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Editorial

It is with tremendous pleasure that we share with you our progress as the editorial and production team.

In the past five years we have transitioned from print only format to print as well as free and open-access online publishing of individual articles and entire editions (no paywalls and no cost to authors or readers accessible through www.CJEN.ca). Articles we publish are now indexed in important academic journal databases such as CINAHL, Directory of Open Access Journals, EBSCO and Google Scholar. We have been vetted by and are now listed with the International Academy of Nursing Editors on their Directory of Nursing Journals. Furthermore, we are under consideration for membership with the prestigious Committee on Publication Ethics. "COPE".

Our print publisher is Pappin Communications, a small Canadian publishing house. Our ISSN is 2293-3921 and our online ISSN is 2563-2655. Our online home is with the Public Knowledge Project's Open Journal System. Submissions are now made and handled through the Open Journal System which keeps journal workflows transparent for authors, reviewers, and editors alike. We receive web hosting and database indexing support through the University of Alberta Digital Initiatives Libraries. Our editorial team has full independence and editorial control, meaning our advertisers or partners do not control what we publish. We are an emergency nursing journal for emergency nurses and other emergency care providers.

CJEN publishes scholarly work in English and French including editorials, reviews and original research related to emergency nursing, patient transport, forensics, resuscitation, harm reduction, emergency medicine, and paramedicine. Our mission is to promote and support excellence in emergency care through community building and knowledge sharing.

Articles we accept for peer review include research, literature reviews, clinical tips and tricks, artistic impressions, and short reports. We have begun publishing bedside focused content including quality improvement conference abstracts, professional organization position statements, clinical case reports, and research protocols. We offer a very quick turn-around time for articles accepted for online publication (often less than thirty days when peer reviewers are suggested at the time of submission). Furthermore, we have undertaken social media engagement (Twitter and Facebook) with our readers as well as video and podcast interviews featuring articles from the journal (available on iTunes, Spotify, TuneIn, YouTube etc). If you haven't yet, do check us out!

We are now in the position of having numerous ongoing submissions, year-round. Our journal is the healthiest it has been in many years. However, we will only be as good as the submissions we receive and our team members. Please send us articles that relate to Canadian emergency nursing practice. We offer manuscript preparation mentorship to NENA members, so come to us with your manuscript ideas and we will help. Also, please consider joining our team if you have an interest in building our profession and our knowledge base as a CJEN team member. Benefits of volunteering your time with CJEN include:

- Editorial and academic writing training
- Participate in the establishment and advancement of our profession and the knowledge base of our specialty
- Your participation looks great on graduate school applications, job interviews, and tenure reviews
- There are opportunities for funding to attend conferences
- Use your experience with us to join other journals and organizations

The first position in the CJEN organization structure is the *editor in chief* who takes responsibility for the journal and acts in a mostly administrative role. The next editorial position is our *editors* who handle articles, supervise their peer-review, and manage them in our online system. The last editorial position is that of the *decision editor* who provides rapid peer-reviews, connects the journal to authors/researchers, and additional reviewers through their relationships with health authorities, hospitals, universities and colleges. We would love to welcome more emergency nurses into the role of decision editors. If you are interested, please reach out to editor@nena.ca

Thank you for all you do and for supporting CJEN, the official journal of the National Emergency Nurses Association of Canada!

Matt Douma
CJEN Editor-in-Chief

Éditorial

C'est avec grand plaisir que nous partageons avec vous le progrès de l'équipe de rédaction et de production.

Au cours des cinq dernières années, notre revue est passée d'un format papier seulement à être aussi disponible en ligne en libre accès (pas de péage et aucun coût pour les auteurs ou les lecteurs sur www.CJEN.ca). Les articles que nous publions sont désormais indexés dans d'importantes bases de données de revues universitaires telles que CINAHL, Directory of Open Access Journals, EBSCO et Google Scholar. Nous avons été approuvés par l'International Academy of Nursing Editors, qui nous a inscrits dans son Directory of Nursing Journals. De plus, nous sommes en cours d'évaluation pour devenir membre du prestigieux *Committee on Publication Ethics* « COPE ».

Notre éditeur imprimé est Pappin Communications, une petite maison d'édition canadienne. Notre ISSN est 2293-3921 et notre ISSN en ligne est 2563-2655. Nous résidons en ligne dans le système de journal ouvert du *Public Knowledge Project*. C'est maintenant le système de journal ouvert qui s'occupe des soumissions de manuscrit. Ce système assure la transparence des flux de travail des revues pour les auteurs, les réviseurs et les rédacteurs. Nous bénéficions d'un soutien en matière d'hébergement Web et d'indexation de bases de données par l'intermédiaire du *University of Alberta Digital Initiatives Libraries*. Notre équipe de rédaction possède une indépendance totale et un contrôle éditorial, ce qui veut dire que nos annonceurs ou partenaires ne contrôlent pas ce que nous publions. Le JCIU est un journal de soins infirmiers d'urgence pour les infirmières d'urgence et autres prestataires de soins d'urgence.

Le JCIU publie des travaux scientifiques en anglais et en français, y compris des éditoriaux, des critiques et des recherches originales sur les soins infirmiers d'urgence, le transport des patients, la médecine légale, la réanimation, la réduction des méfaits, la médecine d'urgence et les soins paramédicaux. Notre mission est de promouvoir et de soutenir l'excellence des soins d'urgence par le développement communautaire et le partage des connaissances.

Les articles que nous acceptons pour l'examen par les pairs comprennent les recherches, les recensions des écrits, les conseils et astuces cliniques, les impressions artistiques et les rapports courts. Nous avons entamé la publication de contenus axés sur les soins aux chevets, notamment des résumés de conférences sur l'amélioration de la qualité, des prises de position d'organisations professionnelles, des rapports de cas cliniques et des protocoles de recherche. Nous offrons un délai d'exécution très rapide pour les articles retenus pour une publication en ligne (souvent moins de trente jours lorsque des réviseurs pairs sont proposés au moment de la soumission). Par ailleurs, nous sommes engagés sur les médias sociaux (Twitter et Facebook) avec nos lecteurs. Nous diffusons également des entrevues vidéos et des balados présentant des articles du journal (disponibles sur iTunes, Spotify, TuneIn, YouTube, etc.). Si vous ne l'avez pas encore fait, allez nous voir !

Nous sommes maintenant en mesure de recevoir de nombreuses soumissions tout au long de l'année. Notre journal n'a pas été aussi robuste depuis des années. Cependant, notre succès dépend des soumissions que nous recevrons et des membres de notre équipe. Veuillez s'il vous plaît nous envoyer des articles qui se rapportent à la pratique des soins infirmiers d'urgence au Canada. Nous offrons un mentorat pour la préparation de manuscrits aux membres de l'ANIIU. Venez nous voir avec vos idées de manuscrits et nous vous aiderons. De plus, si vous souhaitez développer notre profession et notre base de connaissances en tant que membre de l'équipe du JCIU, nous vous invitons à vous joindre à notre équipe. Les avantages du bénévolat au JCIU sont les suivants :

- Formation à la rédaction et à l'écriture académique
- Participation à l'établissement et à l'avancement de notre profession et de la base de connaissances de notre spécialité
- Votre participation fera bonne impression sur les demandes d'admission aux études supérieures, les entretiens d'embauche et les examens de titularisation
- Il existe des possibilités de financement pour assister à des conférences
- Utilisez votre expérience avec nous pour vous joindre à d'autres revues et organismes

Le premier poste de la structure organisationnelle du JCIU est celui du *rédacteur en chef*, qui est responsable du journal et joue un rôle administratif. Ensuite, ce sont nos *rédacteurs* qui traitent les articles, supervisent leur examen par les pairs et les gèrent dans notre système en ligne. Le dernier poste éditorial est celui du *comité de rédaction* qui fournit des examens rapides par les pairs, établit un rapport entre le journal et les auteurs/chercheurs et des examinateurs supplémentaires par leurs relations avec les autorités sanitaires, les hôpitaux, les universités et les collèges. Nous aimerions accueillir davantage d'infirmières d'urgence au comité de rédaction. Si vous êtes intéressé, veuillez communiquer à l'adresse editor@nena.ca.

Merci pour tout ce que vous faites et pour votre soutien au JCIU, le journal officiel de l'Association Nationale des Infirmières et Infirmiers d'Urgence au Canada !

Matt Douma
Rédacteur-en-chef

Text from the cover artist:

Heather Patterson is an Emergency Physician who believes that providing care for patients is a shared experience of humanity. Telling authentic stories of patients and front-line workers during the COVID-19 pandemic, the photographs provide a visual voice for those battling this invisible enemy and highlight the common themes of teamwork, vulnerability, resilience, empathy, joy and suffering. She hopes that her photography will validate the experiences of front-line workers and will inspire hopefulness during these challenging times. Her work can be found on Instagram @heather.l.patterson and will be published in a book available to the public later this year.

Letter to the Editor

John Ellerton, Hermann Brugger, Simon Rauch, Bruce Brink, Sven Christjar Skaiaa, Anthony M. Chahal, Roger Mortimer, Malin Zachau, Mathieu Pasquier, Peter Paal, Giacomo Strapazzon

Response to Drew, R. (2020). Suspension Trauma: The silent killer. Canadian Journal of Emergency Nursing. https://doi.org/10.29173/cjen18

Dear CJEN editors,

We read 'Suspension Trauma. The silent killer by Richard Drew' on suspension trauma with concern. As the author points out there are areas of controversy and lack of knowledge. However, since many of the original papers and the influential Health and Safety Executive report by Sneddon in 2002 appeared, there have been new insights into the pathophysiology of suspension syndrome that do not support the original hypothesis of its origin (Rauch, 2019). We prefer the term 'syndrome' to describe the group of conditions seen when a subject hangs passively in a harness. This is not to say that trauma does not coexist in a subject who has fallen and been held on a rope. Indeed impact and deceleration trauma are well described in these situations. As early as 2006 there was a reigning back of the advice to place the casualty in the semi-recumbent position. For example, in *Casualty Care in Mountain Rescue*, (Ellerton, 2006, p. 320), the supine position was advocated for those patients in cardiac arrest. By 2008, after a further review of the literature, it was apparent that there was no evidence that placing the casualty in the (usual) supine position was associated with a poorer outcome. The authors went as far as to say that the semi-recumbent position may be harmful if internal trauma after a fall held by a rope had occurred (Thomassen, 2009).

In 2011, Mortimer wrote "Search and rescue teams and party members assisting a colleague suspended unconscious on rope should follow standard resuscitation measures to restore circulation to vital organs immediately" (Mortimer, 2011). Adisesh et al. (2011) and Pasquier et al. (2011) concurred with this assessment. The comprehensive European Resuscitation Council Guidelines for Resuscitation 2015 Section 4. Cardiac arrest in special circumstances do not mention suspension syndrome at all; other conditions causing cardiac arrest that require special consideration to standard ACLS are listed.

Not all authors have incorporated the new insights into their work. For example in 2014 on p. 265, the *Outdoor and Mountain Medicine* book published by the Club Alpina Suisse strongly condemns laying the person flat or in the recovery position for 10–20 minutes following rescue (Brunello et al., 2014, p. 265).

We and others feel there is a convergence of opinion amongst researchers and rescuers in the field (Weber, 2020). The key practical points are:

1. that suspension syndrome should be managed with a high degree of urgency. A safe extrication from the hanging position should be effected as soon as possible as a rapid deterioration in a patient's condition can occur in an unpredictable fashion and be fatal.
2. We feel that all casualties should be placed in a supine position once released and managed in line with standard ATLS/ACLS .

Further details of the ICAR MedCom recommendations can be found on our website (http://www.icar-med.com).

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Author's response

Thank you for your letter to the editor.

The intent of this article, "Suspension Trauma—The silent killer" was to bring awareness to a condition that is often not seen or recognized in the medical community. It serves as an understanding of how suspension can occur and brings awareness to how critically compromised a suspension victim could be.

This article, like many others, is seemingly unified with the approach to these victims sharing similar salient features about producing a timely rescue, including that their condition should be approached with a high degree of urgency.

The article, "Suspension Trauma," did take a more cautious approach when providing post-rescue treatment. It recommended that rescued suspension trauma patients who have been vertically suspended for greater than 30 minutes would be kept in a semi-fowlers position for no longer than 30 minutes, at which time lowering the head-of-bed position into a gradual supine position would minimize any further complications. However, this approach did also provide cautionary details and recommendations for those victims—that if at any time they had compromised airway, breathing or circulation, the rescuer may need to lower their head to provide advanced care. This beneficent approach does allow lateral movement for the rescuer when treatment decisions are being balanced to other life-saving measures.

The term of "suspension syndrome" may also be a consideration when identifying these particular victims. This article, "Suspension Trauma," had no biases to the name, but rather chose the name that was commonly used and referenced. In fact, the article did give considerations to other names identifying it in general terms as "orthostatic incompetence." I do appreciate your position and would agree that "syndrome" could be included into the vernacular when describing this particular injured population.

I do thank you for sharing your thoughts and referenced literature as this will certainly help further the discourse with this subject matter.

Richard Drew, RN, BSN, ENC(C)
Covenant Health at the Misericordia Emergency Department in Edmonton, Alberta

Lettre aux éditeurs

John Ellerton, Hermann Brugger, Simon Rauch, Bruce Brink, Sven Christjar Skaiaa, Anthony M. Chahal, Roger Mortimer, Malin Zachau, Mathieu Pasquier, Peter Paal, Giacomo Strapazzon

Réponse à Drew, R (2020). Le traumatisme de suspension : Un tueur silencieux. *Le Journal Canadien des Infirmières d'Urgence, 43*(2), 10–12. https://doi.org/10.29173/cjen18

Chers rédacteurs du JCIU,

Nous avons lu « Le traumatisme de suspension : Un tueur silencieux » par Richard Drew avec inquiétude. Comme le souligne l'auteur, il y a plusieurs éléments de controverse ainsi qu'une insuffisance de connaissances. Cependant, depuis la parution de nombreux documents originaux et de l'influent rapport du Health and Safety Executive par Sneddon en 2002, de nouvelles connaissances sur la physiopathologie du syndrome de suspension ont été acquises qui ne soutiennent pas l'hypothèse initiale de son origine. (Rauch, 2019) Nous préférons le terme « syndrome » pour décrire l'ensemble des conditions observées lorsqu'un individu est suspendu passivement dans un harnais. Cependant, cela ne signifie pas que le traumatisme ne coexiste pas chez un sujet qui est tombé et qui a été retenu par une corde. En effet, les traumatismes liés à l'impact et à la décélération sont bien décrits dans ces situations. Dès 2006, il a été déconseillé de placer la victime en position semi-allongée. Par exemple, dans *Casualty Care in Mountain Rescue*, (Ellerton, 2006, p. 320), les patients en arrêt cardiaque doivent être placés en décubitus dorsal. En 2008, après un nouvel examen de la littérature, rien n'indiquait que le fait de placer la victime en décubitus dorsal (habituel) était associé à un résultat moins bon. Les auteurs sont allés jusqu'à dire que la position semi-allongée peut être nuisible en cas de traumatisme interne après une chute retenue par une corde (Thomassen, 2009).

En 2011, Mortimer a écrit : « Les équipes de recherche et de sauvetage et les membres du parti qui assistent un collègue inconscient suspendu à une corde doivent suivre les mesures de réanimation standard pour rétablir immédiatement la circulation vers les organes vitaux » [Trad. Libre] (Mortimer, 2011). Adisesh et coll. et Pasquier et coll. appuient cette conclusion. Les lignes directrices détaillées du Conseil Européen de Réanimation, Partie 4 sur l'arrêt cardiaque dans des circonstances particulières ne mentionnent pas du tout le syndrome de suspension ; d'autres affectations provoquant un arrêt cardiaque qui nécessitent une attention particulière par rapport à la norme ACLS sont énumérées.

Tous les auteurs n'ont pas intégré ces nouvelles connaissances dans leur travail. Par exemple, en 2014 à la page 265 dans le livre *Outdoor and Mountain Medicine* publié par le Club Alpina Suisse, il est fermement condamné à allonger la personne à plat ou en position de récupération pendant 10 à 20 minutes après le sauvetage (Brunello et coll., 2014, p. 265).

Nous pensons, comme d'autres, qu'il existe une convergence d'opinion entre les chercheurs et les sauveteurs sur le terrain (Weber, 2020). Les principaux aspects pratiques sont les suivants :

1. que le syndrome de suspension doit être géré avec un haut niveau d'urgence. Un sauvetage sécuritaire de la position de suspension doit être effectué dès que possible, car une détérioration rapide de l'état du patient peut se produire de manière imprévisible et être fatale.
2. Nous estimons que toutes les victimes devraient être placées en décubitus dorsal une fois libéré et devraient être gérées conformément à la norme ATLS/ACLS.

Vous trouverez de plus amples informations sur les recommandations du MedCom l'ICAR sur notre site web (http://www.icar-med.com).

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Réponse de l'auteur

Merci pour votre lettre à l'éditeur.

L'intention de cet article « Le traumatisme de suspension : Un tueur silencieux » était de sensibiliser à une condition qui n'est souvent pas vue ou reconnue dans la communauté médicale. Il permet de comprendre comment une suspension peut se produire et de prendre conscience de la manière dont une victime de suspension peut être gravement compromise.

Comme beaucoup d'autres, cet article semble unifié avec son approche de victimes qui partagent les mêmes caractéristiques saillantes concernant la réalisation d'un sauvetage rapide, et souligne que leur condition devrait être abordée avec un haut degré d'urgence.

L'article « Le traumatisme de suspension » a adopté une approche plus prudente en ce qui concerne le traitement post-sauvetage. Il recommandait que les victimes de traumatismes liés à la suspension, qui ont été suspendues verticalement pendant plus de 30 minutes, soient maintenues en position semi-assise pendant une durée maximale de 30 minutes. L'abaissement de la tête de lit en position couchée progressive réduirait alors au minimum les complications supplémentaires. Toutefois, cette approche a également fourni des détails et des recommandations de prudence pour ces victimes. Dans le cas où, à un moment quelconque, leurs voies respiratoires, leur respiration ou leur circulation auraient été compromises, le sauveteur pourrait devoir baisser la tête pour leur prodiguer des soins avancés. Cette approche bénéfique permet au sauveteur de se déplacer latéralement lorsque les décisions relatives au traitement sont exercées en fonction d'autres mesures visant à sauver des vies.

Le terme de « syndrome de suspension » peut également être pris en considération lors de l'identification de ces victimes particulières. L'article « Le traumatisme de suspension » n'avait pas de préjugés quant au terme, mais a plutôt choisi celui qui était employé et cité habituellement. En fait, l'article a pris en considération d'autres noms l'identifiant en termes généraux comme « incompétence orthostatique ». J'apprécie votre position et je serais d'accord pour que le terme « syndrome » soit inclus dans le langage courant pour décrire cette population particulière de blessés.

Je vous remercie d'avoir partagé vos réflexions et la documentation de référence. Cela contribuera certainement à enrichir davantage le discours sur ce sujet.

Richard Drew, IA, B.Sc.Inf., CSU (C)
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Perceptions of healthcare professionals about the presence of family members during cardiopulmonary resuscitation: An integrative literature review

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Abstract

Context: The inclusion of families during cardiopulmonary resuscitation procedures is a clinical challenge. Families are often overlooked in resuscitation protocols aimed at interventions by an interprofessional team, which includes physicians, nurses, respiratory therapists, and orderlies. The existing scientific literature has relatively little to say about the perception of the interprofessional team as to the inclusion of families during resuscitation

Objective: The goal of this integrative review is to explore existing papers on the perception of members of an interprofessional team with regard to the presence of family members during emergency room cardiopulmonary resuscitation procedures.

Methodology: This integrative literature review was carried out by referring to the Cumulative Index to Nursing and Allied Health Literature (CINAHL), PsycINFO, MEDLINE, Web of Science, the Cochrane Library, and the Joanna Briggs Institute (JBI). Data were organized on the basis of the three themes identified by Twibell et al. (2008) in their work: the benefits perceived by Health professionals, the perceived risks and the level of confidence in the professional practice.

Results: Of a total 1,910 works catalogued, 23 scientific papers were selected for subsequent analysis. The three themes identified by Twibell et al. (2008) provided a basis for the analysis of the literature. A thematic content analysis was conducted. The literature primarily addresses the perception of nurses and physicians; very little attention is given to other members of the interprofessional team. Despite the risks and concerns of nurses and physicians, the presence of family members during cardiopulmonary resuscitation procedures is considered to be beneficial to the family.

Limitations: This integrative review found no papers on the perspective of managers or policy-makers; neither did it turn up any information on the point of view of interprofessional teams working in pediatric emergency rooms. Furthermore, the analysis method based on the themes identified by Twibell et al. (2008) leads to a bias in the emergence of other themes. Finally, the perceptions of the interprofessional team were not incorporated into the practice setting.

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Conclusion: The results of this integrative review offer guidelines for improving the practice of inclusion of families during cardiopulmonary resuscitation procedures. Particular attention should be paid to the initial and continuing training of health professionals. Furthermore, this article allows for an initial reflection among managers and decision makers to promote a collaborative culture as well as a patient-centred approach.

Keywords: interprofessional team, resuscitation, emergency department, family, integrative review

Introduction

In emergency rooms, all cardiopulmonary resuscitation procedures take an emotional toll on the individual, their family, and the interprofessional team. Many studies, nevertheless, show that families wish to be present with their loved one in a critical care situation of this nature (Meyers et al., 2000; Mian et al., 2007). A number of researchers report multiple benefits of including family members, in that they represent a source of information for the interprofessional team (Jensen & Kosowan, 2011; Knott & Kee, 2005). Other authors point out that the family's presence helps to make the critical care situation more human (Chapman et al., 2014; McClement et al., 2009; Porter et al., 2014). Accordingly, the Emergency Nurses Association (ENA) issued recommendations in 2007 to develop and support this practice of inclusion in emergency settings (Emergency Nurses Association, 2012). Healthcare professionals' opinions on the subject are mixed, although a majority of them feel that including families is not consistent with the usual practice of keeping families away (Fisher et al., 2008; MacLean et al., 2003; Mason, 2003). This reluctance on the part of healthcare professionals underscores the importance of examining how the interprofessional team perceives the presence of family members during resuscitation procedures. The presence of the family during resuscitation is equivalent to the presence of the family in the environment within which cardiopulmonary resuscitation are provided (Twibell et al., 2018). This presence enables them to have visual or physical contact with the patient during cardiopulmonary resuscitation (Twibell et al., 2018). Thus, the purpose of the article is to provide an overview of the perceptions of the interprofessional team regarding the presence of family members during cardiopulmonary resuscitation in the emergency department.

Method

This integrative review of the literature was carried out using the five-step method of Whittemore & Knafl (2005) comprising problem identification, literature search, data evaluation, data analysis, and presentation of a summary of the data.

The research strategy focused on three key concepts: interprofessional, family and resuscitation. Scientific papers were found through the Cumulative Index to Nursing and Allied Health Literature (CINAHL), PsycINFO, Medline, Web of Science, Cochrane and the Joanna Briggs Institute (JBI). To be included in the review, papers needed to be published in English or French; be a qualitative, quantitative, or mixed study, or a literature review; be published after 2005 to focus on recent research; and deal with family presence during cardiopulmonary resuscitation or the perceptions of healthcare professionals. Papers examining the reality of pediatric emergencies and studies from countries where clinical practices are not similar to those employed in North America were excluded. The articles were examined using a chart analyzing their relevance, rigour and methodology. This chart is based on the book by Loiselle and Profetto-McGrath (2007). The academic papers were not included on the recommendation of a librarian. Indeed, for example, the policies and procedures in terms of inclusion or exclusion of families are usually internal unpublished documents.

Data analysis

Analysis was done using the three themes identified in the works of Twibell et al. (2008) through a thematic analysis of the data (Paillé & Muchielli, 2016). This type of analysis was effective in identifying the perceptions of members of the interprofessional team with regard to the presence of family members during emergency room cardiopulmonary resuscitation procedures linking them to the three themes identified by Twibell et al. (2008). The findings of this integrative review bring to light the benefits and risks perceived primarily by the nurses and physicians with regard to the presence of family and the level of confidence in the professional practice (see Table 1).

