digestion of organic waste), and disposing of electronics in environmentally conscientious ways (eg, reusing, refurbishing, or recycling materials).^{8,16,20,69-73} Emergency departments also have the opportunity to reduce general (nonhazardous) and regulated waste. Regulated waste may be infectious, pathologic (human tissues), sharps, chemical (eg, disinfectants, batteries, solvents), pharmaceutical (eg, expired, unused, or contaminated drugs), and cytotoxic (waste with genotoxic properties).⁷⁰ Pharmaceutical management and disposal is a significant area of opportunity for reducing waste and preventing environmental contamination.¹ Pharmaceutical take-back programs are 1 way in which organizations are already combating this issue that could be further expanded.^{74,75} In addition, emergency care settings can adopt processes that promote efficient pharmaceutical use such as reducing storage redundancy and modifying purchasing habits (eg, use of therapeutic alternatives, selecting 2-part polyolefin intravenous devices that weigh up to one-third less).^{59,}

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Integrating environmental health into nursing and educating emergency nurses on climate change are important components of the reduction of health care's carbon footprint.^{12,20,22,24,26} Emergency nurses can positively influence practice by supporting policies related to climate change, modeling healthy behaviors that promote sustainability, and taking measures to minimize waste.^{10,12,15,16,22,26,28,71} Emergency nurses are also in the unique position of being able to educate patients and families on environmentally safe ways to dispose of regulated waste (eg, unused medication, medical supplies).

Unfortunately, climate change is not universally accepted as a public health hazard by health care professionals in the United States despite being one of the greatest global health threats of this century.^{7,76} It is important for emergency nurses to increase their understanding of the health threats associated with climate to assist in recognizing and anticipating climate-associated effects and become more engaged in the development and effective implementation of prevention, mitigation, and adaptation strategies.

Resources

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Lesbian, Gay, Bisexual, Transgender, Queer Cultural Competency Training to Improve the Quality of Care: An Evidence-based Practice Project: JEN

[ProQuest document link](#)

ABSTRACT (ENGLISH)

Background

One evidence-based practice strategy to improve the provision of care for the lesbian, gay, bisexual, transgender, queer population is providing cultural competency training. The aim of this evidence-based practice project was to improve Knowledge and Skills, Openness and Support, and Oppression Awareness for emergency nurses when providing care to the lesbian, gay, bisexual, transgender, queer population in the military health system.

Methods

The single-unit, educational intervention posttest compared with unit personnel historical controls project took place in an emergency department within the military health system. The participants included registered nurses or licensed practical nurses working in the emergency department. The Ally Identity Measure tool was administered to an unmatched convenience sample of emergency nurses in a military health system pre- and postintervention to assess the intervention's effectiveness. Descriptive statistics and group difference testing (*t* test) were used.

Results

The mean Knowledge and Skills subscale score was improved between the pre- and postintervention groups ($t(70) = -3.33, P = .001$). The mean Openness and Support subscale score was improved between the pre- and postintervention groups ($t(70) = -2.06, P = .04$). The mean Oppression Awareness subscale demonstrated no

significant difference between the pre- and postintervention groups ($t(70) = -0.93, P = .36$).

Conclusion

This project illustrated the feasibility of an educational intervention to promote culturally competent care in the ED environment for the lesbian, gay, bisexual, transgender, queer population. The results illustrated that emergency nurses in this military health system were aware of the oppression that this vulnerable population faces.

FULL TEXT

Introduction Problem Description

Culturally competent or culturally congruent care includes providing care that is sensitive, knowledgeable, and meaningful for the population presenting for health care services.¹ One of the vulnerable populations that exists today is the lesbian, gay, bisexual, transgender, queer (LGBTQ) population. Shrader et al² note that standardized LGBTQ cultural competency training does not exist within the military health system (MHS) since the repeal of the Department of Defense directive “Don’t Ask, Don’t Tell” in 2011. The purpose of this project was to improve the Knowledge and Skills, Openness and Support, and Awareness of Oppression when caring for the LGBTQ population in 1 emergency department within the MHS.

One challenge for health care providers when caring for this population is the lack of cultural competency training. Many organizations and experts have listed yearly LGBTQ cultural competency trainings as a strategy to improve care for the LGBTQ population.³⁻⁵ Margolies et al⁵ identify 3 common goals of LGBTQ cultural competency training: to increase knowledge, to increase LGBTQ-affirming attitude, and to increase LGBTQ-affirming behavior. Here, we describe the implementation of an evidence-based project in our unit to improve LGBTQ cultural competency among emergency nurses.

Available Knowledge

The evaluated evidence indicated that both cultural competency training and promoting gender-inclusive environments are the beginning steps to improving the provision of care for the LGBTQ population.³⁻⁵ Chisolm-Straker et al⁶ identified that 85.2% of the emergency providers reported no formal training on the provision of care for the LGBTQ population, with 88% in the same study reporting caring for this population and 79.2% agreeing that sexual orientation/gender identity questions should be part of the electronic health record (EHR).

There are several barriers that emergency nurses face to provide culturally competent care. For example, the EHR data, wristband, or other retrievable health care data may conflict with the patient’s currently preferred gender or name.⁷ Lack of health care provider cultural competency was identified as a problem when accessing health care.^{3,8,9} Furthermore, the estimated time for teaching LGBTQ health in a bachelor of science in nursing program was 2.12 hours,¹⁰ recognizing that even recently educated staff may lack adequate depth in this crucial preparation.

Although not every study in the literature we reviewed illustrated an improvement in skills and attitudes,^{11,12} all of the interventional studies demonstrated an increase in knowledge.^{2,11-14} Furthermore, patients reported wanting to be asked sexual orientation/gender identity questions by health care staff,^{7,15} and health care providers reported wanting increased training regarding providing culturally competent care for the LGBTQ population.¹⁵

Purpose

This was an evidence-based practice (EBP) project. The clinical question for this EBP project was the following: “Will the implementation of an independent, evidence-based, ED-specific, LGBTQ cultural competency education improve the knowledge, skills, and attitudes toward LGBTQ health care among emergency nurses?” The purpose of this project was to improve the Knowledge and Skills, Openness and Support, and Awareness of Oppression when caring for the LGBTQ population in 1 emergency department within the MHS.

Methods Design

This was a single-unit, EBP project using a pre- and posteducational intervention approach. Unmatched pre- and postintervention assessments of individual nurses were used for data collection.

Context

This project took place in an emergency department within the MHS where there is access to emergency care for

adult and pediatric patients who are active military service members, military family members, and civilians presenting for emergency care. The MHS is a level III trauma center, with an annual volume of 66 000 patients. The number of nurse full-time equivalents was 66.

Participants

A purposive convenience sampling was used to recruit participants for this EBP project. The sample included participants who held a Registered Nurse (RN) or Licensed Practice Nurse (LPN) position within the EBP project setting and consented to participate in the study. Physicians, military health care specialists, and medical secretaries were excluded from the analysis.

Project Team

The project leader was one of the educators for the emergency department and informed the staff of the educational opportunity during the daily shift huddles in the months before implementation. The project leader is a certified emergency nurse and certified pediatric emergency nurse. The project team included the project leader's doctorate of nursing practice chair and the chief nurse of emergency operations.

Intervention

The intervention for this project was an evidence-based, culturally appropriate educational intervention. The resources that were used for the training included the National LGBTQIA+ Health Education Center¹⁶ video "LGBT Voices: Perspectives on Healthcare;" the interactive presentation "Providing Quality Care to Lesbian, Gay, Bisexual, and Transgender Patients: An Introduction for Staff Training;" and the interactive presentation "Affirming LGBT People Through Effective Communication."

The interactive videos and education sessions provided information and practice scenarios on the avoidance of assumptions and effective communication techniques, as well as statistical data on the barriers and challenges that the LGBTQ population faces when accessing health care services. Information regarding local and national resources for LGBTQ individuals and health care providers was provided during the education session. Open discussion and practice scenarios were incorporated in the training for the emergency nurses to voice their perceptions and to reinforce best practices.

The Emergency Nurses Association (ENA)³ toolkit was used to provide handouts on terminology, effective communication techniques, and types of gender-affirming surgeries during the sessions. An interactive presentation developed from the ENA³ toolkit was delivered during the second training session with an open group discussion. The National LGBTQIA+ Health Education Center¹⁶ is free to access, and the ENA³ toolkit is free for members. Permission to use the National LGBTQIA+ Health Education Center's¹⁶ presentations and ENA's³ toolkit for training was obtained.

The cultural competency training was conducted in 2 30-minute, face-to-face, small group training sessions. The educational intervention took a total of approximately 50 to 75 minutes, accounting for open dialogue and discussion at each training session. The methodology was adjusted from the original plan of 5 short sessions with open dialogue to 2 lengthier sessions owing to the time needed for daily coronavirus disease (COVID-19) updates to staff in the morning shift huddles.

Measures

Participant demographic information was collected to include age, gender, gender assigned at birth, ethnicity, and education level. Completion of the pre- and postintervention surveys included the paper-and-pencil method. The data were then entered and analyzed with Intellectus¹⁷ statistical software (Intellectus Statistics).

A preeducation and posteducation validated, reliable tool, the Ally Identity Measure (AIM) tool,¹⁸ was used to assess and score the participants' Knowledge and Skills, Openness and Support, and Oppression Awareness both pre- and postintervention. The validated AIM tool was used for data collection after permission approvals from the researchers Jones et al.¹⁸ The AIM tool uses a 5-point Likert scale, with 1, strongly disagree to 5, strongly agree.¹⁸ The AIM tool includes 19 items that measure the Knowledge and Skills, Oppression Awareness, and Openness and Support when caring for the LGBTQ population.¹⁸ The Knowledge and Skills scale includes 8 items that were tallied for a total score. The Oppression Awareness scale includes 4 items that were tallied for a total score. The Openness

and Support scale includes 7 items that were tallied for a total score.¹⁸ The approximate time taken to complete the tool was less than 15 minutes for both pre- and postintervention groups. The AIM tool has demonstrated good reliability (Cronbach α 0.76 to 0.88)¹⁸ and good convergent and discriminant validity.¹⁸

The AIM tool was used in the ED setting by Bristol et al¹³ in a similar study that was used as a guide for this EBP project. The methods of the Bristol et al¹³ study were not replicated exactly. The educational intervention was modified, and the ED participants were limited to RNs and LPNs in the current study.

Analysis

The 3 identified outcomes—Knowledge and Skills, Oppression Awareness, and Openness and Support identified on the AIM tool—were assessed using a 5-point Likert scale. The items were divided by each of the 3 measures and added for a score. Descriptive statistics, mean and SD, and an independent 2-tailed *t* test were used to determine differences in pre- and postintervention scores using Intellectus¹⁷ statistical software. The Mann-Whitney 2-sample rank-sum test was included to supplement independent *t* test results when 1 or more of the assumptions for the *t* test were violated. *P*-values $\leq .05$ were considered significant.

Sample-Size Recommendation for Study Replication

A post hoc power analysis for an independent-sample *t* test was conducted in G*Power (Heinrich Heine University) to determine a sufficient sample size using an alpha of 0.05, a power of 0.80, a large effect size ($d = 0.8$), and 2 tails.¹⁹ On the basis of the assumptions, the recommended sample size to replicate this project was 61 per group.

Ethical Considerations

The study was approved by the Liberty University Institutional Review Board (IRB-FY19-20-100) and the institutional review board of the MHS (“Memo for Non-Research Determination” was provided). Consent was implied from the health care provider participants through the voluntary completion of the data collection tool. No patient data were collected for the EBP project.

Results Descriptive Statistics

The education was conducted in 2 sessions. A total of 42 health care providers (63%) participated in the first education session. A total of 39 health care providers (59%) participated in the second session of the educational intervention. The total sample included 36 preintervention and 36 unmatched postintervention surveys when only surveys from RNs and LPNs were included in the sample analysis. The results of the data analysis are outlined and described herein. Frequencies and percentages for the demographic data collected are presented in ^{Table 1}, and the summary statistics of the outcome measurements are presented in ^{Table 2}.

Quantitative Results

The mean of the Knowledge and Skills subscale was significantly increased after the intervention compared with the preintervention group ($t_{(70)} = -3.33$, $P = .001$). The result was consistent using the Mann-Whitney U test ($U = 368.5$, $z = -3.15$, $P = .002$).

The second outcome measured was the Openness and Support subscale score. Descriptive statistics for the preintervention survey showed Openness and Support with a mean of 20.17 (SD = 6.95). The postintervention survey showed a mean of 23.69 (SD = 7.59), with a significant increase over the preintervention scores ($t_{(70)} = -2.06$, $P = .04$).

The third outcome measured was the Oppression Awareness subscale. The preintervention mean was 13.28 (SD = 3.81). The postintervention survey showed a mean of 14.14 (SD = 4.06) with no significant difference observed from the preintervention score ($t_{(70)} = -0.93$, $P = .36$). This result was consistent when analyzed using the Mann-Whitney U test ($U = 554$, $z = -1.06$, $P = .29$).

Discussion Summary

The results of this EBP project indicate that a unit-specific culturally appropriate educational intervention was feasible to implement and can contribute to an aggregate increase in Knowledge and Skills and Openness and Support for emergency nurses providing care to the LGBTQ population in the MHS. Overall, the average Knowledge and Skills score increased by 6.44%. The average Openness and Support score increased by 3.52%. There was no significant difference noted in the Oppression Awareness scores.

The results of this EBP study illustrated an increase in knowledge similar to that in 5 previous studies after the implementation of a cultural competency training.^{2,11-14} Shrader et al² delivered an educational intervention in a sample of 51 individuals to increase cultural awareness when caring for the LGBTQ population. Posttest scores demonstrated improvements from pretest scores, ranging from 10% in the category “LGBT terminology” to 45% in the category “preventative measures.” Additional educational categories included “cultural sensitivity,” “barriers to care,” and “pertinent health issues.”² Donaldson et al¹¹ delivered an online LGBTQ educational intervention to a sample of 26 providers across health care disciplines. The participants demonstrated an increase in LGB knowledge and transgender knowledge from pre- to postassessment.¹¹ The study demonstrated no significance between pre- and postassessment in skills and attitudes.¹¹

Maruca et al¹² implemented a transgender simulation to 47 nursing students. The researchers reported an increase in the Gay Affirmative Practice Scale scores postsimulation.¹² The current study illustrated a significant increase in Openness and Support and did not demonstrate a significant increase in Oppression Awareness postintervention. In contrast, Bristol et al¹³ demonstrated a significant increase in Oppression Awareness and did not demonstrate a significant increase in Openness and Support.

Interpretation

The education was intended to increase the Knowledge and Skills, Openness and Support, and Awareness of Oppression when caring for the LGBTQ population in 1 emergency department within the MHS. The mean scores for Knowledge and Skills increased postintervention. During the open dialogue at each session, the emergency nurses voiced an appreciation for the knowledge provided in the education session. In addition, the emergency nurses voiced frustrations regarding the lack of sexual orientation/gender identity data collection in the current EHR owing to military regulations.

Openness and Support scores also increased postintervention. During the open dialogue at each session, the participants reported appreciation of, and an understanding of, the necessity for the training, especially because it was the first training for many participants. Individuals reported using the information the same day after the first part of the educational intervention. The participants reported feeling more comfortable with gender-affirming language and communication postintervention.

Oppression Awareness scores did not demonstrate a statistically significant difference between preintervention and postintervention. This result may be due to many of the individuals becoming aware of the challenges presented to the LGBTQ population through news and media reports. During the open dialogue at each education session, several participants reported having family members or close friends in the LGBTQ population and having noticed and witnessed the challenges that the LGBTQ population experiences in society and when accessing health care services. These shared experiences, coupled with the increase in Knowledge and Skills and Openness and Support, illustrate that a unit-specific cultural competency training may benefit other emergency departments and organizations to improve the provision of care for this vulnerable population.

Limitations

The project had several limitations. The first barrier to implementation was the current COVID-19 pandemic. Owing to COVID-19 limitations, a convenience sample was used, and the sample did not include 100% of the nursing staff. Staffing shortages were present owing to individuals being in quarantine. A post hoc power analysis illustrated a desired sample size of 61 participants per group. The sample size for each group in the current study was 36. Open dialogue sessions were conducted in groups smaller than originally planned owing to COVID-19 social distancing restrictions. The survey used self-reporting that presents the potential for social desirability, meaning that participants may respond in a manner that is considered acceptable to others. Furthermore, the Oppression Awareness results demonstrated a less than 1% change from pre- to postintervention analysis. This may illustrate that it was more difficult to create a statistically significant change in knowledge in a population with a higher level of preexistent knowledge of the topic. The pre- and postintervention surveys were unmatched. Finally, most participants attended both sessions. However, owing to COVID-19 challenges and staffing issues, this was not 100%, which presents the potential for selection bias attributed to the measurements not being matched.

Implications for Emergency Clinical Practice

The ENA³ and the Joint Commission⁴ provide toolkits for organizations to implement LGBTQ cultural competency training. The National LGBTQIA+ Health Education Center¹⁶ provides education, interactive learning modules, and evidence-based resources for administrators and educators to use to facilitate cultural competency training for their units. The ENA,³ the Joint Commission,⁴ and the National LGBTQIA+ Health Education Center¹⁶ provide tools and resources for managers and executives to use to implement additional strategies to improve culturally appropriate care for the LGBTQ population. These strategies include implementing EHR prompts to address the patient's preferred name and pronouns; creating a culturally appropriate and welcoming environment; and informing or revising policies, procedures, and practices, to name a few.

A continued barrier to change includes individuals' previously held beliefs and biases. The LGBTQ population faces many challenges when accessing care in the current health care system. Frequent and annual education on communication techniques, affirming behaviors, and the avoidance of assumptions may prove beneficial in improving care and sustaining cultural competency when providing care for this vulnerable population. Nurse educators remain a crucial component of both reviewing the latest practices for caring for this population and mentoring the staff on monitoring these changes. Similar to best practices to improve the physiological aspects of care, cultural competency remains a fundamental part of providing quality and patient-centered care.

Conclusion

The shared experiences at the open dialogue sessions, coupled with the increase in Knowledge and Skills and Openness and Support, illustrate that a unit-specific cultural competency training may benefit other emergency departments and organizations to improve the provision of care for the LGBTQ population. The results for Knowledge and Skills demonstrated a significant improvement postintervention, Openness and Support illustrated significant improvements postintervention, but Oppression Awareness did not demonstrate a significant difference postintervention. The results illustrated that the individuals were aware of the oppression that the LGBTQ population faces. Therefore, nursing leaders may use this study as a guide to implement similar methodology to improve the Knowledge and Skills and Openness and Support of their health care staff to promote quality, patient-centered, and culturally competent care for this vulnerable population.

Author Disclosures

Conflicts of interest: none to report.

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Variable	Preintervention group (n = 36), n (%)	Postintervention group (n = 36), n (%)
Age		
18-30	2 (6)	3 (8)
31-40	12 (33)	12 (33)
41-50	7 (19)	10 (28)
≥51	12 (33)	10 (28)

Missing	3 (8)	1 (3)
Ethnicity		
Caucasian	22 (61)	25 (69)
African American	2 (6)	2 (6)
Asian/Pacific Islander	0 (0)	1 (3)
Multiple	1 (3)	1 (3)
Other not listed	6 (17)	5 (14)
Missing	5 (14)	2 (6)
Gender		
Male	8 (22)	7 (19)
Female	26 (72)	29 (81)
Missing	2 (6)	0 (0)
Education		
Associate degree	10 (28)	12 (33)
Bachelor's degree	14 (39)	18 (50)
Graduate degree	7 (19)	4 (11)
Chose not to answer	1 (3)	1 (3)
Missing	4 (11)	1 (3)
Gender assigned at birth		
Male	7 (19)	6 (17)
Female	27 (75)	28 (78)
Missing	2 (6)	2 (6)

Variable	M	SD	n	SEm
Knowledge and Skills				
Preintervention	21.78	8.91	36	1.48
Postintervention	28.22	7.47	36	1.24
Openness and support				
Preintervention	20.17	6.95	36	1.16
Postintervention	23.69	7.59	36	1.27
Opression awareness				
Preintervention	13.28	3.81	36	0.64
Postintervention	14.14	4.06	36	0.68

DETAILS

Subject: Sexual orientation; Emergency medical care; Homosexuality; Population; Software; Intervention; Cultural competence; Communication; Bisexuality; Openness; Practice nurses; Transgender persons; Emergency services; Likert scale; Evidence-based practice; Quality of care; Pediatrics; Nurses; Patients; Educational programs; Electronic health records; Feasibility; Health education; Lesbianism; Oppression; Vulnerability; Knowledge; Nursing care; Gays & lesbians; Evidence-based nursing; Military nurses; Data collection; LGBTQ people; Coronaviruses; Gender identity; Womens health

Identifier / keyword: Lesbian; gay; bisexual; transgender; queer; Emergency department; Emergency nursing; Emergency nurses; Cultural competency training; Educational intervention

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Trajectory of Research and Dissemination Through Mentorship and Passion: JEN

[ProQuest document link](https://www.proquest.com/scholarly-journals/lesbian-gay-bisexual-transgender-queer-cultural/docview/2552049784/se-2?accountid=211160)

ABSTRACT (ENGLISH)

A report by the Institute of Medicine, "The Future of Nursing," called for a doubling of the 28 369 doctorally prepared nurses in 2008 by 2020.¹ Although this goal was achieved, it was done primarily through the expansion of Doctor of Nursing Practice programs in the United States. In 2019, the number of nurses graduating with a practice-focused doctorate (Doctor of Nursing Practice) was more than 9 times higher than the number of nurses graduating with a research-focused doctorate (Doctor of Philosophy): 12 250 graduates vs 1306 graduates, respectively.² Given the

number of nurses seeking a doctoral degree, it is important for emergency nurses to consider the meaningful aspects of the research doctorate. In this guest editorial, I relay my own career trajectory from being a stretcherside emergency nurse to my role today as an emergency nurse scientist and leader. It is my hope that emergency nurses will seek opportunities similar to the ones I was afforded through mentorship and dissemination to also become emergency nurse scientists and/or research-focused academic faculty members.