Results

A total of 1,720 papers were excluded from the initial 1,910 papers identified because they did not fulfill the inclusion criteria (Figure 1). Of the 190 remaining papers, 158 were excluded because they did not meet the goal of the integrative review, which was to find papers dealing with the perceptions of professionals about the presence of family members during cardiopulmonary resuscitation procedures in the emergency room. In the final tally, 23 papers were analyzed using a structured

Figure 1. Literature selection process

1,910 papers found in electronic databases
190 papers catalogued
23 papers integrated in the integrative review

1,720 papers excluded
- Published in a language other than French or English
- Published prior to 2005
- Focus on pediatric patients
- Non-relevant countries
- Did not meet inclusion criteria: paper addressing family presence during cardiopulmonary resuscitation document

162 papers excluded
Did not meet the goal of the integrative review

Table 1. Perceived benefits and risks of nurses/physicians in different fields

PERCEIVED BENEFITS

Patient/Family	Nurses/Physicians
• Maintained bond between the patient and their family (Fell, 2009; Holzhauser & Finucane 2008; Howlett et al., 2010; McClement et al., 2009) • The family's awareness of the level of care provided for their loved one and the efforts undertaken by the healthcare team (Chapman et al., 2014; Fell, 2009; Holzhauser & Finucane, 2008; Howlett et al., 2010; Knott & Kee, 2005; McClement et al., 2009; Porter et al., 2014; Tudor et al., 2014) • Help reduce a family's anxiety and help them better grasp the severity of the situation (Jensen & Kosowan, 2011) • May make them more open when it comes time to stop resuscitation procedures (Gomes et al., 2019) • Helps the grieving process (Axelsson et al., 2010; Chapman et al., 2014; Garcia-Martinez & Meseguer-Liza, 2018; Howlett et al., 2010; Knott & Kee, 2005) • Reduction in post-traumatic stress symptoms (Jabre et al., 2013)	• A stronger family/caregiver relationship (Asencio-Gutiérrez & Reguera-Burgos, 2017; Miller & Stiles, 2009; Porter et al., 2014; Powers & Reeve, 2018) • A feeling of being appreciated by the family (Miller & Stiles, 2009) • Family acknowledges the efforts undertaken by professionals (Miller & Stiles, 2009) • Patient information is more accessible (Chapman et al., 2014; Fell, 2009; Holzhauser & Finucane, 2008; Howlett et al., 2010) • Makes the patient seem more human, rather than just a body to be resuscitated (Chapman et al., 2014; McClement et al., 2009; Porter et al., 2014)

PERCEIVED RISKS

Patient/Family	Nurses/Physicians	Environment
• Emotional burden (Garcia-Martinez & Meseguer-Liza, 2018; Holzhauser & Finucane, 2007, 2008; Howlett et al., 2010; Knott & Kee, 2005; Miller & Stiles, 2009) • Psychological trauma (Asencio-Gutierrez & Reguera-Burgos, 2017; Fell, 2009; Howlett et al., 2010; McClement et al., 2009; Porter et al., 2014; Tudor et al., 2014) • Misinterpretation of the care provided (Knott & Kee, 2005; Tudor et al., 2014) • Disruption to the grieving process (Holzhauser & Finucane, 2007) • Infringement of confidentiality and privacy of the patient (Holzhauser & Finucane, 2007; Tomlinson et al., 2010)	• Emotions experienced by the family may disrupt cardiopulmonary resuscitation (Chapman et al., 2014; Holzhauser & Finucane, 2007; Howlett et al., 2010; Köberich et al., 2010; Porter et al., 2014; Tomlinson et al., 2010; Waldemar & Thylen, 2019) • Resuscitation efforts are more stressful (Jensen & Kosowan, 2011) • May lead to an increase in the number of legal proceedings (Axelsson et al., 2010; Fell, 2009; Howlett et al., 2010; Koberich et al., 2010; McClement et al., 2009; Porter et al., 2014; Powers & Reeve, 2018; Tomlinson et al., 2010) • Potential difficulties in stopping resuscitation efforts (Axelsson et al., 2010; Holzhauser & Finucane, 2008; Howlett et al., 2010)	• Considerable reduction in the size of the environment of the resuscitation room (Chapman et al., 2014; Holzhauser & Finucane, 2008; Howlett et al., 2010; Knott & Kee, 2005; McClement et al., 2009; Waldemar & Thylen, 2019)

LEVEL OF SELF-CONFIDENCE EXPERIENCED BY HEALTHCARE PROFESSIONALS

- The higher the level of self-confidence, the more likely physicians and nurses will be to ask the family to be present (Twibell et al., 2008)
- The absence of discretionary authority can present a barrier to self-confidence (Fulbrook et al., 2005)
- When staff are open to the idea of the presence of family members, the comfort level rises (Holzhauser & Finucane, 2007)

chart produced by the authors. The chart was used to synthesize data from the thematic analysis. It is comprised of the following information: the reference to the paper, the country, the research quote, the objective, the data associated with the perceived benefits, risks and level of self-confidence experienced by healthcare professionals. These 23 papers comprised the following: an integrative literature review (n = 1), literature reviews (n = 4), quantitative descriptive studies (n = 11), qualitative descriptive studies (n = 5), a mixed-method descriptive study (n = 1), and a randomized control trial (n = 1). The majority of these papers (n = 20) were published from 2008 onward. The work of Twibell et al. (2008) on the development of a tool validated by psychometric properties, used to measure nurses' perceptions of family presence during resuscitation, set out a path with regard to nursing-related research on the inclusion of family during resuscitation procedures.

Most of the studies were from North America, either the United States (n = 10) or Canada (n = 2). The others were conducted in Europe (n = 5), Australia (n = 5), and Latin America. The number of participants in the studies ranged from 10 to 242. For the quantitative studies, the samples ranged from 40 and 570. The sample size in most of the studies was more than 120. The number of study samples varies greatly, which may influence the generalizability of the results. However, generalization is not an end in itself in the integrative review method of the literature. Participants were either nurses (n = 12) or a combination of nurses and physicians (n = 5). One study group was composed exclusively of physicians despite the inclusion of the concept of an interprofessional team in the selection criteria for the articles and keywords.

The studies originate from emergency departments (n = 6), intensive care units (n = 5), a combination of other hospital units (n = 4), cardiology unit (n = 3) and a study aimed at nurse members of ENA and the AACN (American Association of Critical-Care Nurses).

Theme 1: Perceived benefits of family presence for nurses and physicians.

In the scientific literature, we identified a number of benefits perceived by nurses and physicians. According to Twibell et al. (2018), the perceived benefit involves the individual's assessment as to the adoption of a behaviour. These benefits fall mainly into two categories: patient/family and nurses/physicians.

Patient/family related benefits

Eighteen papers assess the benefits related to patient/family. There are many perceived benefits for the team with regard to patients/families: these benefits concern comfort, emotional support, awareness of the level of care, the grieving process, interruption of resuscitation, assistance, and mitigation of post-traumatic stress.

It is important to point out that the benefits for the patient are not as prevalent in the literature. Waldemar & Thylen (2019) point out that nurses (n = 189) feel that having family present may be beneficial for the patient. Some authors support the presence of family members as a way of providing comfort and emotional support for patients (Fell, 2009; Holzhauser & Finucane, 2008; Howlett et al., 2010; McClement et al., 2009). According to these authors, the presence of family members would allow the bond between the patient and their family to be maintained.

Comparatively, the benefits for the family are well documented. According to many authors, nurses feel that family presence during cardiopulmonary resuscitation helps families understand the level of care provided for their loved one and the efforts undertaken by the healthcare team (Chapman et al., 2014; Fell, 2009; Holzhauser & Finucane, 2008; Howlett et al., 2010; Knott & Kee, 2005; McClement et al., 2009; Porter et al., 2014; Tudor et al., 2014). This awareness helps reassure families in the situation (Tudor et al., 2014) and provides a sense of meaning (Porter et al., 2014). Several authors report that the family members' presence helps them understand that everything has been done for their loved one (Fulbrook et al., 2005; Gomes et al., 2019; Jensen & Kosowan, 2011; Köberich et al., 2010). This in turn may help reduce a family's anxiety and help them better grasp the severity of the situation (Jensen & Kosowan, 2011). Waldemar and Thylen (2019) report that this presence can help prevent the family from developing a distorted or erroneous view of the circumstances. Some authors that show that the presence of family members may make them more open when it comes time to stop resuscitation procedures (Howlett et al., 2010; McClement et al., 2009) also report that nurses see this same benefit (Fulbrook et al., 2005; Köberich et al., 2010). Additonally, Gomes et al. (2019) reports 82% of nurses (n = 40) speculate that family members would be more open to stopping treatment if they were present. A number of authors stress that families who are allowed to be present during their loved one's last moments have the opportunity to say goodbye (Axelsson et al., 2010; Fulbrook et al., 2005; Holzhauser & Finucane, 2007; Howlett et al., 2010; Köberich et al., 2010; McClement et al., 2009). In the view of many authors, family presence may be helpful in initiating the grieving process (Axelsson et al., 2010; Chapman et al., 2014; Fulbrook et al., 2005; García-Martínez & Meseguer-Liza, 2018; Howlett et al., 2010; Knott & Kee, 2005; Waldemar & Thylen, 2019).

In their study, Jabre et al. (2013) report that the frequency of occurrence of post-traumatic stress is significantly higher among families who are not present during the resuscitation of their loved one compared with those who are. Some symptoms of post-traumatic stress, such as anxiety and depression, are more prevalent among family members who were not there while resuscitation was being administered (Jabre et al., 2013).

Nurses/physicians related benefits

Fourteen papers were included under the subtopic of nurse/physician related benefits. The nurse/physician related benefits reported in the papers are as follows: a stronger family/caregiver relationship, rapid access to the patient's medical history, and a more human resuscitation situation. Many authors contend that family presence helps strengthen the relationship between the family and the healthcare team (Asencio-Gutiérrez & Reguera-Burgos, 2017; Fulbrook et al., 2005; Miller & Stiles, 2009; Porter et al., 2014; Powers & Reeve, 2018). Miller and Stiles (2009) indicate that nurses say they feel appreciated by the family if

the family is able to be present during cardiopulmonary resuscitation. These same authors stress that, in this situation, the family acknowledges the efforts undertaken by professionals, thereby creating a stronger caregiver/family bond (Chapman et al., 2014; Fell, 2009; Holzhauser & Finucane, 2008; Howlett et al., 2010). Axelsson et al. (2010) and Fulbrook et al. (2005) feel that family presence has a positive impact on team performance. Several authors assert that family presence makes the patient seem more human, rather than just a body to be resuscitated (Chapman et al., 2014; McClement et al., 2009; Porter et al., 2014). Holzhauser and Finucane (2008) argue that family presence can also be comforting for nurses and physicians.

Theme 2: Risks related to nurses and physicians with regard to family presence

The risks perceived by nurses and physicians with regard to the presence of family members during cardiopulmonary resuscitation are well documented in the scientific literature. Perceived risk is based on how likely a person feels that a threat will materialize (Twibell & al., 2018). Including families can be a negative experience if the professional sees inclusion as a risk

Risks related to the patient/family

Fifteen papers assess the risks related to family. The risks perceived by nurses and physicians as they relate to the patient/family are diverse and varied: emotional burden, misinterpretation of the care provided, harmful behaviour, disruption to the grieving process, and infringement of confidentiality.

Many authors assert that there is an emotional burden for the family who witnesses resuscitation procedures being administered to a loved one (Fulbrook & al., 2005; García-Martínez & Meseguer-Liza, 2018; Holzhauser & Finucane, 2007, 2008; Howlett et al., 2010; Knott & Kee, 2005; Miller & Stiles, 2009). Köberich et al. (2010) state that 24% of nurses (η n = 394) fear that the experience may have long-term emotional repercussions on family members. Recently, Waldemar and Thylen (2019) reported that 13.2% of nurses and physicians (n = 189) feel that the family will suffer negative emotional effects. A number of authors put forward the possibility of psychological trauma for the family (Asencio-Gutiérrez & Reguera-Burgos, 2017; Fell, 2009; Howlett et al., 2010; McClement et al., 2009; Porter et al., 2014; Tudor et al., 2014). Jensen and Kosowan (2011) indicate that 21.9% of nurses and physicians (n = 137) think that the experience is too traumatic and disturbing for the family. Other authors contend that the presence of family members may lead to a skewed interpretation of certain medical acts and the belief that the healthcare team is doing more harm than good (Knott & Kee, 2005; Tudor et al., 2014). In a study by Fulbrook et al. (2005), 75% of nurses (n = 124) believe that they might say something that would unintentionally upset the family. Other authors report potential problem behaviours such as family members who are out of control, hysterical, or panicked (Holzhauser & Finucane, 2007; Knott & Kee, 2005). In Fell (2009), caregivers state they fear a family member may faint while their loved one is undergoing resuscitation. Holzhauser and Finucane (2007) point to a risk of adapting poorly to the grieving process. Gomes et al. (2019) report that 12% of nurses interviewed (n = 40) feel that family presence actually prolongs bereavement. Several authors report that patient confidentiality and right to privacy may be violated if family members are present (Fulbrook et al., 2005; Holzhauser & Finucane, 2007; Köberich et al. 2010; Tomlinson et al., 2010). Fulbrook et al. (2005) and Waldemar and Thylen (2019) both assert that 36.9% of nurses (n = 124) in the first study feel that family presence is not beneficial for the patient. Whereas 31.4% of nurses (n = 124) and 55.6% of physicians (n = 65) in the second study also share this perception. To summarize, nurses and physicians perceive multiple risks with regard to the patient and family.

Risks related to nurses and physicians

Eighteen papers assess the risks related to nurses and physicians. Many risks related to nurses and physicians are reported in the papers: interference during resuscitation procedures, legal action, and difficulties in stopping resuscitation. Many authors contend that the emotions experienced by the family may be disruptive while a patient is coding: some refer to anxiety (Asencio- Gutiérrez & Reguera-Burgos, 2017; Fell, 2009; Howlett et al., 2010; Knott & Kee, 2005; McClement et al., 2009; Porter et al., 2014; Waldemar & Thylen, 2019), some to stress (Chapman et al., 2014; Holzhauser & Finucane, 2007; Howlett et al., 2010; Köberich et al., 2010; Porter et al., 2014; Tomlinson et al., 2010; Waldemar & Thylen, 2019), and others to fear (Holzhauser & Finucane, 2007; Howlett et al., 2010). Jensen and Kosowan (2011) indicate that 61.5% of physicians and nurses (n = 137) feel that family presence during resuscitation would make the situation more stressful for members of their team. McClement et al. (2009) mention that healthcare professionals feel less confident if family members are present while a patient is coding.

Many other authors indicate that caregivers worry that family presence may lead to an increase in the number of legal proceedings against members of the resuscitation team (Axelsson et al., 2010; Fell, 2009; Howlett et al., 2010; Köberich et al., 2010; McClement et al., 2009; Porter et al., 2014; Powers & Reeve, 2018; Tomlinson et al., 2010). Fulbrook et al. (2005) state 26% of nurses (n = 124) fear that misunderstandings might lead to a greater number of lawsuits. According to Fell (2009), healthcare providers think that families' misinterpretation of their interventions may lead them to assume that the code team is incompetent. Other authors report that professionals tend to act casually and use humour to alleviate pressure during resuscitation procedures (Axelsson et al., 2010; McClement et al., 2009; Miller & Stiles, 2009). According to these same authors, this may prompt family members to initiate legal proceedings in the event that resuscitation is unsuccessful. Some authors point out potential difficulties in stopping resuscitation efforts when the family is present (Axelsson et al., 2010; Fulbrook et al., 2005; Holzhauser & Finucane, 2008; Howlett et al., 2010). Köberich et al. (2010) show that 23% of nurses (n = 394) believe that family presence might lead to unnecessary attempts to resuscitate the patient. A number of authors claim that the family may interfere with the resuscitation process (Axelsson et al., 2010; Chapman et al., 2014; Howlett et al., 2010; Jensen & Kosowan, 2011; Köberich et al., 2010; Porter et al., 2014; Tomlinson et al., 2010). Several authors show that this interference may be disruptive to

resuscitation efforts (Jensen & Kosowan, 2011; McClement et al., 2009; Powers & Reeve, 2018) or add to the code team's workload (Chapman et al., 2014). Knott & Kee, (2005) point out that this interference may make nurses feel uncomfortable (McClement et al., 2009), and mention a feeling of inadequacy. Other authors report that being observed by the family could be a distraction to caregivers (Fell, 2009; Powers & Reeve, 2018). Still others bring up the issue of concentration problems among the team (Axelsson et al., 2010; Fulbrook et al., 2005). Recently, Waldemar & Thylen (2019) reported a response rate of 20.5% among nurses (n = 124) and 41.2% among physicians (n = 65) with regard to this topic.

Risks related to the environment in the resuscitation area

Seven papers assess the risks related to the environment. Overall, only a few authors make mention of the risks related to the resuscitation area environment. However, some do specify a considerable reduction in the size of the environment of the resuscitation room (Chapman et al., 2014; Holzhauser & Finucane, 2008; Howlett et al., 2010; Knott & Kee, 2005; McClement et al., 2009; Waldemar & Thylen, 2019). Köberich et al. (2010) indicate that 42 nurses (n = 394) feel that resuscitation rooms are not large enough to allow for families to be present and that any such presence would be detrimental to the environment. Despite these space considerations, it is important to underscore that the authors of most of the studies report rates under 50% with regard to the risks perceived by nurses and physicians. Thus, a majority of caregivers do not perceive any risks due to family presence during cardiopulmonary resuscitation, even when the smaller space is considered.

Theme 3: Nurses' and physicians' self confidence when family members are present

Fourteen papers assess nurses' and physicians' level of self confidence when family members are present. Twibell et al. (2018) define self-confidence as the capacity for a person to adopt a given behaviour. Self-confidence is an important consideration in the inclusion of families during emergency resuscitation. Twibell et al. (2008) among others, assert that nurses' self-confidence while family members are present has a direct impact on family inclusion: the higher the level of self-confidence, the more likely physicians and nurses will be to ask the family to be present.

A number of barriers can affect self-confidence and consequently restrict family inclusion; among these factors are the novelty of this practice and the absence of discretionary authority (Fulbrook et al., 2005). Holzhauser and Finucane (2007) show that, when staff are open to the idea of the presence of family members, the comfort level rises. In such an environment, it is entirely possible for family inclusion to be adopted as a practice. Using the definition provided by Twibell et al. (2018), their self-confidence level would be enhanced. According to Tomlinson et al. (2010), greater public awareness about the resuscitation process would encourage nurses to be more open to family presence. Thus, they will be more inclined to include family members during resuscitation efforts, hence strengthening their confidence in their professional experience.

The level of self-confidence itself is directly linked to professional experience. Tudor et al. (2014) used the scales put forward by Twibell et al. (2008). They concluded that nurses who have previous experience including families in the resuscitation process, or who have themselves stated that they would want a member of their own family to insist on attempting resuscitation on them if need be, have a higher level of self-confidence (Tudor et al., 2014). Howlett et al. (2010) report that 79% of 14 experienced physicians in a regional trauma care centre had a more positive attitude toward family presence than the 19% (n = 22) of less-experienced residents. Self-confidence is also contingent on previous experience in including families in resuscitation procedures. Recently, Twibell et al. (2018) found that physicians who have asked family members to be present during cardiopulmonary resuscitation score significantly higher on the self-confidence scale than those who have never done so. Porter et al. (2014) also point out that, if staff have previously included family members, they are more likely to do so again. The same authors indicate that education may help change attitudes and encourage more caregivers to be open to the presence of family members (Porter et al., 2014). The higher the level of self-confidence, the more likely physicians and nurses will be to ask the family to be present. Their level of self-confidence in their professional experience will thus be increased.

Twibell and her fellow researchers (2018) have led studies using a tool that measures the level of self-confidence in nurses and physicians. They report that nurses who perceive more benefits and fewer drawbacks tend to exhibit greater self-confidence. Emergency nurses show greater self-confidence (Twibell et al., 2008) as well as those who have a specialized certificate (Tudor et al., 2014).

Discussion and recommendations

This integrative review features a table summarizing the benefits and risks perceived by physicians and nurses, as well as their self-confidence levels, with regard to including family members during cardiopulmonary resuscitation procedures (See Table 1).

An initial observation: the studies included in this review focus exclusively on the perceptions of nurses and physicians, even though they are not the only healthcare professionals in the resuscitation room: they work closely within an interprofessional team of nurses, physicians, respiratory therapists and personal support workers (Vincent, 2006). The Ordre des infirmières et infirmiers du Québec (OIIQ) highlights the importance of this interprofessional collaboration in a position paper where the OIIQ asserts that it is a necessary element in every care scenario (OIIQ, 2015). Five years after this paper was issued, the OIIQ reiterated its position on the importance of a collaborative approach (OIIQ, 2020). Similarly, the Université de Montréal embraces a broad view of collaboration, considering both patients and families as partners in the healthcare journey. Furthermore, the institution defines teamwork as the predominant dynamic among patients, families, and healthcare professionals (DCPP & CIO-UdeM, 2016). It is therefore important to stress that this collaborative approach is vital to

interprofessional practice. This collaborative approach supports the results of this integrative review by underlining the importance of patients and their families as healthcare partners. Thus, this collaborative approach could provide the framework for managers in the creation of institutional policies in the context of including family members during emergency room cardiopulmonary resuscitation procedures.

The results of the integrative review also show that favorable perceptions of family inclusion led to families being invited by the interprofessional team. It was further emphasized that these perceptions would lead to greater self-confidence in their professional experience regarding the inclusion of families. Thus, informing students during their initial training on all the benefits highlighted by this integrative review of the literature would certainly elicit favorable opinions regarding this practice. Their level of self-confidence could thus be positively influenced. Simply providing information to students about the benefits of family inclusion may not be enough to ensure that inclusion is put into practice in health care settings. However, it was also seen that professional experience influences the perception of benefits for the interprofessional team in the presence of families during resuscitation procedures. For this reason, it would be relevant to give students the opportunity to practice resuscitation procedures in the presence of a close relative of the patient, during the sessions in the integrated simulation centers. In fact, it has been shown that after simulation-based training, a better application of the recommendations during resuscitation procedures is observed (Boet et al., 2013). Moreover, the simulation would reduce student anxiety (Roh, 2014). This is particularly interesting in view of the results of the integrative review, which show that the inclusion of families could be a source of stress and anxiety for the interprofessional team.

The benefits also extend to on-the-job training. Given this same observation, it would be interesting to include sessions in a simulation centre for healthcare professionals. In effect, the OIIQ highlights that continuing education allows knowledge to be updated, skills to be maintained and care practices to evolve and develop (OIIQ, 2011). What's more, it has been shown that work experience can be acquired through training and on-the-job learning through simulation (Grasser & Rose, 2000). Thus, as the results of the integrative review show, the experience gained could strengthen the level of self-confidence of the interprofessional team in their professional experience leading to positive opinions with regard to the inclusion of families.

It is also possible to conclude, in light of the findings of this integrative literature review, that there seems to be a lack of research on the link between healthcare professionals' perceptions and workplace organization. Yet, from the perspective of hospital management, there is every indication that this research could lead to a culture of family inclusion. To support this hypothesis, it is important to note that the World Health Organization (WHO) presents several advantages of this collaborative culture, such as a more complete and integrated response to the needs of patients and their families, as well as better management of acute care episodes by healthcare workers (WHO, 2010).

Limitations

This paper sheds light on the limitations of this integrative literature review. First, there were no articles included on the point of view of managers or policy-makers. Their perceptions were not included in the research questions. It may have been worthwhile to take this into consideration given the importance of fostering a culture of family inclusion in the healthcare process. This integrative review also did not contain any articles on the point of view of interprofessional teams working in a pediatric emergency context. The study was limited to adult care.

In addition, the data analysis method based on the themes of Twibell et al. (2008) lead to a bias in the emergence of other themes. A final limitation would be the failure to differentiate the perceptions of the interprofessional team according to their practice setting. Thus, this integrative review does not allow for potential differences in perceptions depending on the practice setting.

Conclusion

The results of this integrative review offer new intervention methods to improve the practice of inclusion of families during resuscitation procedures. Particular attention should be paid to initial training for future health professionals, but also to continuing education. Promoting the benefits of this inclusion to students and the interprofessional team would help to generate more positive opinions about the practice. Simultaneously, introducing the inclusion of the family in the integrated simulation centers will develop the caregivers' experience of this care practice while strengthening their confidence in the professional practice. Finally, this article encourages managers and decision-makers to start thinking about the importance of establishing a collaborative culture and a patient-centred approach in healthcare settings.

Implications for nurses

The potential impacts of this integrative literature review extend to clinical practice, training, research, policy-making, and management.

1. From a management perspective, the most significant impact is related to nursing leadership in promoting the inclusion of families during emergency resuscitation procedures. In light of these findings, it is clear that the development of management protocols and policies would help encourage family inclusion as a clinical practice. Faced with these divergent perceptions, it becomes desirable for the manager to facilitate interprofessional meetings during the development of protocols in order to open a dialogue on perceptions among team members.
2. Ongoing efforts to promote awareness within the interprofessional team with regard to the inclusion of families during emergency resuscitation procedures would help contribute to the team's professional development.
3. Finally, from a research standpoint, further studies are required to document the perception of each member of the interprofessional team so that the voices of orderlies and respiratory therapists can also be heard. This would aid in fostering a better understanding of the elements promoting family inclusion.

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RESEARCH REVIEW

Suicide in older people, attitudes and knowledge of emergency nurses: A multi-centre study

Heather McLellan, MEd, BN, RN, CEN, CFRN

Citation

Fry, M., Abrahamse, K., Kay, S., & Elliott, R. (2019). Suicide in older people, attitudes and knowledge of emergency nurses: A multi-centre study. *International Emergency Nursing, 43,* 113–118. https://doi.org/10.1016/j.ienj.2019.01.003

Keywords: suicide, elder, elderly, nursing, mental health, emergency department

Background

Suicide rates have increased worldwide and will continue to be a significant concern as the COVID-19 pandemic unfolds. The authors of this study note that emergency nurses are ideally placed for a role in identifying those at higher risk for suicide.

Purpose of the study

The stated purpose of this study is to evaluate emergency nurses' knowledge of and attitudes toward suicide, particularly as it related to older adults.

Research approach and methods

The authors chose to use a 28-item survey consisting of yes/no, Likert scale and free text responses to collect their data. The information was analyzed using descriptive quantitative statistics along with conventional content analysis. The authors note that the reliability and validity of the survey was not formally verified.

Setting and sample

This study utilized a convenience sample of emergency nurses working in four emergency departments in Sydney, Australia. Participants were recruited using posters placed in the departments and announcements at departmental meetings and then relying on the initiative of the individual nurse to contact the researcher. Individuals included for participation in the survey were regular emergency department nurses, nurse managers and nurse educators for those departments. Excluded were non-nurse providers or relief nurses not normally scheduled in the ER.

Findings

The authors had a response rate of 136 nurses. The experience for the participants is reported as a mean of 7.2 years of ER experience and 11.7 years of nursing experience in general. The majority of respondents were ER floor nurses. Researchers reported that while the nurses identified suicide as a common event in Australia, their knowledge of suicide rates in older people was less sure. The respondents frequently identified previous self-harm, depression and hopelessness as well as male gender as being risk factors for suicide in elderly patients.

Six themes emerged in the free text section of the survey with respect to how the needs of the elderly differed from those of younger people presenting to the ER. These included co-morbidities and chronic illness, social isolation, poor function or loss of independence, cognitive impairment and financial concerns. These were contextualized as opportunities to provide support that might minimize suicide risk for older patients.

Commentary

One of the greatest strengths of this study is that the research is timely considering the current global COVID-19 pandemic response, which has led to increased social isolation, unemployment, and economic recession. Any one of these factors can lead to an increase in suicide rates (McIntyre & Lee, 2020). One of the populations most impacted by the need for social isolation are the elderly. The significant morbidity and mortality for the geriatric population associated with contracting COVID-19 has resulted in often more stringent isolation measures to slow the spread of the disease. This has resulted in exacerbation of loneliness and depression experienced by the elderly (Roy et al, 2020;

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di Giacomo et al, 2020). Another strength would be the strong response from the RN population (vs. management or educators) as this demographic would be the first line for assessing and intervening with high suicide risk older people presenting to the ER.