FULL TEXT

Unlabelled image

A report by the Institute of Medicine, "The Future of Nursing," called for a doubling of the 28 369 doctorally prepared nurses in 2008 by 2020.¹ Although this goal was achieved, it was done primarily through the expansion of Doctor of Nursing Practice programs in the United States. In 2019, the number of nurses graduating with a practice-focused doctorate (Doctor of Nursing Practice) was more than 9 times higher than the number of nurses graduating with a research-focused doctorate (Doctor of Philosophy): 12 250 graduates vs 1306 graduates, respectively.² Given the number of nurses seeking a doctoral degree, it is important for emergency nurses to consider the meaningful aspects of the research doctorate. In this guest editorial, I relay my own career trajectory from being a stretcherside emergency nurse to my role today as an emergency nurse scientist and leader. It is my hope that emergency nurses will seek opportunities similar to the ones I was afforded through mentorship and dissemination to also become emergency nurse scientists and/or research-focused academic faculty members.

My career trajectory as a nurse scientist began in 2001 when I was selected by the *American Journal of Nursing* (AJN) to become a writing fellow. This program, which was cosponsored by industry, the AJN, and the Emergency Nurses Association (ENA), partnered me with a clinical nurse specialist and trauma coordinator to serve as my writing mentor. The most extensive writing I had done at this point was writing class papers. She helped me reflect on my clinical experience as an emergency nurse to identify a topic in which I had some level of expertise; I chose diabetic ketoacidosis. From there, she provided extensive mentorship on the writing process, editing, and using primary references. My manuscript was accepted for a special issue of the AJN.³ The ENA, in collaboration with the industry sponsor, paid for my travel to ENA's annual conference in New Orleans in 2002. During this conference, the ENA hosted a reception where I met Mary Jagim, ENA's immediate past president. Jagim instructed me to keep writing about topics I knew to influence the specialty of emergency nursing; this conversation left a lasting impression on me. Since then, I have engaged with countless ENA members, Academy of Emergency Nursing Fellows, and ENA state and chapter leaders who have supported the career development and leadership aspirations of their fellow ENA members. Key takeaway points that I garnered from these experiences were the importance of obtaining a writing mentor and writing about what you know.

It would be 4 more years until I served as an author on another peer-reviewed manuscript. While matriculating in the Doctor of Philosophy program, several faculty members provided mentorship in both writing and the conduct of research. Although I recognized the importance of writing what I know about, I didn't yet recognize the importance of having *passion* for what you write about. During my initial semester in the doctoral program, I switched my research focus multiple times, initially addressing the problem of frequent use of the emergency department by homeless adults and then onto substance abuse, then police interventions, and so on. It wasn't until the week before spring break in 2006 that I met my next mentor and future dissertation chair. We had a short conversation about the problem of assaults against emergency department workers. Although I had been physically assaulted dozens and dozens of times, I never thought of this violence as a "problem." During spring break, I drafted a manuscript focused on workplace violence against emergency nurses. This manuscript written over 1 week received minimal edits from my course instructors, and the article became the second publication that I had as a first author.⁴ Because I had passion for my topic, my writing was more effective, told a good "story," and required much less effort than writing about something I knew but on a topic about which I was less passionate.

In fall 2007, a program officer from the National Institute for Occupational Safety and Health attended a local conference where I presented my dissertation findings. She informed my dissertation chair and me that we should

write a grant application using the findings from our respective projects as pilot data for an upcoming funding opportunity announcement. My grant application was approved in 2008 as I started my new role as an assistant professor at a college of nursing. From there, I had a defined research focus to serve as the foundation for my trajectory. In addition, I now had a formal writing and research mentor as well as a research topic engulfed with my passion.

As my reputation as a workplace violence nurse scientist and academic faculty member grew, Dr Paula Grubb from the National Institute for Occupational Safety and Health contacted me about the problem of bullying against novice nurses. As a research psychologist, Grubb had become aware of this problem and was seeking a collaborator to begin developing educational interventions to prevent and mitigate the psychological consequences for novice nurses who experienced workplace bullying. Beginning in 2011, Grubb and I began our partnership to address workplace bullying against nurses. From 2011 through 2018, we developed a series of active learning interventions, including role-play simulations, case studies, and debriefing tools that were ultimately deployed at 8 universities and several hospital systems across the US.⁵⁻⁷

In 2012, I applied to the Robert Wood Johnson Foundation (RWJF) Nurse Faculty Scholars program. I was selected as 1 of 12 scholars that year and received research mentorship, leadership development training, and career coaching from several nurse leaders such as Dr Beverly Malone, chief executive officer of the National League for Nursing. Several peers in this program emphasized the importance of selecting the “right” journal to disseminate research findings in. Typically, the choice of the right journal is based on the journal's Clarivate impact factor score (Clarivate Analytics), a measure of how frequently a published article would be cited after publication.⁸ Other factors for selecting a journal are the scientific rigor, editorial quality, peer-review process, reputation, and indexing status of the journal.⁹ For me, I target my paper submissions on the basis of the journal's readership. For example, I purposefully submitted my papers to journals whose readers could use my research findings and implications to transform the emergency care environment to promote a violence-free work environment (eg, *Journal of Emergency Nursing*, *Journal of Hospital Administration*). Because I focused on the target audience of journals, I am now routinely contacted to provide consultations and lectures on building a safer work environment.

Although my research trajectory has been rewarding, my success was based on leveraging the support from, and talents of, multiple others, including past and present mentors across multiple professions (eg, psychology, victimology, public health, nursing). Through the coaching of this mentoring network, I learned to increase the breadth of my research skills. For example, in 2012, I served as the chair for the National Conference on Workplace Violence in Healthcare Settings. One of my mentors, Dr Bonnie Fisher, encouraged me to coordinate a special issue of a journal to report the best papers presented at the conference. In 2014, various conference proceedings were published in a special issue of *Work: A Journal of Prevention, Assessment & Rehabilitation*.¹⁰ From this experience, I learned to manage a large team and coordinate a large project. Dr Corinne Peek-Asa coached me on conducting environmental assessments to determine risk for violence. Dr Rosa Maria Gonzalez-Guarda stressed the value of using community advisory boards,¹¹ which I now use and encourage my students to use as well.¹² Dr Treasa “Susie” Leming-Lee taught me quality improvement science and how to use it legitimately within my research focus area.^{13,14} I received this mentoring over the course of years, with each experience expanding my skill set to allow me to conduct more rigorous research.

These mentoring relationships led to my roles as an ENA Board Director and Associate Dean for Research. During the RWJF Nurse Faculty Scholars program, Dr Malone served as 1 of my formal mentors. She encouraged me to use the leadership development training that the RWJF program was providing as a leader within the ENA. With her encouragement, I ran for the ENA Board of Directors 3 consecutive years and was elected as a director with a term starting in 2018, the same year that I was formally appointed as the Associate Dean for Research at the University of Cincinnati College of Nursing. As a director, I used my skills as an emergency nurse scientist while governing. For example, 1 of the duties of a board member is the “duty of care,” which requires decisions to be evidence-based and made after thoughtful debate.¹⁵ While serving on the ENA Board of Directors, I participated with fellow board members in professional development on board governance, conflict-of-interest management, effective

communications, strategic planning, member accountability, media training, and how to lead during a crisis. I leveraged this professional development to be a more effective Associate Dean for Research where my responsibilities include fostering an inclusive work environment, setting the research strategic direction and benchmarks in collaboration with the faculty, communicating expectations for job performance, and participating in budget management.

During my career, I learned that a hallmark of a great research trajectory is not merely one's personal accomplishments, but also the accomplishments of those being mentored. I strive to model the best of the mentoring I received to my colleagues and students. Partly why I was able to be successful was because my mentors had me use an individual development plan¹⁶; therefore, I now leverage this tool to help my students and faculty members develop short- and long-term goals that will promote a rewarding research trajectory. A component of this tool includes specific goals for manuscript dissemination. Many of my mentees do ultimately publish their research, which has resulted in their collectively having more than 40 articles published in peer-reviewed journals. As I sought for additional ways to "pay it forward" in terms of the mentoring I received over the years, I partnered with Drs Maja Djukic and Cheryl Woods Giscombé to develop a writing mentorship award program with the *AJN*,¹⁷ which has been awarded annually since 2016. This program provides acknowledgment and conference travel support to a new author selected for having published the best paper of the year in which the first author was mentored by another author on the publication.

Key Takeaways

The purpose of this guest editorial was not to be self-flattering but to describe my research trajectory with examples that could be replicated by others. I have highlighted several successes that I have achieved during my career, but I have also experienced many failures and sidesteps. From both my successes and failures, I learned 5 key lessons that I believe can be used by others embarking on their research trajectory:

1. Seek writing and research mentors.
2. Write about what you know and have passion for.
3. Be purposeful regarding where you submit your research-based papers.
4. Develop a mentoring network to address multiple career aspects.
5. Pay it forward by mentoring others.

DETAILS

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Alignment of Nurse Practitioner Educational Preparation and Scope of Practice in United States Emergency Departments: A Systematic Review of the Literature: JEN

ABSTRACT (ENGLISH)

Introduction

National debate persists surrounding the expanded use of nurse practitioners in the emergency department. Current understanding of the alignment of nurse practitioner educational preparation and practice parameters in United States emergency departments is inchoate. The objective of this review was to seek evidence to support that nurse practitioner education and training align with current practices in the emergency department.

Methods

A Preferred Reporting Items for Systematic Reviews and Meta-Analyses guided systematic review of the existing literature was conducted of 4 relevant databases. Level of evidence and quality assignments were made for each article using Grading of Recommendations, Assessment, Development, and Evaluation or Confidence in Evidence from Reviews of Qualitative Research as appropriate.

Results

Nurse practitioners are increasingly staffing emergency departments, providing care to both patients classified as high-acuity and low-acuity. Reports of nurse practitioner scope of practice vary widely. No studies evaluated alignment of educational preparation and training for actual clinical practice.

Discussion

This review of the literature was inconclusive, and the review team was unable to find evidence that supports the alignment of nurse practitioner educational preparation and training with scope of clinical practice in United States emergency departments. Future research should seek to articulate the landscape of nurse practitioner academic preparation for specialty practice in the emergency department and to specifically examine the alignment of educational preparation with scope of practice and impact on clinical outcomes of patients seen in the emergency department.

FULL TEXT

DETAILS

Subject:	Workforce planning; Emergency medical care; Databases; Clinical training; Medical libraries; Nurse practitioners; Emergency services; Teams; Staffing; Clinical outcomes; Patient satisfaction; Qualitative research; Scope of practice; Systematic review; Workforce; Parameters; Nursing; Departments; Literature reviews; Education; Clinical medicine
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Emergency Nursing Review Questions: July 2021: JEN

[ProQuest document link](#)

ABSTRACT (ENGLISH)

Correct answer: C Absence of urticaria, delay in the use of EPINEPHrine, severity of reaction, biphasic reaction, age above 65 years, cardiovascular or pulmonary disease, medication as a trigger, and uncontrolled asthma are all factors that increase the risk for severe, near-fatal, or fatal anaphylaxis. 1 2. Correct answer: B Biphasic anaphylactic reactions are characterized by an initial reaction, followed by an asymptomatic period of 1 hour or more and then a subsequent return of symptoms without further exposure to antigen. Correct answer: D The signs of pediatric cold shock include tachycardia; tachypnea without increased effort; delayed capillary refill time (>3 seconds); weak peripheral pulses; narrow pulse pressure; decreased urine output; irritability; decreased level of consciousness; and cold, pale, mottled, diaphoretic skin.

FULL TEXT

These review questions are based on the Emergency Nursing Core Curriculum and other resources pertinent 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 an anaphylactic reaction. Which factor puts them at an increased risk for severe, near-fatal, or fatal anaphylaxis?

- A.Age below 65 years
- B.Food as a trigger
- C.Absence of urticaria
- D.Diabetes

2. The most effective medication to treat anaphylaxis:

- A.EPINEPHrine
- B.H1 antihistamines
- C.Steroids
- D.H2 antihistamines

3. A patient returns to your emergency department after being treated for anaphylaxis 72 hours earlier. The initial reaction occurred 1 hour after taking an oral dose of Augmentin. They were adequately treated with steroids, EPINEPHrine, and antihistamines. Their symptoms resolved, and they were discharged home. They present to the emergency department today with complaints of a hoarse voice, urticaria, and tongue-swelling that began 15 minutes before their arrival. They have not taken any medications since discharge. This patient is most likely experiencing:

- A.Uniphasic anaphylaxis
- B.Biphasic anaphylaxis
- C.Protracted anaphylaxis
- D.Viral illness

4. A 2-year-old presents to the emergency department with complaint of a barking cough, stridor at rest, and use of accessory muscles. They are interactive and alert. What medications do you anticipate this patient receiving?

- A.Racemic EPINEPHrine through intravenous (IV) infusion and steroids through nebulizer
- B.Racemic EPINEPHrine through nebulizer and steroids orally or through IV infusion/intramuscular (IM) injection
- C.Albuterol through nebulizer and acetaminophen orally
- D.Steroids orally or through IV infusion/IM injection and albuterol through nebulizer

5. Signs of cold shock in a pediatric patient include:

- A.Wide pulse pressure
- B.Increased urine output
- C.Flushed skin
- D.Weak peripheral pulses

ANSWERS

1. Correct answer: C

Absence of urticaria, delay in the use of EPINEPHrine, severity of reaction, biphasic reaction, age above 65 years, cardiovascular or pulmonary disease, medication as a trigger, and uncontrolled asthma are all factors that increase the risk for severe, near-fatal, or fatal anaphylaxis.¹

2. Correct answer: A

EPINEPHrine is the most effective treatment for anaphylaxis. It is a nonselective agonist of all adrenergic receptors, which are present in every body system affected by anaphylaxis. H1 antihistamines, H2 antihistamines, and steroids are all components used to adequately treat anaphylaxis; however, EPINEPHrine remains the most effective treatment.²

3. Correct answer: B

Biphasic anaphylactic reactions are characterized by an initial reaction, followed by an asymptomatic period of 1 hour or more and then a subsequent return of symptoms without further exposure to antigen. Uniphasic anaphylactic reactions typically peak within hours after symptom onset and then either resolve spontaneously or after treatment. Protracted anaphylactic reactions last hours to days without clearly resolving completely. This is not the typical presentation of a viral illness.³

4. Correct answer: B

Moderate croup is characterized by barking cough, stridor at rest, chest retractions, and use of accessory muscles. Patient remains alert and interactive. Management includes keeping patient calm and administering nebulized racemic EPINEPHrine and steroids orally or through IV infusion/IM injection. They should be observed after treatment for a minimum of 4 hours to monitor for any rebound respiratory distress. Croup is almost always viral in origin and does not require antibiotics unless there are additional signs or symptoms of a concurrent bacterial infection.⁴

5. Correct answer: D

The signs of pediatric cold shock include tachycardia; tachypnea without increased effort; delayed capillary refill time (>3 seconds); weak peripheral pulses; narrow pulse pressure; decreased urine output; irritability; decreased level of consciousness; and cold, pale, mottled, diaphoretic skin. These signs may often be subtle and require getting a detailed history. The signs of warm shock include warm and flushed skin, brisk capillary refill, and bounding pulses.⁴

DETAILS

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Commentary on “A CLIMATE: A Tool for Assessment of Climate-Change–Related Health Consequences in the Emergency Department”: JEN

[ProQuest document link](#)

ABSTRACT (ENGLISH)

[...]they can ensure that health care and public health systems are resilient in the face of climate change and weather extremes and, at the same time, are taking steps to become carbon-neutral and optimally sustainable. Owing to this focus on ultimate disposition, it may not be feasible to accomplish the full framework within the ED visit, especially for patients who are critically ill. [...]it is vital to expand this framework to health care providers working in the inpatient setting as well as outpatient settings. From fact sheets and videos to complete lesson plans, there are many valuable resources available to aid in education of both members of the public as well as health professionals to learn more about the health impacts of climate change.⁸ Finally, providers can work to systematically reduce the carbon footprint of emergency departments and spur larger health system changes through interventions that improve energy resource management and operational expenditures.⁹ Perhaps the most devastating aspect of climate change's impacts on health is that those who are already vulnerable owing to gender, race, ethnicity, geography, socioeconomic status, or health status are most likely to suffer the worst of the impacts.¹ Health outcomes for vulnerable individuals depend on a multitude of factors, many of which can be addressed through careful application of the A CLIMATE framework² during clinical encounters. Because emergency providers are already trained to recognize social determinants of health and vulnerability, this framework allows for that understanding to be combined with climate change and health awareness, ultimately acting as a positive force in protecting the most vulnerable from climate change impacts.

FULL TEXT

The health manifestations of climate change are becoming increasingly common and present urgent and complex challenges for emergency clinicians.¹ As temperatures rise, air quality worsens, extreme weather events become more frequent, and those who need medical care turn to their local emergency department as their primary point of health system access. Although climate change may stress many aspects of the health system, emergency care—on the front lines of acute care nationwide and the nation's primary safety net provider—stands to bear the largest burden. In “A CLIMATE: A Tool for Assessment of Climate-Change–Related Health Consequences in the Emergency Department,” Nicholas et al² put forth a vital framework for the integration of climate and health knowledge in the clinical setting, laying the foundation for how we can begin to save lives now and in an inevitably hotter and more unpredictable future. Crucially, this framework has broad applicability not just to nursing providers, but also to all members of the emergency care team: physicians, advanced practice providers, occupational therapists, physical therapists, social workers, and care coordinators. To demonstrate applicability, the authors present a case example that demonstrates how a clinical climate lens improves the outcome of a patient in the emergency department who is critically ill and further increases her resilience toward future climate-related health impacts by identifying and addressing the root causes of her vulnerability.

Any new or evolving disease process or exposure requires education of medical professionals to adapt and intervene. Climate change is no exception. It affects the patients we see on a daily basis as well as the very health systems whose continuous operations we rely on for the provision of clinical care. Historically, there has been very

little education or training for clinicians in regard to how climate change affects human health,³ and providers are generally unaware of how profoundly interlinked these 2 entities are. However, as Nicholas et al² point out, disaster preparedness, environmental emergency response, and health emergency management are core tenets of our practice that are already being affected in the face of climate change. As described by Lemery et al,⁴ health care professionals have 3 primary roles in supporting broader societal efforts to address the climate crisis. First, they must protect both individual and community health from the increasingly severe health threats posed by climate change and weather extremes. Second, they can ensure that health care and public health systems are resilient in the face of climate change and weather extremes and, at the same time, are taking steps to become carbon-neutral and optimally sustainable. And third, they can bring their voices and scientific expertise to advocate for cross-sectoral solutions to the climate crisis. Clearly, to be effective in these 3 areas, health care workers and leaders must have sufficient training and access to evidence-based guidance. As stated by Nicholas et al,² health care professional involvement in the climate and health crisis is not only imperative to save the lives of patients, but is also deeply imbued in the ethos of our professions. Because nurses are the most trusted professionals in the United States, with physicians close behind,⁵ there is a huge opportunity to use this trust to educate patients and the public and to prepare ourselves.

From a patient suffering from chronic obstructive pulmonary disease who requires intubation in the setting of poor air quality owing to the increasing frequency of wildfires to a patient with suicidal thoughts after being displaced by a hurricane, emergency providers see climate impacts on health firsthand.⁶ Thus, as emergency clinicians, we have meaningful opportunities to improve patient outcomes and health care delivery.⁶ The A CLIMATE framework² helps providers and patients understand the linkages between environmental conditions and health. When patients suffer from an acute exacerbation of a previously well-controlled disease or experience a traumatic injury from an extreme weather event, the team treating them can make a strong connection between climate change and their own personal health. By connecting the changing climate to their medical condition and framing climate change as a health emergency, we have the opportunity to make a lasting impression on patients and help them protect their own health.

Although A CLIMATE² is a much-needed framework, there are some limitations. These limitations include time restrictions common in many emergency departments, as well as the lack of provider knowledge regarding climate change and health. This framework would ideally be applied in every emergency department at all times; however, the reality of time constraints, patient volumes, and provider bandwidth are likely to impede that from happening. Success in executing this framework therefore requires an interdisciplinary approach. Members of the patient care team will likely execute different aspects of the framework. This practical reality underscores the importance of providing climate-and-health education to all members of the ED care team. Emergency departments are also oriented toward rapid movement of patients out of the department to the admission floor or discharge home after evaluation. Owing to this focus on ultimate disposition, it may not be feasible to accomplish the full framework within the ED visit, especially for patients who are critically ill. Therefore, it is vital to expand this framework to health care providers working in the inpatient setting as well as outpatient settings.

The individual components of the mnemonic A CLIMATE² provide a step-by-step process for implementing concepts of climate and health in the clinical setting. Some of the individual elements of this framework are possibly redundant (eg, Learn from a climate assessment, Implement a climate history), but there is value in having an easy way for providers to remember to keep climate in mind, even if they do not accomplish each component of the mnemonic for each patient. Importantly, knowledge of health impacts due to climate change can often initially elicit feelings of helplessness or hopelessness (for providers and patients); therefore, there must also be a focus on actionable steps for the patient and provider to take to address their health. Perhaps the last “E” could include “Empower” in addition to “Evaluate and Educate.” Further, the A CLIMATE² mnemonic should also include a way to empower nursing professionals (and other health care providers) to take climate action even beyond their clinical roles and advocate for climate change mitigation and adaptation, as well as health care sustainability.

Providers can take actions beyond their clinical duties in many different ways. They can lead interdisciplinary

research to both better understand the health and health care system effects of climate change and develop an evidence-based approach for adaptation and health protection. They can continue to strengthen partnerships with public health entities to further interventions such as health early warning systems and epidemiologic surveillance for infectious disease. They can also incorporate climate education into training programs as well as increase learning opportunities for professional education. The Global Consortium on Climate and Health Education, based out of the Mailman School of Public Health at Columbia University, has developed climate-and-health core competencies, which are recommended for all health professionals and serve as a guide for all specialties and clinical roles.⁷ The National Institute of Environmental Health Sciences has also produced ample resources for climate and health education. From fact sheets and videos to complete lesson plans, there are many valuable resources available to aid in education of both members of the public as well as health professionals to learn more about the health impacts of climate change.⁸ Finally, providers can work to systematically reduce the carbon footprint of emergency departments and spur larger health system changes through interventions that improve energy resource management and operational expenditures.⁹

Perhaps the most devastating aspect of climate change's impacts on health is that those who are already vulnerable owing to gender, race, ethnicity, geography, socioeconomics, or health status are most likely to suffer the worst of the impacts.¹ Health outcomes for vulnerable individuals depend on a multitude of factors, many of which can be addressed through careful application of the A CLIMATE framework² during clinical encounters. Because emergency providers are already trained to recognize social determinants of health and vulnerability, this framework allows for that understanding to be combined with climate change and health awareness, ultimately acting as a positive force in protecting the most vulnerable from climate change impacts. Well known as society's safety net and primary health care providers for many of the most underserved patients, the ED team can further protect the health of vulnerable populations by adopting and enacting this framework.

Climate change is a health emergency, and its impacts are worsening the health of patients and disrupting the ability to give care.¹ The A CLIMATE framework² provides a much-needed next step to empower providers to integrate the concepts of climate change and health into daily clinical practice.

DETAILS

Subject:	Emergency medical care; Public health; Medical personnel; Interdisciplinary aspects; Weather; Race; Adaptation; Health status; Geography; Emergency services; Personal health; Outdoor air quality; Climate change; Patients; Ethnicity; Clinical outcomes; Health education; Emergency preparedness; Change agents; Health care; Vulnerability; Social factors; Empowerment; Resource management; Emergency communications systems; Extremes; Expenditures; Departments; Inpatient care
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Patient Characteristics of Persons Dead on Arrival Received in a Danish Emergency Department: A Retrospective Review of Health Records: JEN

[ProQuest document link](#)

ABSTRACT (ENGLISH)

Introduction

In addition to treating living patients, emergency nurses are also responsible for receiving and caring for persons who are dead on arrival and their relatives. There is limited knowledge about the dead on arrival patient and family population as well as care practice for the dead and their relatives. The first step in improving care for dead on arrival persons is to know the size and characteristics of the population. Therefore, the aim of this study was to describe the size and characteristics of the dead on arrival population in a Danish emergency department.

Methods

A retrospective review of health records was undertaken for all consecutive dead on arrival persons received in 1 Danish emergency department between January 2018 and December 2019.

Results

A total of 719 dead on arrival persons were included, 350 in 2018 and 369 in 2019. Males accounted for 64%. The mean age was 71 years with a range from 18 to 102 years. The place of death was 80% at home, and more than half (54%) were found either dead or dying by a spouse, cohabitant, or son/daughter. In most cases, the cause of death was described as unknown (92%), whereas suicide and accidents accounted for 8%.

Discussion

The population of dead on arrival persons in a Danish emergency department were mainly men, found dying or dead by relatives and brought in from home. Additional research and development are warranted regarding care practices for dead on arrival and their families in the emergency department.

FULL TEXT

DETAILS

Subject:	Men; Patients; Emergency medical care; Population; Accidents; Trauma; Death & dying; Relatives; Place of death; Nursing care; Hospitals; Cardiopulmonary resuscitation--CPR; Nurses; Emergency services; Grief; Quality of care; Research & development--R & D; Health records; Pediatrics; Characteristics; Suicide; Suicides & suicide attempts
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A Case for Case Reviews: JEN

[ProQuest document link](#)

ABSTRACT (ENGLISH)

In the rural setting, we also worked many nights and weekends with physicians who were not board-certified in emergency medicine but were willing to cover the shift with exceptional backup support from anesthesia on call or advanced paramedics should emergent intubation or other acute stabilization skills be required. Time constraints such as those involved in completing a quality improvement–focused capstone project in 1 academic semester are especially dissonant in the ED setting where there is clear and profound seasonality in the types and volumes of presentations.^{5,6} Furthermore, sustainability over time is a crucial component of implementation science and quality improvement in the clinical setting, and addressing sustainability tends to be well outside the feasible scope of the usual single DNP project time frame.⁷ The emergency department in January, susceptible to patient-volume spikes from infectious epidemics such as annual influenza, is a vastly different context from the same emergency department in June wherein the team can often be found in the throes of the traumatic injuries peak of the 100 days of summer. [...]the time is ripe to revisit, reimagine, and reinvent educational pathways for advanced emergency practice, clinical residencies or fellowships, interdisciplinary preceptorship, and capstone project focus and requirements. At JEN, we strongly encourage the submission of case reviews that are relevant to care in the ED setting from authors across all levels of educational preparation and professional development using the CARE (for CAse REports) transparent reporting guidelines.⁸ Astute observation of both clinical and laboratory anomalies has long been an essential starting point for far-reaching scientific discoveries and breakthroughs.⁹ Case reviews have been dubbed as the “first line” of evidence-based practice in the evidence hierarchy.¹⁰ Although we acknowledge

that there is an important hierarchy of evidence to inform the efficacy of practice interventions with a high value placed on the well-designed randomized controlled trial at the top of the pyramid, case reviews serve many important additional purposes in evidence-based nursing practice and clinical reasoning development. [...]an important resource about ongoing research and evidence-based education for patients and clinicians on rare diseases can be found at the Genetic and Rare Diseases Information Center of the National Institutes of Health.¹¹ Case reviews serve as an essential problem-based learning tool to develop and refine clinical reasoning processes in education and professional development.

FULL TEXT

Unlabelled image

“When you hear hoofbeats, think horses and not zebras.” Our new locum tenens attending physician admonished my emergency nursing colleague by invoking a common metaphor. This use of the metaphor suggested that the patient’s problem was most likely a common diagnosis and not a rare or unusual disease. This is usually sound advice to maintain efficiency in a crowded and under-resourced emergency department. My colleague seemed to silently weigh the risks and benefits to the patient of each course of possible action, including what it would mean to repeat his request, and with what urgency. He chose to remain silent in the exchange, nodded professionally, and walked past us whispering a barely perceptible, “Just wait until the good doctor learns about the zonkeys.” We concealed our knowing smiles as his humor diffused the interpersonal tension. We knew he was referring to the local zoo’s zonkey, the crossbred offspring of a zebra and donkey. As a high-performing team, we trusted our colleague to speak up again if it was a matter of immediate patient safety and would have offered our mutual support. We could also trust our colleague to creatively advise and empower the patient to seek additional and specific testing on an outpatient basis. This nurse knew in depth which expert local providers would be empathetic to the patient’s concerns if the patient wished to pursue further diagnostic testing.

In hindsight, there was so little to laugh about when examining the outcomes of the exchange. My expert emergency nursing colleague was in graduate school to become a nurse practitioner. He was from a local, low-income background and understood the community, the resources, and the power dynamics, as well as the clinical care applications in the emergency department. Once he completed his nurse practitioner credentialing process, he moved into another specialty where his skills were valued and supported by the entire interdisciplinary clinical team. In turn, he then recruited another exceptional emergency nurse coworker to follow in his footsteps.

We had a stellar team of attending physicians who earned our great respect in the ED setting. In the rural setting, we also worked many nights and weekends with physicians who were not board-certified in emergency medicine but were willing to cover the shift with exceptional backup support from anesthesia on call or advanced paramedics should emergent intubation or other acute stabilization skills be required. We rapidly formed high-functioning clinical teams with numerous newly introduced locum tenens physicians. Although most of these clinical teamwork experiences were outstanding, they were not always so. The hospital organization required a provider with physician credentials to meet reimbursement and regulatory standards set by national decision makers. These national decision makers may have no inkling about the local problems, resources, or dynamics in this rural community. There were instances where these regulatory and reimbursement requirements extracted a great financial expense from the community without an equivalent return on this monetary investment in high-quality, competent, and culturally appropriate clinical care. I have little doubt that the community would have been better served if the nurse practitioners, who were often lifelong members of the community themselves, had been welcomed, valued, invested in, trained, and supported to function to the full extent of their professional potential. This full extent of professional potential could include serving in the attending provider role when needed, after adequate training preparation with interdisciplinary preceptors who currently serve in this role. As a specialty, we can hemorrhage our best and brightest colleagues to positive career paths, trajectories, and progressions where medical teams and leadership authentically integrate and elevate the full value of advanced practice nurses’ contributions. As nursing practice evolves to meet the health care needs of the public, the integration and delineation of emergency medical, nursing,

and advanced practice roles and responsibilities simply cannot be viewed as zero-sum games or turf wars. Aligned with the experiences I relay in this personal narrative of my professional experience, the National Academies of Sciences, Engineering, and Medicine has just released an important report entitled “The Future of Nursing 2020-2030: Charting a Path to Achieve Health Equity.”¹ This report provides a roadmap to address the need to both transform nursing education and remove practice barriers for advanced practice registered nurses to meet the health needs of the public we serve.

In regard to nurse practitioner educational preparation, Veenema et al² conducted a systematic review of the literature that appears in this issue of *Journal of Emergency Nursing (JEN)*. The authors identified a dearth of published evidence on training specifically for practice in the emergency specialty. Of particular interest is the need for collaborative training with emergency medicine preceptors and programs. The authors synthesize evidence that most nurse practitioners have expressed a desire for an emergency medicine fellowship. However, it is unclear from this evidence that these nurse practitioners would be willing to geographically relocate as many physicians do to match with emergency clinical fellowship training opportunities. This important systematic review by Veenema et al² advances the scholarship related to the Emergency Nurses Association's Position Statement entitled “Advanced Practice Registered Nurses in the Emergency Care Setting,” which calls for updated scopes of practice, core competencies, and specialty education.³

McCauley et al⁴ recently published a transparent and essential debate from the academic dean's perspective about programs to prepare advanced practice nurses to complete the doctor of nursing practice (DNP) degree. Here, the academic leadership amplifies the message found in Veenema et al² about the potential for increasing clinical preparation hours, including debating the placement of residency or fellowship before or after degree conferment to achieve readiness for practice. DNP students invest 500 hours each in a capstone project, which is often directed at a leadership initiative topic rather than at enhanced clinical readiness. Although this leadership focus may have been understandable in the earlier evolution of the degree when most DNP students already had substantial clinical practice and may have already been prepared as nurse practitioners at the master's degree level, the contemporary preparation needs to be revisited because more students work on continuous education to the doctoral level rather than inserting periods of nursing practice and expertise development at a clinical site between degree program enrollments. Clinical experience and expertise development in the ED setting are unique. Clinical practice in the emergency department requires more preparation to respond to one of the broadest ranges of acuity, age, differential diagnoses, and affected body system than almost any other specialty. Furthermore, as implementation science and quality improvement methods and standards evolve, devoting only 500 hours to a leadership project may prove to be too time-constrained to allow for adequately meaningful methodological designs and measures. Time constraints such as those involved in completing a quality improvement-focused capstone project in 1 academic semester are especially dissonant in the ED setting where there is clear and profound seasonality in the types and volumes of presentations.^{5,6} Furthermore, sustainability over time is a crucial component of implementation science and quality improvement in the clinical setting, and addressing sustainability tends to be well outside the feasible scope of the usual single DNP project time frame.⁷ The emergency department in January, susceptible to patient-volume spikes from infectious epidemics such as annual influenza, is a vastly different context from the same emergency department in June wherein the team can often be found in the throes of the traumatic injuries peak of the 100 days of summer. Thus, the time is ripe to revisit, reimagine, and reinvent educational pathways for advanced emergency practice, clinical residencies or fellowships, interdisciplinary preceptorship, and capstone project focus and requirements.

At *JEN*, we strongly encourage the submission of case reviews that are relevant to care in the ED setting from authors across all levels of educational preparation and professional development using the CARE (for CAse REports) transparent reporting guidelines.⁸ Astute observation of both clinical and laboratory anomalies has long been an essential starting point for far-reaching scientific discoveries and breakthroughs.⁹ Case reviews have been dubbed as the “first line” of evidence-based practice in the evidence hierarchy.¹⁰ Although we acknowledge that there is an important hierarchy of evidence to inform the efficacy of practice interventions with a high value placed

on the well-designed randomized controlled trial at the top of the pyramid, case reviews serve many important additional purposes in evidence-based nursing practice and clinical reasoning development. As observational studies of a single patient's clinical course, case reviews may serve as the highest level of possible evidence for extremely rare diseases or unusual emergency presentations where a sample size with adequate statistical power would be impossible to achieve. Meanwhile, an important resource about ongoing research and evidence-based education for patients and clinicians on rare diseases can be found at the Genetic and Rare Diseases Information Center of the National Institutes of Health.¹¹

Case reviews serve as an essential problem-based learning tool to develop and refine clinical reasoning processes in education and professional development. Case reviews are also indispensable for disseminating clinical information about novel diseases or presentations; rare diseases or presentations; treatment side effects (incidentally, beneficial as well as adverse), overdose, or poisoning; complex mechanisms of disease or unusual multimorbid disease interactions; elucidating the clinical reasoning of an expert author; general education or audit; or unique, rare, or unusual presentations of common disease.¹²⁻¹⁵ Given that clinical education continues to evolve with increasing integration of simulation as part of clinical practice preparation and educational program requirements of clinical time, published case reports may also serve as a crucial foundation for educational simulation scenarios⁴ to prepare the next generation for "real world," practice-relevant cases. Last July, Metheny and Krieger¹⁶ disseminated a publication innovation using a systematic review of case reports. Here, they furthered the systematic review methodology, allowing the clinical reader comprehensive insights into a rare toxicity. It would serve as a fruitful leadership dialogue and debate to consider if this type of in-depth systematic review of a case report could serve as a model for academic capstone projects, particularly to advance the clinical reasoning of those in graduate programs seeking qualifications as advanced emergency care practitioners. The development and depth of clinical reasoning required for an exemplary published case report may generate a greater impact for both the student and the published literature, replacing the currently more common option of a single-site, single academic semester quality improvement initiative with no contemporaneous control condition. We welcome the sharing of clinical mastery evident in a well-designed systematic review of case report manuscripts relevant to the emergency clinical setting from students, expert interdisciplinary colleagues, scholars, and clinicians across all levels of practice. Our case for case reviews is strengthened by the expert clinicians' need to anticipate, discern, and differentiate the metaphorical horse (common), zebra (rare), and zonkey (unusual and unanticipated combinations) of emergency care presentations and diagnoses.

In addition to original research evidence, evidence-based practice columns, and systematic review, we are thrilled to disseminate and integrate several case reports in this issue of *JEN*. Nicholas et al¹⁷ provide a case example of an older adult presenting with heat-related illness to illustrate the introduction of their innovative practice mnemonic A CLIMATE framework/assessment tool for use in the emergency department. A CLIMATE stands for (1) **A**ct immediately to stabilize life-threatening conditions, (2) **C**onsciously consider climate, (3) **L**earn from a climate history, (4) **I**mplement a climate-focused assessment, (5) **M**anage ongoing climate emergency care, (6) **A**ct to integrate a plan addressing physical and mental health climate symptoms, (7) **T**ell the patient how climate affects their health, and (8) **E**valuate, educate, and refer for long-term follow-up. Consistent with the theme of health effects of climate change in this issue,¹⁸ Baez and Suffoletto¹⁹ provide a case report on Lyme disease sequelae in a potentially commonly overlooked differential diagnosis for an ED presentation. Hall and Hall²⁰ provide a case report of a patient who presented to the emergency department in circulatory shock and hypoxia and required intubation, ventilation, vasopressor support, and emergent dialysis. The case involved critical nursing interventions and astute clinical investigation in determining the differential diagnosis and causal agent. The authors have generously provided an infographic to aid in precepting and educating new emergency nurses about preparing for emergent rapid-sequence intubation. James and London²¹ disseminate another case review requiring acute clinical mastery in responding to cardiogenic shock, third-degree heart block, and inability to tolerate transcutaneous pacing. Finally, McNicholas et al²² review a case of internal abdominal hemorrhage in an adolescent with von Willebrand disease. We hope our reader's practice, education, policy, and research are enhanced with the clinical wisdom, insights, and

fast-paced practice-relevant content in these case reviews. Our case for case reviews rests on the clinical practice relevance, depth of clinical mastery, and impact on clinical reasoning inherent to this form of frontline evidence.

DETAILS

Subject:	Reimbursement; Emergency medical care; Quality management; Problem based learning; Paramedics; Clinical medicine; Professional development; Interdisciplinary aspects; Physicians; Nurse practitioners; Emergency services; Efficacy; On call; Evidence based research; Evidence-based practice; Physical trauma; Advanced practice nurses; Medicine; Anesthesia; Artificial respiration; Teams; Influenza; Rare diseases; Evidence-based nursing; Epidemics; Research; Clinical nursing; Systematic review; Education; Clinical trials; Professional practice; Clinical decision making
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Document 21 of 31

Emergency Nurses' Knowledge, Attitudes, and Practices Related to Blood Sample Hemolysis Prevention: An Exploratory Descriptive Study: JEN

[ProQuest document link](#)

ABSTRACT (ENGLISH)

Introduction

The aim of the study was to identify emergency nurses' knowledge, attitudes, and practices related to blood sample hemolysis prevention and explore associations between these factors and demographic characteristics. The current state is unknown. Understanding baseline knowledge, attitudes, and practices addresses a gap in the literature.

Method

An exploratory, descriptive design with cross-sectional survey methodology employing a study-specific instrument was used.

Results

Request for participation email was sent to a random sample of 5000 Emergency Nurses Association members, and 427 usable surveys were returned (response rate = 8.5%). Mean years in nursing was 13.85 (standard deviation = 10.78), and 226 (52.9%) were certified emergency nurses. Only 85 participants (19.9%) answered all 3 knowledge questions correctly. Answering the 3 knowledge questions correctly was significantly associated with being a certified emergency nurse ($\chi^2 = 7.15, P < .01$). Participant responses to attitude items about the sequelae of blood sample hemolysis were skewed toward agreement, and most attitude items were associated with whom participants reported as being primarily responsible for phlebotomy. Emergency nurses remain primarily responsible for phlebotomy as well as addressing hemolyzed samples, but few reported that blood sample hemolysis was addressed at a departmental level.