This paper would be stronger with further detail around the respondents. The convenience sample passively recruited is appropriate as a non-random sample, but it may not be representative of the population without knowing the characteristics of the overall RN population for these combined urban emergency departments. Those who took the initiative to participate may be more confident (or less) in their knowledge and attitudes toward suicide than their peers thus skewing the results. The overall response rate was lower than recommended for survey research at 58% of potential respondents. Kelley et al. (2003) identify that a good response rate for survey research is between 65% and 75% depending on how the survey is administered.

Overall, this is an important topic for exploration and the authors should be commended for their foray into the subject. It is imperative that ER nurses recognize both the breadth of their knowledge base and biases within it to provide comprehensive care across the life span.

Key messages

- Older people can be at high risk for suicide, but that risk can go un- or under-recognized.
- ER nurses are well positioned to assess and intervene with patients who are at high risk for suicide across the life span.
- Education on suicide prevention and risk recognition across the life-span is imperative.

About the author

Heather McLellan has been an emergency and critical care transport nurse for more than 40 years. Heather currently works as an Associate Professor with the Advanced Studies in Critical Care Nursing (ACCN) program at Mount Royal University and a bedside clinical nurse in the Foothills Medical Centre emergency department. Her research interests include hypothermia in transport and scholarship of teaching and learning related to nursing in high acuity practice areas.

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ÉTUDE DE RECHERCHE

Le suicide chez les personnes âgées, les attitudes et connaissances du personnel infirmier d'urgence : Une étude multicentrique

Heather McLellan, MEd, BN, RN, CEN, CFRN

Référence

Fry, M., Abrahamse, K., Kay, S., & Elliott, R. (2019). Suicide in older people, attitudes and knowledge of emergency nurses: A multicentre study. *International Emergency Nursing, 43,* 113—118. https://doi.org/10.1016/j.ienj.2019.01.003

Contexte

On observe un taux plus élevé de suicide à l'échelle mondiale et ceci demeurera une préoccupation importante tout au long de la pandémie de COVID-19. Les auteurs de cette étude soulignent que le personnel infirmier d'urgence est mieux placé pour jouer un rôle de premier plan pour pouvoir identifier les patients à haut risque de suicide.

L'objectif de l'étude

Cette étude vise à évaluer les connaissances et les attitudes des infirmières envers le suicide, notamment quant aux personnes âgées.

Orientation et méthodologie de recherche

Les auteurs ont choisi d'employer un questionnaire de 28 points, comprenant des réponses oui/non, l'échelle de Likert et les réponses en texte libre pour recueillir leurs données. Les renseignements ont été analyses à l'aide de statistiques descriptives et déductives de même qu'une analyse conventionnelle du contenu. Les auteurs font remarquer que la fiabilité et la validité du questionnaire n'ont pas fait l'objet d'une vérification officielle.

Cadre de recherche et échantillon

Cette étude a utilisé un échantillon de commodité composé de personnel infirmier d'urgence œuvrant dans quatre départements d'urgence à Sydney, en Australie. Les participants ont été recrutés à l'aide d'affiches placées dans les départements et d'annonces lors de réunions. On a ensuite compté sur l'initiative des membres du personnel infirmier de communiquer avec les chercheurs. Les individus qui ont participé à l'enquête comprennent des membres du personnel infirmier d'urgence permanent, des infirmières gestionnaires et infirmières enseignantes pour ces départements. Ont été exclus les fournisseurs de soins autres que les infirmières et les infirmiers de relève qui ne sont pas normalement à l'horaire en salle d'urgence.

Constatations

Les auteurs ont obtenu un taux de réponse de 136 membres du personnel infirmier. En moyenne, les participants ont 7,2 années d'expérience en salle d'urgence et 11,7 années d'expérience en soins infirmiers en général. La plupart des répondants étaient des infirmiers d'urgence. Les chercheurs ont indiqué que, bien que les infirmières aient identifié le suicide comme événement commun en Australie, leur connaissance du suicide chez les personnes âgées était moins sûre. Les répondants ont fréquemment signalé des antécédents d'automutilation, de dépression et de désespoir ainsi que d'être de sexe masculin comme étant des facteurs de risque du suicide chez les personnes âgées.

Six thèmes sont ressortis dans la section de réponses en texte libre par rapport à comment les besoins des personnes âgées diffèrent de ceux des jeunes qui se présentent à l'urgence. Les thèmes incluent les maladies chroniques et les comorbidités, l'isolement social, la fragilité et la perte d'autonomie, une capacité cognitive réduite et des inquiétudes financières. Le tout a été présenté dans un contexte de façon à les voir en tant qu'occasions pour offrir un soutien pour minimiser le risque de suicide chez les patients âgés.

Commentaires

Une des forces de cette étude réside en ce qu'elle est à propos, considérant le plan de lutte contre la pandémie de la COVID-19

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mondiale actuelle, donnant lieu à une augmentation d'isolement social, le chômage et une crise économique. L'un ou l'autre ce des facteurs peuvent occasionner une augmentation du taux de suicide (McIntyre & Lee, 2020). Les aînés sont une des populations les plus touchées par la nécessité de l'isolement social. La morbidité et la mortalité significative associée à la contraction de la COVID-19 chez les personnes âgées se sont souvent traduites par des mesures d'isolement plus strictes pour ralentir la propagation de la maladie. Ceci a donné lieu à l'exacerbation des sentiments d'isolement, de solitude et de dépression vécue par les aînés (Roy et coll., 2020 ; di Giacomo et coll., 2020). Une autre force serait la forte réponse obtenue chez la population des IA (par rapport aux gestionnaires ou enseignantes), car ce segment de la population serait parmi les répondants de première ligne chargé d'évaluer et d'intervenir auprès des personnes âgées à risque élevé de suicide qui se présentent en salle d'urgence.

Ce document serait plus solide avec plus de détails au sujet des répondants. L'échantillon de commodité recruté de façon passive est approprié pour la sélection non aléatoire, mais il peut ne pas être représentatif de la population sans savoir les caractéristiques de la population des IA en général pour ces départements d'urgence urbains combinés. Ceux et celles qui ont pris l'initiative d'y participer pourraient être plus (ou moins) confiants que leurs pairs en leurs connaissances et leurs attitudes envers le suicide, ce qui peut biaiser les résultats. Dans l'ensemble, le taux de réponse était inférieur au minimum recommandé à 58 %. Kelley et al. (2003) indiquent qu'un bon taux de réponse pour un questionnaire de recherche se situe entre 65 % et 75 % en fonction de la manière dont le questionnaire est administré.

En général, c'est un sujet très important à examiner et les auteurs méritent d'être félicités pour leur percée dans le domaine. Il est impératif que le personnel infirmier d'urgence reconnaisse à la fois l'étendue de leur base de connaissances et le biais qu'elle renferme pour pouvoir dispenser des soins complets tout au long de la vie.
Messages principaux

- Les personnes âgées peuvent être à haut risque de suicide, mais ce fait peut passer inaperçu ou peu reconnu
- Le personnel infirmier d'urgence est bien placé pour évaluer et intervenir chez les patients à haut risque de suicide tout au long de la vie
- L'éducation sur la prévention du suicide et la reconnaissance des risques tout au long de la vie est impérative.

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A commentary on the action plan to modernize gender, sex and sexual orientation information practices in Canadian digital health systems

Francis Lau[1], PhD, FCAHS, CTSS, on behalf of the CIHR planning project team, Infoway Sex and Gender Working Group, and participating organizations and communities who contributed to this action plan

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Sexual and gender minorities (SGM) face numerous health inequities and challenges in Canada. Many are stigmatized, face discrimination and even violence when seeking care (Standing Committee on Health, 2019). Bauer et al. (2014) found in an Ontario survey that 21% of SGM avoided Emergency Department (ED) care because of perceived negative encounters with their identities, and 52% had negative ED experiences with their felt gender. One structural challenge is that most existing digital health systems are unable to capture gender, sex, and sexual orientation (GSSO) data beyond a single-sex or gender data field with male and female options (Lau, Antonio, Davison, Queen, & Bryski, 2020). In many health organizations, SGM-inclusive language, data standards and policies do not exist, making it often necessary for nurses and other healthcare staff to record GSSO data in an ad-hoc fashion in different parts of the electronic and paper charts (Lau et al., 2020). These factors have made SGM largely invisible in digital health systems. What we do know from the literature, based largely on primary research and not digital health system data, is that SGM populations have higher rates of premature mortality, chronic diseases, depression and suicide, and barriers to preventive health screening and care (Standing Committee on Health 2019; Abramovich et al., 2020).

The Infoway Sex and Gender Working Group was established in December 2019 and spent 12 months working with organizations and communities across Canada to address this challenge (Infoway, n.d. [a]). The result of this effort was the co-creation of a high-level action plan to modernize GSSO information practices in Canadian digital health systems (Infoway, n.d. [b]). The plan has seven transformative actions, as outlined below.

Action 1 - Vision and Goal: Envisage an equity- and SGM-oriented health ecosystem that embraces diversity and aligns with other SGM-related initiatives. The goal is to have inclusive organizational policies, culturally competent staff and enabling digital health systems with modernized GSSO information practices to help achieve equitable healthcare access, experiences and outcomes for SGM.

Action 2 - Engagement and Partnerships: Engage organizations and communities across Canada to modernize GSSO information practices in digital health systems that support equity-oriented healthcare and meet SGM needs. Explore opportunities to partner with agencies beyond health that collect and use GSSO data to ensure consistency, leverage resources, optimize efforts and maximize impact.

Action 3 - GSSO Terminology: Establish a precise, inclusive, appropriate and multi-level GSSO terminology with standardized data definitions, coding schemes, and value sets that support affirming patient care, provide complete and accurate health system use of data, including research. The terminology should be inclusive of all SGM identities and adaptable, as the GSSO language evolves over time.

Action 4 - Enabling Digital Health Systems: Adopt a common set of digital health functions that support the collection and use of standardized GSSO data, SGM-oriented clinical care guidelines, data-driven analytics, health system performance monitoring, and health evidence generation. There should be common

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specifications on data fields, terminology, interfaces, security and privacy, data quality, decision support rules, outputs and technology support.

Action 5 - GSSO Policy/Practice Guidance: Integrate and tailor GSSO data collection and use, including secondary purposes within all organizational structures, policies, practices, governance, use cases and workflow processes in order to address specific SGM needs. Examples of policies include explicit guidance on why, what and when GSSO data should be collected, who should collect the data, and safeguards in place for the data, and privacy of the individuals asked to disclose the information.

Action 6 - Education and Training: Educate and train healthcare staff to enhance their capacity to provide culturally competent and safe care, and digital health system vendors, system implementers, policy-makers and researchers to ensure safeguards are in place to protect these data. Inform patients of the need for GSSO data collection and protections for safe access and use.

Action 7 - Central Hub for Coordination: Establish a central hub to liaise, guide, assist and monitor the progress of this plan over time. Examples of hub activities include hosting seminars to share lessons and best practices, refining the GSSO terminology to reflect current trends, discussing GSSO documentation approaches and implications, and sharing relevant tools and resources.

This high-level action plan addresses what should be done, with details on who, how, when and where still to be elaborated. The plan can be adapted for different scope coverage, implementation options and migration stages depending on its overall fit with an organization's priorities, readiness, and capacity. Since ED is the main place of contact for those seeking emergency care, it is important to ensure all ED staff, especially nurses, can provide culturally competent, safe and affirmative care in ways that are supported by a welcoming environment that is inclusive and respects diversity. Readers interested in this work can contact the author for further detail.

Acknowledgement

The author and the planning project team wish to thank all members of the Canada Health Infoway Sex and Gender Working Group and participating organizations and communities for their contributions toward the co-creation of the action plan. This work was funded by the Canadian Institutes for Health Research Institute of Gender and Health.

Author notes

Dr. Francis Lau, PhD, FCAHS, CTSS, has a PhD in Applied Sciences in Medicine from the University of Alberta with specialization in medical informatics. During 2008–2013, he was the recipient of the eHealth Chair funded by CIHR/Infoway to establish an eHealth Observatory to examine the impact of health information system deployment in Canada. Dr. Lau's current research covers eHealth equity, patient-centred measurements, patient portals, evidence-based health informatics, and health terminology standards.

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Un commentaire sur le plan d'action pour moderniser le genre, le sexe et l'orientation sexuelle en matière d'information dans les systèmes de santé numériques canadiens

Francis Lau[1], FCAHS, SCNT, au nom de l'équipe du projet de planification des IRSC, du groupe de travail sur le sexe et le genre d'Inforoute, et des organismes et communautés participants qui ont contribué à ce plan d'action

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Au Canada, les minorités sexuelles et de genre (MSG) sont confrontées à de nombreuses iniquités et difficultés en matière de santé. Beaucoup sont stigmatisés, font l'objet de discrimination et même de violence lorsqu'ils cherchent à obtenir des soins de santé (Comité permanent de la santé, 2019). Bauer et al. (2014) ont trouvé dans une enquête ontarienne que 21 % des MSG évitaient les soins des services d'urgence à cause de la perception négative de leur identité, et 52 % avaient des expériences négatives en lien avec leur identité sexuelle ressentie. Un des enjeux structurels est que la plupart des systèmes de santé numériques actuels ne sont pas en mesure de saisir les données relatives au genre, au sexe et à l'orientation sexuelle (GSOS) au-delà d'un champ de données sur le sexe unique ou le genre avec des options masculines et féminines (Lau, Antonio, Davison, Queen, & Bryski, 2020). Dans de nombreux organismes de santé, il n'existe ni de langage, ni de normes de données, ni de politiques incluant les MSG, ce qui oblige souvent les infirmières et autres membres du personnel de santé à enregistrer les données sur le GSOS de manière improvisée dans différentes parties des dossiers électroniques et sur papier (Lau, Antonio, Davison, Queen, & Devor, 2020). Ces facteurs ont rendu les MSG à peu près invisibles dans les systèmes de santé numériques. Ce que nous constatons dans la littérature, qui repose en grande partie sur la recherche primaire et non sur les données numériques du système de santé, c'est que les populations de MSG présentent des taux plus élevés de mortalité prématurée, de maladies chroniques, de dépression et de suicide, ainsi que des obstacles au dépistage et aux soins de santé préventifs (Comité permanent de la santé, 2019 ; Abramovich et al., 2020).

Le groupe de travail d'Inforoute sur le sexe et le genre a été créé en décembre 2019 et a passé 12 mois à travailler avec des organismes et des communautés de partout au Canada pour relever ce défi (Inforoute n. d. [a]). Le résultat de cet effort a été la co-création d'un plan d'action de haut niveau visant à moderniser les pratiques d'information relatives au GSOS dans les systèmes de santé numériques canadiens (Inforoute n. d. [b]). Le plan comporte sept actions transformatives décrites ci-dessous.

Action 1–Vision et objectif : Concevoir un écosystème de la santé axé sur l'équité et les MSG, qui englobe la diversité et s'aligne sur les autres initiatives liées aux MSG. L'objectif est d'avoir des politiques administratives inclusives, un personnel culturellement compétent et des systèmes de santé numériques habilitants avec des pratiques d'information modernisées pour aider les MSG à obtenir des expériences, des résultats, et un accès équitable aux soins de santé.

Action 2–Engagement et partenariats : Engager les organismes et les communautés de tout le pays à moderniser les pratiques d'information sur le GSOS dans les systèmes de santé numériques de manière à soutenir les soins de santé axés sur l'équité et à répondre aux besoins des MSG. Explorer les possibilités de partenariat avec des organismes autres que ceux du secteur de la santé qui recueillent et utilisent les données relatives au GSOS afin d'assurer la cohérence, de tirer parti des ressources, d'optimiser les efforts et de maximiser l'impact.

Action 3–Terminologie relative au GSOS : Établir une terminologie GSOS précise, inclusive, appropriée et à plusieurs niveaux avec des définitions de données, des codes et des ensembles de valeurs normalisés qui soutiennent l'affirmation des soins aux patients, fournissent une utilisation complète et précise des données par le système de santé, y compris la recherche. L'emploi d'un langage inclusif pour toutes les identités des MSG est de mise et il doit pouvoir être adapté à mesure que le langage par rapport au GSOS évolue au fil du temps.

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Action 4–Mise en place des systèmes de santé numériques : Adopter un ensemble commun de fonctions de santé numériques qui soutiennent la collecte et l'utilisation de données normalisées par rapport au GSOS ; des directives de soins cliniques axées sur les MSG ; une analyse fondée sur les données ; une évaluation de la performance du système de santé et la production de preuves en matière de santé. Il devrait y avoir des spécifications communes sur les champs de données, la terminologie, les interfaces, la sécurité et la confidentialité, la qualité des données, les règles d'aide à la décision clinique, les produits et résultats et le soutien technologique.

Action 5–Politique sur le GSOS/Conseils de pratique : Intégrer et adapter la collecte et l'utilisation des données concernant le GSOS, y compris aux fins secondaires dans toutes les structures organisationnelles, les politiques, les pratiques, la gouvernance, les scénarios d'utilisation et les processus de flux de travail afin de répondre aux besoins spécifiques des MSG. Les exemples de politiques comprennent des indications explicites sur : les raisons, la nature et le moment de la collecte des données sur le GSOS, les personnes qui doivent collecter les données, les garanties en place pour les données et la vie privée des personnes à qui il est demandé de divulguer les informations.

Action 6–Éducation et formation : Éduquer et former le personnel de santé afin de renforcer sa capacité à fournir des soins culturellement compétents et sûrs, ainsi que les fournisseurs de systèmes de santé numériques, les responsables de la mise en œuvre des systèmes, les décideurs politiques et les chercheurs afin de garantir les mécanismes de protection de ces données. Informer les patients de la nécessité de recueillir des données concernant le GSOS et de protéger l'accès et l'utilisation.

Action 7–Centraliser la communication : Établir une plate-forme pour assurer la liaison, encadrer, assister, et surveiller l'évolution de ce plan au fil du temps. Parmi les activités de plate-forme, on peut par exemple organiser des séminaires pour partager les leçons et les meilleures pratiques, affiner la terminologie concernant le GSOS pour refléter les tendances actuelles, discuter des approches et des implications de la documentation par rapport au GSOS, et partager les outils et les ressources pertinents.

Ce plan d'action de haut niveau traite de ce qui devrait être fait, avec des détails sur qui, comment, quand et où il est encore nécessaire à élaborer. Le plan peut être adapté en fonction du champ d'application, des options de mise en œuvre et des étapes de migration, en tenant compte de son harmonisation globale avec les priorités, l'état de préparation et les capacités d'une organisation. Étant donné que le service des urgences est le principal lieu de contact pour les personnes cherchant à obtenir des soins d'urgence, il est important de s'assurer que tout le personnel du service des urgences, en particulier les infirmières, peut fournir des soins culturellement compétents, sécuritaires et positifs, dans un environnement accueillant qui est inclusif et qui respecte la diversité. Les lecteurs intéressés par cet ouvrage peuvent communiquer avec l'auteur pour plus de renseignements.

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Notes de l'auteur

Le Dr Francis Lau est titulaire d'un doctorat en sciences médicales appliquées de l'université d'Alberta avec une spécialisation en informatique médicale. De 2008 à 2013, il a été titulaire de la chaire de recherche appliquée IRSC/Inforoute Santé du Canada a créé l'observatoire de la cybersanté destiné à examiner l'impact du déploiement des systèmes d'information sur la santé au Canada. Les recherches actuelles du Dr Lau portent sur l'équité en matière de santé en ligne, les mesures axées sur le patient, les portails de patients, l'informatique de santé fondée sur des données probantes et les normes de terminologie de la santé.

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Educational strategies for deployment of resuscitative endovascular balloon occlusion of the aorta in a tertiary Canadian emergency department

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Abstract

Resuscitative endovascular balloon occlusion of the aorta (REBOA) is not a novel intervention in the trauma literature. However, the incorporation of this intervention into the Canadian emergency department setting is recent in onset. This healthcare setting is dynamic and the nurses who practise in the emergency setting must be efficient care providers for an infinitely diverse set of potential patient presentations. The introduction of this complex procedure was accompanied by a variety of educational strategies to enhance the uptake of this new knowledge. The usage of small groups, didactic teaching, hands-on practice, establishing unit champions, coordinating in-situ simulations, and creating workflow documents were strategies used by the education team at this academic center for this particular knowledge dissemination exercise.

Key words: REBOA, hemorrhage, education, emergency, nurse

The introduction of new procedures, equipment, policies and practice changes are a regular occurrence for a registered nurse (RN) who works in an emergency department. Efforts of educators in this environment to incorporate novel initiatives must be flexible and reflective of the learning needs and styles of the team. Resuscitative endovascular balloon occlusion of the aorta (REBOA) is a complex intervention that has been introduced across several Canadian trauma centres. The purpose of this article is to provide a brief overview of REBOA from an emergency nursing perspective, highlighting knowledge translation strategies, both routine and creative, which were employed at one centre to educate emergency nurses on this topic and the attempts to mitigate subsequent knowledge attrition.

Background

What is REBOA?

Despite advances in practice protocols and early recognition strategies, uncontrolled hemorrhage and hemorrhagic shock continue to be the leading causes of potentially preventable death after a traumatic injury (Moore et al., 2015). Hemorrhagic shock is a condition produced by a rapid and significant loss of intravascular volume, which leads to hemodynamic instability and decreases in oxygen delivery, which then impacts tissue perfusion causing cellular hypoxia, organ damage, and potentially death (Moore et al., 2015). In the trauma patient scenario, noncompressible torso hemorrhage (NCTH) is one potential cause of this significant intravascular blood loss (Sambor, 2018). NCTH is the vascular disruption of the vascular activity of the axial torso vessels, solid organs, the pulmonary parenchyma and/or the bony pelvis (Adamski, 2016). NCTH is not treatable with local hemostatic interventions such as pressure dressings or tourniquets due to anatomical location of the source of bleeding and the definitive treatment for it is surgical (Qasim et al., 2015).

REBOA is an intervention that can potentially be used for hemorrhage control for these patients in the interim between injury and definitive treatment (Adamski, 2016). REBOA involves placing a catheter designed with a compliant balloon into the aorta via the common femoral artery and inflating this balloon until the aorta is occluded allowing for temporary hemorrhage control, and maintenance of cerebral and coronary perfusion (Sambor, 2018).

Historical review

Despite only recently being introduced into trauma centres in Canada, REBOA is not a novel concept. It has been documented as an intervention since the 1950s where a field military physician used this approach on soldiers who were injured in the Korean War (Glaser & Brenner, 2017; Qasim et al., 2015). Over the next few decades, literature on REBOA was limited to select case studies and animal trials (Qasim et al., 2015). Since the turn of the century, medical professionals in Japan and the United Kingdom began utilizing this intervention with higher frequency and began generating an increased repository of data and subsequent scientific literature (Glaser & Brenner, 2017).

Current literature

Within the past decade, increasing research and effort has been put into optimizing the design of available catheters to ensure

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an increased ease of use for practitioners and patient safety (Ordoñez et al., 2017). There has been an increasing number of case studies and other emerging literature from the United States in this timeframe, as well (Glaser & Brenner, 2017). Literature is focused on the impact on mortality and morbidity rates associated with the usage of the intervention and may or may not also include comparison data on the use of a different and far more invasive method for hemorrhage control; the thoracotomy (Glaser & Brenner, 2017; Qasim et al., 2015).

As the literature develops, there is an increased focus on favourable patient outcomes from the use of this hemorrhage control strategy, as patients who undergo REBOA experience slightly higher overall survival rates than those who underwent a thoracotomy or were not treated with some measure of hemorrhage control (Glaser & Brenner, 2017; Ordoñez et al., 2017). Authors who write on REBOA indicate that as familiarity and exposure to this intervention develops among trauma teams, there may be an increase in these optimal patient outcomes (Glaser & Brenner, 2017; Sambor 2018).

This intervention was featured in Canadian mainstream media in 2018 following the addition of the ER-REBOA™ catheter to Health Canada's (2017) approved registered medical devices list in 2017 (Global News, 2018; St. Michael's Hospital, 2018). There was also an article that made national news from Montreal in the form of a REBOA success story. A patient was interviewed while recovering from traumatic injuries where REBOA had been used to successfully control hemorrhage while in the emergency department until the patient transferred to the operating room (Canadian Broadcasting Corporation, 2018). Following the lead of other Canadian centres, the Ottawa Hospital also considered the potential implementation of this intervention.

REBOA initiative at The Ottawa Hospital

Setting

The Ottawa Hospital (TOH) is a tertiary level academic healthcare centre serving the population of eastern Ontario. The facility is made up of three sub-sites, which provide a range of services including sub-acute, chronic, and acute care. The site where this initiative was rolled out is the designated site for the following subspecialties: trauma, neurosciences, cardiovascular and vascular services. This site receives patients who require these specialized services from throughout the region. In the annual report released by the Ottawa Regional Trauma Program for 2017-2018, it was noted that 856 patients were admitted to TOH for trauma care (Ottawa Regional Trauma Program, 2018). The leading mechanisms of injuries were motor vehicle collisions and falls, which comprised 40.7% and 40.2% of these visits respectively, while penetrating trauma accounted for an additional 10% of these trauma-related visits (Ottawa Regional Trauma Program, 2018).

Process initiate REBOA as a patient care intervention

This intervention was initially proposed for usage at TOH by members of the trauma program, which includes both RNs and MDs. This proposal followed both the approval of usage of the ER-REBOA™ catheter by Health Canada and the release of a joint statement from trauma and emergency medicine leaders in the United States on the suggested clinical use of REBOA (Brenner et al., 2018). Of data reviewed by members of the trauma program from the 2015-2016 trauma registry, 12 patients were identified that would have been potential candidates for the procedure (Ottawa Regional Trauma Program, 2016). These numbers were presented as part of the initial discussion with the corporate operations committee for the hospital to determine impact on overall operations. After the product was approved for use at TOH by senior leadership teams, including the product evaluation committee and corporate operations committee, the implementation planning phase was brought back to key stakeholders. These primary stakeholders included: emergency nurses and educators, trauma physicians, emergency physicians, and emergency administration. Input was also sought from clinical representatives from the operating room, vascular, anesthesia, interventional radiology and the intensive care unit.

Work was completed by members of the trauma program, emergency administration and emergency educators to complete a TOH specific Standard Operating Procedures to delineate the appropriate use of this tool (Appendix A). Part of the procedure notes that the only physicians at TOH who can currently use this equipment in patient care are trauma team leaders who have undertaken private specialty training in its use. Supply and procurement are currently monitored by the trauma coordinator.