Discussion

Findings suggest that emergency nurses lack some knowledge related to blood sample hemolysis prevention best practices. Attitudes toward phlebotomy practices may be 1 reason practice has not changed. Every effort should be made to prevent hemolyzed blood samples to decrease delays and costs in emergency care.

FULL TEXT

DETAILS

Subject:	Emergency medical care; Electron tubes; Prevention; Investigations; Attitudes; Health care expenditures; Knowledge; Theory of planned behavior; Blood tests; Veins & arteries; Nurses; Emergency services; Polls & surveys; Best practice; Nursing; Departments; Phlebotomy; Electronic mail systems; Demography; Response rates
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The Other Side of Immediate Bedding: A Call to Action to the Research Community: JEN

[ProQuest document link](#)

ABSTRACT (ENGLISH)

In "Triaging the Emergency Department, not the Patient: United States Emergency Nurses' Experience of the Triage Process," Wolf et al² define immediate bedding, or "pull until full," as the intake process of bringing patients directly to treatment areas without screening, triage, or physiological assessment. Lack of timely, accessible primary care and ED crowding are well established concerns in the emergency department.³ These concerns contribute to delays in completing triage within the recommended time frames.²⁻⁴ Studies have shown that direct bedding can significantly reduce door-to-provider times and left-without-being-seen rates.^{5,6} But before we consider increasing patient throughput as synonymous with quality care, consider this illustrative scenario. Additional, more complex studies need to be performed that consider factors such as nurse staffing levels, including demographics, certifications, and experience; delays in care; patient quality outcomes; and perhaps an emergency department's physical design before pull-until-full, direct-bedding, or quick-look models are declared a best practice.^{2,5,6} For a pull-until-full intake process to maintain or improve the quality of care delivered, resources must be present and aligned to nursing, patient, and unit needs.^{6,7} Appropriate staffing can increase throughput, improve flow, and decrease costs; and solely focusing on productivity can compromise quality of care.⁸ The Emergency Nurses Association⁹ confirms that adequate staffing has contributed to the reported success of prior initiatives regarding pull-until-full/direct-bedding practices, but this cannot be validated until research that examines this intake practice includes staffing levels and other vital information in its analyses.

FULL TEXT

Dear Editor:

It is every triage nurse's worst nightmare to lose a patient in their lobby who was waiting for care.¹ But could patients also be at risk of suboptimal outcomes in a patient care room while waiting to see a provider? This question and the unintended consequences of direct bedding are worthy of rigorous, systematic exploration.

In "Triaging the Emergency Department, not the Patient: United States Emergency Nurses' Experience of the Triage Process," Wolf et al² define immediate bedding, or "pull until full," as the intake process of bringing patients directly to treatment areas without screening, triage, or physiological assessment.

Lack of timely, accessible primary care and ED crowding are well established concerns in the emergency department.³ These concerns contribute to delays in completing triage within the recommended time frames.²⁻⁴ Studies have shown that direct bedding can significantly reduce door-to-provider times and left-without-being-seen rates.^{5,6} But before we consider increasing patient throughput as synonymous with quality care, consider this illustrative scenario.

At 2 pm, a triage nurse leaves the ED lobby with an older adult, who speaks English as a second language, with a chief complaint of shortness of breath and palpitations. The triage nurse rooms the patient after paging the communication devices of the primary nurse, Sarah, and the technician, Rob. At this time, Sarah has received a critically ill patient who just arrived by ambulance and whom she is attending to next door. This patient will likely

require intubation. Rob has been temporarily reassigned to another area, with no one available to cover his assignment. The triage nurse assists the patient from the wheelchair to the gurney. “Your doctor and nurse will be in shortly,” they say to the patient. Briskly, they return to the lobby, which has now been unattended for 10 minutes. At 2.30 pm, as Sarah heads to the computed tomography department with her intubated patient, she notices a patient in a room that normally does not have patients in it. She asks the charge nurse to follow up on this because she will likely start tissue plasminogen activator therapy once she returns from the computed tomography department. Rob was relieved of his temporary assignment by an incoming technician and could return to his pod at approximately 3.45 pm. When he returns to his side of the department, he quickly learns that no one has seen this patient and on the basis of the patient’s chief complaint he meets the protocol for an immediate electrocardiogram. Once an electrocardiogram (revealing ST elevation) is performed, the emergency physician and charge nurse are notified immediately. Sarah returns from the intensive care unit at 4.15 pm just after the ST-segment elevation myocardial infarction notification was paged out. She jumps into the room to start an intravenous catheter and provide care to the patient.

Sarah described the situation in the hospital’s occurrence reporting system. It was not the first one she had submitted, and she knew that it would likely not be the last. This dynamic, in addition to the brand-new and much larger emergency department that they had moved into, was making the recently implemented direct-bedding intake process extremely risky.

Additional, more complex studies need to be performed that consider factors such as nurse staffing levels, including demographics, certifications, and experience; delays in care; patient quality outcomes; and perhaps an emergency department’s physical design before pull-until-full, direct-bedding, or quick-look models are declared a best practice.²^{5,6} For a pull-until-full intake process to maintain or improve the quality of care delivered, resources must be present and aligned to nursing, patient, and unit needs.^{6,7} Appropriate staffing can increase throughput, improve flow, and decrease costs; and solely focusing on productivity can compromise quality of care.⁸ The Emergency Nurses Association⁹ confirms that adequate staffing has contributed to the reported success of prior initiatives regarding pull-until-full/direct-bedding practices, but this cannot be validated until research that examines this intake practice includes staffing levels and other vital information in its analyses. In their most recent investigation to establish research priorities for the Emergency Severity Index, Wolf and Delao¹⁰ found the work environment and its effect on triage accuracy and processes to be the lowest priority focus. I am aware that emergency nurses who work triage regularly may feel differently, but I am reassured by the intentional focus of future research on triage in general and ESI in particular.

I would like to reiterate the conclusion of Wolf et al² and stress that “Future research should focus on intervention and comparison studies examining the effect of staffing, nurse experience, hospital policies, and length of shift on the accuracy of triage decision making.” Before we consider pull-until-full intake models as a safe or best practice, let us make sure that the research that is coming out on this topic is comprehensive and includes quality outcomes beyond the time metrics of door-to-doctor times and throughput and even beyond left-without-being-seen rates and patient satisfaction.^{5,6} These are important, but experience suggests that there are deeper implications to this practice than are evident in the existing literature. Perhaps Dr Wolf and her research team would be willing to provide specific study design ideas to emergency nurses wishing to examine direct-bedding triage models further.

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Response to Routsolias and Mycyk Letter: JEN

ABSTRACT (ENGLISH)

[...]patients with opioid withdrawal symptoms benefit from its agonistic properties in the form of diminished cravings; however, its ceiling effect prevents the consequences of respiratory depression and euphoria present with full μ -receptor agonists such as methadone.¹ These characteristics contribute to buprenorphine's excellent safety and efficacy profiles, protecting patients with OUD from overdose and death. [...]we respectfully disagree with the notion that "medication alone is not sufficient treatment for OUD."¹¹ In addition to the difficulties accessing treatment for OUD—including buprenorphine or buprenorphine-naloxone—that our colleagues in Chicago describe and we have seen in Maine as well, emerging literature points to other pandemic-related challenges.^{12,13} First, evidence suggests that people with OUD may be at higher risk for experiencing COVID-19 infection due to a higher prevalence of pre-existing conditions, smoking, opioid-related immunosuppression, and the presence of structural lung disease.¹⁴⁻¹⁷ In addition, those with OUD are more likely to reside in congregate living situations such as group recovery housing, shelters, and correctional facilities where they may be unable to maintain social distancing.^{14,15} People with OUD also make up a disproportionate share of the United States unsheltered and unstably housed population, placing them at further risk for exposure to COVID-19.^{16,18} Although social distancing is an important public health measure, there is potential for the isolation associated with COVID-19 to cause harm for those with OUD.¹⁹ There is a strong association between social isolation, mood, and substance use disorders.²⁰ Isolation can act as a trigger for some, exacerbating existing patterns of substance use or contributing to a return to use for those who are in recovery.¹⁹ In addition, many supportive and harm-reducing services for people with OUD are unavailable as a result of the current pandemic, including support groups, treatment programs, daily medication dispensing clinics, and needle exchanges.

FULL TEXT

To the Editor:

We appreciate the interest of Drs Routsolias and Mycyk in our paper entitled, *Understanding ED Buprenorphine Initiation for Opioid Use Disorder: A Guide for Emergency Nurses*.¹ Although addressing the effects of the current coronavirus disease 2019 (COVID-19) pandemic on patients with opioid use disorder (OUD) was beyond the scope of our original paper, Drs Routsolias and Mycyk correctly point out the importance of this issue and the profound, multi-faceted challenges that the pandemic has created for this vulnerable group of patients.² We appreciate the opportunity to discuss this issue.

As noted by Routsolias and Mycyk, Cook County Medical Examiner data do demonstrate a record number of opioid-related deaths during 2020.³⁻⁵ By June 2020, the Chicago Department of Public Health reported that 82% of overdose deaths were fentaNYL-involved, an increase of nearly 57% over the previous year. Additionally, they reported an 80% increase in fentaNYL-involved fatal overdoses in 2019, before the current COVID-19 pandemic, demonstrating the tremendous impact that the increased availability of this powerful synthetic opioid has had on Chicagoans.⁵ Medical examiner data further reveal that by mid-2020, methadone-involved overdoses had increased by 156% over the previous year. These data clearly indicate that increased use of synthetic opioids such as fentaNYL and methadone have contributed to the growing number of fatal overdoses in Chicago, and do not indicate improved access to buprenorphine or buprenorphine-naloxone as a key factor, as suggested by our colleagues.² The pandemic may be contributing to increased opioid overdose deaths by disrupting existing drug supply chains, replacing heroin with fentaNYL because it is more powerful, less expensive to produce, and easier to smuggle, and by increasing the number of individuals using in isolation.^{6,7} Overdose death data from the Centers for Disease Control and Prevention support the same trend on a national level—the increase in drug overdose mortality began in 2019 and continued through 2020, before the national pandemic emergency was declared in March 2020.⁸ Further, data from the Centers for Disease Control and Prevention also indicate that the primary driver of the increase in

overdose deaths has been wide use of synthetic opioids, in particular, fentaNYL.⁸ In addition, we would like to reiterate that, unlike methadone, buprenorphine is a partial μ -receptor agonist. Therefore, patients with opioid withdrawal symptoms benefit from its agonistic properties in the form of diminished cravings; however, its ceiling effect prevents the consequences of respiratory depression and euphoria present with full μ -receptor agonists such as methadone.¹ These characteristics contribute to buprenorphine's excellent safety and efficacy profiles, protecting patients with OUD from overdose and death. In addition, as we previously discussed, the use of combination buprenorphine-naloxone products decreases the potential for diversion and nonmedical use because the injection or inhalation of the naloxone-containing product activates its antagonistic effects.¹ Importantly, patients who take prescribed buprenorphine-naloxone have less frequent heroin and fentaNYL use that place them at much higher risk for fatal overdose. Finally, we respectfully disagree with the notion that "medication alone is not sufficient treatment for OUD."² As discussed in our full paper, research evidence demonstrates that medical management with buprenorphine is an effective treatment for OUD, and whereas there is also benefit in multimodal treatment programs, patients' preferences for medication alone should not preclude them from receiving opioid agonist treatment.^{1,9,10} The National Academies of Science, Engineering, and Medicine consensus report on medications for OUD concluded that "Lack of availability or utilization of behavioral interventions is not a sufficient justification to withhold medications to treat OUD."¹¹ Further, they also conclude that "confronting the major barriers to the use of medications to treat OUD is critical to addressing the opioid crisis."¹¹ In addition to the difficulties accessing treatment for OUD—including buprenorphine or buprenorphine-naloxone—that our colleagues in Chicago describe and we have seen in Maine as well, emerging literature points to other pandemic-related challenges.^{12,13} First, evidence suggests that people with OUD may be at higher risk for experiencing COVID-19 infection due to a higher prevalence of pre-existing conditions, smoking, opioid-related immunosuppression, and the presence of structural lung disease.¹⁴⁻¹⁷ In addition, those with OUD are more likely to reside in congregate living situations such as group recovery housing, shelters, and correctional facilities where they may be unable to maintain social distancing.^{14,15} People with OUD also make up a disproportionate share of the United States unsheltered and unstably housed population, placing them at further risk for exposure to COVID-19.^{16,18}

Although social distancing is an important public health measure, there is potential for the isolation associated with COVID-19 to cause harm for those with OUD.¹⁹ There is a strong association between social isolation, mood, and substance use disorders.²⁰ Isolation can act as a trigger for some, exacerbating existing patterns of substance use or contributing to a return to use for those who are in recovery.¹⁹ In addition, many supportive and harm-reducing services for people with OUD are unavailable as a result of the current pandemic, including support groups, treatment programs, daily medication dispensing clinics, and needle exchanges. Social isolation is increasing the risk of fatal overdose for those with OUD, as many who typically follow harm reduction guidance to not use alone are doing so during the pandemic. This lessens the potential for administration of bystander naloxone, contributing to overdose deaths.¹⁶

There is also evidence that pandemic-related disruptions to existing drug trafficking patterns and supply chains increase risk for those with OUD.^{16,19,21} Faced with a lack of usual supply, people who use drugs are forced to seek substances from places other than their known and trusted sources, increasing the risk of exposure to adulterated or contaminated substances.^{16,19} Recent research conducted by Niles et al²² documented a 50% increase in the risk of urine positivity for nonprescribed fentaNYL during the pandemic, despite a substantial decrease in urine drug testing overall. They also observed significant increases in positivity for high-risk drugs (heroin, fentaNYL, opioids, benzodiazepines) and dangerous drug combinations (eg, fentaNYL and opioids).

We agree with Drs Routsolias and Mycyk that additional attention to the merging of the COVID-19 pandemic and the continuing opioid epidemic is sorely needed.² Of note, there is an active study, funded through the National Institutes of Health's Helping to End Addiction Long-term Initiative, examining the effects of the COVID-19 pandemic on ED visits for opioid-related issues as well as ED buprenorphine prescribing patterns in a diverse group of EDs from across the US (PI D'Onofrio, Co-I Hawk). We look forward to the results of their analysis for a more comprehensive

look at this issue. Whereas we understand the serious constraints many of our nation's emergency departments are facing because of the pandemic, the crisis facing our patients with OUD is also of critical importance. Emergency departments continue to be the lowest barrier setting for patients with OUD to receive the evidence-based, high quality, compassionate care that they need and deserve. We call for the continued expansion of ED-based buprenorphine programs and ED-based teaching around harm reduction strategies, removal of barriers to buprenorphine prescribing for advance practice providers, and as much as possible, the safe re-opening of outpatient supportive and treatment resources.—*Tania D. Strout, PhD, RN, MS, Department of Emergency Medicine, Maine Medical Center, Portland, ME and Tufts University School of Medicine, Boston, MA. **Twitter:** @tania_strout. **ORCID identifier:** <https://orcid.org/0000-0001-9053-1523>; E-mail: Strout@mmc.org; Michael R. Baumann, MD, Department of Emergency Medicine, Maine Medical Center, Tufts University School of Medicine, Boston, MA. **Twitter:** @mikebaumann_EM. **ORCID identifier:** 0000-0001-7420-5613; Lauren Wendell, MD, MS, Department of Emergency Medicine, Maine Medical Center, Portland, ME and Tufts University School of Medicine, Boston, MA. **Twitter:** @ltwendell. **ORCID identifier:** 0000-0002-9026-2017; Gail D'Onofrio, MD, MS, Yale School of Medicine, New Haven, CT. **Twitter:** @DonofrioGail. **ORCID identifier:** <https://orcid.org/0000-0002-3833-1871>; Kathryn Hawk, MD, MHS, Department of Emergency Medicine, Yale School of Medicine, New Haven, CT. **Twitter:** @kathryn_hawk, **ORCID identifier:** <https://orcid.org/0000-0001-7435-5945>.*

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Emergency Nurses' Guide to Neonatal Lumbar Punctures: JEN

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ABSTRACT (ENGLISH)

A neonatal lumbar puncture can present many challenges for emergency nurses that may not be seen with older children or adults. It is imperative that emergency nurses have the knowledge and training related to the procedure to ensure a positive process for the neonate, involved family and health care team members, as well as the overall outcomes of the procedure. This paper provides a practical guide to the essential knowledge for a neonatal lumbar puncture in the emergency department. The main points conveyed in this paper include considerations such as indications for a neonatal lumbar puncture, how to prepare for the procedure, how to position the neonate, possible complications, and caregiver support.

FULL TEXT

Introduction

A lumbar puncture (LP) is an invasive procedure of the lumbar spine for diagnostic or therapeutic purposes. Owing to the high risk for sepsis in the neonatal period, LPs are commonly performed when neonates present with signs or

symptoms of possible infection.¹ Approximately 321 000 neonates per year are seen in emergency departments.² Fever accounts for 92% of all neonatal ED visits.³ A neonatal LP can present many challenges for emergency nurses that may not be seen with older children or adults. Because of this, it is important for emergency nurses to have knowledge and skills of the procedure for an LP, its indications, procedure preparation, neonate positioning, potential complications, and how to support the parents or caregiver.

Indications

There is a wide range of reasons for why a neonate may need an LP. The most common reason for the procedure is fever.⁴ Owing to neonates' underdeveloped immune system, they are at higher risk for infection and sepsis; thus, fevers must be treated seriously.⁵ Other LP indications include seizure activity, vomiting, irritability, jaundice, or bulging fontanel.⁶ The purpose of an LP in a neonate is to evaluate the cerebrospinal fluid (CSF) for meningitis. Meningitis in neonates is linked to a high risk of mortality and morbidity, as well as long-term complications, including neurologic deficits and cerebral palsy.⁶ If the CSF shows increased inflammatory cells, increased protein level, or low glucose level, it could be indicative of meningitis.⁷ The CSF should also be cultured to look for the growth of any organisms that may indicate a bacterial infection.⁸ The culture results will determine the type of infection.

Preparing for the Procedure

The preparation for an LP procedure for a neonate requires numerous supplies. Most facilities have prepackaged LP trays with the necessary equipment for a medical provider to perform the procedure. In general, the items include the following: a spinal needle, 5 mL and 10 mL syringes, 4 sterile specimen tubes, gauze pads, betadine swab sticks, lidocaine, fenestrated drape, towel, and bandage. LPs are considered sterile procedures; therefore, appropriate personal protective equipment (PPE) is required for each person in the room. Emergency nurses should follow the institutional policy and procedure for the use of appropriate PPE. The PPE includes a sterile gown, gloves, and mask. In addition, appropriate-size sterile gloves and additional needles are important to have at the bedside in case the first attempt is unsuccessful. To minimize the risk of infection during the procedure, ensure that the site is free from cellulitis before performing the LP. An LP through an area of cellulitis can cause meningitis.⁷ The emergency nurse or the holder at the bedside should ensure that the medical provider is maintaining a sterile technique during the entire procedure. The emergency nurse should also require all staff members involved in the procedure to wear appropriate PPE to help keep the site sterile. As required by the Joint Commission, a preprocedure time-out should be taken to reduce the risk of performing a procedure on the wrong patient or at the wrong location. The preprocedure time-out should include all members of the team present for the procedure, and these team members should agree on the patient identity, the correct procedure site, and the procedure being completed.⁹

The procedure can cause discomfort; therefore, it is helpful to have sucrose water at the bedside. The methods of delivering sucrose water are to give the neonate a pacifier dipped in the sucrose water or give small amounts through an oral syringe. When using an oral syringe, the typical effective dosing ranges from 0.1 mL to 2 mL.¹⁰ Sucrose water decreases the neonate's perception of pain by activating an opioid response.¹¹ Other types of analgesia that may be used include topical lidocaine, jet-injected lidocaine, locally injected 1% lidocaine, or intranasal fentaNYL.¹²

Monitoring is essential during an LP to ensure that the neonate does not have any unexpected, acute changes in vital signs. Proper monitoring and continuous airway assessment by a nurse or respiratory therapist are crucial during the procedure in case of respiratory arrest or respiratory failure owing to positioning during the procedure.⁷ Vital sign changes that may be seen include bradypnea or apnea, bradycardia, and oxygen desaturation.¹³ Continuous cardiopulmonary and oxygen saturation monitoring should be incorporated during all LP procedures. The emergency nurse should ensure that neonate resuscitative oxygen supplies such as a nonrebreather and bag-valve mask, suction, and emergency medications are readily available if needed.

The number of attempts should be limited to decrease the risk of infection and pain.¹⁴ The emergency nurse can increase the probability of a successful procedure with limited attempts by keeping the neonate comfortable during the procedure, maintaining the neonate's correct position, and confirming the correct needle size. Emergency nurses

and trained health care providers must act as patient advocates and limit the number of attempts for the neonate.

Caregiver Support

An LP can be extremely stressful for a parent or caregiver of a neonate. The emergency nurse should make every attempt to ease caregiver concerns during the entire ED visit. Providing education is one of the most important roles of the emergency nurse regarding the neonate's family. Caregivers often feel more reassured and remain calmer with information given to them regarding the process and reasoning behind the procedure for an LP.⁷ The provider obtains consent for the procedure; however, emergency nurses may begin providing education as soon as they are aware that an LP will be performed. One opportunity for the nurse to provide parental education is while setting up for the procedure. When having these difficult conversations, it is important for the emergency nurse to be empathetic, exhibit open communication, and remember that family-centered care is the basis for pediatric care.¹⁵ The parent or caregiver should be given the opportunity to ask questions, and information should be reiterated regarding the process of the LP and what to expect postprocedure.

Emergency nurses must remember that caregivers of neonates may have increased anxiety in general.¹⁶ The emergency nurse or emergency staff should provide breastfeeding mothers with appropriate equipment for pumping, as well as privacy, if the neonate is unable to feed. For family and neonate comfort, the emergency nurse should assess if the families have the necessary supplies to care for the neonate while they wait, such as diapers, wipes, formula, bottles, or a pacifier. Emergency nurses should support the entire family to make them feel more comfortable with the LP process.

Caregiver presence during an LP varies by institution. Some institutions do not allow caregivers to be present owing to the risk of contamination to the sterile field. Caregivers may wait in a parent room or the ED lobby, depending on the institution. If caregivers are asked to leave, emergency nurses should carefully explain the rationale for having them out of the room during the procedure, specifically the risk of infection. Increased stress may occur owing to the separation; therefore, emergency nurses should assess and offer additional support from the social work, pastoral care, or other support staff. The emergency nurse should provide the family reassurance that the neonate will not be alone and that the caregiver can come back to the room immediately after the procedure.

After the procedure, the emergency nurse should provide the caregiver with information about how the neonate coped during the procedure. The emergency nurse should provide all necessary education to the caregiver, including the necessity of having the neonate remain lying on the back for at least an hour if possible, the signs and symptoms to watch for, and when to notify a member of the care team. Parents or caregivers should notify a member of the health care team immediately if the infant develops redness, drainage, or swelling at the site, or presents with persistent irritability.

Neonate Positioning

Correct positioning is an essential component of an LP. Only trained emergency nurses and other health care professionals should be permitted to hold the neonate during an LP to prevent respiratory compromise. Parents should not be permitted to hold the neonate during the LP. Emergency nurses may place neonates in 1 of the 2 recommended positions during an LP (^{Figure 1}). The purpose of positioning is to facilitate easier entry to the subarachnoid space and enable access to the CSF. The choice of positioning is determined by the provider. One possible position is the "sitting position." In the "sitting position," the neonate is placed in a seated position with their back facing the provider. Facing the neonate, the holder positions the neonate so that the neonate's head and legs are tucked inward toward the abdomen to give the neonate's back a rounded appearance. The hips must be aligned for the provider to find the appropriate landmarks. These landmarks are found by the provider using an imaginary line, called the intercrystal line (^{Figure 2}), that joins the superior and posterior aspects of the right and left iliac crests.¹⁷ By palpating these landmarks, the provider can then find an intervertebral space above or below the point where the needle will be inserted.¹⁷

A second possible position is the side-lying or lateral position. In this position, the neonate lies on their side with the back facing the provider performing the procedure. The holder faces the neonate and maintains proper positioning. Just as in the "sitting position," the holder should tuck the neonate's head and legs inward toward the abdomen to

give the neonate's back a rounded appearance. The hips should again be aligned correctly.

Maintaining a patent airway is an important consideration during all LP procedures. Each position used during an LP, if done incorrectly, can cause respiratory failure or respiratory arrest. Neonates have lower respiratory reserve than an older infant or child and weaker diaphragmatic muscles; therefore, it is essential that a trained health care provider such as an emergency nurse or respiratory therapist provides constant monitoring of the neonate.¹³ The provider should be prepared to intervene when there is an acute change in respiratory status. Neonates may also cry and move during the procedure; therefore, a trained health care provider should hold the neonate to maintain the correct position. Often, an unsuccessful LP is due to the neonate's movement or improper positioning.¹⁸

Potential Procedural Complications

Anticipated and unanticipated complications may occur during the procedure. Some postprocedure complications are more difficult to assess in a neonate. Astute nursing assessment is critical in the identification of postprocedural complications. Because of the many potential procedural and postprocedural complications, it is important to frequently assess vital signs and maintain cardiorespiratory and oxygen saturation monitoring during and after the procedure. Assessment of the procedure site should also be done frequently to watch for signs of bleeding or infection.

PAIN

One of the most common complications is pain. Pain and discomfort are expected complications during and after LPs and should be assessed accordingly. One example of an appropriate pain scale to use in the neonatal population is the Neonatal Infant Pain Scale. It can be used to assess procedural pain in premature or full-term neonates.¹⁹ Pain-reducing interventions should be used before, during, and after the procedure to ensure that pain is controlled. As previously mentioned, neonates may be given sucrose water as a nonpharmacologic pain intervention during the procedure. Other types of analgesia may be used, as discussed. Systemic pain control or general anesthesia is rarely used for pain control in this patient population.

Although unable to verbally communicate pain, neonates can display symptoms that alert the nurse to pain. Irritability and tachycardia are common symptoms of pain in neonates. Pain may be associated with a postprocedural headache. Therefore, neonates should remain lying flat for approximately 1 hour postprocedure. The caregiver can hold the neonate postprocedure but should be encouraged to keep the neonate's head level with the heart. The emergency nurse should be diligent in assessing for, and notifying the provider of, increased irritability, abnormal vital signs, or any sudden onset symptom or acute change in condition that may indicate pain and other complications.

Infection

Preventing infection at the procedure site is important because infection can lead to serious complications. Assessment of the procedure site should be done frequently to watch for signs of bleeding or infection. Specific signs of infection at the procedure site include redness or swelling of the site or purulent drainage. Other possible signs of infection include pain, lethargy, and any alteration in the neonate's neurologic status. Although neonates who have an LP are not typically discharged to home from the emergency department, the signs of infection to watch for are among important home-going instructions to give caregivers at discharge from the hospital.

Spinal Hematoma/Abscess

An uncommon complication, but one that the nurse should be cognizant of, is a spinal hematoma or spinal abscess. Signs and symptoms of a spinal hematoma/abscess include sensory deficits or paralysis.⁷ These take hours to days to develop postprocedure and are more likely to develop if there are multiple attempts during the procedure. To avoid missing this complication, the emergency nurse should communicate to the admitting nurse that an LP was performed and the number of attempts that were necessary. A spinal hematoma is more likely if the LP was difficult and produced bloody CSF;⁷ therefore, this information should be conveyed to the inpatient nurse. Although spinal hematomas are a possibility, there are limited reports of this occurring in neonates.⁶ The emergency nurse should also educate the neonate's caregivers about the potential for this complication and provide them with information about the signs and symptoms to watch for at home.

Implications for Emergency Nurses

An emergency nurse must be proficient in the process of an LP procedure for a neonate owing to the high risk of airway compromise and the anxiety a caregiver may have owing to the procedure. Although the LP procedure itself is similar at different facilities, each agency should have a policy and procedure regarding emergency nurse competency to assist with a neonatal LP. The emergency nurse should follow best practice but also use their own institutional policy and procedure for detailed guidance. A helpful resource that provides guidance on the process of an LP procedure is "Lumbar Puncture in the Neonate,"²⁰ available at the link in the reference list.

There are many actions that an emergency nurse should ensure happen before, during, and after the LP procedure. The emergency nurse should ensure that proper PPE is worn by all staff participating in the LP procedure. An adequately trained support person should be present for the caregiver of the neonate; they could be a child life specialist, if available, social worker, or pastoral care team member. Proper education must be provided to the neonate's caregiver preprocedure and at discharge. If the patient is being admitted, clear information must be conveyed to the neonate's inpatient nurse regarding potential complications.

Emergency nurses should also be aware of unique potential complications and the ways to prevent and treat them because prompt attention is vital to overall outcomes for neonates. First, emergency nurses must guarantee correct positioning of the neonate during the procedure. It is also imperative that the emergency nurse or respiratory therapist monitors the neonate's airway throughout the LP procedure. The emergency nurse should also be astute in recognizing pain during and after a neonatal LP to provide adequate pain management. The emergency nurse's role is critical to a successful and safe neonatal LP.

Conclusion

Neonates frequently present to the emergency department with fever or other symptoms that may require an LP. Without proper training and knowledge, an emergency nurse should not be assisting with the process of a neonatal LP. An emergency nurse should be competent in the essential correct positioning of a neonate during an LP owing to the major risk of airway compromise. Airway monitoring and treatment of airway complications should be of the highest priority for the emergency nurse. Ultimately, the emergency nurse's understanding and expertise during the LP will improve the procedure for the neonate, involved caregivers, and members of the health care team, as well as the overall outcomes of the procedure.

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DETAILS

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Sexual Assault Nurse Examiner/Forensic Nurse Hospital-based Staffing Solution: A Business Plan Development and Evaluation: JEN

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ABSTRACT (ENGLISH)

Nationally and internationally, providing competent and sustainable sexual assault nurse examiner/forensic nurse coverage has been a shared challenge. This project, "Sexual Assault Nurse Examiner/Forensic Nurse Hospital-based Staffing Solution: A Business Plan Development and Evaluation," provides an example for assessment, construction, implementation, and evaluation of a business plan for a sustainable sexual assault nurse examiner/forensic nurse staffing solution. By using preexisting float pool positions and converting them to sexual assault nurse examiner emergency nurses, coverage for sexual assault nurse examiner examinations in a 16-hospital health system was established, which decreased sexual assault nurse examiner turnover related to burnout while increasing the sustainability of sexual assault nurse examiner nurses who provided quality care to patients who had experienced a sexual assault, domestic or intimate partner violence, elder or child abuse or neglect, assault, strangulation, or human trafficking. Implementation of the business plan resulted in a 179% increase in completed sexual assault nurse examiner examinations and a 242% increase in all types of completed forensic examinations from 2015 to 2019 as 7 new community hospitals were added to the health system. A sum of more than \$20000 allocated for training new sexual assault nurse examiners/forensic nurses was saved per year by using a sexual assault nurse examiner emergency nurse. By creating a supportive structure that fosters and sustains sexual assault nurse examiners/forensic nurses, both medical and mental health concerns can be addressed through trauma-informed care techniques that will affect lifelong health and healing as well as engagement in the criminal justice process for patients who have experienced sexual assault, abuse, neglect, and violence.

FULL TEXT

DETAILS

Subject: Workforce planning; Domestic violence; Psychiatric nurses; Healing; Adult abuse & neglect; Health problems; Child abuse & neglect; Burnout; Hospitals; Community hospitals; Emergency services; Quality of care; Abused children; Business plans; Sex crimes; Staffing; Pediatrics; Nurses; Examiners; Trafficking; Patients; Intimate partner violence; Sustainability; Trauma; Business planning; Professional training; Sexual assault; Criminal justice; Nursing; Education; Mental health; Emergency medical care

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Utility of the Emergency Severity Index by Accuracy of Interrater Agreement by Expert Triage Nurses in a Simulated Scenario in Japan: A Randomized Controlled Trial: JEN

[ProQuest document link](#)

ABSTRACT (ENGLISH)

Objective

The Emergency Severity Index (ESI) is a highly reliable and valid triage scale that is widely used in emergency departments in not only English language regions but also other countries. The Japan Triage and Acuity Scale (JTAS) is frequently used for emergency patients, and the ESI has not been evaluated against the JTAS in Japan.

This study aimed to examine the decision accuracy of the ESI for simulated clinical scenarios among nursing specialists in Japan compared with the JTAS.

Method

A parallel group randomized trial was conducted. In total, 23 JTAS-trained triage nurses from 10 Japanese emergency departments were randomly assigned to the ESI or the JTAS group. Nurses independently assigned triage categories to 80 emergency cases for the assessment of interrater agreement.

Results

Interrater agreement between the expert and triage nurses was $\kappa=0.82$ (excellent) in the ESI group and $\kappa=0.74$ (substantial) in the JTAS group. In addition, interrater agreement by acuity was level 2=0.42 (moderate) in the ESI group and level 2=0.31 (fair) in the JTAS group. Interrater agreement for triage decisions was classified in a higher category in the ESI group than in the JTAS Scale group at level 2. Triage decisions based on the ESI in Japan maintained the same level of interrater agreement and sensitivity as those in other countries.

Conclusion

These findings suggest that the ESI can be introduced in Japan, despite its different emergency medical background compared with other countries.

FULL TEXT

Introduction BACKGROUND

In the field of emergency health care services, triage using a scale with reliability and validity is attracting attention to respond to the increasing number of emergency patients.¹⁻³ Among the existing triage scales, the Emergency Severity Index (ESI) is a highly reliable and valid system that is widely used in the emergency department in not only English language regions but also other countries.^{4,5}

The advantages of using the ESI include the ability to assess patient acuity based on clinical reasoning and medical resources and to make decisions according to clear algorithms.^{6,7} In addition, the ESI limits the acuity level for requesting vital signs, which reduces the time required for triage and contributes to prompt physician examinations.^{8,9}

The Japan Triage and Acuity Scale (JTAS) was developed in Japan with reference to the Canadian Triage and Acuity Scale.¹⁰ However, the JTAS has not yet been widely adopted, and many emergency departments continue to use their own triage scale. In regard to the background of the emergency health care field in Japan, the concept of triage has a cultural connotation reminiscent of disasters, and ED triage has not yet become common.¹¹ In addition, the emergency health care system is also categorized into primary emergency (nonurgent, such as fever without medical history) to tertiary emergency (immediate, such as traffic injuries) according to the severity.¹² As a result, triage nurses have little chance to deal with patients of all acuities. Furthermore, the use of the JTAS requires specialized education, which takes effort in general hospitals. Few studies investigating triage scales, including the ESI, have been carried out in Japan.¹³ Thus, emergency departments might not be interested in using a new triage scale. Therefore, it is important to discuss whether a triage scale more suitable for emergency clinical practice in Japan is needed.

OBJECTIVE

This study aimed to examine the decision accuracy of the ESI for simulated clinical scenarios among nursing specialists in Japan compared with the JTAS.

Methods ETHICAL APPROVAL

This study was registered with the University Hospital Medical Information Network Clinical Trial Registry in Japan (000033519). The experimental protocol was approved by the ethics committee of the first author's university in Japan (approval no. 28-0314). All participants provided written, informed consent after receiving an explanation of the study purpose and procedures. The present study was conducted in accordance with the Consolidated Standards of Reporting Trials statement.

TRIAL DESIGN

This randomized, controlled trial was conducted using a parallel design. Randomization was carried out in a

stratified manner. This study was conducted as a single-blind test in which the researcher was blinded to the group to which the participants were assigned. This study replicated the methods used by our previous study.¹³ Expert triage nurses were randomly assigned to the ESI or JTAS group according to a random allocation table prepared in advance in Microsoft Excel for Mac (version 16.44; Microsoft Japan Co Ltd, Tokyo, Japan).

PARTICIPANTS

The recruitment period for this study was 1 year from July 2018, and a request was sent to facilities with critical care centers in Japan. Sample size and power calculations were performed using EZR (Saitama Medical Center, Jichi Medical University, Saitama, Japan) software.¹⁴ The sample size of 23 participants was identified to provide the study with power exceeding 80% to detect a noninferiority margin of 20% for levels of agreement between the ESI group and the JTAS group. This was based on an assumption of interrater agreement of 80% for our earlier study, allowing a 2-sided type 1 error rate of 5%.

OUTCOMES Main Outcome

The main outcome in this study was interrater agreement regarding the accuracy of the ESI and the JTAS for triage decisions in simulated clinical scenarios based on the weighted kappa coefficient.

Subjective Evaluations in the Simulation Tasks

As a secondary outcome, subjective usability was evaluated using a 10-cm linear visual analog scale with no numerical range between not easy to use (0) and very easy to use (100).¹⁵ The nurses assessed subjective usability by drawing a horizontal line on the visual analog scale. The time required to make a decision for the ESI and the JTAS was measured from the beginning to the end of each simulation task.

PROCEDURES

The intervention involved 23 nurses assigned to undergo 3 hours of clinical lectures and a simulated clinical test with 80 case scenarios collected prospectively from the ESI Handbook using either the ESI or the JTAS (Figure). Participants learned the triage tool in the 2 rooms, which were prepared for each of the 2 groups. They were instructed not to interact with each other until the test was completed. Regarding specific contents, the age, sex, chief complaint, vital signs, and pain scale were described for each patient, and the scenarios were selected in consideration of the degree of acuity and the characteristics of patients in Japan.¹⁶ Regarding the response method for the task, the nurses were asked to rate the case from level 1 to level 5. The simulated patient task targeted all age groups and acuity levels. After answering all questions, the intervention was completed by filling out the survey form when returning the test.

STATISTICAL METHODS

All data were analyzed using SPSS (version 24.0; SPSS Japan, Inc, Tokyo, Japan). Interrater agreement was measured using the weighted kappa coefficient for multiple raters. The interrater agreement between expert triage nurses was evaluated using Cohen's kappa coefficient.¹⁷ Many previous studies also used Cohen's weighted kappa coefficient, so this study's results could be compared more effectively using this as an index of interrater agreement.^{7,10,13,18} Interrater agreement regarding categorization of acuity levels for the evaluation within each group was evaluated using Fleiss' kappa coefficient.¹⁹ Each of the kappa coefficients was interpreted using conventional standards.²⁰ The 95% CIs and categories are shown for each measurement. Categorical data are shown as percentages in addition to the values used to calculate the percentages. All data are presented as mean (SD). The participants' characteristics were analyzed using descriptive statistics. In addition, the rates of over-triage (OT) and under-triage (UT) were calculated according to the results of interrater agreement. Sample characteristics, usability, and decision time were analyzed using the Mann-Whitney *U* test. The criterion for significance was set at 0.05.

Results PARTICIPANTS AND GROUP DIFFERENCES

In total, 23 triage nurses were recruited from 10 emergency departments in Japan (ESI=12, JTAS=11). This study was limited to registered nurses with specialized knowledge to adjust for the background of the participants. All nurses were clinical specialists, such as a certified nursing specialists and nurse practitioners, who belonged to a hospital emergency department and routinely used the JTAS to assess ED patients in a clinical setting in Japan. All nurses had 10 to 20 years of work experience in the emergency department and 4 to 10 years of experience using

the JTAS. No significant differences in age (mean (SD); ESI=35.5 (5.4) years vs JTAS=35.4 (4.6) years, $P=.75$), years of nursing (ESI=13.8 (3.1) vs JTAS=14.3 (2.7), $P=.69$), years working in the emergency department (ESI=9.2 (3.9) vs JTAS=6.8 (41.7), $P=.10$), or years of experience in triage (ESI=4.7 (0.9) vs JTAS=4.3 (1.1), $P=.32$) were found between the 2 groups.

INTERRATER AGREEMENT BETWEEN EXPERT TRIAGE NURSES

This study was conducted on 23 clinical specialist nurses. The interrater agreement between expert triage nurses was $\kappa=0.82$ (excellent) in the ESI group and $\kappa=0.74$ (substantial) in the JTAS group (Table 1). In addition, the UT and OT rates were 20.3% and 14.8%, respectively, in the ESI group and 30.3% and 16.7%, respectively, in the JTAS group.

INTERRATER AGREEMENT BY ACUITY CATEGORY

Interrater agreement by acuity is shown in Table 2. The results showed that the ESI scale was associated with higher agreement than the JTAS.

USABILITY AND DECISION TIME BY TRIAGE SCALE

No significant differences by triage scale were found between the 2 groups with respect to usability (mean \pm SD; ESI=6.6 \pm 1.9 vs JTAS=6.4 \pm 2.0, $P=.95$) or decision time (ESI=68.5 \pm 22.6 seconds vs JTAS=73.3 \pm 26.1 seconds, $P=.67$).

Discussion

This study investigated interrater agreement of the accuracy of decisions by expert triage nurses in simulated clinical scenarios for the ESI and the JTAS. The results showed that the ESI scale was associated with higher agreement than the JTAS. In addition, the interrater agreement for triage decisions was classified into a higher category in the ESI than in the JTAS group at level 2. Furthermore, significant differences were seen in the rates of UT and OT between the 2 groups ($P=0.13$). Similarly, another study of the ESI reported excellent interrater agreement between triage nurses in clinical patients.¹⁸ A meta-analysis regarding the ESI also showed similar interrater agreement to that seen in the present study.²¹

In the concept of triage, level 2 is the most important criterion for identifying patients who require immediate medical attention.⁶ In the case of level 2 or higher acuity, patients should enter the examination room without waiting, but in level 3 or lower, there is waiting time in the emergency department. Patients who are not correctly assigned by this criterion have to wait a long time for a medical examination despite having a high acuity, and there are risks that their condition might worsen, the waiting time might change suddenly, or the clinical outcome might be affected.⁶ Compared with the JTAS, the ESI had superior overall interrater agreement, more accuracy in terms of patient acuity groups, and lower rates of UT and OT. UT causes patients to wait unnecessarily for a medical examination, which causes a worsening medical condition. OT causes patients with less urgent issues to occupy the examination area, which causes problems for the entire emergency outpatient department.⁶ Therefore, the ESI has excellent interrater agreement for triage decisions for patients who require a prompt medical examination and can accurately determine patients with high acuity. The ESI with its higher agreement could contribute to the prevention of a worsening medical condition for patients who are critically ill because it would not force patients with high acuity to wait unnecessarily.