Educational dissemination strategies

While the physicians were trained offsite in a private two-day program, there also needed to be a comprehensive plan to complete an educational roll-out with members of the emergency nursing team at this site who practise in the resuscitation area or critical care section of the department. At the time of roll-out, there were approximately 125 RNs in the department with 85 of them fully trained to practise in the resuscitation area. However, to support universal professional development, no nurses were excluded from the training plan. This was a complex roll-out, as this is an intervention that demands expertise despite the limited exposure to both the procedure and, thus, the components used. Educational strategies were planned and implemented by an education team comprised of emergency nurse educators, emergency nurses and the trauma coordinator for the trauma program. A combination of activities was planned to try to increase visual and tactile exposure to this complex intervention (Trauma System News, 2018). Based on previous feedback from nurses in this department, it was important that both formal and informal teaching methodologies were incorporated into this education plan. It was also important to consider different learning styles that would need to be accommodated in this knowledge translation process (Saunders et al., 2017).

Formal approaches

Small group sessions. The initial approach to the formalized education was to bring in an expert from Prytime Medical. This representative held small focus groups over the course of three days, which offered a combination of didactic and hands-on approach to learning. These focus groups lasted from 45 minutes to one hour in duration. Each session ran through an overview of the equipment, relevant historical use, theory and rationale for usage, inclusion criteria to initiate the intervention, insertion techniques, and nursing interventions before, during, and after the procedure. It also included teaching on the company mnemonic—MEFIIS™—used to guide insertion. This dedicated

time allowed staff to manipulate the device and necessary additional equipment with the guidance of an expert, as a realistic mannequin was present and featured a cardiovascular simulator to allow the user to experience the circulatory impact of the REBOA. This also allowed visual, auditory and tactile learners a way to interact with the teaching that meets their needs (Melrose et al., 2015). The small group approach allowed for 35 RNs to receive training, or, approximately 40% of eligible staff. The invitation was extended to operating room, anesthesiologist and ICU staff in an effort to promote an interdisciplinary approach, reflective of the inherent nature of trauma care.

Establishing unit champions. The initial selection of who would be covered to attend the small group session was driven by a desire to create a group of unit champions who would also contribute to the dissemination process. Unit champions are individuals who are viewed from an 'implementation science' perspective as persons who are able to positively influence uptake and action of a new process (Miech et al., 2018). Individuals who best suit this role are described in the literature as those who are respected, positive about change, advocates and skilled team members (Mount & Anderson, 2015). Nurses who possess these traits and had expressed an interest in teaching, or who had previously demonstrated skill as a mentor were initially approached to become a unit champion for this initiative.

The creation of such a group of individuals is meant to foster a collegial learning environment that other staff can benefit from. This is a methodology that has been used for previous successful educational implementations at this facility and has the necessary 'buy-in' from staff. Working with the pre-existing staffing rotations allowed for the targeting of a diverse group of RNs to help ensure coverage across different staffing cohorts. Initially it was hoped that approximately 20 RNs could be targeted to fit this group. However, an increased number of nurses were able to attend the small group sessions, which increased the size of this group.

In-situ simulation. In-situ simulation is a methodology for teaching that has recently been featured heavily in nursing education literature (Swift & Wannamaker, 2018). TOH has used this method of teaching in different areas, including the emergency department. This method has been used internally to study communication, test different protocols and to collect quality assurance data on how the team functions and on how process or product changes impact the flow of patient care. In-situ simulation has been used to test the capacity of various response systems at TOH, including the disaster response for a mass casualty event. Being able to complete patient interventions as a team, in a high-fidelity setting yields high value for both learners and educators (Barleycorn & Lee, 2018). The small group sessions with the representative at the onset of this educational dissemination allowed for low-fidelity simulation, as the attending nurses were able to guide each other through the intervention with realistic equipment and simulator-generated patient outcomes.

Six months after the intervention was introduced to the team, a high-fidelity simulation exercise was planned. The team this time was much more inclusive to different specialties and roles were played by those who would be completing the tasks in an actual patient scenario. That is, the trauma team leaders who have received the training for insertion of REBOA were active players in this simulation design with one participating. Planning for this simulation required curriculum design for the session, the development of educational objectives, and the preparation of a structured debrief. Using in-situ simulation allowed the education team to monitor the ongoing ability of the team to be able to support this patient intervention. There are additional simulation sessions planned for future dates at the time of this article creation and, thus, there is no final number of nurses impacted by this methodology.

Unit tool boxes. Various formalized worksheets were created for usage by both the primary and secondary trauma nurse for the patient who requires REBOA (Appendix B). These are housed with the ER-REBOA™ catheters to ensure that they are always easily accessible, as a tool to guide the various elements of the intervention. Having these worksheets is meant to ease the cognitive burden of being able to execute this complex task. It is helpful for the RN who is documenting the intervention, but also for the bedside RN who is assisting the trauma team leader.

Informal approaches

In addition to the formal approaches described, other, more informal and less-structured methods were used to aid in knowledge translation. These approaches augmented the formal training aids to allow avenues for open discourse in a supportive space about the intervention and associated concerns to be addressed.

Off-site education night. The education team hosted an off-site informal gathering in the setting of an education night. The nurses who work in this setting hold these education nights on a semi-regular basis and invite different physicians to present on a variety of emergency medicine content. Previous feedback had indicated that staff find these nights to be immensely valuable and highly applicable for practice. At this event, a trauma surgeon presented on the importance of properly resuscitating the trauma patient. REBOA was discussed as an adjunct to treatment only. The education was augmented with a mannequin with exposed vasculature so that the insertion of the ER-REBOA™ catheter could be emulated with a visual representation of the circulatory effects. This was key as experts note the importance of repeated exposure and hands-on experience to the overall success in training nursing staff in this modality (Trauma Systems News, 2018). Staff were able to manipulate the device and ask questions of the education team and trauma surgeon present. The documents that make up the toolbox were also present for staff to use. Sixteen nurses were present for this informal event.

Unit newsletter. Educational newsletters are distributed to the unit on a biweekly to monthly basis. They cover practice changes and reminders, give cues to what new processes are coming or are being implemented and always include a focused section which highlights a particular topic and how to find additional resources. Just prior to the official implementation date to initiate the REBOA intervention in this facility, the newsletter focused on this subject. It included relevant links to provider videos and teaching information. Newsletters are circulated to all staff via intranet email within the hospital, but there is no official tracking of readership completed, so it is difficult to evaluate the reach of this methodology.

Challenges

Environmental

In this site there are constant fluctuations in staffing levels and in staff movement out of the department. There are also high, but fluctuating volumes and patient acuity that challenge staffing

needs as well. In this type of an environment, it can be difficult to arrange dedicated worked hours towards education. The chaotic care environment also contributes to a difficult teaching environment. Attempts to mitigate the impact of the environment were taken by moving an educational activity off-site and work will be done with new hires to the department to complete the necessary training as part of orientation processes.

Exposure and knowledge attrition

Initial training at TOH was completed six months prior to the writing of this article. At this time, REBOA has not been used at this site. With the initial retrospective review predicting low potential patient candidates for this procedure, this is not necessarily surprising. As this life-saving intervention is complex, both in theoretical content and in skill mastery, the usage of in-situ simulation has been helpful for staff to work at remaining current with this skillset.

Future plans

As has been stated, at the time of this submission, REBOA has yet to be initiated as a patient care intervention at TOH. The education team will provide follow-up education and assess for areas of optimization as they are identified for the staff nurses. The unit newsletter will include a reminder in regards to the REBOA resources within the 'practice reminders' session periodically. When staff who are advancing to work within this specialized area, they undergo a training day where orientation to REBOA is included. As this education day happens within the unit, it is and has been an opportunity for current staff to have a refresher training session with the modified mannequin and the unit toolbox. Additionally, as has been mentioned, further in-situ simulation days have been planned for the unit to enhance team collaboration in preparing to use this complex patient intervention.

Conclusion

Resuscitative endovascular balloon occlusion of the aorta is a hemorrhage control intervention that has the potential to optimize select patient care. Emergency nurses at the Ottawa Hospital have been provided with various educational strategies, both formal and informal, to assist in the uptake of this procedure. Ongoing efforts to reduce knowledge attrition rates will focus on succinct reminders and on locally available resources both for self-directed learning and for usage if the intervention is to be implemented.

Take aways

- REBOA is a potentially life-saving strategy for life-threatening hemorrhage.
- Emergency nurses have an important role in the implementation of a REBOA program.
- Simulation and multi-method education strategies are essential components of an implementation plan for a complex intervention such as REBOA.

About the authors

Sarah Gaudet, MN, RN, ENC(C), is a current Clinical Emergency Nursing Educator in Ottawa, transplanted in from the East Coast. She is currently serving as a board member for the Emergency Nurses Association of Ontario and has a passion for trauma care, simulation and digital learning.

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Mathieu LeBreton, RN, BScN, CNCC(C), has a diverse nursing background in critical care, emergency, and flight nursing and was the Trauma Coordinator for The Ottawa Hospital from 2015-2020. He is currently the Clinical Care Leader in the Intensive Care Unit of The Ottawa Hospital's Civic Campus. His interests are quality improvement and system efficiency, and he is currently completing his Master's in Healthcare Quality at Queens University.

Cari Poulin, MN, RN, is an Emergency Nurse Educator in Ottawa who has completed a Master of Nursing. Her interests include anything trauma or resuscitation related, and she is a champion within the organization for using in-situ sim as a tool to 'stress-test' the Resus room.

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Appendix A: Standard Operating Procedure (SOP)

The Ottawa Hospital | L'Hôpital d'Ottawa	ISSUE DATE:	SOP#:
	LAST REVIEWED:	APPROVED BY:
	NEXT REVIEW DATE:	ISSUED BY:
STANDARD OPERATING PROCEDURE (SOP) FOR: Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA)		PAGE NUMBER: 18 of 4
		TRAINING OR CERTIFICATION REQUIRED? ❑ YES ❑ NO

Purpose Statement:
REBOA is a balloon catheter introduced through a 7Fr sheath in the common femoral artery (CFA) and advanced above the aortic bifurcation (Zone III) or in the thoracic aorta (Zone I). The compliant balloon is inflated to achieve aortic occlusion to stop hemorrhage downstream. The catheter is impregnated with a radiopaque band. This is intended to be a bridge therapy for definitive & immediate surgical hemorrhage control

Indications:
- Life threatening torso hemorrhage below the diaphragm due to traumatic mechanism of injury

Scope:
- This procedure is exclusively done by REBOA-trained Trauma Team Leaders (TTL).
- This will be performed exclusively at the Civic Campus of The Ottawa Hospital (Lead Trauma Hospital)

Alerts:
In the event REBOA is not available, an Emergency Department Thoracotomy could be warranted with the goal to cross clamp the aorta at the discretion of the TTL.

Definition(s)
- REBOA: Resuscitative Endovascular Balloon Occlusion of the Aorta
- CFA: Common Femoral Artery
- TTL: Trauma Team Leader
- ME-FIIS: Measure, Empty-Flush, Insert, Inflate, Secure

Equipment:
- Sterile Drape
- Central Line Kit
- Introducer Sheath 7F x1 (Prelude Pro 11cm 7F TOH order # 789273)
- 18G 7cm Echogenic Needle
- Syringe 20ml x1
- Syringe 10ml prefilled/sterile x 3
- Scalpel #11 x 1
- Suture, nylon 2-0 reverse cutting x 1

Procedure

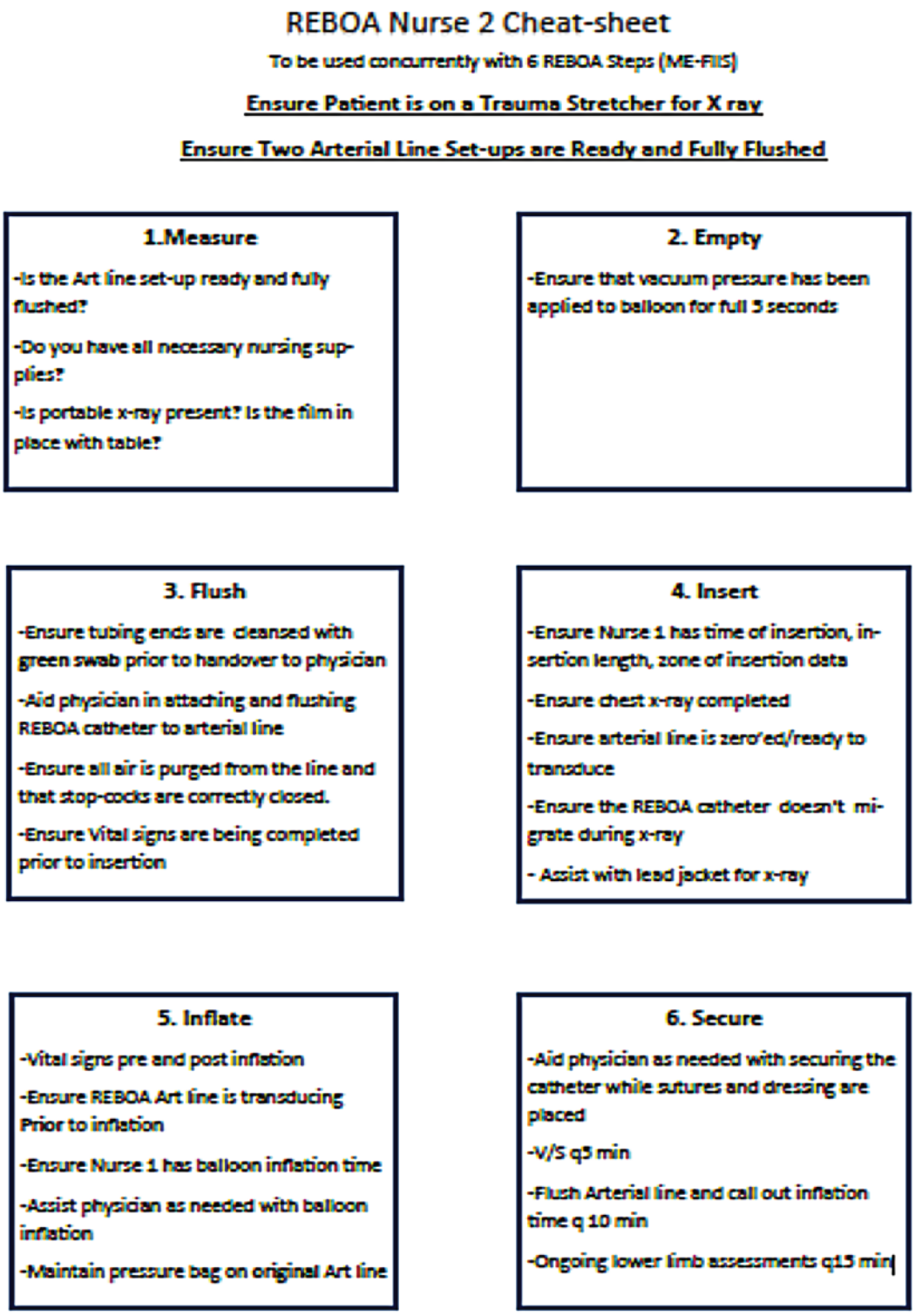
Insertion of catheter

1. Ensure that Trauma Surgeon covering the Trauma Unit is on route
2. Book operating room as Priority A case as soon as possible
3. Obtain CFA access as per standard technique and use introducer sheath.
4. Measure from sternal notch to CFA access point
   1. Zone III; Approximately 28cm
   2. Zone I: Approximately 46cm
5. Ensure Balloon is fully deflated by holding vacuum for 5 seconds and close stopcock
6. Advance & twist peel-away to cover P-tip by using a "Corkscrew method". Ensure the balloon and P-tip are covered.
7. Attach & flush the arterial line set up
8. Insert peel-away into valve of sheath approximately 5mm
9. Advance catheter to desired depth by holding orange peel-away, advancing blue catheter and pull peel-away back after balloon passes valve.
10. Position catheter using x-ray to confirm position using radiopaque markers
11. Inflate balloon, starting with 2cc of saline. Do not overinflate
12. Monitor arterial waveform and watch for increase in blood pressure
    1. Feel for loss of contralateral pulse
    2. Note time of inflation
13. Secure catheter close to the introducer sheath

Removal of catheter

1. Fully deflate balloon slowly and hold vacuum for 5 seconds and close stopcock.
2. Twist the catheter in "Corkscrew method" while removing
   1. If necessary, remove the catheter and sheath as a unit
   2. Prepare healthcare team for rebound hypotension
3. Apply manual pressure over access point for 15 minutes (longer if patient is anticoagulated or Trauma Induced Coagulopathy).
4. Check for full and equal pulse in each leg.

Appendix B



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Stratégies éducatives pour le déploiement de l'occlusion aortique endovasculaire par ballonnet (REBOA) comme mesure de réanimation dans une salle d'urgence de soins tertiaires canadiens

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Résumé

L'occlusion aortique endovasculaire par ballonnet (REBOA) comme mesure de réanimation n'est pas un sujet nouveau dans la littérature sur les traumatismes. Toutefois, l'intégration de cette mesure d'intervention en salle d'urgence est récente au Canada. Ce milieu de soins est dynamique et les infirmières qui exercent dans le cadre des urgences doivent être des prestataires de soins efficaces pour un ensemble infiniment varié de situations cliniques. L'introduction de cette procédure complexe s'est accompagnée d'une série de stratégies éducatives visant à favoriser l'assimilation de ces nouvelles connaissances. L'utilisation de petits groupes, l'enseignement didactique, la pratique, l'établissement de champions d'unité, la coordination de simulations in situ et la création de documents de flux de travail ont été les stratégies utilisées par l'équipe éducative de ce centre universitaire pour cet exercice particulier de diffusion des connaissances.

Mots clés : REBOA, hémorragie, éducation, urgence, infirmière

L'introduction de nouvelles procédures, d'équipements, de politiques et de changements de pratiques est assez fréquente pour l'infirmière autorisée (IA) en milieu d'urgence. Les efforts des éducateurs dans cet environnement pour intégrer de nouvelles initiatives doivent être flexibles et refléter les besoins et les styles d'apprentissages de l'équipe. L'occlusion aortique endovasculaire par ballonnet (REBOA) comme mesure de réanimation est une intervention complexe qui a été introduite dans plusieurs centres de traumatologie canadiens. Cet article a pour objectif de donner un aperçu de REBOA du point de vue des soins infirmiers d'urgence, soulignant les stratégies d'application des connaissances à la fois routinières et créatives qui ont été employées dans un centre pour former les infirmières d'urgence à ce sujet et les mesures à prendre ultérieurement pour atténuer l'attrition des connaissances.

Contexte

Qu'est-ce que le REBOA ?

Malgré les progrès des protocoles de pratique et des stratégies de détection précoce, les hémorragies non contrôlées et les chocs hémorragiques restent les principales causes de décès potentiellement évitables après une blessure traumatique, les hémorragies non maîtrisées et les chocs hémorragiques demeurent les principales causes de décès potentiellement évitables après une blessure traumatique (Moore et coll., 2015). Le choc hémorragique est une complication produite par une perte rapide et importante de volume intravasculaire qui donne lieu à une instabilité hémodynamique et une diminution de l'apport en oxygène qui a ensuite un impact sur la perfusion des tissus, provoquant une hypoxie cellulaire, la défaillance des organes et potentiellement la mort. Dans le scénario du patient ayant subi un traumatisme,

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l'hémorragie du torse non compressible (*NCTH*) est l'une des causes possibles de cette importante perte de sang intravasculaire (Sambor, 2018). *NCTH* est la perturbation de l'activité vasculaire des vaisseaux axiaux du torse, d'organes solides, du parenchyme pulmonaire ou du bassin osseux (Adamski, 2016). *NCTH* ne peut être traitée par des interventions hémostatiques locales telles que des pansements compressifs ou des garrots en raison de la localisation anatomique de la source du saignement. Le traitement définitif est chirurgical (Qasim, Brenner, Menaker, & Scalea, 2015).

REBOA est une intervention qui peut être employé pour contrôler les hémorragies chez ces patients dans l'intervalle entre la blessure et le traitement définitif (Adamski, 2016). REBOA consiste à insérer un cathéter muni d'un ballonnet souple dans l'aorte via l'artère fémorale commune et à gonfler ce ballonnet jusqu'à ce que l'aorte soit obstruée, ce qui permet de contrôler temporairement l'hémorragie et de maintenir la perfusion cérébrale et coronarienne (Sambor, 2018).

Aperçu historique

Bien qu'il n'ait été introduit que récemment dans les centres de traumatologie au Canada, REBOA n'est pas une notion inédite. Ce mode d'intervention a été documenté depuis les années 1950 où un médecin militaire a employé cette approche sur des soldats qui ont été blessés pendant la guerre de Corée (Glaser & Brenner, 2017 ; Qasim et coll., 2015). Au cours des décennies suivantes, la littérature sur le REBOA s'est limitée à des études de cas et des essais sur les animaux (Qasim et coll., 2015). Depuis le début du siècle, les professionnels de la santé au Japon et au Royaume-Uni ont commencé à utiliser cette intervention avec une plus grande fréquence et ont ainsi généré un plus grand nombre de données et de littérature scientifique (Glaser & Brenner, 2017).

Documentation actuelle

Au cours de la dernière décennie, des recherches et des efforts croissants ont été réalisés pour optimiser la conception des cathéters disponibles afin de garantir une plus grande facilité d'utilisation pour les praticiens et pour la sécurité des patients (Ordoñez, et coll., 2017). Un nombre croissant d'études de cas et d'autres publications émergentes en provenance des États-Unis ont également été réalisées au cours de cette période (Glaser & Brenner, 2017).

La littérature se concentre sur l'impact sur les taux de mortalité et de morbidité associés à l'utilisation de l'intervention et peut inclure ou non, des données de comparaison sur l'utilisation d'une méthode différente et beaucoup plus invasive pour le contrôle des hémorragies, la thoracotomie (Glaser & Brenner, 2017 ; Qasim et coll., 2015). Au fur et à mesure de l'évolution de la littérature, on s'intéresse de plus en plus aux résultats favorables obtenus par les patients grâce à cette stratégie de contrôle des hémorragies, car les patients qui subissent une REBOA ont un taux de survie global légèrement plus élevé que ceux qui ont subi une thoracotomie ou qui n'ont pas été traités avec une certaine mesure de contrôle des hémorragies (Glaser & Brenner, 2017 ; Ordoñez et coll., 2017). Les auteurs qui écrivent sur le REBOA indiquent qu'à mesure que la familiarité et l'exposition à cette intervention se développent parmi les équipes de traumatologie, il pourrait y avoir une augmentation de ces résultats optimaux pour les patients (Glaser & Brenner, 2017 ; Sambor 2018). Cette intervention a été présentée dans les grands médias canadiens en 2018 à la suite de l'ajout du cathéter ER-REBOA™ à la liste des dispositifs médicaux enregistrés approuvés par Santé Canada (2017) en 2017 (Global News, 2018 ; St Michael's Hospital, 2018). Il y avait aussi un article dans la presse de Montréal qui a mené à une couverture médiatique nationale présentée sous la forme d'histoire de réussite concernant le REBOA. Un patient a été interrogé alors qu'il se remettait de blessures traumatiques où le REBOA avait été utilisé pour contrôler avec succès une hémorragie pendant qu'il était aux urgences jusqu'à son transfert en salle d'opération (Canadian Broadcasting Corporation, 2018). À l'instar d'autres centres canadiens, l'hôpital d'Ottawa a également envisagé la mise en œuvre éventuelle de cette intervention.

Initiative REBOA à l'hôpital d'Ottawa

Cadre

L'Hôpital d'Ottawa est un centre de soins de santé universitaire de niveau tertiaire qui dessert la population de l'est de l'Ontario. L'Hôpital d'Ottawa est un centre médical universitaire de soins de santé tertiaires qui dessert la population de l'est de l'Ontario. L'établissement est composé de trois sous-sites qui fournissent une gamme de services comprenant des soins subaigus, chroniques et aigus. Le site où cette initiative a été déployée est celui désigné pour les sous-spécialités suivantes : traumatisme, neurosciences, services cardiovasculaires et vasculaires. Ce site accueille les patients qui ont besoin de ces services spécialisés dans toute la région. Dans le rapport annuel publié par le programme régional de traumatologie d'Ottawa en 2017–2018, il est indiqué que 856 patients ont été admis à l'Hôpital d'Ottawa pour des soins de traumatologie (Programme régional de traumatologie d'Ottawa, 2018). Le mécanisme principal des blessures était les collisions de véhicules à moteur et les chutes, qui représentaient respectivement 40,7 % et 40,2 % de ces visites ; tandis que les traumatismes par pénétration représentaient 10 % supplémentaires de ces visites liées à des traumatismes (Programme régional de traumatologie d'Ottawa, 2018).

Processus de lancement du REBOA en tant qu'intervention de soins aux patients

Cette intervention a été initialement proposée pour être utilisée à l'Hôpital d'Ottawa par les membres du programme de traumatologie qui comprend à la fois des infirmières et des médecins. Cette proposition faisait suite à l'approbation de l'utilisation du cathéter ER-REBOA™ par Santé Canada et à la publication d'une déclaration commune des responsables de la traumatologie et de la médecine d'urgence aux États-Unis sur l'utilisation clinique suggérée du REBOA (Brenner et coll., 2018). Parmi les données examinées par les membres du programme de traumatologie du registre des traumatismes 2015–2016, 12 patients ont été identifiés qui auraient été des candidats potentiels pour la procédure (Programme régional de traumatologie d'Ottawa, 2016). Ces chiffres ont été présentés dans le cadre de la discussion initiale avec le comité des opérations de l'hôpital afin de déterminer l'impact sur l'ensemble des opérations. Une fois le produit approuvé pour utilisation à l'Hôpital d'Ottawa par les équipes

de direction, y compris le comité d'évaluation des produits et le comité des opérations de l'entreprise, la phase de planification de la mise en œuvre a été rapportée aux principales parties prenantes. Ces principales parties prenantes comprenaient : les infirmières et éducateurs d'urgence, les médecins-traumatologues, les médecins-urgentistes et l'administration des urgences. La contribution des représentants cliniques de la salle d'opération, des services vasculaires, d'anesthésie, de radiologie interventionnelle et de l'unité de soins intensifs a également été sollicitée.

Des membres du programme de traumatologie, de l'administration des urgences et des éducateurs en matière d'urgence ont travaillé à l'élaboration de procédures opératoires normalisées précises à l'Hôpital d'Ottawa afin de définir l'utilisation appropriée de cet outil (annexe A). Une partie de la procédure indique que seuls les médecins-chefs d'équipe de traumatologie de l'Hôpital d'Ottawa qui ont suivi une formation privée spécialisée dans son utilisation peuvent actuellement utiliser cet équipement pour les soins aux patients. L'approvisionnement et l'achat sont actuellement gérés par le coordinateur des traumatismes.

Stratégies de diffusion pédagogiques

Bien que les médecins aient été formés hors site dans le cadre d'un programme privé de deux jours, il fallait également prévoir un plan détaillé pour mener à bien un déploiement éducatif avec les membres de l'équipe d'infirmiers d'urgence de ce site qui exercent dans la zone de réanimation ou la zone des soins intensifs du service. Au moment du déploiement, il y avait environ 125 IA dans le département et 85 d'entre elles étaient entièrement formées pour pratiquer dans le domaine de la réanimation. Cependant, pour soutenir le développement professionnel généralisé, aucune infirmière n'a été exclue du plan de formation. C'était un déploiement complexe, car il s'agit d'une intervention qui exige une expertise malgré l'exposition limitée à la fois à la procédure et donc aux composants utilisés. Les stratégies éducatives ont été planifiées et mises en œuvre par une équipe d'éducation composée d'infirmières-éducatrices, d'infirmières d'urgence et du coordinateur du programme de traumatologie. Une combinaison d'activités a été prévue pour tenter d'augmenter l'exposition visuelle et tactile à cette intervention complexe (Trauma System News, 2018). Ayant tenu compte des commentaires précédents des infirmières de ce département, il était important que des méthodes d'enseignement formelles et informelles soient intégrées dans ce plan d'éducation. Il était également important de prendre en considération les différents styles d'apprentissages qui devraient être adaptés dans ce processus d'application des connaissances (Saunders, Green, & Cross, 2017).

Approches formelles

Séances en petits groupes. L'approche initiale de l'enseignement formalisé a consisté à faire venir un expert de Prytime Medical. Ce représentant a organisé de petits groupes de discussion pendant trois jours (d'une durée entre 45 minutes et une heure chacun) qui ont permis de combiner une approche didactique et pratique de l'apprentissage. Chaque séance comportait un aperçu de l'équipement, de l'utilisation historique pertinente, de la théorie et de la justification de l'utilisation, des critères d'inclusion pour lancer l'intervention, des techniques d'insertion et des interventions infirmières avant, pendant et après la procédure. Les séances comprenaient également un enseignement sur la mnémonique de l'entreprise — MEFIIS™ — utilisée pour guider l'insertion. Ce temps réservé a permis au personnel de manipuler l'appareil et l'équipement supplémentaire nécessaire avec les conseils d'un expert, puisqu'un mannequin réaliste était présent et disposait d'un simulateur cardiovasculaire pour permettre à l'opérateur de ressentir l'impact circulatoire du REBOA. Cela a également permis aux apprenants visuels, auditifs et tactiles d'interagir avec la méthode d'enseignement qui répond à leurs besoins (Melrose, Park, & Perry, 2015). L'approche centrée sur les petits groupes a permis à 35 infirmières autorisées de recevoir une formation, soit environ 40 % du personnel éligible. L'invitation a été étendue au personnel des salles d'opération, des anesthésistes et des unités de soins intensifs en vue de promouvoir une approche interdisciplinaire, reflétant la nature des soins de traumatologie.

Désignation de champions d'unité. Le processus de sélection initial des personnes qui seraient retenues pour participer à la session en petits groupes a été motivé par le désir de créer un groupe de champions d'unité qui contribueraient également au processus de diffusion. Les champions d'unité sont des personnes qui sont considérées du point de vue de la « science de l'application des connaissances » comme des personnes capables d'influencer positivement l'adoption et l'action d'un nouveau processus (Miech, Rattray, Flanagan, Damschroder, Schmid et Damush, 2018). Les individus qui conviennent le mieux à ce rôle sont décrits dans la littérature comme ceux qui sont : respectés, positifs relatifs au changement, défenseurs et membres d'équipe compétents (Mount & Anderson, 2015). Les infirmières qui possèdent ces caractéristiques et qui ont exprimé un intérêt pour l'enseignement, ou qui ont déjà démontré leurs compétences en tant que mentores, ont été invitées au départ à devenir championnes d'unité pour cette initiative.

La création d'un tel groupe de personnes vise à favoriser un environnement d'apprentissage collégial dont les autres membres du personnel peuvent bénéficier. Il s'agit d'une méthodologie qui a été utilisée avec succès lors de précédentes mises en œuvre éducatives dans cet établissement et qui a obtenu l'adhésion nécessaire du personnel. Le travail avec les rotations de personnel préexistantes a permis de cibler un groupe diversifié d'IA afin d'assurer la couverture des différentes cohortes de personnel. Au départ, il était souhaité qu'environ 20 infirmières autorisées puissent être ciblées pour ce groupe, mais un nombre accru d'infirmières ont pu assister aux séances en petits groupes, ce qui a augmenté la taille de ce dernier.

La simulation in situ. La simulation in situ est une méthodologie d'enseignement qui a récemment fait l'objet de nombreux articles dans la littérature sur l'enseignement des sciences infirmières (Swift & Wannamaker, 2018). L'Hôpital d'Ottawa a utilisé cette méthode d'enseignement dans différents domaines, dont le service des urgences. Cette méthode a été utilisée à l'interne pour étudier la communication, faire des essais de différents protocoles et recueillir des données d'assurance de la qualité sur le fonctionnement de l'équipe et sur la façon dont

les changements de processus ou de produits ont une incidence sur le déroulement des soins aux patients. La simulation in situ a été utilisée pour évaluer la capacité de divers systèmes d'intervention à l'Hôpital d'Ottawa, y compris l'intervention en cas de catastrophe causant un grand nombre de victimes. Être capable d'effectuer des interventions en équipe, dans un environnement de haute-fidélité, apporte une grande valeur aux apprenants et aux éducateurs (Barleycorn & Lee, 2018). Au lancement de cette diffusion éducative, des séances en petits groupes avec la représentante ont permis une simulation basse-fidélité, car les infirmières présentes ont pu se guider mutuellement tout au long de l'intervention avec un équipement réaliste et des résultats cliniques générés par le simulateur.

Six mois après que l'intervention ait été présentée à l'équipe, un exercice de simulation haute-fidélité a été prévu. Cette fois, l'équipe était beaucoup plus ouverte aux différentes spécialités et les rôles ont été interprétés par ceux qui allaient accomplir les tâches dans un scénario réel. C'est-à-dire que les chefs d'équipe de traumatologie qui ont reçu la formation pour l'insertion du REBOA ont joué un rôle actif dans cette conception de simulation avec un participant. La planification de cette simulation a nécessité la conception du programme de la séance, l'élaboration d'objectifs pédagogiques ainsi que la préparation d'un compte rendu structuré. L'utilisation de la simulation in situ a permis à l'équipe pédagogique de contrôler la capacité continue de l'équipe à soutenir cette intervention auprès du patient. Au moment de la création de cet article, d'autres séances de simulation sont prévues pour des dates ultérieures. Il n'y a donc pas de nombres définitifs d'infirmières concernées par cette méthodologie.

Trousses d'outils des unités. Diverses feuilles de travail officialisées ont été élaborées à l'usage de l'infirmière en traumatologie au niveau primaire et secondaire pour le patient qui a besoin de REBOA (annexe B). Elles sont rangées avec les cathéters ER-REBOA™ afin de garantir qu'elles soient toujours facilement accessibles comme outil pour guider les différents éléments de l'intervention. Le fait de disposer de ces fiches de travail vise à alléger le fardeau cognitif que représente l'exécution de cette tâche complexe. Elles sont utiles pour l'infirmière qui documente l'intervention, mais aussi pour l'infirmière de chevet qui assiste le chef de l'équipe de traumatologie.

Approches informelles

Outre les approches formelles décrites, d'autres méthodes plus informelles et moins structurées ont été utilisées pour faciliter l'application des connaissances. Ces approches ont renforcé le matériel didactique formel pour permettre d'ouvrir des voies de discussion dans un climat de confiance sur l'intervention et les préoccupations associées à aborder.

Soirée éducative hors site. L'équipe chargée de l'éducation a organisé une réunion informelle hors site dans le contexte d'une soirée de formation. Les infirmières qui travaillent dans ce contexte organisent ces soirées de formation sur une base semi-régulière et invitent différents médecins à faire des présentations sur une variété de contenus sur la médecine d'urgence. Les réactions précédentes ont montré que le personnel trouve ces soirées extrêmement utiles et très applicables à la pratique. Lors de cet événement, un chirurgien-traumatologue a fait une présentation sur l'importance de réanimer correctement le patient traumatisé. Le REBOA a été discuté comme un complément au traitement uniquement. La formation a été complétée par un mannequin dont le système vasculaire est exposé, de sorte que l'insertion du cathéter ER-REBOA™ puisse être reproduite avec une représentation visuelle des effets circulatoires. Ce fut un élément clé, car les experts soulignent l'importance de l'exposition répétée et de l'expérience pratique pour le succès global de la formation du personnel infirmier à cette modalité (Trauma Systems News, 2018).

Le personnel a pu manipuler l'appareil et poser des questions à l'équipe pédagogique et au chirurgien-traumatologue présents. Les documents qui constituent la trousse d'outils étaient également présents pour que le personnel puisse les utiliser. Seize infirmières étaient présentes pour cet événement informel.

Bulletin d'information de l'unité. Des bulletins d'information éducatifs sont distribués à l'unité toutes les deux semaines ou tous les mois. Elles traitent des changements de pratiques et des rappels, donnent des indications sur les nouveaux processus à venir ou en cours d'exécution et comprennent toujours une section qui met en évidence un sujet particulier et explique comment trouver des ressources supplémentaires. Juste avant la date officielle de mise en œuvre de l'intervention de REBOA dans cet établissement, le bulletin d'information s'est concentré sur ce sujet. Il comprenait informations pédagogiques et des liens pertinents vers les vidéos des fournisseurs. Les bulletins d'information sont diffusés à tout le personnel par courrier électronique sur l'intranet de l'hôpital, mais aucun suivi officiel du lectorat n'est effectué, de sorte qu'il est difficile d'évaluer la portée de cette méthodologie.

Enjeux

Environnementaux

Sur ce site, il y a des fluctuations constantes dans les effectifs et dans les mouvements de personnel à l'extérieur du service. Il y a également des volumes élevés, mais fluctuants, et une acuité des patients qui mettent à l'épreuve les besoins en personnel. Dans ce type d'environnement, il peut être difficile d'organiser des heures de travail consacrées à l'éducation. L'environnement chaotique des soins contribue également à un climat d'enseignement difficile. Des tentatives pour alléger l'impact de l'environnement ont été faites en déplaçant une activité éducative hors du site. De ce fait, le travail sera effectué avec les nouvelles recrues du service afin de compléter la formation nécessaire dans le cadre des processus d'orientation.

Exposition et la perte des connaissances

La formation initiale à l'hôpital d'Ottawa a été achevée six mois avant la rédaction de cet article. Pour l'instant, le REBOA n'a pas été utilisé sur ce site. Vu l'examen rétrospectif initial prévoyait un faible potentiel de patients candidats pour cette procédure, cela n'est pas nécessairement surprenant. Comme cette intervention vitale est complexe tant sur le plan du contenu théorique que de la maîtrise des compétences, l'utilisation de la simulation in situ a permis au personnel de rester à jour dans ce domaine.

Projets d'avenir

Comme il a été précisé, au moment de cette soumission, le REBOA n'a pas encore été lancé en tant qu'intervention de soins aux patients à l'Hôpital d'Ottawa. L'équipe de formation assurera un suivi et évaluera les domaines d'optimisation à mesure qu'ils seront identifiés pour le personnel infirmier. Le bulletin d'information de l'unité comprendra un rappel concernant les ressources du REBOA dans le cadre de la séance de « rappel de pratique » de temps à autre. Le personnel qui se dirige vers ce domaine spécialisé suit une journée de formation où l'orientation vers le REBOA est incluse. Comme cette journée de formation se déroule au sein de l'unité, elle était et est encore aujourd'hui l'occasion pour le personnel actuel d'avoir une séance de remise à niveau avec le mannequin modifié et la trousse d'outils de l'unité. De plus, comme cela a été mentionné, d'autres journées de simulation in situ ont été prévues pour l'unité afin d'améliorer la collaboration de l'équipe dans la préparation de l'utilisation de cette intervention complexe auprès des patients.

Conclusion

L'occlusion aortique endovasculaire par ballonnet (REBOA) comme mesure de réanimation est une intervention de contrôle des hémorragies qui a le potentiel d'optimiser les soins de certains patients. Les infirmières des urgences de l'hôpital d'Ottawa ont reçu diverses stratégies éducatives, formelles et informelles, pour les aider à adopter cette procédure. Les efforts en cours pour réduire le taux d'attrition des connaissances se concentreront sur des rappels succincts et sur les ressources disponibles sur place, tant pour l'apprentissage autonome que pour l'utilisation si l'intervention doit être mise en œuvre.

Matière à réflexion

- Le REBOA est une stratégie qui peut sauver des vies en cas d'hémorragie potentiellement mortelle
- Les infirmières d'urgence ont un rôle important dans la mise en œuvre d'un programme REBOA
- La simulation et les stratégies d'éducation multiméthodes sont des composantes essentielles d'un plan de mise en œuvre d'une intervention complexe telle que REBOA
- La simulation et les stratégies d'éducation qui reposent sur plusieurs méthodes sont des composantes essentielles d'un plan de mise en œuvre d'une intervention complexe telle que REBOA

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Annexe A

The Ottawa Hospital | L'Hôpital d'Ottawa	ISSUE DATE:	SOP#:
	LAST REVIEWED:	APPROVED BY:
	NEXT REVIEW DATE:	
		ISSUED BY:
STANDARD OPERATING PROCEDURE (SOP) FOR: Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA)		PAGE NUMBER: 18 of 4
		TRAINING OR CERTIFICATION REQUIRED? ❑ YES ❑ NO

Purpose Statement:
REBOA is a balloon catheter introduced through a 7Fr sheath in the common femoral artery (CFA) and advanced above the aortic bifurcation (Zone III) or in the thoracic aorta (Zone I). The compliant balloon is inflated to achieve aortic occlusion to stop hemorrhage downstream. The catheter is impregnated with a radiopaque band. This is intended to be a bridge therapy for definitive & immediate surgical hemorrhage control

Indications:
- Life threatening torso hemorrhage below the diaphragm due to traumatic mechanism of injury

Scope:
- This procedure is exclusively done by REBOA-trained Trauma Team Leaders (TTL).
- This will be performed exclusively at the Civic Campus of The Ottawa Hospital (Lead Trauma Hospital)

Alerts:
In the event REBOA is not available, an Emergency Department Thoracotomy could be warranted with the goal to cross clamp the aorta at the discretion of the TTL.

Definition(s)
- REBOA: Resuscitative Endovascular Balloon Occlusion of the Aorta
- CFA: Common Femoral Artery
- TTL: Trauma Team Leader
- ME-FIIS: Measure, Empty-Flush, Insert, Inflate, Secure

Equipment:
- Sterile Drape
- Central Line Kit
- Introducer Sheath 7F x1 (Prelude Pro 11cm 7F TOH order # 789273)
- 18G 7cm Echogenic Needle
- Syringe 20ml x1
- Syringe 10ml prefilled/sterile x 3
- Scalpel #11 x 1
- Suture, nylon 2-0 reverse cutting x 1

Procedure

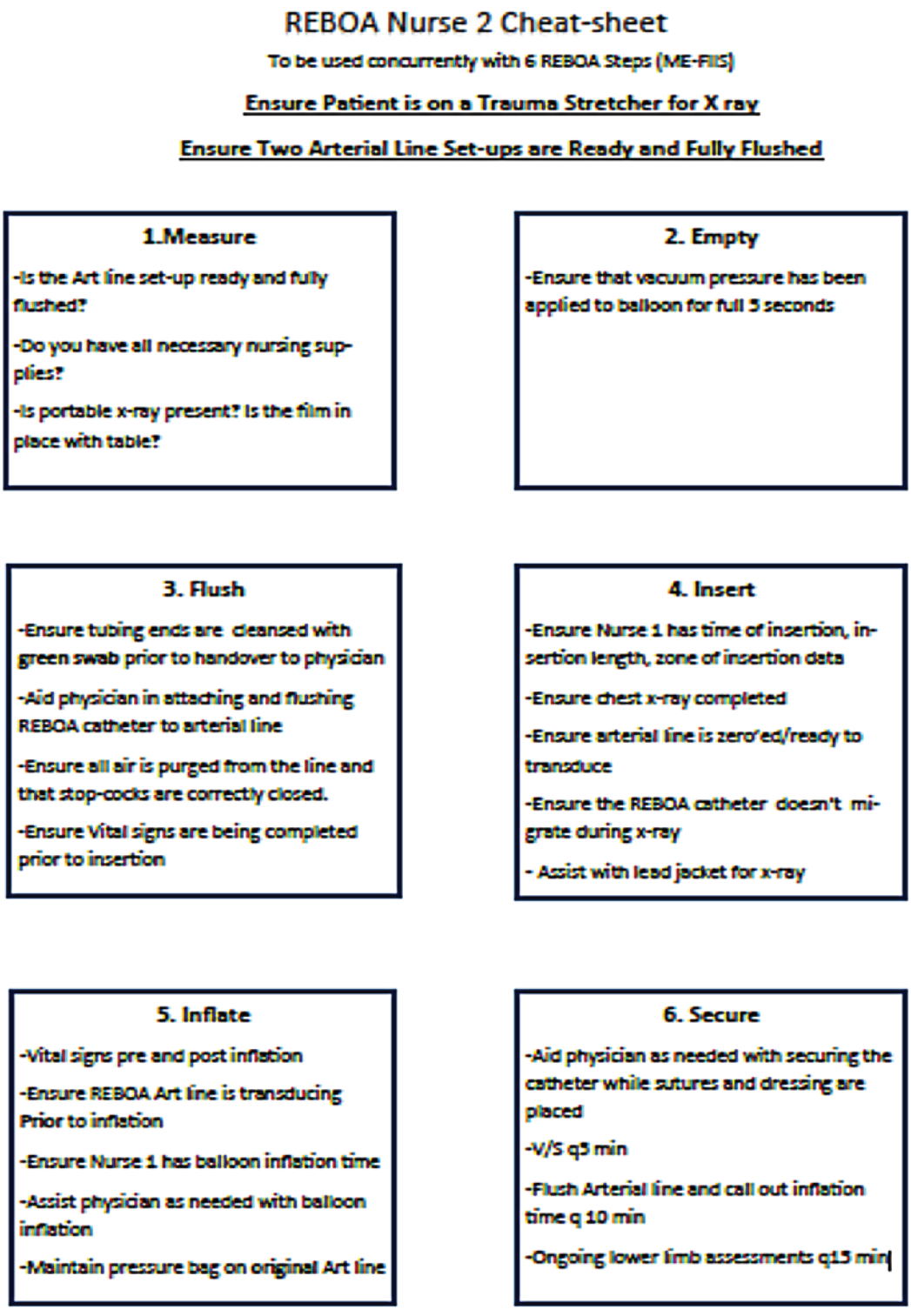
Insertion of catheter

1. Ensure that Trauma Surgeon covering the Trauma Unit is on route
2. Book operating room as Priority A case as soon as possible
3. Obtain CFA access as per standard technique and use introducer sheath.
4. Measure from sternal notch to CFA access point
    1. Zone III; Approximately 28cm
    2. Zone I: Approximately 46cm
5. Ensure Balloon is fully deflated by holding vacuum for 5 seconds and close stopcock
6. Advance & twist peel-away to cover P-tip by using a "Corkscrew method". Ensure the balloon and P-tip are covered.
7. Attach & flush the arterial line set up
8. Insert peel-away into valve of sheath approximately 5mm
9. Advance catheter to desired depth by holding orange peel-away, advancing blue catheter and pull peel-away back after balloon passes valve.
10. Position catheter using x-ray to confirm position using radiopaque markers
11. Inflate balloon, starting with 2cc of saline. Do not overinflate
12. Monitor arterial waveform and watch for increase in blood pressure
    1. Feel for loss of contralateral pulse
    2. Note time of inflation
13. Secure catheter close to the introducer sheath

Removal of catheter

1. Fully deflate balloon slowly and hold vacuum for 5 seconds and close stopcock.
2. Twist the catheter in "Corkscrew method" while removing
    1. If necessary, remove the catheter and sheath as a unit
    2. Prepare healthcare team for rebound hypotension
3. Apply manual pressure over access point for 15 minutes (longer if patient is anticoagulated or Trauma Induced Coagulopathy).
4. Check for full and equal pulse in each leg.

Annexe B



REBOA Nurse 2 Cheat-sheet

To be used concurrently with 6 REBOA Steps (ME-FIIS)

Ensure Patient is on a Trauma Stretcher for X ray

Ensure Two Arterial Line Set-ups are Ready and Fully Flushed

1.Measure

-Is the Art line set-up ready and fully flushed?

-Do you have all necessary nursing supplies?

-Is portable x-ray present? Is the film in place with table?

2. Empty

-Ensure that vacuum pressure has been applied to balloon for full 5 seconds

3. Flush

-Ensure tubing ends are cleansed with green swab prior to handover to physician

-Aid physician in attaching and flushing REBOA catheter to arterial line

-Ensure all air is purged from the line and that stop-cocks are correctly closed.

-Ensure Vital signs are being completed prior to insertion

4. Insert

-Ensure Nurse 1 has time of insertion, insertion length, zone of insertion data

-Ensure chest x-ray completed

-Ensure arterial line is zero'ed/ready to transduce

-Ensure the REBOA catheter doesn't migrate during x-ray

- Assist with lead jacket for x-ray

5. Inflate

-Vital signs pre and post inflation

-Ensure REBOA Art line is transducing Prior to inflation

-Ensure Nurse 1 has balloon inflation time

-Assist physician as needed with balloon inflation

-Maintain pressure bag on original Art line

6. Secure

-Aid physician as needed with securing the catheter while sutures and dressing are placed

-V/S q5 min

-Flush Arterial line and call out inflation time q 10 min

-Ongoing lower limb assessments q15 min

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What's in a BP: Do you FOLLOW THE MAP?

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Abstract

The purpose of this case study is to review a case of a patient in the emergency department with a complaint of acute on chronic back pain and shortness of breath. We propose that monitoring and trending blood pressure, mean arterial pressure and pulse pressure in patients who present with symptoms that may indicate a pulmonary and/or cardiac complaint, along with abnormal vital signs or abnormal lab values, would result in more timely intervention. Through this case study, we hope to encourage healthcare professionals to consider the importance of trending mean arterial pressure on helping to identify early hypovolemic shock, severe sepsis and other significant life-threatening conditions, as well as the need for continued nursing education.

Initial patient presentation and relevant history

Mr. B was a 60-year-old male who presented to the Emergency Department (ED) of a Level Three trauma centre at 2200. His chief complaint at triage was shortness of breath and non-specific back pain. He stated that he had a history of chronic back pain from a work-related injury; however, this was "different pain". The vital signs at triage are presented in Table 1. Mr. B denied other significant medical conditions, but 25 pack-year smoking history. He was given a Canadian Triage and Acuity Scale (CTAS) score of 3 and sent to the waiting room.

Relevant examination and diagnostic findings

Mr. B was assessed by the emergency nurse and physician approximately one-hour post-arrival to the ED. The differential diagnoses considered by the ED physician included myocardial infarction (MI) and pulmonary embolism (PE). Blood work, a urinalysis and a chest x-ray were ordered, along with an intravenous (IV) bolus of two litres of normal saline due to tachycardia and hypotension. At 0100hrs, his troponin was reported to be 0.1ng/L; a repeat troponin and electrolyte panel was ordered for 0500. Refer to Table 2 for relevant laboratory results. His chest x-ray was normal, and his urinalysis was unremarkable. A 12-lead electrocardiogram tracing showed sinus tachycardia with no acute ischemic or injury changes. Mr. B remained hypotensive after the two litres of normal saline.

Table 1. Vital signs at triage

Vital signs:	• Blood Pressure (BP) 95/64 millimeters of mercury (mmHg) • Heart Rate (HR) 126 beats per minute (bpm) • Temperature (T) 36.9 Celsius • Respiratory Rate (RR) 18 • Oxygen Saturation (Sp02) 93% on room air.

Table 2. Relevant Laboratory Results

Lab Test	Patient result 0100h	Patient result 0700h	Normal value
White blood cell count	14.6	Repeat not ordered	4.5–11.0 x 10^3/mm^3
Troponin I	0.10	0.10	< 0.02ng/L
Serum creatinine	218	265	60–110mmol/L
Lactate	2.5	2.8	<2mmol/L
D-dimer	1662	Repeat not ordered	<500ng/ml

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Given the results of the diagnostic tests, including an elevated D-dimer with shortness of breath and back pain, the physician considered that these may indicate a PE. At this hospital site, there is no specialized on-site diagnostic imaging available during the night. As such, the physician prescribed a weight-based dose of low molecular weight heparin (LMWH), IV crystalloid, and for Mr. B to remain in the ED for a ventilation/perfusion (VQ) scan in the morning. Mr. B was placed on Q 30 minute automatic BP and HR monitoring, provided with a call bell, and was advised to try to sleep. Refer to Table 3 for Mr. B's vital signs during the night.

While the day shift staff nurse completed the morning assessment, Mr. B reported increased back pain and shortness of breath; he also requested analgesia. Repeat vital signs at 0712 were a BP 83/40 mmHg and a HR of 127bpm. The nurse assured Mr. B that his pain would be discussed with the physician; the nurse was hesitant to administer analgesia due to his low BP. Mr. B's repeat blood work reported the troponin unchanged and his creatinine increased.