The findings of this study also showed that triage decisions based on the ESI maintain the same levels of sensitivity and agreement among evaluators in Japan as those in countries that commonly use the ESI. The ESI has shown high interrater agreement among triage nurses and emergency physicians in clinical patients in Iran.²² Grossmann et al⁵ reported excellent interrater agreement for the ESI when translated into German. In addition, a study conducted in the Netherlands reported that ESI decisions accurately reflected patient acuity and were highly sensitive for identifying patients unlikely to require admission.²³ Therefore, the ESI can also be plausibly used in Japan, where English is not the official language.

Limitations

This study involved an educational intervention for nurses who already had knowledge of the triage system; it was conducted in a single-blind rather than a double-blind fashion. In addition, this study was limited to clinical specialist

nurses, making it difficult to generalize the findings to all nurses. In addition, this was a simulation study, not with real patients, and the number of observers was small. The sample size was smaller than expected, but the number of people gathered was about the same as in previous studies.^{7,13,18,22} Furthermore, no significant differences in usability or decision time were found between the 2 groups by triage tool. Because a simulated patient task was used in this study, it can be inferred that it was practically difficult to reflect the total time required for the procedure, including vital sign measurements and examinations/treatments. Therefore, future studies should carry out prospective research that more faithfully reproduces clinical triage scenes and the patient's duration of stay after presenting in the emergency department. The trial protocol was not registered.

Implications for Emergency Nursing

The ESI may be used in the Japanese emergency department. In addition, this triage scale has higher interrater agreement for level 2 than the JTAS currently in use, and this could lead to prompt medical examination. In addition, triage decisions made based on the ESI appear to contribute to the prevention of a worsening medical condition for patients who are critically ill. Thus, the ESI could be expected to lead to reliable triage decisions by emergency nurses.

Conclusions

The results of this study indicated that the ESI has good agreement at the most important triage level (level 2). In addition, this scale is less likely to generate OT/UT. Furthermore, the ESI can be used in Japan, despite the different background characteristics of the emergency health care system. Therefore, introducing the ESI to the triage system could be expected to contribute to a better understanding of triage decisions in Japanese clinical emergency departments.

Author Disclosures

Conflicts of interest: none to report.

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Triage tool	Cohen's κ (95% CI)	Category
ESI group (n=12)	0.82 (0.80-0.85)	Excellent
JTAS group (n=11)	0.74 (0.70-0.77)	Substantial

Rating category	ESI (n=12)		JTAS (n=11)	
κ (95% CI)	Category	κ (95% CI)	Category	
0.67 (0.65-0.70)	Substantial	0.68 (0.66-0.72)	Substantial	2
0.42 (0.39-0.45)	Moderate	0.31 (0.28-0.34)	Fair	3
0.38 (0.36-0.41)	Fair	0.25 (0.22-0.28)	Fair	4

0.31 (0.29-0.34)	Fair	0.25 (0.22-0.28)	Fair	5
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DETAILS

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Hemolyzed Blood Samples in the Emergency Department - Finding Our “Why”: JEN

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ABSTRACT (ENGLISH)

When patients present to the emergency department, they expect strong communication from the hospital staff and short wait times and to be treated with empathy and compassion.^{1,2} Patients commonly present during a time of high stress and uncertainty, so addressing these areas of patient care as well as other areas that invoke patient harm have remained a focus for ED leaders: one area for improvement of ED care that has not received as much attention as its potential warrants is the hemolysis of blood samples. Evidence-based technique modifications that have been demonstrated to reduce the rate of hemolysis include the use of a steel-straight needle for phlebotomy, the use of an antecubital site with IV cannulation, and the use of low-vacuum tubes.⁸ Thus, it is puzzling that the rate of hemolyzed blood samples in the emergency department continues to be significantly elevated despite the literature not only describing the importance of this topic but also suggesting simple methods for improvement. [...]the finding that most participants were unaware of blood sample hemolysis prevention initiatives when there is an Emergency Nurses Association clinical practice guideline on the topic demonstrates that there is space and need for education efforts.¹² Moving forward with this root knowledge in mind, further research can be conducted on system requirements such as the time spent by emergency nurses repeating hemolyzed samples versus placing IVs, the impact of high emergency nursing turnover on practice change, and the ever-increasing requirements on uniquely skilled and qualified caregivers that tax their ability to multitask in an as efficient as possible manner.

FULL TEXT

When patients present to the emergency department, they expect strong communication from the hospital staff and short wait times and to be treated with empathy and compassion.^{1,2} Patients commonly present during a time of high stress and uncertainty, so addressing these areas of patient care as well as other areas that invoke patient harm have remained a focus for ED leaders: one area for improvement of ED care that has not received as much attention as its potential warrants is the hemolysis of blood samples.

Hemolysis occurs when blood cells are disturbed owing to turbulence during the collection or analysis process resulting in cell lysis and the release of intracellular potassium (where most of the ion is stored). Any traumatic disturbance (such as excessive centrifugation), chemical contaminant (ethanol swab not allowed to dry, intravenous [IV] medications), improper temperature, or prolonged storage can thus lead to falsely elevated potassium levels. This can occur during analysis (estimated to be approximately one-third of cases) or during collection (two-thirds).³ The American Society for Clinical Pathology has stated that there should be a baseline rate of 2% or lower for hemolysis among completed blood samples.⁴ However, the emergency department remains the hospital department with the highest incidence of hemolyzed samples, as high as 32% reported in one study.^{5,6} One study found that the

average length of stay in the emergency department was 62 minutes longer for patients with hemolyzed blood samples, and another found that the median length of time between blood draws after a hemolyzed sample was 145 minutes.^{5,7} This demonstrates a clear area for improvement in patient satisfaction as short wait times is one of the most common patient expectations.

Much of the research on this topic has focused on identifying when a hemolyzed sample does not need to be redrawn as well as methods to prevent the hemolysis from occurring. Evidence-based technique modifications that have been demonstrated to reduce the rate of hemolysis include the use of a steel-straight needle for phlebotomy, the use of an antecubital site with IV cannulation, and the use of low-vacuum tubes.⁸ Thus, it is puzzling that the rate of hemolyzed blood samples in the emergency department continues to be significantly elevated despite the literature not only describing the importance of this topic but also suggesting simple methods for improvement. Is this due to unique patient characteristics in the emergency department inevitably leading to hemolysis or have we not yet found why we are accepting this status quo?

We read with great interest the study by Burchill et al⁹ that sought to describe emergency nurses' knowledge, attitudes, and practices (KAP) related to hemolysis prevention as well as to explore the associations between nurse demographics and their KAP. Using an exploratory, descriptive design, the authors sought the answers to this fundamental question on the topic: Why are we not doing better? Realizing that simply education about how to prevent hemolysis may not be enough, the authors⁹ sharply used the model laid out by Ajzen's¹⁰ Theory of Planned Behavior to ultimately get to the root of the behavior itself. They surveyed 427 emergency nurses, of whom all were Emergency Nurses Association members and most were clinical staff nurses with a bachelor's degree in nursing employed in a teaching hospital that served both adults and children. The survey contained 3 multiple choice knowledge items, a series of 5 attitude items answered using a Likert scale, 7 multiple choice practice pattern items, and 8 departmental demographic items. The knowledge items, which tested key facts about hemolysis, were answered correctly by only 19.91% of the participants. They found that being board certified in emergency nursing was significantly associated with answering these knowledge items correctly. The overwhelming majority of participants agreed or totally agreed with the attitude items (59.95%-95.78%). The agreement with these attitude items demonstrates that the participants know that sticking patients multiple times for blood lowers patient satisfaction and hemolyzed samples interfere with the care for other patients in the department and delay patient care. The practice pattern items demonstrated that nurses are primarily responsible for blood draws in the emergency department and primarily responsible for being notified about hemolyzed samples. Phlebotomy is most often performed with IV insertion, and a little more than half do use low-volume tubes.

The results of this study are encouraging. Understanding the depth of the knowledge gap is imperative before developing a solution.⁹ Despite developing a deeper understanding of the KAP of emergency nurses, this study does have limitations. As the authors noted, they surveyed a rather small, self-selected convenience sample that created some selection bias. However, the characteristics of the nurses surveyed seem to be representative of the general workforce.¹¹ In addition, some of the suggestions for improvement leave questions unanswered. For instance, the authors suggest that the use of phlebotomists in the emergency department could lower the rate of hemolysis. Despite this likely being true, the results of their study demonstrated that there is plenty of room for improvement in emergency nurses' knowledge on hemolysis, making it reasonable to attempt before reassigning the role of venipuncture.⁹ Furthermore, reassignment may simply just run into the same set of systemic challenges in meeting the expectations of a population with unique needs while still minimizing the (not too) uncommon "unavoidable" mishap of hemolysis. The authors also appropriately noted that education may not be enough because of strongly held beliefs that could prevent the adoption of best practices; however, with only 19.91% of the participants answering the knowledge questions correctly, education will clearly be fundamental in creating the gradual change necessary for quality improvement. For example, the finding that most participants were unaware of blood sample hemolysis prevention initiatives when there is an Emergency Nurses Association clinical practice guideline on the topic demonstrates that there is space and need for education efforts.¹²

Moving forward with this root knowledge in mind, further research can be conducted on system requirements such

as the time spent by emergency nurses repeating hemolyzed samples versus placing IVs, the impact of high emergency nursing turnover on practice change, and the ever-increasing requirements on uniquely skilled and qualified caregivers that tax their ability to multitask in an as efficient as possible manner. Understanding and predicting which patient's experiences can be most efficiently improved by using different draw techniques upfront will ultimately bring this quality improvement to the bedside. Ongoing local improvement/implementation efforts can utilize a structured approach such as the updated Behavioral Engineering Model to reevaluate progress and uptake.¹³ Finally, the best methods for education and dissemination (as well as benchmarking) of this knowledge through departments and regional/national organizations will also have to be explored. The authors have laid the groundwork for understanding why practice patterns have not changed despite clear solutions for an important problem.⁹ We still have a long way to go, but with the findings in this study, we have recognized an opportunity to make headway in practice pattern modification that not only raises patient satisfaction but nursing satisfaction as well.

Author Disclosures

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A CLIMATE: A Tool for Assessment of Climate-Change–Related Health Consequences in the Emergency Department: JEN

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ABSTRACT (ENGLISH)

Climate change is an urgent public health problem that has looming implications and associated deleterious health consequences. The intersection of climate change and health has broad implications for health professionals in a variety of settings but especially for ED settings. Climate change is already affecting human health and health systems—which includes impacts on ED care. Disaster response and emergency preparedness are critically important public health interventions in our climate-changing world, and the contributions of emergency nurses are essential. Disaster preparedness, environmental emergency response, and health emergency management are important elements of emergency nursing and are explicated in *Sheehy's Emergency Nursing Principles and Practices, 7th Edition*. The purpose of this article is to present an overview of a clinical tool and mnemonic, A CLIMATE, developed by the authors with application to a case review. It is imperative that the nursing profession—particularly emergency clinicians—address the intersection of climate and health to engage in the assessment, intervention, management, evaluation, education, and referral of those who present to emergency

departments with potential climate-related health impacts.

FULL TEXT

Contribution to Emergency Nursing Practice

- The current literature lacks a specific framework for the integration of climate and health knowledge for addressing the health history, physical examination, management, and evaluation of climate-related conditions.
- This article contributes to the increasing clinician awareness and engagement in understanding the deleterious health impacts of climate change.
- Key implications for emergency nursing practice include the A CLIMATE tool for health assessment in the emergency department and other settings.

Introduction

Climate change is an urgent public health problem that has looming implications and associated deleterious health consequences. The intersection of climate change and health has broad implications for health professionals in a variety of settings but especially for ED settings. Climate change is associated with physical health consequences—acute and chronic—and mental health sequelae that are well described in the literature.¹⁻⁶ Haines and Ebi² note that climate change is already affecting human health and health systems—which includes impacts on ED care. Disaster response and emergency preparedness are critically important public health interventions in our climate-changing world, and the contributions of emergency nurses are essential. Disaster preparedness, environmental emergency response, and health emergency management are important elements of emergency nursing and are explicated in *Sheehy's Emergency Nursing Principles and Practices, 7th Edition*.⁷ The purpose of this article is to present an overview of a clinical tool and mnemonic, A CLIMATE, developed by the authors with application to a case review.

A growing body of scientific literature urges climate action as a moral imperative to avoid catastrophic health effects by 2050.^{4,5,8,9} Climate effects on health manifest as air quality issues, respiratory illnesses, and allergies related to aeroallergens; vector-borne and waterborne illnesses; food and water insecurity; heat stress, heat strain, and heat stroke, particularly in older persons and occupational workers (construction workers and migrant farmworkers); and acute and chronic kidney illnesses (renal calculi and Mesoamerican nephropathy) related to dehydration and lack of heat breaks. The American Nurses Association¹⁰ developed environmental principles that encompass health in our climate-changing world and explicitly address global climate change. The Canadian Nurses Association developed a position statement in 2009 that was updated in 2017 dealing with the role of nurses in addressing climate change and health. It is imperative that the nursing profession—particularly emergency nurses—address the intersection of climate and health to engage in the assessment, intervention, management, evaluation, and referral of those who present to emergency departments with potential climate-related health impacts.

The Professional Obligation, Leadership, Education, Accountability, Science, and Engagement Framework and A CLIMATE Mnemonic

As 1 exemplar of a mnemonic, the Professional Obligation, Leadership, Education, Accountability, Science, and Engagement (PLEASE) framework⁹ was illustrative in the development of our A CLIMATE mnemonic. Developed by Schenk,¹¹ the PLEASE framework is a key approach to addressing the impact of climate change and greenhouse gas emissions and the importance of environmentally safe and healthy practices. The PLEASE framework¹¹ was built on 3 foundational American Nurses Association documents: *Scope and Standards of Practice*,¹² *Code of Ethics*

with *Interpretive Statements*,¹³ and *Nursing's Social Policy Statement*.¹⁴ From these documents, Schenk¹¹ gleaned key concepts to develop the PLEASE framework, aimed at environmentally safe and healthy practices. These specific areas are explicated in the online supplementary material for consideration of their relevance in the integration of the A CLIMATE mnemonic for ED clinicians and interprofessional assessment, planning, intervention, and evaluation of climate-related health consequences. In the ED setting, a framework for determining the etiology of climate-related health challenges may be relevant for the accurate, time-sensitive, and important contributions of members of the ED team.

The A CLIMATE Assessment Framework for Addressing Health Consequences in Our Climate-Changing World

There is a paucity of frameworks, assessment tools, or teaching tools on climate change for clinical practice. Our previous scoping review¹⁵ suggested that nursing is increasingly engaging in publishing about the health impacts of climate change. Frameworks that were elicited from the literature include the United Nations Sustainable Development Goals framework and climate;¹⁵ the Building Resilience Against Climate Effects framework from the Centers for Disease Control and Prevention with a public health approach;¹⁶ a climate change and sleep framework;¹⁷ a climate change and mental health causal pathways framework;¹⁸ and an environmental protection framework.¹⁹ These climate-and-health-related frameworks did not yield applicability for a framework for climate and health that would be relevant for interprofessional or ED clinicians; thus, we developed an innovative approach to the assessment of health consequences in our climate-changing world and a mnemonic—A CLIMATE—as a clinical tool for adoption in emergency settings.

Here we focus on the development of the A CLIMATE clinical tool and mnemonic, which is based on our model of contributing factors to climate-related health challenges (Table 1); this mnemonic was developed and aimed at assessing, managing, intervening, and evaluating climate-and-health-related challenges. The A CLIMATE mnemonic includes the following domains: A—Act immediately to stabilize life- and limb-threatening conditions; C—Consider the climate-and-health etiology of symptoms; L—Learn from a climate health history; I—Implement a climate-and-health-focused assessment; M—Manage the ongoing care of the climate-related emergency; A—Act to integrate an action plan that includes physiological and psychological climate symptoms; T—Treat urgent climate symptoms and consequences; and E—Evaluate, educate, and refer for long-term follow-up.

The A CLIMATE clinical assessment framework and mnemonic were developed on the basis of our understanding of contributing factors to climate-related health challenges and are meant to guide the assessment, management, interventions, and evaluation of care through a lens of climate change and its impact on health and well-being. This framework was developed from an interprofessional perspective and can be used by all members of the ED team providing patient care (Table 1). The mnemonic comprises 8 domains (Figure 1), which are described below.

A—Act Immediately to Stabilize Life- and Limb-Threatening Conditions

This domain addresses the importance of the emergency clinician in a lens of a focused primary and secondary assessment and priority intervention to address the critical first moments of rapid care in the emergency encounter. Mawardi et al²⁰ urge that disaster preparedness in our climate-changing world should be an essential priority in emergency and disaster preparedness in the community within a multidisciplinary approach. Thus, bringing the unique lens of emergency nurses to consider the health impacts of climate change in emergency settings and incorporating the rapid emergency nursing process are critical aspects of care. For example, potential life- and limb-threatening emergencies linked with climate disasters are key aspects of emergency assessment.

In the emergency setting, it is critical to triage the patient and assign a triage category and consider initiating special alerts (eg, stroke alert). For example, when heat stroke is suspected, other key interventions are to secure large-bore intravenous access and use critical-thinking skills to administer a fluid bolus for hypotension or intravenous

therapy to reduce the risk of fluid overload in an elderly patient. It is also essential to immediately initiate cooling measures (place ice packs to groin and axillae, remove clothing, and use a spray mist with a fan). It is important to consider whether an indwelling catheter is needed to measure output and check for rhabdomyolysis or disseminated intravascular coagulation and place a special indwelling catheter device to measure core temperatures. Monitoring core temperature through a rectal temperature probe or other indwelling device while obtaining a licensed independent provider's engagement for medication to control shivering and also collect blood specimens for laboratory testing including electrolyte imbalance are critical emergency actions.

C—Consciously Consider the Health Impacts of Climate Change Specific to the Regions in Which You Practice

It is important that health care providers are aware of local and regional climate trends (Figure 2). For example, extreme precipitation has increased over the last 30 to 50 years, and the largest increases have been in the Midwest and Northeast. In addition, there has been an increase in floods in these same regions,²¹ resulting in traumatic injury, mental health impacts, preterm birth and low birth weight, increases in infectious diseases, and carbon monoxide poisoning related to power outages.²² Understanding regional climate trends and being aware of physical and mental health impacts related to extreme precipitation and flooding will allow ED providers to anticipate and plan for surges in ED admissions. Similarly, heat waves are more intense and are occurring with greater frequency, particularly in the western United States.¹ Providers who work in regions that experience increasing extreme heat events can anticipate more ED visits related to heat-related illnesses, particularly in older adults, young children, and certain occupational groups.²³ Moreover, ED clinicians can also anticipate an increase in admissions related to violence and aggression because there is a causal link between increasing temperatures and aggression.²⁴ A key factor is that the "C" in the A CLIMATE mnemonic encompasses a regional-level and a hospital/departmental-level response as part of the preparation for care of an individual patient by ED clinicians.

L—Learn From A Climate–Health History

A climate–health history can be a key element for clinical practice in the emergency department. Understanding the associated health consequences of these impacts and knowing which groups are most vulnerable will inform how providers approach a focused health assessment, which can be key to identifying health problems that are exacerbated by climate issues. It is critical for ED clinicians to be aware of those individuals, communities, and populations who are most vulnerable to the health threats associated with climate change. Vulnerability is variable, and health impacts differ by location, pathways of exposure, adaptive capacity, and underlying susceptibility.²⁵ However, there are certain groups who have been identified as populations of concern. These include those with low socioeconomic status, some communities of color, indigenous peoples, immigrant groups, children, pregnant women, older adults, persons with disabilities, and those with pre-existing physical and mental or chronic conditions.