Table 3. Blood pressure and heart rate recordings

Time	BP (MAP)	Heart rate (HR)
0112	88/53 (64)	115
0142	No BP recorded	No HR recorded
0212	106/47 (66)	104
0242	No BP recorded	No HR recorded
0312	120/89 (98)	112
0342	76/42 (52)	121
0412	89/43 (57)	118
0442	95/63 (72)	118
0512	93/58 (69)	121
0542	88/53 (64)	125
0612	99/47 (64)	123
0642	110/44 (65)	126
0712	83/40 (53)	127

Case Progression

Throughout the morning, Mr. B became increasingly agitated; he began pacing the room and reiterated that his back hurt too much for him to lay still. Given the complaint of increased back pain, the nurse determined the need to obtain bilateral BPs as she was concerned that Mr. B could have an abdominal aortic aneurysm (AAA). The nurse attempted to obtain bilateral BPs with both automatic and manual cuffs; however, there was a lack of measurable BP in Mr. B's left arm. The nurses also repeated the bilateral BPs while Mr. B was lying supine; his left arm pressure remained absent and his right arm BP was 131/30mmHg. The nurse was concerned about the lack of BP in the left arm and the widening pulse pressure; the day shift ED physician was immediately notified. Upon reassessment, the day shift physician decided to order an urgent chest and abdomen CT to rule out AAA; the radiologist confirmed that Mr. B had a ruptured AAA.

Case outcome

As Mr. B was at a Level Three trauma and surgical centre, the ED physician made arrangements for aeromedical transfer to a designated vascular surgery site approximately 200 kilometres north of the current location. The nursing staff quickly prepared Mr. B for transfer, established additional IV access, administered a dose of protamine sulphate to reverse the effects of the LMWH and monitored his condition closely. Mr. B's status continued to deteriorate as he waited for transfer, with signs and symptoms of hypovolemic shock. His back pain increased to 7/10 and he began to vomit; anti-emetics were given, but narcotics were held due to hypotension. By the time the aeromedical crew arrived, Mr. B had become increasingly hemodynamically unstable and his transfer was slightly delayed on the helicopter pad until the crew was certain he was safe to move.

Mr. B arrived at the designated hospital for vascular surgery in a pre-arrest condition, showing signs of decompensated shock, with a declining level of consciousness and a HR of 160 bpm. He was taken for emergent surgery where an aortic graft was completed. He survived surgery and was taken to intensive care, where it was determined he had acute kidney injury and emergency hemodialysis was commenced. During his first night in the intensive care unit, Mr. B succumbed to his critical condition and died.

Case discussion

Abdominal aortic aneurysm rupture is a life-threatening condition that requires rapid diagnosis, emergency resuscitation and surgical intervention. The Centers for Disease Control and Prevention (2020) report that ruptured AAA has an overall mortality rate of 80% and was the primary cause of death in over 9,923 patients in the United States in 2018. A leaking AAA may show no signs or symptoms until it has expanded or ruptured; the patient may present with an acute abdomen or back pain (Badger et al., 2014). A patient with a ruptured AAA may present with acute chest pain indicating a ripping or tearing sensation, rapid or weak thready peripheral pulses, dyspnea, nausea shortness of breath, inability to speak, weakness or paralysis on one side of the body, back pain, loss of vision or even loss of consciousness (Woodrow, 2011). When Mr. B was told his diagnosis, he then recalled a strong family history of AAA. Refer to Table 4 for AAA symptoms and risk factors.

Upon reviewing the details of Mr. B's case, we determined that there were several factors that indicated he was suffering from a ruptured AAA, as well as a number of factors that may have impeded the recognition of his condition. Confounding factors include dyspnea (acute on chronic given history of smoking), a history of chronic back pain and weakly elevated troponin values. We believe that Mr. B's fluctuating BP, subsequent hypovolemic shock, increased serum creatinine and significantly

Table 4. Symptomology and Risk Factors for AAA		
Common signs & symptoms	**Risk ractors for Mr. B**	**Mr. B's signs & symptoms**
Deep constant pain in abdomen can indicate enlarging aneurysm. Sudden, intense persistent back or abdominal pain can indicate rupture.	Tobacco use Was a 25+ year smoker	Back pain stated different from his chronic back pain
Pulsating near belly button can indicate enlargement	Being male	Not documented
Low blood pressure	Being white	Hypotensive initial BP 95/64 mmHg
Tachycardia	Mr. B discloses a positive family history	Tachycardia 126 bpm
Weak or thready pulse	Atherosclerosis	Not documented
Shortness of breath	Known hypertension	Short of breath
Signs of shock	Age > 65	Initial VS could be classified as early signs of shock

elevated D-dimer were indicators of Mr. B's acute condition, and that closer evaluation of these could have led to an earlier diagnosis of ruptured AAA.

The importance of trending BP, MAP and PP

When Mr. B's medical record was reviewed, a wide variation in his BP measurements throughout his seven-hour stay in the ED were noted (refer to Table 3 for vital signs). Scheetz (2006) presented a case report of an acute aortic dissection that also noted extreme fluctuations in BP with pressures that ranged from hypotensive with a systolic pressure under 75mmHg and hypertensive with diastolic pressures greater than 100mmHg. Mercer-Deadman (2014) notes that the presentation of aortic aneurysm and rupture are often similar as hypotension in the dissected patient is often profound. At different times during his emergency room stay, Mr. B also experienced hypotension (refer to Table 3). Mercer-Deadman notes that while both dissection and rupture are uncommon, the latter is quite rare and is often difficult to diagnose in the ED. The rarity of these conditions, as well as their shared risk factors and similar presentations, can often cause confusion amongst practitioners assessing and recognizing dissections and rupture. Refer to Table 4 for the differences between aortic dissection and AAA rupture. Furthermore, these conditions also mimic other common conditions seen in the ED. Upon review of Scheetz's (2006) case, we believe that monitoring and evaluation of Mr. B's mean arterial pressure (MAP) may have led to an earlier diagnosis.

Mean arterial pressure tells healthcare practitioners about how effectively blood and oxygen are being delivered to tissue and organs (Handler, 2009). MAP is "the average pressure required that forces blood through the systemic organs" ((Ferns et al., 2010), pp. 41). It is a more accurate measurement in determining the actual pressure of blood against arterial walls (Handler, 2009). MAP should be used over SBP for the management of patients with acute conditions where there is a concern for appropriate organ perfusion (reference required). According to Bradshaw (2012), MAP has been used in hemodialysis as a guide to monitor intravascular changes and could also be beneficial in indicating critical changes in any patient acute or chronic to improve outcomes. The desirable range is 70–100 mmHg; a minimum of 60mmHg is required to supply enough blood to nourish the coronary arteries, brain and kidneys. If MAP falls below 60mmHg for an appreciable length of time, vital organs can be deprived of oxygen (Chapleau, 2012).

Pulse pressure is the difference between the systolic and diastolic BP; it represents the force that the heart generates each time it contracts (Blood Pressure, 2020). For example, if the resting BP is 130/80 mm Hg, then the pulse pressure is 50 mmHg. A narrow pulse pressure can be an early indication of shock (Ferns et al., 2010). A narrowed pulse pressure is a cue for a clinician to suspect hypovolemia or a decrease in cardiac output.

Serum creatinine as a measure of tissue perfusion

The vital signs presented in Table 3 indicated that Mr. B had MAPs during his ED stay that likely were not adequate for effective tissue perfusion; inadequate perfusion limits the delivery of blood and oxygen to organs ultimately causing organ dysfunction and tissue death. Increased serum creatinine levels occur for many reasons, one of the most common being changes to kidney health and function. Prior to his visit, Mr. B had no known history of kidney dysfunction or failure. Mr. B's creatinine of 268 mmol/L could indicate acute renal failure. In retrospect, it is assumed that ineffective tissue perfusion due to hypovolemia and the resultant decreased MAP was a factor for Mr. B's acute kidney injury and failure. We believe that when put into context with the other abnormal lab values and the patient's presenting symptoms, the elevated serum creatinine was an early indicator of poor tissue perfusion caused by hypovolemia.

Elevated serum lactate

Lactate is a byproduct of carbohydrate metabolism and serum lactate rises as a result of increased cellular metabolism (LoCicero, 2018). Lactate levels are a reliable measure of

tissue oxidation and a by-product of anaerobic metabolism. We can assume that increased metabolic demand and anaerobic metabolism can cause blood lactate levels to rise including most commonly in septicemia, but also in hemorrhage, myocardial infarction and pulmonary embolus. As indicated in Table 2, there was an upward trend in blood lactate levels when the patient decompensated. Mr. B's initial elevated blood lactate was treated with a fluid bolus, which may have affected his clotting cascade. Perhaps, if elevated lactate was discussed as a marker of poor oxidation, and not just as a benchmark of sepsis in our ED, there would have been more investigation into his impaired tissue perfusion.

The significance of elevated D-dimer

Another confounding factor in Mr. B's presentation was his elevated serum D-dimer levels coupled with his non-specific symptoms of shortness of breath and non-specific acute vs. chronic back pain. Nienaber & Clough (2015) state "D-dimer is fibrin degradation product of a thrombus" (pp. 801). However, it is well known that D-dimer elevation can occur with the presence of any thrombus, even a superficial contusion. Nienaber & Clough (2015) indicate that in the case of AAA, D-dimer has a sensitivity of 97% and specificity of 47%. Classically, an elevated D-dimer paired with a patient experiencing shortness of breath raises suspicion for a pulmonary embolus. However, Nienaber & Clough (2015) suggest that D-dimers in significantly elevated levels are more likely in an acute aortic dissection than levels seen in patients with acute coronary syndromes, with a sensitivity of 98%. As such, we believe that the significantly elevated D-dimer presented in this case should have led to further diagnostic workup before a diagnosis of acute aortic dissection was ruled out and the patient was treated with anticoagulants.

A note on CTAS

Upon presentation to the ED, Mr. B was triaged and assigned a CTAS score of 3. According to Bullard et al. (2017), Mr. B's initial abnormal vital signs support a CTAS 2 score. His report of chronic back pain may have been a factor in driving his score in the wrong direction. Furthermore, it is possible the lower CTAS score delayed Mr. B's assessment by a physician.

Education as a strategy to improve practice

In recent years, a Canadian designed emergency nursing course has been developed to enhance decision-making within emergency nursing care. Emergency Practice Interventions & Care Canada (EPICC), emphasizes the importance of assessment, monitoring and planning in emergency nursing (EPICC, 2018). Currently in our practice setting, a policy exists for hourly assessment of vital signs. This frequent vital sign assessment is further supported by nursing documentation forms designed for frequent charting and trending of vital signs including BP, pulse, RR & SPO2. The form does not include a documentation area for recording and trending MAP. Educating ED nurses on MAP and including it on assessment and documentation records, supports improved monitoring and recognition of changes to hemodynamic status (EPICC, 2018). Furthermore, Chapleau (2012) proposes that monitoring MAP, as a means of determining adequate tissue perfusion, may help nurses identify and respond to acute changes in hemodynamic status. By trending and documenting changes in MAP, nurses may recognize life-threatening illness earlier. We believe that there is a need to further evaluate how MAP is used in other care settings particularly the ED to support inclusion of it as a standard of assessment in emergency and urgent care facilities across Canada.

Teaching points

1. By monitoring and trending MAP in patients that present with symptoms that indicate pulmonary/cardiac distress, and abnormal vital signs and lab values, earlier detection of hypovolemic shock and severe sepsis is possible. Nurses involved in caring for critically ill patients should be provided education on and encouraged to evaluate MAP as part of their regular practice.
2. Abdominal aortic aneurysm is a life-threatening emergency that may present with signs and symptoms similar to other acute problems such as pulmonary embolus, myocardial infarction and renal colic. Significantly elevated D-dimer lab values may be a sign of AAA and thus, this diagnosis should not be ruled out until advanced diagnostic imaging can be performed. Changes in serum creatinine and blood lactate should also be evaluated and considered as indicators of diminished tissue perfusion and not just indicators of one specific problem such as septicemia.
3. ED nurses care for critically ill patients and require a high level of education and orientation prior to entering their care setting. Standardized education and orientation to EDs should be developed nationwide to improve nursing practice and patient outcomes. Including EPICC foundations as part of new employee education in Canadian EDs is one strategy to provide new ER nurses with the tools to effectively assess, monitor and intervene in critical situations.

Conclusion

Mr. B's case reminds us that AAA is a serious condition with a high mortality rate. Often, these patients present to EDs with symptoms that warrant a wide differential diagnosis. When confounding factors exist such as non-specific symptoms, abnormal lab values that are relevant to AAA as well as other serious conditions, there is increased risk of missed diagnosis. As nurses, we can learn from our failure to recognize, assess, communicate or escalate when caring for a deteriorating patient. Broadening our assessment practice to include monitoring BP, MAP and PP may be one way to improve outcomes for our critically ill patients. Following the MAP may just save a life. Lastly, we identified the need for ongoing study and review of AAA patients in the ED as well as critical reflection and self-evaluation as essential component of emergency nursing practice.

About the authors

Jennifer is an ER RN currently working in Lethbridge, AB. She graduated with Great Distinction from the University of Lethbridge's Bachelor of Nursing After Degree program. She has previous degrees in Exercise Science and Anthropology and has previously published work in the field of Exercise Physiology. She is currently studying for her MN. with a focus in shock physiology. When she's not nursing or studying, Jenn loves riding her Peloton

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Dawn lives in Lethbridge, Alberta and graduated from the RN program at the Lethbridge College in 1994 and obtained her Bachelor of Nursing at the University of Lethbridge in 2013. She is the current NENA-AB President and Director of Alberta with NENA-National. Dawn is also Chair of the International Advisory Council with ENA. She has been nursing for 26 years, and in 2009 she started working in Emergency Nursing and found my home. Since 2014 Dawn has been the Clinical Instructor with AHS for the Rural South West Zone while still working casual in the CRH-ED. Dawn's interest are in advocacy for equal education and resources for all Emergency Nurses. She is the proud grandma of two beautiful little girls and enjoys spending time with them, hiking in the mountains, scrapbooking, reading and travelling.

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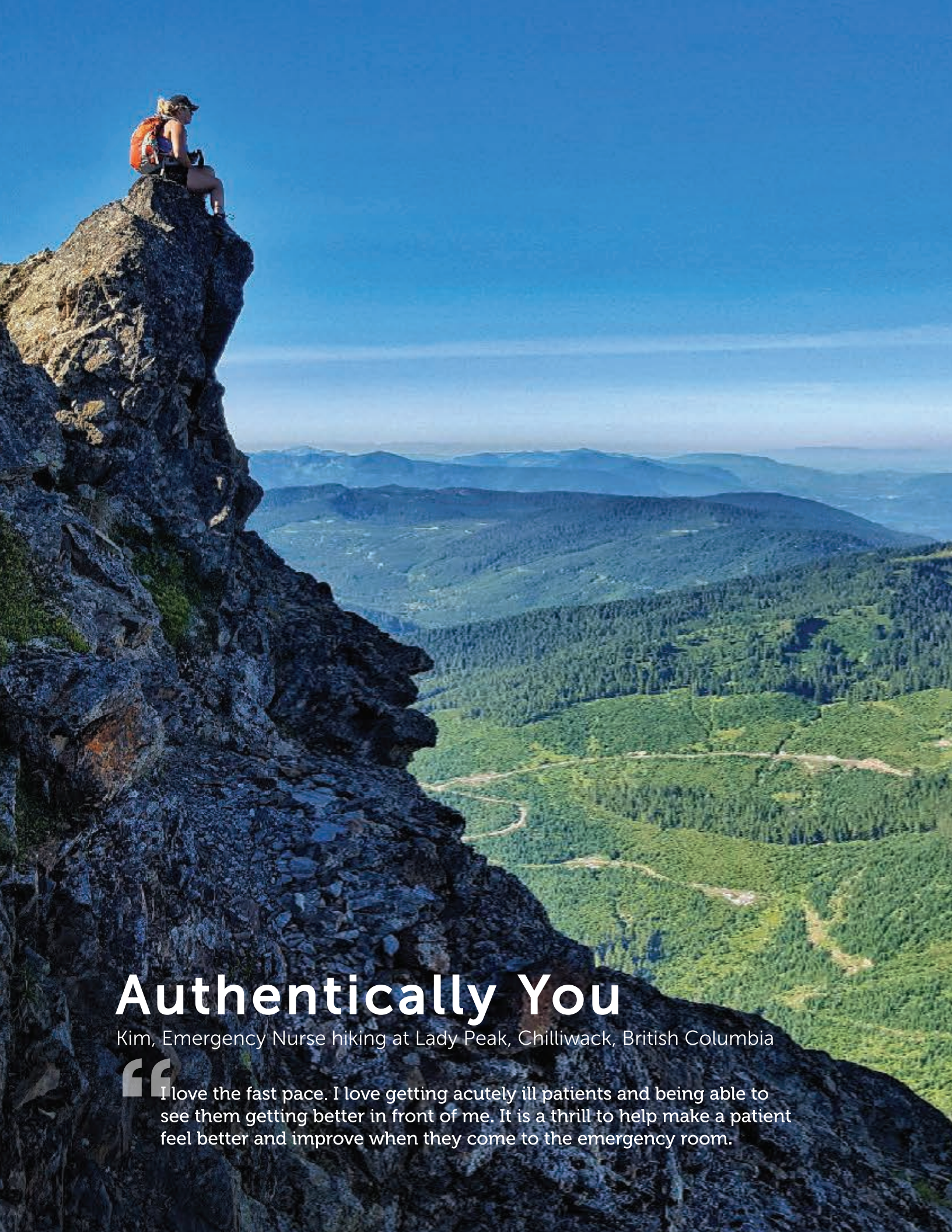
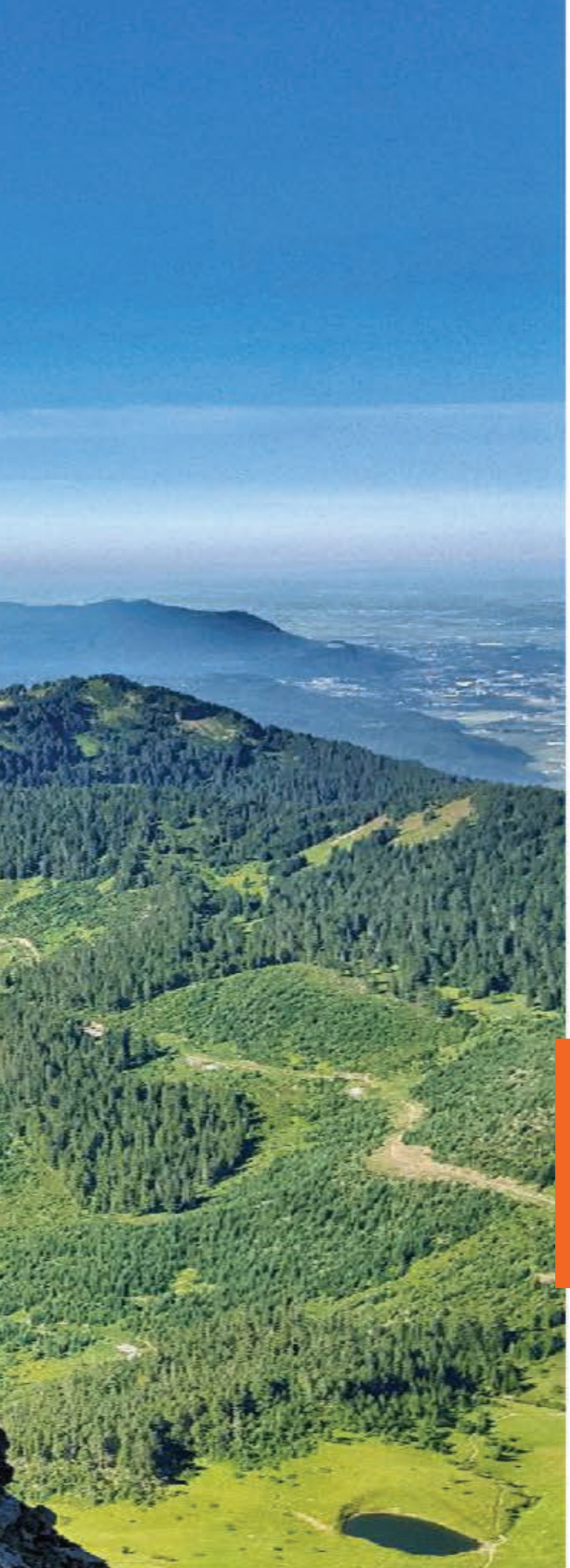


Authentically You

Kim, Emergency Nurse hiking at Lady Peak, Chilliwack, British Columbia

"I love the fast pace. I love getting acutely ill patients and being able to see them getting better in front of me. It is a thrill to help make a patient feel better and improve when they come to the emergency room.



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Que signifie la TA : suivez-vous LA TAM?

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Résumé

L'objectif de cette étude de cas est d'examiner le profil d'un patient du service des urgences qui se plaint de douleurs dorsales chroniques et d'essoufflement. Nous proposons que la vérification et l'évolution de la pression sanguine, de la pression artérielle moyenne et du pouls des patients qui présentent des symptômes pouvant indiquer un problème pulmonaire ou cardiaque, ainsi que des signes vitaux anormaux ou des valeurs de laboratoire anormales, permettent d'intervenir plus rapidement. Par cette étude de cas, nous espérons encourager les professionnels de la santé à considérer l'importance de la tendance de la pression artérielle moyenne pour aider à identifier de manière précoce le choc hypovolémique, la septicémie grave et d'autres conditions importantes mettant la vie en danger, ainsi du besoin qu'a le personnel infirmier de formation continue.

Situation initiale du patient et antécédents pertinents

M. B était un homme de 60 ans qui s'est présenté au service des urgences (DE) d'un centre de traumatologie de niveau 3 à 22 h. Sa plainte principale au triage était l'essoufflement et des douleurs dorsales non précises. Il a déclaré qu'il avait des antécédents de douleurs dorsales chroniques dues à un accident de travail, mais qu'il s'agissait d'une « douleur différente ». Les signes vitaux au triage sont présentés dans le tableau 1. M. B a nié avoir d'autres problèmes de santé importants, mais il a fumé pendant 25 ans. Il a reçu une note de 3 sur l'échelle canadienne de triage et de gravité (ÉCTG) et a été envoyé dans la salle d'attente.

Observations pertinentes et conclusions du diagnostic

M. B a été évalué par l'infirmière et le médecin-urgentiste environ une heure après son arrivée au DE. Les diagnostics différentiels considérés par le médecin des urgences comprenaient l'infarctus du myocarde (IM) et l'embolie pulmonaire (EP). Une analyse sanguine, une analyse d'urine et une radiographie pulmonaire ont été ordonnées, ainsi qu'un bolus intraveineux (IV) de deux litres de solution saline normal en raison de la tachycardie et de l'hypotension. À 0100hrs, sa troponine était de 0,1 ng/L ; un nouveau dépistage de troponine et d'électrolyte a été commandé pour 0500hrs. Voir le tableau 2 pour les résultats pertinents de laboratoire. Sa radiographie du thorax était normale, et son analyse d'urine semblait normale. Un électrocardiogramme à 12 dérivations a montré une tachycardie sinusale sans modification ischémique aiguë ni blessure. M. B est demeuré hypotendu après les deux litres de solution saline normale.

Tableau 1. Signes vitaux au triage

Signes vitaux :	• Tension artérielle (TA) 95/64 millimètres de mercure (mmHg) • Fréquence cardiaque (FC) 126 battements par minute (bpm) • Température (T) 36,9 Celsius • Fréquence respiratoire (FR) 18 • Saturation en oxygène (Sp02) 93 % à l'air ambiant.

Tableau 2. Résultats de laboratoire pertinents

Test en labo	Résultat du patient à 1 h	Résultat du patient à 7 h	Valeur normale
Taux de globules blancs	4,6	Répétition non ordonnée	4,5-11,0 x 10^3/ mm^3
Troponine I	0,10	0,10	<0,02ng/L
Créatinine sérique	218	265	60-110 mmol/L
Lactate	2,5	2,8	<2 mmol/L
D-dimère	1662	Répétition non ordonnée	<500 ng/ml

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À la lumière des résultats des tests de diagnostic, dont un taux élevé de D-dimères avec essoufflement et douleurs dorsales, le médecin a estimé que ces résultats pouvaient indiquer une EP. Sur ce site hospitalier, il n'y a pas d'imagerie diagnostique spécialisée disponible sur place la nuit. Le médecin a donc prescrit une dose d'héparine de faible poids moléculaire (HBPM), un soluté cristalloïde en perfusion intraveineuse, et a demandé à M. B. de rester aux urgences pour un examen de ventilation/perfusion (VQ) le matin. M. B a été placé sous surveillance automatique (toutes les 30 minutes) de la TA et la FC. On lui a donné une sonnette d'appel, et on lui a conseillé d'essayer de dormir. Consultez le tableau 3 pour connaître les signes vitaux de M. B pendant la nuit.

Lorsque l'infirmière de l'équipe de jour a effectué son examen du matin, M. B a signalé une augmentation des douleurs dorsales et de l'essoufflement ; il a également demandé une analgésie. Les signes vitaux répétés à 7 h 12 étaient une TA de 83/40 mmHg et une FC de 127bpm. L'infirmière a assuré à M. B que sa douleur serait discutée avec le médecin ; l'infirmière hésitait à lui administrer une analgésie en raison de sa faible tension artérielle. Les analyses sanguines répétées de M. B ont indiqué que la troponine était toujours la même et que sa créatinine avait augmenté.

Progression de cas

Tout au long de la matinée, M. B est devenu de plus en plus agité ; il a commencé à faire les cent pas dans la pièce et a déclaré à nouveau que son dos lui faisait trop mal pour qu'il reste allongé. Étant donné la plainte de douleurs dorsales aggravées, l'infirmière a déterminé qu'il était nécessaire d'obtenir une tension artérielle bilatérale, car elle craignait que M. B puisse avoir un anévrisme de l'aorte abdominale (AAA). L'infirmière a tenté d'obtenir des prises de tension bilatérales avec des brassards automatiques et manuels ; cependant, il n'y avait pas de prise de tension mesurable dans le bras gauche de M. B. Les infirmières ont également répété les prises de tension bilatérales alors que M. B était allongé sur le dos ; la pression du bras gauche est toujours absente et la prise de tension du bras droit est de 131/30 mmHg. L'infirmière était préoccupée par l'absence de TA dans le bras gauche et par l'augmentation de la pression du pouls ; le médecin des urgences de l'équipe de jour en a été immédiatement informé. Après réévaluation, le médecin de l'équipe de jour a décidé d'ordonner une tomodensitométrie urgente de la poitrine et de l'abdomen pour exclure un AAA ; le radiologue a confirmé que M. B avait une rupture de l'aorte abdominale.

Tableau 3. Enregistrements de la pression artérielle et du rythme cardiaque

Heure	TA (TAM)	Fréquence cardiaque (FC)
1 h 12	88/53 (64)	115
1 h 42	Aucune TA enregistrée	Aucune FC enregistrée
2 h 12	106/47 (66)	104
2 h 42	Aucune TA enregistrée	Aucune FC enregistrée
3 h 12	120/89 (98)	112
3 h 42	76/42 (52)	121
4 h 12	89/43 (57)	118
4 h 42	95/63 (72)	118
5 h 12	93/58 (69)	121
5 h 42	88/53 (64)	125
6 h 12	99/47 (64)	123
6 h 42	110/44 (65)	126
7 h 12	83/40 (53)	127

Résultat de cas

Étant donné que M. B se trouvait dans un centre de traumatologie et de chirurgie de niveau 3, le médecin des urgences a pris des dispositions pour un transfert aéromédical vers un centre de chirurgie vasculaire désigné, situé à environ 200 kilomètres au nord de l'endroit où il se trouve actuellement. Le personnel infirmier a rapidement préparé M. B au transfert, a établi un accès IV supplémentaire, lui a administré une dose de sulfate de protamine pour inverser les effets de l'HBPM et a suivi son état de près. L'état de M. B a continué à se détériorer en attendant son transfert, montrant des signes et des symptômes de choc hypovolémique. Son mal de dos est passé à 7/10 et il a commencé à vomir ; on lui a donné des antiémétiques, mais les narcotiques ont été freinés en raison de l'hypotension. À l'arrivée de l'équipe aéromédicale, M. B était devenu de plus en plus instable sur le plan hémodynamique et son transfert a été légèrement retardé sur l'héliport jusqu'à ce que l'équipage soit certain qu'il pouvait le déplacer en toute sécurité. M. B est arrivé à l'hôpital désigné pour une chirurgie vasculaire dans un état de pré-arrêt cardiaque, montrant des signes de choc décompensé, avec un niveau de conscience en baisse et une FC de 160 bpm. On l'a emmené en chirurgie d'urgence où une greffe aortique a été réalisée. Il a survécu à la chirurgie et a été transféré aux soins intensifs, où il a été déterminé qu'il souffrait d'une blessure rénale aiguë. Une hémodialyse d'urgence a donc été effectuée. Au cours de sa première nuit aux soins intensifs, M. B a succombé à son état critique et est décédé.

Discussion de cas

La rupture d'anévrisme de l'aorte abdominale est une maladie mortelle qui nécessite un diagnostic rapide, une réanimation d'urgence et une intervention chirurgicale. Les Centers for Disease Control and Prevention (2020) rapportent que les ruptures d'AAA ont un taux de mortalité global de 80 % et ont été la cause principale de décès de plus de 9923 patients aux États-Unis en 2018. Un AAA qui fuit peut ne présenter aucun signe ou symptôme tant qu'il ne s'est pas dilaté ou rompu ; le patient peut présenter des signes de douleur aiguë à l'abdomen ou au dos (Badger, 2014). Un patient souffrant d'une rupture d'AAA peut présenter une douleur thoracique aiguë indiquant une sensation de déchirement, un pouls périphérique rapide et filiforme ou faible, une dyspnée, des nausées, un essoufflement, une incapacité à parler, une faiblesse ou une paralysie d'un côté du corps, des douleurs dorsales, une perte de vision et même une perte de conscience (Woodrow, 2011). Lorsque M. B a appris son diagnostic, il s'est alors souvenu d'une forte histoire familiale d'AAA. Voir le tableau 4 pour les symptômes et les facteurs de risque de l'AAA.

Après avoir examiné les détails du cas de M. B, nous avons déterminé que plusieurs facteurs indiquaient qu'il souffrait d'une rupture de l'AAA, ainsi qu'un certain nombre de facteurs qui ont pu entraver la reconnaissance de son état. Les facteurs de confusion comprennent la dyspnée (aiguë en raison d'antécédents de tabagisme chronique), des antécédents de douleurs dorsales chroniques et des valeurs de troponine faiblement élevées. Nous estimons que, la fluctuation de la tension artérielle de M. B, le choc hypovolémique qui a suivi, l'augmentation de la créatinine sérique et un taux de D-dimère considérablement élevé étaient des indicateurs de l'état aigu de M. B, et qu'une évaluation plus approfondie de ceux-ci aurait pu mener à un diagnostic plus précoce de rupture de l'AAA.

L'importance des tendances de TA, TAM et PP

Lors de l'examen du dossier médical de M. B, on a constaté une grande variation des mesures de sa tension artérielle tout au long de son séjour de sept heures aux urgences (voir le tableau 3 pour les signes vitaux). Scheetz (2006) a présenté un rapport de cas d'une dissection aortique aiguë qui a également noté des fluctuations extrêmes de la tension artérielle avec des pressions allant de l'hypotension avec une pression systolique inférieure à 75 mmHg à l'hypertension avec des pressions diastoliques supérieures à 100 mmHg. Mercer-Deadman (2014) note que la présentation d'un anévrisme aortique et sa rupture sont fréquemment similaires, car l'hypotension du patient disséqué est souvent profonde. À différents moments pendant son séjour aux urgences, M. B. a également souffert d'hypotension (voir tableau 3). Mercer-Deadman note que bien que la dissection et la rupture soient peu fréquentes, la seconde est assez rare et souvent difficile à diagnostiquer en urgence. La rareté de ces conditions, ainsi que leurs facteurs de risque communs et leurs présentations similaires, peut souvent être des facteurs de confusion pour les praticiens qui évaluent et reconnaissent les dissections et les ruptures. Consultez le tableau 4 pour connaître les différences entre la dissection aortique et la rupture de l'AAA. Par ailleurs, ces conditions imitent également d'autres conditions courantes observées dans le DE. Après examen du cas de Scheetz (2006), nous croyons que le suivi et l'évaluation de la tension artérielle moyenne (TAM) de M. B ont pu conduire à un diagnostic plus précoce. La pression artérielle moyenne indique aux professionnels de la santé l'efficacité avec laquelle le sang et l'oxygène sont acheminés vers les tissus et les organes (Handler, 2009). TAM est « la tension moyenne requise qui force le sang à traverser les organes systémiques » ([Ferns et al., 2010], pp 41). Il s'agit d'une mesure plus précise pour déterminer la pression réelle du sang contre les parois artérielles (Handler, 2009). La TAM doit être utilisée plutôt que la TAS pour la prise en charge des patients souffrant d'affections aiguës lorsqu'il y a un souci de perfusion d'organe appropriée (référence requise). Selon Bradshaw (2011), la TAM a été utilisée en hémodialyse comme guide pour surveiller les modifications intravasculaires et pourrait également être utile pour indiquer les changements critiques chez tout patient aigu ou chronique afin d'améliorer les résultats. La plage souhaitable est de 70-100 mmHg ; un minimum de 60 mmHg est nécessaire pour fournir suffisamment de sang pour nourrir les artères coronaires, le cerveau et les reins. Si la TAM est inférieure à 60 mmHg pendant une durée prolongée, les organes vitaux peuvent être privés d'oxygène (Chapleau, 2012). La pression du pouls est la différence entre la pression artérielle systolique et diastolique ; elle représente la force que le cœur génère chaque fois qu'il se contracte (Tension artérielle, 2020). Par exemple, si la tension artérielle au repos est de 130/80 mm Hg, alors la pression du pouls est de 50 mmHg. Un pouls étroit peut être un signe précoce de choc (Ferns et al., 2010). Un rétrécissement de la pression du pouls est un indice qui permet au clinicien de soupçonner une hypovolémie ou une diminution du débit cardiaque.

La créatinine sérique comme mesure de perfusion tissulaire

Les signes vitaux présentés dans le tableau 3 indiquent que M. B avait une TAM pendant son séjour à l'urgence qui n'était probablement pas appropriée pour une perfusion tissulaire efficace ; une perfusion inadéquate limite l'apport de sang et d'oxygène aux organes, ce qui entraîne finalement une défaillance des organes et la mort des tissus. Une augmentation du taux de créatinine sérique se produit pour de nombreuses raisons, l'une des plus courantes étant les changements dans la santé et le fonctionnement des reins. Avant sa visite, M. B n'avait aucun

Tableau 4. Symptomatologie et facteurs de risque pour l'AAA

Signes et symptômes fréquents	Facteurs de risques pour M. B	Signes et symptômes de M. B
Une douleur profonde et constante dans l'abdomen peut indiquer un élargissement de l'anévrisme. Une douleur soudaine, intense et persistante dans le dos ou l'abdomen peut indiquer une rupture.	Consommation de tabac. Fumeur depuis plus de 25 ans	Douleur dorsale déclarée différente de sa douleur dorsale chronique
Une pulsation près du nombril peut indiquer un élargissement	Être un homme	Non documenté
L'hypotension artérielle	Être caucasien	Hypotension initiale TA 95/64 mmHg
La tachycardie	M. B révèle une histoire familiale d'AAA	Tachycardie 126 bpm
Pouls faible ou filiforme	L'athérosclérose	Non documenté
L'essoufflement	Souffre d'hypertension artérielle	Essoufflé
Des signes de choc	Âge > 65 ans	Les premiers signes vitaux pourraient être qualifiés de signes précurseurs de choc

antécédent connu de défaillance ou d'insuffisance rénale. Un taux de créatinine de 268 mmol/L chez M. B pourrait indiquer une insuffisance rénale aiguë. Rétrospectivement, on suppose que l'inefficacité de la perfusion tissulaire due à l'hypovolémie et la diminution de la TAM qui en a résulté ont été un facteur dans la blessure et l'insuffisance rénale aiguë de M. B. Nous jugeons que, lorsqu'elle est mise en contexte avec les autres valeurs de laboratoire anormales et les symptômes présentés par le patient, la créatinine sérique élevée était un indicateur précoce d'une mauvaise perfusion tissulaire causée par l'hypovolémie.

Élévation des concentrations sériques de lactate

Le lactate est un sous-produit du métabolisme des glucides. Le lactate sérique augmente en raison de l'augmentation du métabolisme cellulaire (LoCicero, 2018). Les niveaux de lactate sont une mesure fiable de l'oxydation des tissus et un sous-produit du métabolisme anaérobie. Nous pouvons donc supposer que l'augmentation de la demande métabolique et du métabolisme anaérobie peut entraîner une augmentation des niveaux de lactate dans le sang, le plus souvent en cas de septicémie, mais aussi d'hémorragie, d'infarctus du myocarde et d'embolie pulmonaire. Comme l'indique le tableau 2, une tendance à la hausse des taux de lactate sanguin a été observée lorsque le patient a décompensé. Le taux de lactate sanguin initialement élevé de M. B a été traité avec un bolus de liquide qui a pu avoir une incidence sur sa cascade de coagulation. Peut-être que si le taux élevé de lactate était considéré comme un indicateur d'une mauvaise oxydation, et non pas seulement comme un indicateur de septicémie dans notre DE, il y aurait eu plus de recherche sur l'inefficacité de sa perfusion tissulaire.

L'importance d'un D-dimère élevé

Un autre facteur de confusion dans la présentation de M. B était son taux élevé de D-dimères sériques associé à ses symptômes non spécifiques d'essoufflement, de douleurs dorsales aiguës ou chroniques. Nienaber & Clough (2015) affirment que « le D-dimère est le produit de dégradation de la fibrine d'un thrombus » (pp. 801). Toutefois, il est bien connu que l'élévation des D-dimères peut se produire avec la présence de tout type de thrombus, même une contusion superficielle. Nienaber & Clough (2015) indiquent que dans le cas d'un AAA, le D-dimère a une sensibilité de 97 % et une spécificité de 47 %. Typiquement, un D-dimère élevé associé à un patient souffrant d'essoufflement nous amène à soupçonner une embolie pulmonaire. Cependant, Nienaber & Clough (2015) suggèrent que les D-dimères à des niveaux nettement élevés sont plus probables lors d'une dissection aortique aiguë que les niveaux observés chez les patients atteints de syndromes coronariens aigus, avec une sensibilité de 98 %. Ainsi, nous estimons que les niveaux de D-dimère considérablement élevés dans ce cas auraient dû provoquer un examen diagnostique plus approfondi avant d'exclure un diagnostic de dissection aortique aiguë et de soigner le patient avec des anticoagulants.

Une note sur l'ÉCTG

Lors de sa présentation au DE, M. B a été trié et s'est vu attribuer une note de 3 pour l'ÉCTG. Selon Bullard et al. (2017), les signes vitaux anormaux initiaux de M. B justifient un score de 2 sur l'ÉCTG. Le fait qu'il ait déclaré avoir des douleurs dorsales chroniques a peut-être contribué à fausser son score. De plus, la basse note sur l'ÉCTG peut avoir retardé l'évaluation de M. B par un médecin.

L'éducation comme stratégie pour améliorer la pratique

Depuis quelques années, un cours de soins infirmiers d'urgence de conception canadienne a été mis au point pour améliorer la prise de décision dans le cadre des soins infirmiers d'urgence. Emergency Practice Interventions & Care Canada (EPICC), souligne l'importance de l'évaluation, de la surveillance et de la planification dans les soins infirmiers d'urgence (EPICC, 2018). Actuellement, dans le cadre de notre pratique, il existe une politique d'évaluation horaire des signes vitaux. Cette évaluation fréquente des signes vitaux est en outre soutenue par des formulaires de documentation infirmière conçus pour la consignation fréquente et la tendance des signes vitaux, notamment la TA, le pouls, la FR et la SPO2. Le formulaire ne comporte pas de zone de documentation pour l'enregistrement et l'évolution de la TAM. La formation des infirmières d'urgence à la TAM et son inclusion dans les dossiers d'évaluation et de documentation permettent d'améliorer la surveillance et la reconnaissance des changements de l'état hémodynamique (EPICC, 2018). En outre, Chapleau (2012) propose que la surveillance de la TAM, en tant que moyen de déterminer la perfusion tissulaire adéquate, puisse aider les infirmières à identifier et à répondre aux changements aigus de l'état hémodynamique. En suivant les tendances et en documentant les changements de la TAM, les infirmières peuvent reconnaître plus précocement une maladie mortelle. Nous croyons qu'il est nécessaire d'évaluer davantage la façon dont la TAM est utilisée dans d'autres contextes de soins, en particulier aux urgences, afin de soutenir son inclusion comme norme d'évaluation dans les établissements de soins d'urgence à travers le Canada.

Concepts clés à enseigner

1. En surveillant et en établissant les tendances de la TAM chez les patients qui présentent des symptômes indiquant une détresse pulmonaire/cardiaque, ainsi que des signes vitaux et des valeurs de laboratoire anormales, il est possible de détecter plus tôt un choc hypovolémique et une septicémie grave. Les infirmières qui soignent les patients gravement malades doivent être formées et encouragées à évaluer la TAM dans le cadre de leur pratique régulière.
2. L'anévrisme de l'aorte abdominale est une urgence qui peut mettre la vie en danger et présenter des signes et symptômes similaires à d'autres conditions aiguës tels que l'embolie pulmonaire, l'infarctus du myocarde et les coliques rénales. Des valeurs de laboratoire considérablement élevées des D-dimères peuvent être un signe d'AAA. Ainsi, ce diagnostic ne doit pas être exclu tant qu'une imagerie diagnostique avancée n'a pas été réalisée. Les fluctuations de la créatinine sérique et du lactate sanguin doivent également être évaluées et considérées comme des indicateurs d'une diminution de la perfusion tissulaire et pas seulement comme des indicateurs d'un problème particulier tel que la septicémie.
3. Les infirmières d'urgence sont responsables des soins aux patients gravement malades et ont besoin d'un niveau élevé

de formation et d'orientation avant d'entrer dans leur établissement de soins. Une éducation et une orientation normalisée aux urgences devraient être élaborées à l'échelle nationale afin d'améliorer la pratique des soins infirmiers et les résultats pour les patients. L'intégration des fondations EPICC dans la formation des nouveaux employés des services d'urgence canadiens est une stratégie visant à fournir aux nouvelles infirmières d'urgence les outils nécessaires pour évaluer, surveiller et intervenir efficacement dans les situations critiques.

Conclusion

Le cas de M. B nous rappelle que l'AAA est une maladie grave avec un taux de mortalité élevé. Souvent, ces patients se présentent aux urgences avec des symptômes qui méritent un diagnostic différentiel important. En présence de facteurs de confusion, tels que des symptômes non spécifiques, des valeurs de laboratoire anormales relatives à l'AAA ainsi que d'autres affections graves, il existe un risque accru de diagnostic erroné. En tant qu'infirmières, nous pouvons tirer des leçons de notre incapacité à reconnaître, à évaluer, à communiquer ou à intensifier les soins à un patient dont l'état se détériore. L'élargissement de notre pratique d'évaluation pour y inclure le suivi de la TA, de la TAM et de la PP peut être une façon d'améliorer les résultats pour nos patients gravement malades. Suivre la TAM permettrait peut-être de sauver une vie. Enfin, nous avons cerné la nécessité d'une étude et d'un examen continus des patients atteints d'AAA aux urgences, ainsi que d'une réflexion critique et d'une auto-évaluation en tant que composantes essentielles de la pratique des soins infirmiers d'urgence.

Les auteurs

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Dawn demeure à Lethbridge, en Alberta. Elle a obtenu son diplôme d'infirmière autorisée au Lethbridge College en 1994 et son baccalauréat en sciences infirmières à l'Université de Lethbridge en 2013. Elle est l'actuelle présidente d'ANIIU-AB et directrice de l'Alberta auprès d'ANIIU-National. Dawn est également présidente du conseil consultatif international de l'ENA. Elle est infirmière depuis 26 ans, et en 2009, elle a fait ses débuts en soins infirmiers d'urgence et y a trouvé son foyer. Depuis 2014, Dawn est l'instructrice clinique de l'AHS pour la zone rurale du sud-ouest, tout en continuant à travailler occasionnellement dans le CRH-ED. Dawn s'intéresse à la défense de l'égalité de l'éducation et de ressources pour toutes les infirmières d'urgence. Elle est l'heureuse grand-mère de deux magnifiques petites filles et aime passer du temps avec elles, faire des randonnées en montagne, faire du scrapbooking, lire et voyager.

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Emergency Nursing Certification in Canada

Heather McLellan, MEd, BN, RN, CEN, CFRN

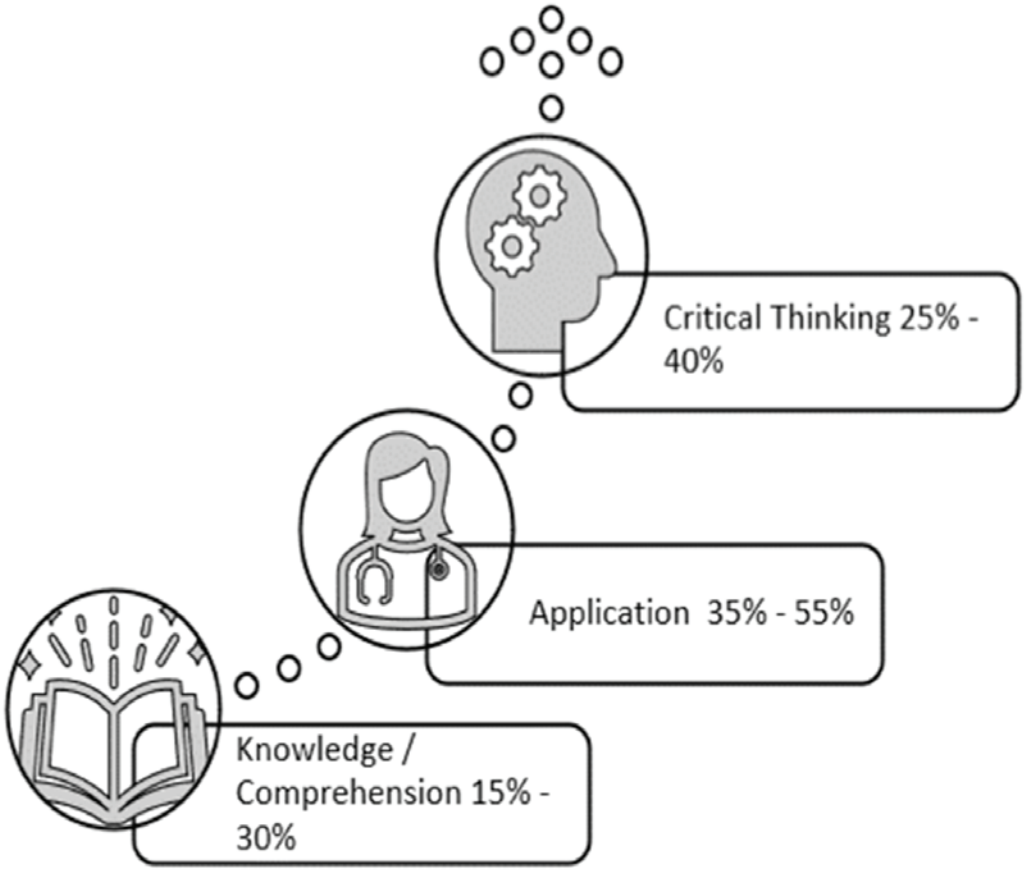
Specialty nursing certifications recognize mastery of clinical and theoretical knowledge, clinical judgement, and experience within a specific nursing specialty. The Canadian Nurses Association offers a specialty certification credentialing exam for registered nurses. There are also certification programs available in other countries, such as the Board of Certification for Emergency Nursing in the United States. However, the focus of this article will be about the Canadian experience.

Why is certification important?

Becoming certified in your specialty indicates to your patients, employers, and colleagues that you have mastered a core set of theoretical concepts specific to emergency nursing. This can help you in delivering safe, efficient, and high-quality patient care. Some studies have shown that certified nurses have a positive effect on patient outcomes (Krapohl et al., 2012). In addition, being certified may help you advance your career and have positive financial effects in terms of stipends.

What are the eligibility criteria for becoming certified?

The exam's eligibility criteria include holding an active licence as a registered nurse and meeting the specific experience and/



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or education expectations. The experience criteria option stipulates that the candidate must have a minimum of 1,950 hours over the past five years in the specialty area. If using the combined experience and education option to demonstrate eligibility, you will need to (a) have taken a formal post-basic specialty course from a community college or university that is at least 300 hours in length and (b) have a minimum of 1,000 hours of clinical experience in your specialty over the last five years.

What content is covered on the emergency nursing certification exam?

The exam is based on the NENA Emergency Nursing Scope and Standards of Canadian Practice Sixth Edition (NENA, 2018) and the ENC(C) Exam Blueprint (CNA, 2020).

The exam consists of approximately 165 questions with 21 categories of topics related to both clinical emergencies and professional issues. These questions are distributed across three levels of cognitive response. **Knowledge and Comprehension**, which is a more basic level of question requiring recall of knowledge and facts; **Application**, in which you must take information that you know and apply it in a specific situation, and finally **Critical Thinking**, which is a higher level of question requiring you to analyze information and extrapolate beyond the immediate information and to identify priorities in managing a situation.

Finally, the topics are sorted by age, client culture, client health situation, and health-care environment. A comprehensive breakdown of the exam blueprint, topic categories, and competency examples can be found on the CNA website (see the link at the end of this article).

How do I prepare for the exam?

NENA and CJEN want to help you prepare for this exam. NENA supports its members by offering access to a bursary to support both those writing the certification exam for the first time or those renewing their certification. Preparation resources for NENA members include access to a free online preparation program based on the CNA's Emergency Nursing Examination Blueprint document (see NENA link below for more information).

The editors at CJEN are pleased to introduce a new section in this issue of the journal featuring certification exam sample questions with answers and rationales. We want to thank our two ENC(C) mentors and item writers, Margaret Dymond and Leanne Tyler, who helped produce this section by authoring and editing these questions to align with the current expectations of the exam. We look forward to the inclusion of this regular feature as a way of supporting Canadian emergency nurses on their journey to certification.

Links and resources:

Canadian Nurses Association (CNA): https://www.cna-aiic.ca/en/certification/exam-preparation/exam-competencies-and-blueprints

National Emergency Nurses Association (NENA): https://nena.ca/courses/

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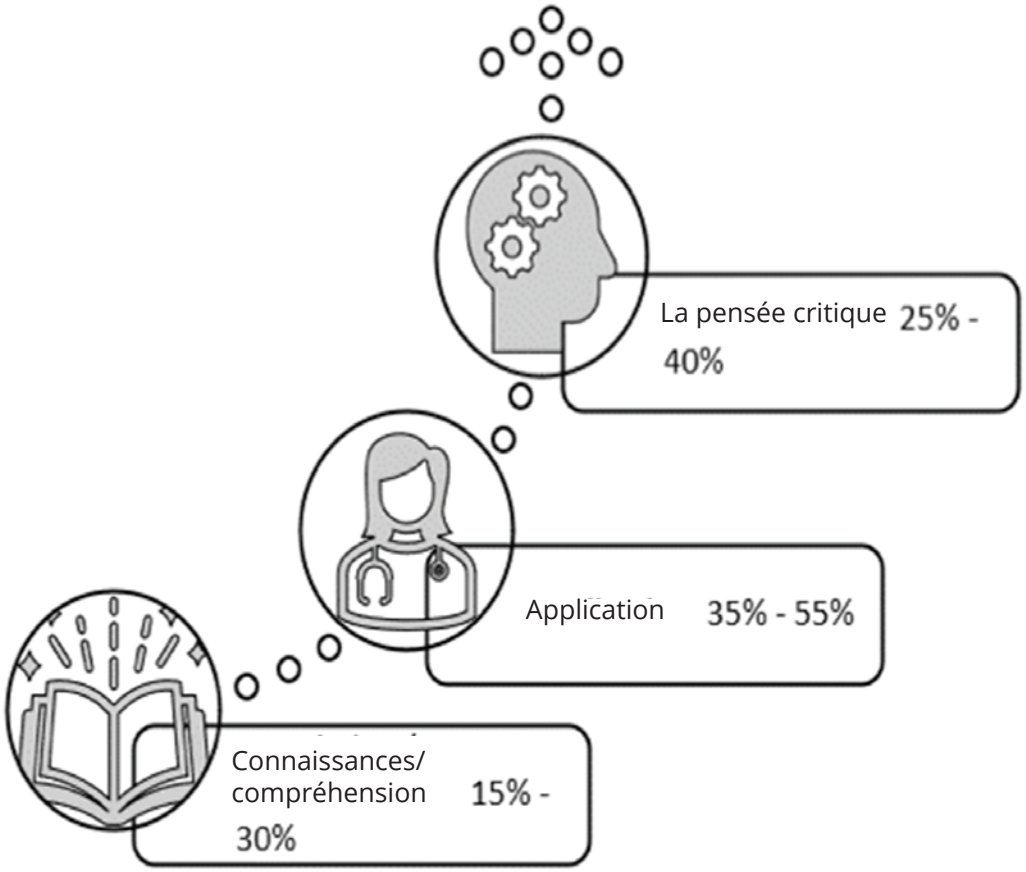
Certification en soins infirmiers d'urgence au Canada

Heather McLellan, MEd, BN, RN, CEN, CFRN

La certification en soins infirmiers spécialisés reconnaît la maîtrise des connaissances théoriques cliniques, du jugement clinique et de l'expérience dans une spécialité infirmière. L'Association des infirmières et infirmiers du Canada offre un examen de certification de spécialité pour les infirmières et infirmiers autorisés. Il existe également des programmes de certification dans d'autres pays, comme le Board of Certification for Emergency Nursing aux États-Unis, mais le présent article se penchera sur l'expérience canadienne.