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Hastings²⁶ examined the impact of climate change and the role of the emergency nurse linking the integration of climate change knowledge, how climate change affects health, and the emergency nurse's role in fighting climate change (Supplementary Figure). It is important to inquire about the environments where patients live, work, and play and the impact that their environment has on their health. For example, when a child presents to the emergency department with increasing and more severe asthma attacks, learning through a climate history that the child lives, and goes to school, close to a congested, high-traffic roadway would be a significant factor in care planning. In addition, it would be equally as important to know if the same child lives in an urban area that experiences the urban heat island effect because the combination of increased greenhouse gas emissions coupled with temperature rise further decreases air quality, which will significantly affect the severity of their disease.²⁷ This aspect of the mnemonic addresses the unit level of ED care.

I—Individualize A Climate-and-Health-Focused Assessment to Ensure Relevant, Climate-Related Impacts are Addressed

A climate–health history and knowledge of regional climate trends are important factors that will guide the focused assessment. The Global Consortium on Climate and Health Education (GCCHE) based out of the Mailman School of Public Health at Columbia University has developed climate-and-health core competencies, which are recommended for all health professionals. The competencies address 5 areas of practice: climate-and-health knowledge and analytical skills; climate change and public health practice; climate change and clinical practice; climate change and health policy; and communication. One of the goals for practicing clinicians is to demonstrate competence in diagnosing and managing climate-sensitive and climate-induced illness.²⁸ The outcomes they identify have relevance for conducting a climate-and-health–focused assessment. For instance, a competency specific to the assessment is to “identify and describe patient presentations and triage considerations as manifestations of direct and indirect climate change conditions.”²⁸ Examples of direct effects would include trauma and heat-related illnesses, whereas indirect effects would include symptoms related to either vector-, food-, or waterborne illnesses.

M—Manage Acute, Chronic, and Complex Climate-and-Health Consequences

Climate-related health consequences can manifest as acute problems, chronic problems, and/or complex problems. Case in point: consider a patient who presents to the emergency department with symptoms of a myocardial infarction. The history reveals that the patient has been under a lot of stress because a hurricane resulted in the loss of her home and the subsequent need to relocate. Although the initial care and management will focus on stabilizing the patient’s physical condition, it will be important to address the potential mental health impacts related to her loss of home and sense of belonging. Therefore, the plan should include mental health screening. The impact will be 2-fold: to provide psychological support and to potentially improve her cardiac health because chronic compounded stress results in increased cortisol levels that have negative cardiovascular effects.²⁴ Climate-related environmental health challenges also overlap with well-known environmental exposures such as heat illness, heat stroke, and fluid and electrolyte imbalance that are well described in *Sheehy’s Emergency Nursing Principles and Practices, 7th Edition*.⁷ In this edition, Worley⁷ also addresses environmental emergency content that has important relevance for the treatment of urgent climate symptoms and consequences.

A—Act Comprehensively to Address Physiological and Psychological Climate Symptoms

Formulating an action plan to address both physiological and psychological climate symptoms is key for the individual level of emergency care. Physiological symptoms require unique action plans that are driven by the patient’s presenting diagnosis and level of acuity. Mental health consequences—particularly for those with previous mental health challenges—are also important to recognize and address. Early recognition of, and intervention with, patients at risk for climate-related mental health sequelae can reduce the occurrence of both acute and long-term impacts; acute impacts may include depression, anxiety, increased substance use, and long-term impacts may include post-traumatic stress disorder.²⁴ As an illustration, it would be a priority to attend to the physical needs of a patient who presents to the emergency department with trauma resulting from an extreme weather event such as a hurricane or flood because it would perhaps involve life- and/or limb-saving interventions. However, to mitigate psychological effects such as post-traumatic stress disorder, anxiety, or depression, initiating treatment such as psychological first aid should be included in the planning and implementation of care²⁴ at the individual level of care. The earlier “A” (Acting immediately to stabilize life- and limb-threatening conditions addressed in this mnemonic) should be followed up with the second “A” (Act comprehensively to address physiological and psychological climate symptoms). This stage should include the need to re-evaluate the effectiveness of initial interventions to stabilize the patient, continue ongoing monitoring and stabilization, following up on the return of diagnostic results, and alerting

the interdisciplinary team of priority findings such as results consistent with rhabdomyolysis or disseminated intravascular coagulation.

T—Tell the Patient Explicitly in What Ways Climate Change has Influenced Their Health

Since 2014, there has been an increase in the number of Americans who believe that the degree to which climate change is harming human health and will become more common is concerning.²⁹ On the basis of the results of a survey addressing 10 areas that focused on impacts related to extreme heat, severe storms and hurricanes, asthma and lung disease, wildfires, vector-borne disease, flooding, food- and waterborne illness, pollen-related allergies, severe anxiety, and depression, the authors found increases ranging from 13% to 28% across all categories. Of the 10 areas addressed, the 3 areas with the greatest change since 2014 include bodily harm from wildfires (28% change), bodily harm from flooding (25% change), and bodily harm from severe storms and hurricanes (21% change). Yet, only 4 in 10 Americans think that they will be personally harmed by climate change;²⁹ therefore, it is important to make explicit how climate change is affecting their health and incorporate strategies to mitigate negative health consequences and symptoms into patient education. Moreover, it is also important to offer an individualized patient approach and discuss ways to optimize the health co-benefits that come from adaptive strategies such as using alternative transportation options, including walking and biking. Patient education is a key role of the emergency clinician whereby there is explicit dialogue with the patient regarding the risk of a recurrence of a climate-change-related health consequence.

E—Evaluate the Effectiveness of Interventions and Ensure Appropriate Referrals and Follow-Up

One of the most important roles that ED clinicians have is to initiate appropriate referrals on the basis of the individual patient's response to the interventions delivered. Most patients who are seen in the emergency department are either admitted to the hospital or discharged to home or another health care facility. It is critical that clinicians work collaboratively not only to provide safe, effective care, but also to ensure comprehensive handoffs that include information obtained from the climate-health history and physical assessment and the initiation of appropriate referrals. Patient education is a part of the discharge, admission, or transfer process, and a key aspect of the ED encounter. Using the example given above of the patient who presents with a myocardial infarction who reports increased life stressors such as losing her home during a hurricane, it would be important to ensure that a referral to a social worker or mental health provider—both during the inpatient stay and on discharge—be completed.

Application of the A CLIMATE Assessment Framework to a Case Review in the ED Setting

^{Table 2} illustrates a case involving an older adult with potential heat stroke—a common yet preventable life-threatening medical condition that is exacerbated in our climate-changing world. The patient is a 74-year-old woman who resides at home alone in low-income senior housing in a densely populated urban area. Applying the A CLIMATE framework allows for a comprehensive approach that can mitigate future climate-related events and ED admissions, thus addressing the likelihood that patients such as her receive optimal care and follow-up. Below is a description of how the A CLIMATE framework could be applied in the most favorable circumstances where the patient is successfully treated and well enough to be discharged home.

A—Act Immediately to Stabilize Life- and Limb-Threatening Conditions

It is essential for the emergency clinician to immediately assess this patient for priority interventions to address the critical first moments of rapid care in the emergency encounter. For this patient, prioritizing acute neurologic changes and the potential for a diagnosis of heat stroke or acute cerebrovascular accident/stroke are important differential diagnoses for the emergency clinician to consider and rapidly assess and plan urgent interventions to stabilize the patient.

C—Consciously Consider the Health Impacts of Climate Change Specific to the Regions in Which you Practice

In this case, it is important to take into consideration that the heat index has been above “32.22” °C (90 °F) for several days. Heat index accounts for the combined effects of temperature and humidity. When the relative humidity is high, the rate of evaporation, a process of cooling, decreases. In general, extreme caution should be taken when the heat index ranges from “32.22” to “40” °C (90-103 °F).³⁰ Health care providers should consider these climate-related factors and be aware that older adults are more vulnerable to heat-related illness. Understanding these environmental factors will help providers to proactively plan for potential surges related to climate-change-related illnesses such as in the patient case presented here. An example of a commonly found disease is Lyme disease—its spread is increasing owing to warming of the environment—which should also be consciously considered by ED clinicians.

L—Learn From A Climate–Health History

The patient’s age and socioeconomic status identify her as vulnerable to climate-related health impacts. In addition to her age, the patient’s pre-existing conditions (congestive heart failure and hypertension) increased her risk for heat-related illness. Her medications also contributed to this risk. For instance, taking a diuretic in the context of a prolonged high heat index will exacerbate dehydration, and cardiac medications such as Metoprolol can further decrease cardiac output. The patient presented with both tachycardia and hypotension in the emergency department, despite having Metoprolol prescribed. Moreover, it is important to note that the patient does not have an air conditioner at home, which also contributed to her current condition, and that she lives in an urban heat island. Furthermore, her history revealed that she has minimal social contacts. Social isolation, particularly in older adults, is a risk factor for developing heat-related illness.

I—Individualize A Climate-and-Health–Focused Assessment to Ensure Relevant, Climate-Related Impacts are Addressed

Whereas heat stroke is part of the differential diagnosis, there are other diagnoses to consider, such as acute stroke, encephalitis, and infection/sepsis.³¹ Taken together, her history and physical examination indicate signs and symptoms of heat stress or stroke and also suggest objective signs of other potential diagnoses. Therefore, considering a heat-related illness as a potential diagnosis is important. ED clinicians have recognized and treated heat stress and heat stroke in ED settings for years. However, with the increase in ambient heat in our climate-changing world, there is a significantly increased prevalence of heat-related illness in vulnerable populations, including older adults, children, and occupational workers that may include farmworkers, construction workers, and others exposed to heat.^{32,33}

M—Manage Acute, Chronic, and Complex Climate-and-Health Consequences

Given the emergent nature of heat stroke, interventions should not be delayed while other diagnoses are being ruled out. Interventions for cooling for a likely diagnosis of heat stroke while obtaining a computed tomography scan to rule out a cerebrovascular accident/stroke and considering other possible differential diagnoses are critical for the ED clinician. It is important to consider the potential for a diagnosis of heat stroke to avoid progression of the condition, which may lead to organ failure and death.³¹ In addition to ruling out other diagnoses, it is a priority that interventions aimed at decreasing the patient’s temperature and rehydrating her (while monitoring her carefully, given her diagnosis of congestive heart failure) is an important priority of the entire ED team.

A—Act Comprehensively to Address Physiological and Psychological Climate Symptoms

It is unclear if the patient has significant mental health sequelae from this event. Physiological and psychological climate symptoms are important in the assessment. These may include disorientation, delirium, and agitation as both physiological and psychological manifestations. However, it can be very distressing for patients who are

confused and who may be aware of their actions and behaviors while disoriented. Therefore, it would be important to explore this with the patient and her family once she is stabilized. This aspect of the plan of care would also be inclusive of a comprehensive understanding of her baseline neurocognitive status. Teaching the family the importance of a daily check-in during hot weather and perhaps every day should also be incorporated in the action plan.

T—Tell the Patient Explicitly in What Ways Climate Change has Influenced Their Health

Once the patient has stabilized and her neurologic status has returned to baseline, it will be important to begin patient education and discharge teaching. Communication with patients and families is critical to address population health needs related to climate change and its health impacts.³⁴ Information that should be discussed and reinforced include the following:

- What are heat-related illnesses and how can they be prevented?
- The importance of staying hydrated and the changes to perceptions of thirst that occur in older adults.
- The importance of avoiding errands, going outdoors during peak temperatures.
- How medications can impact hydration status and heart rate and blood pressure.
- Strategies for cooling such as air conditioners (if financially feasible), shades to block the sun, or local cooling centers.
- What kinds of symptoms should be reported to her primary care provider?

E—Evaluate the Effectiveness of Interventions and Ensure Appropriate Referrals and Follow-Up

The patient should be referred to her primary care physician and a comprehensive team to optimize her home care and for follow-up. A referral for a visiting nurse is necessary to continue physiological monitoring, medication teaching, and home safety. Other key members of her home care team can be engaged by the case management team and should include a home health aide, occupational therapist, physical therapist, and social worker. An occupational therapy practitioner referral would be beneficial to assess her home to determine if there are environmental factors contributing to her potential for heat-related illness, whereas a physical therapist can work on strength training and mobility. A social worker referral will also be important to ensure that she is optimizing the services for which she qualifies, such as Meals on Wheels and other elder services located in her community. Initiating other available services can also reduce her level of social isolation and minimize her chances of having another heat-related event. Implementing a comprehensive, interprofessional approach to care is critical for at-risk older adults, particularly because the frequency, intensity, and duration of extreme heat events is increasing. Education of patients about cooling centers and public spaces that can be accessed to offset exposure to heat during periods of high ambient temperatures is important. Social work or community programs that donate or support funds for air conditioners or fans for those with chronic illnesses may be another opportunity for referral. Daily check-in by the individual's professional care team and family during heat-related weather events and perhaps daily on a regular basis are important aspects of follow-up care.

Conclusion

The emergency nurse, along with the interdisciplinary team, must intervene to reduce the impacts of climate change on health, particularly for vulnerable populations who frequently use the emergency department for acute, chronic, and complex health problems. Using the A CLIMATE framework and mnemonic may increase the ability for

emergency nurses and clinicians to uncover climate-related health challenges, increase screening of patients, offer interventions, and address education for those at risk of the deleterious health consequences of climate change. This framework may guide emergency specialty practice in our climate-changing world and address the important focus on symptom identification; management; gathering a comprehensive health history; in-depth physical examination; and accurate diagnosis, intervention, referral, and follow-up. Although the prevalence of climate-change-related health consequences is increasing, intervention by emergency nurses and other health professionals is imperative to optimizing professional care.

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Supplementary Data

Author Disclosures

Conflicts of interest: none to report.

Supplementary Data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.jen.2020.10.002>.

Health care provider	Roles in addressing climate-related health impacts.
Advanced practice provider (physician, nurse practitioner, physician assistant)	Acute stabilization of life- and limb-threatening conditions. Perform a focused medical history and physical examination that incorporates knowledge of climate-related illness common to the region and identifies patients from vulnerable groups to ensure a comprehensive plan of care.
Registered nurse	Acute stabilization of life- and limb-threatening conditions. Assess for risk of developing, or the presence of, climate-related illnesses; provide climate-informed patient and family education aimed at prevention of future health threats and reduction in severity of climate-related illnesses; ensure a comprehensive approach to care.
Occupational therapist	Address occupation deprivation—the potential loss of meaningful roles and occupations owing to climate change—and support patients who experience life-role disruptions.
Mental health professional	Screen for climate-related mental health sequelae, and initiate a plan to provide psychological care and support.

Social worker	Coordinate outreach to appropriate community services to address individual climate vulnerabilities (eg, elder services and transportation).
Care coordinator	Ensure that all relevant inpatient or outpatient follow-up referrals to address physical and mental health sequelae are made and integrated into hospital admission or ED discharge planning.
Physical therapist	Optimize activities of daily living for those with chronic and complex illnesses exacerbated by climate change.

Background
This case takes place in early August in the northeast United States. The heat index has exceeded 32.22 °C (90 °F) for 4 days. The patient is a 74-year-old African American woman who lives in low-income senior housing in a heavily populated urban area. She does not have an air conditioner. The patient is found by her son in apparent distress; he calls 911.
Prehospital setting
The first responders find her to be febrile with acute neurologic changes (lethargic, confused, incoherent, and unable to follow commands), hypotensive, and tachycardic. Vital signs at the scene: temperature 40 °C (103.3 °F) orally, HR 110 ST, BP 84/50, RR 30, and oxygen saturation 90% on room air. An intravenous line is placed, and a 500-mL bolus of normal saline is administered. The patient is transported to the local emergency department.
Emergency department

Past medical history: HTN (stage II), hypercholesterolemia, and mild congestive heart failure (diagnosed 10 y ago); ejection fraction 40%.

Social history: The patient lives alone in low-income urban senior housing. She is a retired US postal worker. Her apartment lacks air-conditioning, but she does have a fan. She receives Meals on Wheels 3 times a week. Her husband of 45 years died 10 years ago. She has 2 children who visit approximately every 2 to 3 weeks. Other than family, she has limited social interaction outside the housing complex, apart from an occasional visit with neighbors and a visiting nurse and social worker.

Family history: Mother had hypertension, history of a myocardial infarction. Father had diabetes and died from complications of stroke. Adult children with unknown health backgrounds.

Medications: Furosemide 80-mg by mouth daily; Lisinopril 20-mg by mouth daily; Metoprolol SR 50-mg by mouth daily; Simvastatin 20-mg by mouth daily.

Allergies: No known allergies.

Objective data

Vital signs: temperature 40 °C (102.5 °F) core, HR 106 ST, BP 90/58, RR 28, and oxygen saturation 96% on 2-L/min nasal cannula.

Review of systems:

General: The patient is a 74-year-old African American woman; height 1.55 meters; weight 52.2 kilograms; no obvious signs of injury or distress noted; lying on stretcher; she is awake, unable to follow commands consistently, and appears restless. HEENT: Lips are pale and dry; buccal mucosa and tongue are dry; no nodes or masses palpated.

Neurologic: Oriented to person only; speech slurred; pupils are 3-mm equal and reactive to light and accommodation; no obvious focal deficits noted; difficult to assess systematically owing to patient's mental status. Moving limbs equally.

Cardiac: Normal S1, S2; no murmurs or bruits noted. Radial and distal pulses are 1+, equal bilaterally; +CSM; no peripheral edema noted. Decreased skin turgor, tenting noted.

Respiratory: Lungs are clear bilaterally; patient tachypneic but does not seem to be in distress; no nasal flaring or use of accessory muscles noted.

Abdominal/GI: Abdomen soft, nontender; bowel sounds present in all 4 quadrants; no pain; no masses; no bruits noted.

Musculoskeletal: Gait not assessed owing to neurologic changes. Hip flexion Skin/dermatologic: Skin is hot, dry, and intact.

DETAILS

Subject: Emergency medical care; Intervention; Public health; Clinical medicine; Trends; Catheters; Health problems; Heatstroke; Emergency services; Heat; Nursing; Outdoor air quality; Older people; Emergency preparedness; Nurses; Climate change; Accountability; Organizational climate; Precipitation; Health care; Regions; Health education; Disasters; Medical personnel; Illnesses; Mental health; Disaster medicine

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Response to Amberson Letter: JEN

Lisa Adams Wolf

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FULL TEXT

Dear Editor:

We appreciate the comments and suggestions of Amberson¹ on our research² on the conditions necessary for accurate triage of ED patients. Our work and that of other researchers^{3,4} suggests that there are both individual and environmental factors that contribute to effective triage decision-making.

A significant environmental factor is the socioclinical understanding and operationalization of the role of the triage nurse as one who assesses for patient risk and is not solely a facilitator of throughput. In ED environments that identify time metrics as the driving outcomes measure, the important safety concerns that triage nurses identify can be less valued. Amberson points out, correctly, that there is little evidence examining this problem; in fact, the outcomes measures identified in the few studies around immediate bedding processes are entirely focused on left-without-being-seen numbers and door-to-provider times.⁵⁻⁷

Although patient outcomes are not examined in studies of immediate bedding, qualitative findings suggest that there is concern from emergency nurses about the safety of these processes regarding missed diagnoses, delayed care, and failure to rescue. Our recent studies in the exploration of triage processes around pregnancy-capable people⁸ and occultly suicidal people⁹ suggest that immediate bedding processes are a source of great concern to emergency nurses because critical assessments are delayed or not done, compromising patient care and safety.

This leaves us with the excellent question of how best to study the impact of different triage processes on nursing and patient outcomes. We agree with Amberson that the workplace environment is a critical element in clinical decision-making and associated patient outcomes. A useful theoretical framework that describes the intersection between the socioclinical environment and the individual nurse as it affects decision-making is the study "Integrated, ethically driven environmental model of clinical decision making in emergency settings" by Wolf.⁴ It is an ED setting-specific theory that can examine these overlapping and interwoven threads.¹⁰

More concretely, we offer research priorities for Emergency Severity Index triage¹¹ and suggest that correlational study designs that explore the relationships between triage elements (eg, number of triage nurses, triage processes and decision-making, and nurse time in triage) and outcomes measures (eg, accuracy of Emergency Severity Index level assigned, time to triage, time to first diagnostic, and time to first intervention) would be a valuable place to start. These studies can be population-specific (eg, triage of patients classified as pediatric, geriatric, obstetrical, or psychiatric) or complaint-specific (eg, chest pain and shortness of breath), as the situation demands. Overall, each emergency department is unique in its community served and in the triage processes it uses to rapidly identify and treat patients who are acutely ill; the questions grounded in one's own emergency department present research opportunities to determine if these processes are effective in providing safe care.

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Kratom Ingestion and Emergency Care: Summary and a Case Report: JEN

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ABSTRACT (ENGLISH)

Kratom ingestion for its psychotropic effect or to self-treat opioid withdrawal symptoms has increased over the last 10 years in the United States. Although mild adverse effects have been observed in users, reports of respiratory failure and shock after kratom consumption remain rare. In this case, a 35-year-old man initially presented to the emergency department with profound circulatory shock, metabolic acidosis, hypoxia, and symptoms of autonomic nervous system dysfunction. The patient required vasopressor support, multiregimen sedation and rapid sequence intubation, mechanical ventilation, and emergent hemodialysis. Within 72 hours, the patient's condition stabilized, and he was extubated. The patient reported regular consumption of large quantities of kratom as well as injection of

heroin and cocaine. In this report, a rare clinical presentation after kratom ingestion is described.

FULL TEXT

DETAILS

Subject:	Laboratories; Emergency medical care; Drug overdose; Drug withdrawal; Artificial respiration; Sedation; Heroin; Opioids; Consumption; Hypoxia; Nervous system; Side effects; Emergency services; Cocaine; Ventilation; Central nervous system; Autonomic nervous system; Withdrawal symptoms; Dialysis; Critical care; Case reports; Respiratory failure
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Case report detailing an inferior myocardial infarction, third-degree heart block, and cardiogenic shock: JEN. (2021). *Journal of Emergency Nursing*, 47(4), 557-562. doi:<https://doi.org/10.1016/j.jen.2021.04.003>

An infarction in the right coronary artery affects the inferior wall of the heart and can also cause impedance to the cardiac conduction system. The right coronary artery perfuses the sinoatrial and atrioventricular nodes, and a loss of blood flow contributes to a breakdown in the communication system within the heart, causing associated bradycardias, heart blocks, and arrhythmias. This case report details the prehospital and emergency care of a middle-aged man who experienced an inferior myocardial infarction, concomitant third-degree heart block, and subsequent cardiogenic shock, with successful revascularization. This case is informative for emergency clinicians to review symptoms of acute coronary syndrome, rapid lifesaving diagnostics and intervention, and the unique treatment and monitoring considerations associated with right ventricular involvement and third-degree heart block.

The story of a broken heart: Takotsubo cardiomyopathy: JEN. (2021). *Journal of Emergency Nursing*, 47(4), 635-642. doi:<https://doi.org/10.1016/j.jen.2020.12.014>

Licensed independent practitioners in emergency clinical practice are tasked with differentiating acute cardiac presentations. Despite its similarity in clinical presentation to acute coronary syndrome, Takotsubo cardiomyopathy is a unique cardiac disorder characterized by a stress-induced ballooning of the myocardium. Also known as the broken heart syndrome, Takotsubo cardiomyopathy most frequently occurs after an overwhelming emotional or physical stressor. The subsequent impaired contractility of the heart places the patient at risk of complications, including acute heart failure, cardiogenic shock, thromboembolism, arrhythmias, and left ventricular outflow obstruction. Takotsubo cardiomyopathy is similar in presentation to other cardiac disorders; therefore, clinicians in emergency settings must be efficient and effective in their diagnosis of this disorder on the basis of its distinct criteria. The current article uses most recent evidence to describe the etiology, pathophysiology, diagnosis, and recommended treatment for Takotsubo cardiomyopathy to support licensed independent practitioners in emergency departments in improving patient outcomes and reducing morbidity.

Migrating swollen joint and lyme disease: A case report: JEN. (2021). *Journal of Emergency Nursing*, 47(4), 543-550. doi:<https://doi.org/10.1016/j.jen.2021.04.009>

This article discusses a case involving a pediatric patient who presented to a large urban children's hospital in the Northeastern United States with complaints of migratory monoarticular joint swelling. The patient had presented with a swollen and painful left knee but with no other associated symptoms. He was nontoxic appearing, afebrile, and had normal vital signs. On examination, he was noted to have a tender and swollen left knee that was not erythematous, bruised, or warm to the touch. There was a history of fevers over the summer after returning home from a camping trip in a park located in the northeastern United States. A plain film knee x-ray showed signs of joint effusion but no osseous abnormalities. A bedside ultrasonography of the knee showed a pocket of fluid in the joint space. With parental consent, the left knee joint was aspirated under direct ultrasound guidance, with collection of dark yellow synovial fluid. This was sent for analysis that included cultures, Gram stain, crystal analysis, and Lyme antigens. The patient was admitted, and his symptoms improved during his hospitalization. The results were positive for Lyme and he was discharged home on a 3-week course of Amoxicillin with complete resolution of his symptoms.

Table of contents: JEN. (2021). *Journal of Emergency Nursing*, 47(4), A1-A3. doi:[https://doi.org/10.1016/S0099-1767\(21\)00144-6](https://doi.org/10.1016/S0099-1767(21)00144-6)

Adolescent with von willebrand disease type 3 spontaneous abdominal hemorrhage: JEN. (2021). *Journal of Emergency Nursing*, 47(4), 661-668. doi:<https://doi.org/10.1016/j.jen.2021.04.008>

An adolescent female classified as unstable with a spontaneous abdominal hemorrhage was transferred to a level 1 pediatric trauma tertiary emergency department. Pertinent medical history included von Willebrand disease type 3, menorrhagia, and obesity. Preparation before patient arrival included mobilization of multidisciplinary medical team

experts in hematology, pharmacy, blood bank, radiology, and nursing who provided lifesaving interventions. The administration of factor products, blood products, interventional radiology, emergent hepatic angiography, and embolization coordination resulted in a successful outcome. After an 18-day intensive hospital course, the patient returned home close to her baseline health status.

Implanted port access in the emergency department: A unit-level feasibility study of a nurse-led port access algorithm: JEN. (2021). *Journal of Emergency Nursing*, 47(4), 599-608. doi:<https://doi.org/10.1016/j.jen.2021.01.010>

IntroductionThe objective of this study was to determine the impact of an emergency nurse-led implanted port access algorithm for ED patients with implanted ports admitted to the hospital.**Methods**A feasibility study evaluated the implementation of a central line-associated bloodstream infection algorithm in the emergency department over a 1-month study period. Emergency nurses received central line-associated bloodstream infection education and training for port access algorithm implementation. Pre- and postimplementation surveys measured the nurses' knowledge, attitudes, and behaviors regarding central line-associated bloodstream infections. The nurses' perceptions of the algorithm were assessed pre- and postimplementation. ED patient port access and central line-associated bloodstream infection rates were compared with preimplementation rates.**Results**Emergency nurses (N = 32) received central line-associated bloodstream infection education and algorithm training. Pre- and postimplementation as well as knowledge, attitude, and behavior surveys were completed by 59% (n = 19) of the nursing staff. Knowledge regarding central line-associated bloodstream infections significantly improved, $t(19) = -4.8$, $P < .001$. The nurses' pre- and postimplementation attitude and behavior scores did not differ significantly. They expressed no concerns regarding implementation of the algorithm; 89% (n = 17) reported that the algorithm "fit well" with the ED workflow, and 21% (n = 4) integrated the patient's decision regarding venous access into their shift report. The ED port access incidence during the study period was 17.6% (n = 3), compared with 83.3% (n = 15) in the month before the study.**Discussion**The emergency nurse-led port access algorithm decreased ED port access rates. The nurses' pre- and postimplementation knowledge of central line-associated bloodstream infections increased. The emergency nurse-led port access algorithm empowered emergency nurses to educate their patients on implanted port access and decreased central line use.

Information for readers: JEN. (2021). *Journal of Emergency Nursing*, 47(4) doi:[https://doi.org/10.1016/S0099-1767\(21\)00147-1](https://doi.org/10.1016/S0099-1767(21)00147-1)

Incorporating end-of-life care into the management of dead on arrival patients in the emergency department: Invited commentary: JEN. (2021). *Journal of Emergency Nursing*, 47(4), 521-523. doi:<https://doi.org/10.1016/j.jen.2021.05.001>

...]both the Emergency Nurses Association⁸ and American Heart Association⁹ support policies and practices for family presence and family-witnessed resuscitation, as many families find reassurance in the knowledge that all possible steps were taken to revive their loved ones.¹⁰ Although incorporating end-of-life care into the management of DOA patients will undoubtedly improve patient care and family experience, addressing the needs of DOA patients and families is ultimately an ethical issue. Beyond the obvious potential physical harms of resuscitative efforts, from pneumothoraces to survival with devastating neurologic injury, being a bystander to resuscitation has been identified as a potentially traumatic event for those involved.¹¹ Moreover, when the provision of cardiopulmonary resuscitation appears to be medically inappropriate (some would use the word "futile") by emergency medical personnel, such providers are at risk for moral injury.¹² To this end, advance care planning (ACP) provides an opportunity for the medical and nursing communities not only to align the end-of-life care desired by patients with that delivered but also potentially to prevent distress experienced by families and providers alike. In the United States, for instance, the Centers for Medicare & Medicaid Services instituted regulations in 2016 designed to encourage ACP documentation by specifically reimbursing providers for time spent on such activities.¹⁵ More recently, the emergency department setting has been identified as an underutilized venue for ACP activities, and further efforts are underway to bolster emergency department-based ACP.

CE earn up to 12.0 contact hours: JEN. (2021). Journal of Emergency Nursing, 47(4), 675.
doi:[https://doi.org/10.1016/S0099-1767\(21\)00166-5](https://doi.org/10.1016/S0099-1767(21)00166-5)

Pain medication administered and prescribed to patients with an ankle sprain treated in an emergency department: A record-based cohort study: JEN. (2021). Journal of Emergency Nursing, 47(4), 609-620.e3.
doi:<https://doi.org/10.1016/j.jen.2020.12.011>

IntroductionRecent data indicate that patients treated in the emergency department for an ankle sprain receive multiple medications. However, research has not been able to accurately identify all the medications because of study limitations. The primary purpose of this study was to document the type of medication, number of doses, and number of encounters given a prescription at discharge or instructions to take over-the-counter medication. The secondary purpose was to determine if the proportion of encounters given each type of medication varied on the basis of age, sex, race, and year.
MethodsA retrospective record-based cohort study design was used to review the electronic medical records (N = 1740) of encounters reporting to a southeast academic level 1 trauma center and diagnosed with an ankle sprain between 2013 and 2017. All relevant data were extracted for nonsteroidal anti-inflammatory drugs, muscle relaxants, opioids, and nonopioid analgesics.
ResultsFifty-eight percent of the encounters had at least 1 dose of medication administered in the emergency department. Twenty-eight percent received a prescription at discharge, and 54.5% were instructed to take over-the-counter medication. Cumulatively, opioids accounted for most of the medications, but the yearly rates declined from 2013 to 2017. A greater proportion of patients aged ≤ 15 years received nonsteroidal anti-inflammatory drugs or nonopioid analgesics. Most of the patients aged > 15 years received opioid medication.
DiscussionPatients are primarily given an opioid or nonsteroidal anti-inflammatory drug in the emergency department. Fewer patients receive a prescription at discharge but are regularly instructed to take over-the-counter medication.

Looking to the 12 points of the scout law as inspiration: JEN. (2021). Journal of Emergency Nursing, 47(4), 509-510.
doi:<https://doi.org/10.1016/j.jen.2021.05.003>

The 12 points of the Scout Law were recited weekly at my Scout meetings as a youth and now as an adult leader. Helpful: Do we take that extra step to help the person in the hospital who looks lost? Do we pick up that piece of trash along the sidewalk when we are out running errands or pick up and recycle the bottle we see on the hiking trail?

Editorial board: JEN. (2021). Journal of Emergency Nursing, 47(4) doi:[https://doi.org/10.1016/S0099-1767\(21\)00145-8](https://doi.org/10.1016/S0099-1767(21)00145-8)

Mitigating the effects of climate change on health and health care: The role of the emergency nurse: JEN. (2021). Journal of Emergency Nursing, 47(4), 621-626. doi:<https://doi.org/10.1016/j.jen.2021.05.004>

Description Earth's climate is changing more rapidly than at any other point in the history of modern civilization, and it is largely a result of human activity.¹⁻⁷ The impact of climate change is being experienced globally and is projected to intensify in the future.^{4,6,8} Climate change affects communities in many ways: the economy, social systems, quality of water, ecosystems, agriculture and food, infrastructures, oceans and coasts, tourism, human health, and quality of life.^{4,6,7} A major contributor to the warming of the climate system is the health care sector, accounting for 8% of greenhouse gas emissions in the United States and 4.5% globally.⁸⁻¹⁰ The main greenhouse gases responsible for climate change are carbon dioxide, methane, nitrous oxide, and fluorinated gases.¹¹ In conjunction with black carbon, these gases impair the earth's reflective capacity while simultaneously absorbing solar radiation that is re-emitted to Earth's atmosphere, ultimately leading to surface warming.¹¹ Rising global temperatures are associated with more frequent and severe storms, intense heat, drought, worsening air quality, and changes in the distribution of pathogens.^{8,11-16} Water scarcity, land degradation, and desertification also have accelerated in the past century owing to natural disasters, environmental pollution, and destruction of green space.^{12,17-21} More frequent and intense extreme weather and climate-related events, as well as changes in average climate conditions, are expected to damage infrastructure, ecosystems, and social systems that provide essential benefits to communities. The physical environment where people live, learn, work, and play, which is

affected by rising global temperatures, is a social determinant of health.^{22,23} Future climate change is expected to further disrupt many aspects of life, posing challenges to those most vulnerable populations including children, older adults, pregnant women, some communities of color, immigrants, lower-income and under-resourced communities, and those with comorbidities (eg, immunocompromised, allergies, respiratory disease) who have a lower capacity to prepare for and cope with extreme weather and climate-related events.^{1,2,4,6-8,24-26} Ambient air pollution contributes to 4.2 million premature deaths worldwide and is associated with increased morbidity from numerous illnesses.^{27,28} More than 90% of children are subjected to fine particulate matter that exceeds health standards, whereas maternal exposure is associated with an increase in preterm births, low birth weight, and stillbirths.²⁹ Poor air quality also leads to emergency visits for asthma, chronic obstructive pulmonary disease, cardiovascular events, and mental health complaints.^{7,12,26-28,30} In 2018, a record number of older adults (220 million) were exposed to at least 1 heatwave,⁸ with exposure to the stress of extreme heat causing nephropathy, electrolyte disturbances, cerebrovascular events, congestive heart failure, and preterm births.^{8,12,31,32} Psychological stress owing to displacement, socioeconomic consequences, and exposure to trauma is anticipated to rise with the increased prevalence of climate-related natural disasters.¹² Providing education to patients and their families on climate change and disaster readiness may help them prepare and mitigate these consequences. According to the World Health Organization,²⁸ climate change can be mitigated by transitioning to sustainable and efficient energy practices, conserving and protecting resources, designing climate-resilient infrastructure, and adopting methods of sustainable waste disposal and management practices. ...]emergency care settings can upgrade to energy-efficient equipment, replace incandescent light bulbs with LED bulbs, and install lighting control systems such as occupancy sensors.^{16,20,24,59-61} The use of renewable and alternative energy sources (eg, solar-powered photovoltaic, water pumps, wind) are additional means of reducing fossil fuel use.^{9,16,59-62} Combined heat and power technology is another alternative; this technology captures excess heat from electricity generation and uses it for thermal energy.⁹ Energy production is not the only source of carbon emission: more than half of the nitrogen oxides emitted globally are from fuels used for transportation.⁸ Using locally sourced food and on-site food production (eg, rooftop gardens) in hospital cafeterias and catering are methods of reducing emissions from transporting supplies while modeling sustainable food practices.^{8,16,24} Emergency care settings can further reduce transport emissions by supporting staff use of environmentally conscious forms of transport (eg, cycling) and advocating for vehicles (eg, ambulances) that use alternative fuel, are electric, or have zero emissions.^{12,63} Emergency nurse leaders can incorporate climate resilient solutions into facility renovation and future design.^{8,12,59} For example,

Lesbian, gay, bisexual, transgender, queer cultural competency training to improve the quality of care: An evidence-based practice project: JEN. (2021). *Journal of Emergency Nursing*, 47(4), 654-660.
doi:<https://doi.org/10.1016/j.jen.2020.12.007>

BackgroundOne evidence-based practice strategy to improve the provision of care for the lesbian, gay, bisexual, transgender, queer population is providing cultural competency training. The aim of this evidence-based practice project was to improve Knowledge and Skills, Openness and Support, and Oppression Awareness for emergency nurses when providing care to the lesbian, gay, bisexual, transgender, queer population in the military health system.**Methods**The single-unit, educational intervention posttest compared with unit personnel historical controls project took place in an emergency department within the military health system. The participants included registered nurses or licensed practical nurses working in the emergency department. The Ally Identity Measure tool was administered to an unmatched convenience sample of emergency nurses in a military health system pre- and postintervention to assess the intervention's effectiveness. Descriptive statistics and group difference testing (t test) were used.**Results**The mean Knowledge and Skills subscale score was improved between the pre- and postintervention groups ($t(70) = -3.33, P = .001$). The mean Openness and Support subscale score was improved between the pre- and postintervention groups ($t(70) = -2.06, P = .04$). The mean Oppression Awareness subscale demonstrated no significant difference between the pre- and postintervention groups ($t(70) = -0.93, P = .36$).**Conclusion**This project illustrated the feasibility of an educational intervention to promote culturally competent care in the ED environment for the lesbian, gay, bisexual, transgender, queer population. The results illustrated that emergency nurses in this military health system were aware of the oppression that this vulnerable population faces.

Trajectory of research and dissemination through mentorship and passion: JEN. (2021). *Journal of Emergency Nursing*, 47(4), 511-513. doi:<https://doi.org/10.1016/j.jen.2021.04.014>

A report by the Institute of Medicine, "The Future of Nursing," called for a doubling of the 28 369 doctorally prepared nurses in 2008 by 2020.¹ Although this goal was achieved, it was done primarily through the expansion of Doctor of Nursing Practice programs in the United States. In 2019, the number of nurses graduating with a practice-focused doctorate (Doctor of Nursing Practice) was more than 9 times higher than the number of nurses graduating with a research-focused doctorate (Doctor of Philosophy): 12 250 graduates vs 1306 graduates, respectively.² Given the number of nurses seeking a doctoral degree, it is important for emergency nurses to consider the meaningful aspects of the research doctorate. In this guest editorial, I relay my own career trajectory from being a stretcher-side emergency nurse to my role today as an emergency nurse scientist and leader. It is my hope that emergency nurses will seek opportunities similar to the ones I was afforded through mentorship and dissemination to also become emergency nurse scientists and/or research-focused academic faculty members.

Alignment of nurse practitioner educational preparation and scope of practice in United States emergency departments: A systematic review of the literature: JEN. (2021). *Journal of Emergency Nursing*, 47(4), 563-581. doi:<https://doi.org/10.1016/j.jen.2021.04.005>

IntroductionNational debate persists surrounding the expanded use of nurse practitioners in the emergency department. Current understanding of the alignment of nurse practitioner educational preparation and practice parameters in United States emergency departments is inchoate. The objective of this review was to seek evidence to support that nurse practitioner education and training align with current practices in the emergency department.**Methods**A Preferred Reporting Items for Systematic Reviews and Meta-Analyses guided systematic review of the existing literature was conducted of 4 relevant databases. Level of evidence and quality assignments were made for each article using Grading of Recommendations, Assessment, Development, and Evaluation or Confidence in Evidence from Reviews of Qualitative Research as appropriate.**Results**Nurse practitioners are increasingly staffing emergency departments, providing care to both patients classified as high-acuity and low-acuity. Reports of nurse practitioner scope of practice vary widely. No studies evaluated alignment of educational preparation and training for actual clinical practice.**Discussion**This review of the literature was inconclusive, and the review team was unable to find evidence that supports the alignment of nurse practitioner educational preparation and training with scope of clinical practice in United States emergency departments. Future research should seek to articulate the landscape of nurse practitioner academic preparation for specialty practice in the emergency department and to specifically examine the alignment of educational preparation with scope of practice and impact on clinical outcomes of patients seen in the emergency department.

Emergency nursing review questions: July 2021: JEN. (2021). *Journal of Emergency Nursing*, 47(4), 633-634. doi:<https://doi.org/10.1016/j.jen.2021.03.008>

Correct answer: C Absence of urticaria, delay in the use of EPINEPHrine, severity of reaction, biphasic reaction, age above 65 years, cardiovascular or pulmonary disease, medication as a trigger, and uncontrolled asthma are all factors that increase the risk for severe, near-fatal, or fatal anaphylaxis.1 2. Correct answer: B Biphasic anaphylactic reactions are characterized by an initial reaction, followed by an asymptomatic period of 1 hour or more and then a subsequent return of symptoms without further exposure to antigen. Correct answer: D The signs of pediatric cold shock include tachycardia; tachypnea without increased effort; delayed capillary refill time (>3 seconds); weak peripheral pulses; narrow pulse pressure; decreased urine output; irritability; decreased level of consciousness; and cold, pale, mottled, diaphoretic skin.

Commentary on "A CLIMATE: A tool for assessment of climate-Change-Related health consequences in the emergency department": JEN. (2021). *Journal of Emergency Nursing*, 47(4), 518-520. doi:<https://doi.org/10.1016/j.jen.2021.04.004>

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