Pourquoi la certification est-elle importante ?

L'obtention d'une certification dans votre spécialité indique à vos patients, à vos employeurs et à vos collègues que vous maîtrisez un noyau de concepts théoriques propres aux soins infirmiers d'urgence. La certification peut vous aider à fournir des soins aux patients sûrs, efficaces et de haute qualité. Certaines études ont révélé que les infirmières qui sont certifiées ont un effet positif sur les résultats des patients (Krapohl et coll., 2012). En outre, le fait d'être certifié peut non seulement vous aider à faire



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progresser votre carrière, mais aussi avoir des effets financiers positifs en ce qui concerne la rémunération.

Quels sont les critères d'éligibilité pour être certifié ?

Les critères d'admissibilité à l'examen comprennent la détention d'une licence d'infirmière autorisée et la satisfaction des attentes spécifiques en matière d'expérience ou de formation. L'option du critère d'expérience prévoit que la candidate doit compter 1,950 heures au cours des cinq dernières années dans le domaine spécialisé. Si vous utilisez l'option de l'expérience et de l'éducation combinées pour démontrer votre admissibilité, vous devrez (a) avoir suivi un cours de base officiel dans une spécialité d'une durée d'au moins 300 heures provenant d'un collège communautaire ou d'une université et (b) détenir un minimum de 1 000 heures d'expérience dans votre spécialité au cours des cinq dernières années.

Quel est le contenu de l'examen de certification en soins infirmiers d'urgence ?

L'examen est basé sur la sixième édition du document de l'ANIIU (2018) « Étendue et normes de la pratique Canadienne » et le Plan directeur de l'examen et compétences de la spécialité de l'AIIC (2020).

L'examen comprend environ 165 questions réparties en 21 catégories de sujets liés à la fois aux urgences cliniques et aux problèmes professionnels. Ces questions sont réparties sur trois niveaux de réponse cognitive. La connaissance et la compréhension, qui est un niveau de questions plus fondamental nécessitant le rappel de connaissances et de faits ; l'application, dans laquelle vous devez prendre des informations que vous connaissez et les appliquer dans une situation particulière, et finalement, la pensée critique qui est un niveau supérieur de questions vous demandant d'analyser des informations et d'extrapoler au-delà de l'information immédiate et d'identifier les priorités dans la gestion d'une situation.

Enfin, les sujets sont classés par âge, culture du client, état de santé du client et milieu de soins de santé. Vous trouverez une description complète du plan de l'examen, des catégories de sujets et des exemples de compétences sur le site Web de l'AIIC (consultez le lien à la fin de cet article).

Comment puis-je me préparer à l'examen ?

L'ANIIU et le JCIU veulent vous aider à vous préparer à cet examen. L'ANIIU appuie ses membres en leur offrant l'accès à une bourse d'études pour aider ceux et celles qui passent l'examen de certification pour la première fois ou ceux qui renouvellent leur certification. Les ressources de préparation pour les membres de l'ANIIU comprennent l'accès à un programme de préparation en ligne gratuit basé sur Plan directeur de l'examen d'infirmière d'urgence de l'AIIC (voir le lien vers l'ANIIU ci-dessous pour plus d'informations).

Les rédacteurs de la JCIU ont le plaisir de présenter une nouvelle section dans ce numéro de la revue, qui présente des exemples de questions d'examen de certification avec des réponses et des justifications. Nous tenons à remercier nos deux mentors CSU(C) et rédactrices de questions, Margaret Dymond et Leanne Tyler, qui ont contribué à la production de cette section en rédigeant et en modifiant ces questions pour qu'elles correspondent aux attentes actuelles de l'examen. Nous attendons avec plaisir l'inclusion de cette rubrique régulière dans le but de soutenir les infirmières d'urgence canadiennes dans leur parcours vers la certification.

Liens et ressources:

Association des infirmières et infirmiers du Canada (AIIC) : https://www.cna-aiic.ca/fr/certification/preparation-a-lexamen/competences-et-plan-directeur-lies-a-lexamen

Association Nationale des Infirmières et Infirmiers d'Urgence (ANIIU) : https://nena.ca/courses/

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Association Nationale des Infirmières et Infirmiers d'Urgence (ANIIU) (2018). *Étendue et normes de la pratique Canadienne* (6e édition). https://nena.ca/w/wp-content/uploads/2019/07/final-NENA-Standards-of-ED-Nursing-Practice-2018-FR.pdf

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Look for supplemental materials such as author interviews and podcasts at www.CJEN.ca

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ENC(C) Review Questions

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Authors: Margaret Dymond, BSN, RN, ENC(C), Leanne Tyler, MR, RN, MHM, ENC(C)

1. Which of the following patients may be at more risk of developing acute tubular necrosis (ATN) and renal failure?
A) A 34-year-old female with pyelonephritis
B) A 34-year-old male with a UTI
C) A 34-year-old male with multiple trauma and hypotension
D) A 34-year-old male with unstable angina

2. The physician orders activated charcoal 50 grams PO for a patient with polypharmacy drug ingestion. The patient has a GCS of 8, B/P 100/70, HR 104, RR-12, SpO2 93% on room air. Time of ingestion is unknown. What is the priority intervention?
A) Administer activated charcoal PO as ordered
B) Request an order to insert a gastric tube verses PO
C) Insert a nasogastric tube as the risk of aspiration is lower
D) Inform the physician that the patient has a GCS of 8 and requires re-assessment and airway management prior to activated charcoal administration.

3. EMS arrives with a 65-year-old female who fell down a flight of stairs and was found unresponsive. Her vital signs are B/P 190/100, heart rate 52, respiratory rate 10, GCS 8 and she has an oral airway in situ and unequal pupils. The vital signs and clinical assessment best describes:
A) Cushing's triad
B) Babinski reflex
C) Cushing's syndrome
D) Clonus reflex

4. Chest pain that is sudden in nature and severe is associated with:
A) Aortic dissection
B) Gastrointestinal reflux
C) Pneumonia
D) Acute coronary syndrome

5. A 24-year-old male arrives at the emergency department. He stumbles into the triage area, appears confused and disorientated, speech rambling, agitated, uncooperative. The patient is uncooperative with any attempt to get vital signs. The triage nurse recognizes a high priority is which of the following?
A) Call the police
B) Obtain the patient's blood glucose
C) Place the patient in a secure room and call security
D) Restrain the patient at triage to obtain vital signs

6. The physician is examining a patient's eye and decides an intraocular pressure is needed. What structure in the eye is this measuring?
A) Posterior chamber
B) Choroid
C) Anterior chamber
D) Lens

7. A patient has been diagnosed with a pulmonary embolism (PE). Lab results reveal a slightly elevated troponin. Which of the following is the most likely pathophysiologic mechanism for this result?
A) Increased right ventricular (RV) afterload
B) Plasmin degradation of fibrin
C) Increased RV myocardial stretch
D) Systemic activation of inflammatory mediators

8. A 24-year-old male has been bucked off a horse, landing on his back. He arrives complaining of right flank pain and hematuria. He denies abdominal pain. Which of the following rationales supports this finding?
A) Injuries to the genitourinary system always have hematuria
B) The kidneys are located in the peritoneal space
C) The patient may have a rib fracture
D) The kidneys are located in the retroperitoneal space

9. A five-year-old patient is admitted with severe fluid volume deficit due to gastroenteritis. His weight is 18 kg. Which of the following would be an appropriate initial bolus for fluid resuscitation?
A) D5 ½ NS 450 ml
B) NS 360 ml
C) LR 180 ml
D) 3% NS 500 ml

10. An elderly patient presents to the ED with signs of acute stroke. While conducting the motor portion of a neurologic exam, you observe downward drift and pronation of the left forearm. This finding indicates which of the following?
A) Right cerebral hemisphere lesion
B) Left cerebral hemisphere lesion
C) Cerebellar incoordination
D) Dorsal column lesion

Answer Key with Rationale

1. Correct Answer: C
Rationale: Severe hypotension and poor perfusion to the kidney may cause ATN and renal failure. ATN occurs when there is a prolonged ischemic insult to the kidneys. Other conditions that may result in ATN are sepsis, any condition involving volume loss (e.g., GI bleeding) or a nephrotoxin (e.g., vancomycin). Most patients who have a UTI do not develop ATN. A young male with unstable angina would not be expected to develop ATN (Erdbruegger & Okusa, 2020).

2. Correct Answer: D
Rationale: Activated charcoal is best administered within one hour of the ingestion. There still may be a potential clinical benefit after one hour. To avoid aspiration in a patient who has altered mental status is to secure the airway by intubating the patient. The patient should have a gastric tube inserted followed by

activated charcoal administration via the gastric tube if ordered. Activated charcoal would be contraindicated if the ingestion was a hydrocarbon (gasoline, lamp oil), toxins poorly absorbed (metals-Iron, Lithium, toxic alcohols- methanol), or presence of an intestinal obstruction (Hendrickson & Kusin, 2019).

3. Correct Answer: A
Rationale: Cushing's reflex (triad) is common in patients with acute brain injury with signs of increased ICP and a compensatory mechanism to preserve cerebral blood flow. The patient will have a widening pulse pressure (the difference between the systolic and diastolic blood pressure), a reflex bradycardia, and respiratory depression. Babinski reflex is an abnormal finding in adults and is fanning of the big toe when the foot is simulated. Cushing syndrome is reflective of a person taking a corticosteroid medication over time. Clonus occurs with interruption of the upper motor neurons. (Smith & Amin-Haniaini, 2019; Fareedy & Pathak, 2015).

4. Answer: A
Rationale: Pain that starts suddenly and is severe at onset is associated with aortic dissection, pneumothorax, and pulmonary embolism. Discomfort from an acute coronary syndrome typically starts gradually and may worsen with exertion. With stable angina, discomfort occurs only when activity creates an oxygen demand that outstrips supply limitations imposed by a fixed atherosclerotic lesion. This occurs at relatively predictable points and changes slowly over time. Unstable angina represents an abrupt change from baseline functioning, which may manifest as discomfort that begins at lower levels of exercise or at rest (Hollander & Chase, 2020).

5. Answer: B
Rationale: Always consider a medical emergency may exist before a mental health condition. A chief complaint of confusion or isolated abnormal mental status implies that vital signs are stable and normal or near normal, which excludes many life-threatening conditions. Patients with abnormal behaviour are screened for hypoxia and hypoglycemia by bedside testing (Huff, 2019).

6. Answer: C
Rationale: The anterior chamber is the fluid-filled space inside the eye between the pupil and the cornea's innermost surface, the endothelium. Aqueous humour is the fluid that fills the anterior chamber. Hyphema and glaucoma are two main pathologies in this area. In hyphema, blood accumulates in the anterior chamber. In glaucoma, blockage of the canal of Schlemm prevents the normal outflow of aqueous humour, resulting in accumulation of fluid, increased intraocular pressure, and eventually blindness (Nolan-Kelley, 2020).

7. Answer: A
Rationale: In pulmonary embolism, troponin may be slightly elevated due to right heart strain (increased afterload); however, this result must be interpreted cautiously. Patients with pre-existing heart failure or renal failure may also have increased troponin levels (Rali et al., 2016, p. 134). D-dimer reflects the plasmin degradation of cross-linked fibrin in clots (products of thrombus degradation) (McCance & Rote, 2019, p. 956). D-dimer may also be elevated in PE; although highly sensitive for clot formation, it has relatively low specificity for the diagnosis of PE (Rali et al., 2016, p. 134). In the setting of increased left and/or right ventricular myocardial stretch, such as in heart failure, brain natriuretic peptide (BNP) is released causing vasodilation and increased sodium and water loss via the kidneys (Lough, 2018, pp. 179-180). Lastly, C-reactive protein (CRP) is the most frequently used serum laboratory study to assess for the presence of systemic inflammatory mediators (Haynes 2018, p. 291).

8. Answer: D
Rationale: The kidneys are located in the retroperitoneal space, the anatomical space behind the peritoneum. They are situated at the level of the 12th thoracic vertebra to the 3rd lumbar vertebra and lie posterior to the stomach, spleen, colonic flexure, and small bowel (Bacidore, 2020, p. 467). The peritoneal space lies between the parietal and visceral peritoneum; it is a 'potential' space filled with a small amount of serous fluid, allowing the membranes to slide freely over each other without friction (Bacidore, 2020, p. 465). Injuries to the genitourinary system do not always result in hematuria. For example, mechanism of injury (MOI) and degree of bladder distention are key to suggesting potential for bladder injury. A pelvic fracture sustained in a motor vehicle collision, along with a full bladder, is more likely to result in hematuria than mild blunt force to the abdomen with an empty bladder (Bacidore, 2020, pp. 473-475).

9. Answer: B
Rationale: In the pediatric patient, fluid resuscitation requires rapid bolusing with 20ml/kg of an isotonic crystalloid solution, as needed, until improvement is seen. NS is an isotonic solution; it is similar in osmolality and composition to body fluids (e.g., plasma), thus more fluid remains in intravascular space to expand intravascular volume. D5 ½ NS (D5/0.45% NS) is a hypertonic solution most appropriate for maintenance fluids; however, once the dextrose is metabolized, it becomes hypotonic. It provides some nutrients (e.g., glucose) to ensure nutritional intake. LR is an isotonic crystalloid solution; however, it is most often used post-operatively to buffer pH and replace electrolytes (e.g., calcium, potassium). 3% NS is a hypertonic solution used mainly in severe hyponatremia. It is not appropriate for fluid resuscitation due to risk of fluid overload, pulmonary edema, and central pontine myelinolysis (Khin, 2016, pp. 320-321; Kuiper, 2020, p. 194)

10. Answer: A
Rationale: Pronator drift indicates abnormal function of the corticospinal tract (upper motor neurons) in the contralateral hemisphere. Cerebellar incoordination is seen when an arm tapped briskly downward, returns to its original position but overshoots and bounces. A lesion in the dorsal column is associated with a loss of proprioception (position sense) and is seen when an arm drifts up or laterally while the eyes are closed (Marsh & Banasik, 2019).

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Questions de révision pour l'examen de CSU (C)

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Auteures : Margaret Dymond, BSN, RN, ENC(C), Leanne Tyler, MR, RN, MHM, ENC(C)

1. Parmi les patients suivants, lesquels peuvent être plus à risque de développer une nécrose tubulaire aiguë (NTA) et une insuffisance rénale ?
A) Une femme de 34 ans atteinte de pyélonéphrite ;
B) Un homme de 34 ans atteint d'une infection urinaire ;
C) Un homme de 34 ans souffrant de multiples traumatismes et d'hypotension ;
D) Un homme de 34 ans souffrant d'une angine instable.

2. Le médecin prescrit du charbon actif 50 grammes per os pour un patient ayant ingéré plusieurs médicaments. Le patient a un score de 8 sur l'Échelle de coma de Glasgow, T/A 100/70, FC 104, FR-12, SpO2 93 % sur l'air ambiant. Le moment de l'ingestion est inconnu. Quelle est l'intervention prioritaire ?
A) Administrer le charbon actif per os, selon les ordres ;
B) Demander une ordonnance pour l'insertion d'une sonde gastrique au lieu de PO ;
C) Insérez une sonde naso-gastrique, car le risque d'aspiration est plus faible ;
D) Informez le médecin que le patient a un score de 8 sur l'Échelle de coma de Glasgow, qu'il doit être réévalué, et que ses voies aériennes doivent être gérées avant l'administration du charbon actif.

3. Les paramédics arrivent avec une femme de 65 ans qui est tombée dans les escaliers et qui est inconsciente. Ses signes vitaux sont T/A 190/100, fréquence cardiaque 52, fréquence respiratoire 10, score de 8 sur l'Échelle de coma de Glasgow, une voie aérienne en place et ses pupilles sont inégales. Les signes vitaux et l'évaluation clinique décrivent au mieux :
A) La triade de Cushing ;
B) Signe de Babinski ;
C) Le syndrome de Cushing ;
D) Le clonus.

4. Les douleurs thoraciques de nature soudaine et grave sont associées à :
A) La dissection aortique ;
B) Reflux gastrique ;
C) Pneumonie ;
D) Syndrome coronarien aigu.

5. Un homme de 24 ans arrive aux urgences. Il trébuche dans la zone de triage, semble confus et désorienté, son discours est décousu, il est agité et peu coopératif. Le patient n'est pas coopératif lorsqu'on essaie d'obtenir ses signes vitaux. L'infirmière de triage reconnaît que la priorité est la suivante :
A) Appeler la police ;
B) Obtenir la glycémie du patient ;
C) Placer le patient dans une salle sécurisée et appeler la sécurité ;
D) Immobiliser le patient au triage pour obtenir des signes vitaux.

Clé de correction et justification

1. Réponse : C
Justification : Une hypotension grave et une mauvaise perfusion rénale peuvent provoquer une NTA et une insuffisance rénale. Une NTA se produit lorsqu'il y a une insulte ischémique prolongée aux reins. Les autres affections pouvant entraîner une NTA sont la septicémie, toute affection impliquant une perte de volume (par exemple, une hémorragie gastro-intestinale) ou une néphrotoxine (par exemple, la vancomycine). La plupart des patients qui souffrent d'une infection urinaire ne développent pas de NTA. Un jeune homme souffrant d'une angine instable ne devrait pas développer de NTA (Erdbruegger & Okusa, 2020).

2. Réponse : D
Justification : Il est préférable d'administrer le charbon actif dans l'heure qui suit l'ingestion. Il pourrait encore y avoir un bénéfice clinique potentiel après une heure. Pour éviter l'aspiration chez un patient dont l'état mental est altéré, il faut sécuriser les voies respiratoires en intubant le patient. Le patient devrait se faire poser une sonde gastrique, suivie de l'administration de charbon actif par cette dernière, si elle est prescrite. Le charbon actif serait contre-indiqué si l'ingestion était d'un hydrocarbure (essence, huile de lampe), des toxines mal absorbées (métaux — fer, lithium, alcools toxiques - méthanol), ou la présence d'une obstruction intestinale (Hendrickson & Kusin, 2019).

3. Réponse : A
Justification : La triade de Cushing est fréquente chez les patients atteints de lésions cérébrales aiguës présentant des signes d'augmentation de la pression intracrânienne et un mécanisme compensatoire pour préserver le flux sanguin cérébral. Le patient aura un pouls qui s'élargit (la différence entre la pression artérielle systolique et diastolique), une bradycardie et une dépression respiratoire. Le signe de Babinski est une anomalie chez l'adulte et consiste à éventer le gros orteil lorsque le pied est stimulé. Le syndrome de Cushing est le résultat de la prise d'un corticostéroïde au fil du temps. Le clonus se produit avec une interruption des motoneurones supérieurs. (Smith & Amin-Haniaini, 2019 ; Fareedy & Pathak, 2015).

4. Réponse : A
Justification : La douleur qui commence soudainement et qui est sévère au départ est associée à la dissection aortique, au pneumothorax et à l'embolie pulmonaire. Le malaise causé par un syndrome coronarien aigu commence généralement progressivement et peut s'aggraver à l'effort. Dans le cas d'une angine stable, le malaise ne survient que lorsque l'activité crée une demande en oxygène qui dépasse les limites de l'offre imposées par une lésion athérosclérotique fixe. Cela se produit à des moments relativement prévisibles et évolue lentement au fil du temps. L'angine instable représente un changement soudain par rapport au fonctionnement de base, qui peut se manifester par un malaise qui commence à des niveaux d'exercice plus faibles ou au repos (Hollander & Chase, 2020).

5. Réponse : B
Justification : Il faut toujours considérer qu'une urgence médicale peut exister avant un trouble de santé mentale. Une plainte principale de confusion ou d'état mental anormal isolé implique que les signes vitaux sont stables et normaux ou presque, ce qui exclut de nombreuses conditions mettant la vie en danger. Les patients présentant un comportement anormal sont soumis à un dépistage de l'hypoxie et de l'hypoglycémie par un test au chevet du patient (Huff, 2019).

Notes des auteures

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  - the work has not been published and is not under consideration for publication elsewhere
  - acknowledgement that the submission will undergo computerized analysis for plagiarism
  - the contact information of up to 3 potential peer-reviewers or any requests not to have a certain individual contacted to provide peer-review
- Permission from the copyright holder for any previously published material.

Manuscripts submitted for publication must follow the following format:

1. Title page with the following information:

- Author(s) name, and credentials, title/position
- Place of employment/affiliation
- If there is more than one author, co-authors' names, credentials, titles/positions should be listed in the order that they should appear in the published article
- Indicate the primary person to contact and address for correspondence
- Provide five key words for indexing

2. A brief abstract of the article is required for original research, systematic reviews and meta-analyses, on a separate page of 150–250 words. The abstract should provide the context or background for the study and should state the study's purpose, basic procedures (selection of study participants, settings, measurements, analytical methods), main findings (giving specific effect sizes and their statistical and clinical significance, if possible), and principal conclusions. It should emphasize new and important aspects of the study or observations, note important limitations, and not over interpret findings. Clinical trial abstracts should include items that the CONSORT group has identified as essential.

3. Acknowledgements

- Other contributing individuals and sources of research funding should appear in an acknowledgment section.

4. Body of manuscript (approximate maximum):

- Length, including tables, figures, and references:
  - new clinical practices = 8 pages, 2 tables or figures
  - research papers = 20 pages, 6 tables or figures
  - practice improvement papers = 12 pages, 4 tables or figures
  - scholarly projects = 12 pages, 2 tables or figures
  - reviews = 16 pages, 2 tables or figures
  - arts-informed scholarship = 8 pages, 2 tables or figures
  - letters to the editor = 4 pages, 1 table or figure
  - clinical case studies = 8 pages, including tables and figures

Additional specific guidelines for Clinical Case Studies. Case Studies should be written in a similar format to include the following:

- Initial patient presentation
- Relevant history
- Relevant physical exam findings
- Relevant diagnostics
- Case progression
- Final case outcome
- Discussion/Teaching points
- References.

Graphics that will enhance the case study are encouraged (e.g., photos, diagrams, diagnostics).

Authors must receive, and submit, the appropriate permission from the source(s) to use such images in the final publication. Information or graphics that uniquely identify the patient may only be included if written permission for publication in CJEN is received from the patient.

Case studies usually document the management of one patient, with an emphasis on presentations that include care given in an emergency/urgent care/pre-hospital setting and involving emergency nurses and/or nurse practitioners and /or emergency pre-hospital providers. Other features that will be of interest to the reader include cases:

- that are unusual, rare or where there was an unexpected response to treatment
- where new diagnostic tools were used
- that inform readers of new treatment and management options, including relevance to emergency care practice.

5. Implications for nurses

- Provide a separate page with three to five important points or clinical/research implications relevant to the paper. These will also be published with the paper and possibly in NENA social media (e.g., newsletters, Facebook, Twitter).

6. Copyright

- Manuscripts submitted and published in the CJEN become the property of NENA.

7. Submission

- Submit manuscripts electronically as a Word document to the editorial office and NENA national office (editor@nena.ca).
- Submit a signed Author Declaration. All authors must declare any conflicts of interest and acknowledge that they have made substantial contributions to the work and/or contributed substantially to the manuscript at the time of acceptance.

8. Review process and timelines

- All manuscripts are reviewed through a blinded, peer review process.
- Accepted manuscripts are subject to copyediting.
- Expected timeline from submission to response is approximately 8 weeks.
- Papers can be accepted as is, accepted with minor revisions, sent back for revisions and a request to resubmit, or rejected.
- If a paper is rejected, that decision is final.
- Once a manuscript is accepted, time to publication is approximately 3–6 months.

Canadian Journal of Emergency Nursing Preferred Style

- Format: double spaced, 2.5 cm margins on all sides. Pages should be numbered sequentially including tables, and figures. Line numbering should be used as well.
- Prepare the manuscript in the style as outlined in the American Psychological Association's (APA) Publication Manual 7th Edition. An exception from APA is the spelling (should be current "Canadian" use where applicable).
- Use only generic names for products, devices and drugs.
- Suggested format for research papers is background, methods, findings/results, discussion, and conclusion.
- The CJEN supports the SAGER guidelines and encourages authors to report data systematically by sex or gender when feasible.
- Tables, figures, illustrations and photographs must be submitted each on a separate page after the references. Illustrations should be computer-generated or professionally drawn. Images should be in electronic form and high resolution. The CJEN is only printed in black and white copy. If you want to publish a photograph of people you must include a consent from them. CJEN will not reimburse the author for any costs incurred for permission to use a graphic for publication.

References

American Psychological Association. (2020). *Publication Manual of the American Psychological Association* (7th ed.). American Psychological Association.

Heidan, S., Babor, T. F., De Castro, P., Tort, S., & Curno, M. (2016). Sex and gender equity in research: Rationale for SAGER guidelines and recommended use. *Research Integrity and Peer Review, 1*(2). http://dx.doi.org/10.1186/s41073-016-0007-6

Note

The Canadian Journal of Emergency Nursing strives for excellence in publishing and adheres to the recommendations of the International Committee of Medical Journal Editors as well as the Code of Conduct and Best Practice Guidelines for Journal Editors. Feedback from authors, readers, reviewers and editorial board members about ways the CJEN can improve, are encouraged.

Disagreements with editorial decisions should be brought forward to the CJEN editor. If resolution cannot be obtained, complaints should be forwarded to the NENA President.