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NENA

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Calling all instructors

If your students have put the work into a presentation, a case study, a disease process, research, etc., encourage them to write it up into a brief article to be published in CJEN. Our editors will work closely with them to help in the process, and they can see their hard work in print, help to educate emergency nurses across the country, and add a publication to their resume—a win-win situation! Articles can be submitted to the editor at **editor@nena.ca**

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Canadian Emergency Nurses Caring During the COVID-19 Pandemic

Dear Readers and NENA Membership,

This edition of the Canadian Journal of Emergency Nursing (CJEN) is being sent to publication while the COVID-19 pandemic is ramping up in Canada. Emergency nurses across the country are preparing for and facing this great emergency. During this year, designated the 'year of the nurse and the midwife' by the World Health Organization, we are being challenged in ways that few of us have imagined. We are practising social distancing in our personal and professional lives. Our kids are home, schools and daycares have been closed across Canada. Millions of Canadians are without work following massive country-wide layoffs, there are supply shortages in hospitals and grocery stores, and nurses are going to work and grappling with the real risk of bringing home a potentially fatal infection.

Still early in Canada's pandemic response, multiple emergency nurses are already off sick and in isolation with COVID-19 infections. The stark reality is that Canadian emergency nurses may die as a result of the COVID-19 virus. Over one hundred health care workers have died already in Iran, Italy and Spain, Although not often talked about, this sobering thought underlies the actions we take. Nursing colleges and associations across the country are rapidly granting emergency practice licenses while at the same time suspending and finding alternative clinical experience for students. Hundreds of non-emergency nurses are being reassigned to existing emergency departments that are being expanded or temporary hospitals that are being established.

The sobering numbers coming from the countries hit by the pandemic before Canada suggest that we may be called to depart from dogmatic procedures and deviate from traditional practice. We may need to depart from restrictive infection prevention and control guidelines. Nurse leaders may, whenever possible, avoid assigning older nurses and those with high-risk comorbidities to highest risk aerosol-generating procedures, and there is a possibility of the burden of caring becoming so great that typical functions like discharge teaching or documentation are approached differently. We believe that the Canadian Nurses Association, National Emergency Nurses Association, Canadian Federation of Nursing Unions, and provincial and territorial colleges recognize that this is an unprecedented time and trust you to act professionally and in the best interests of those you care for and yourselves.

Over the coming months, nurses and health care systems around the world will face the greatest peacetime challenge of the last century. As the language of care adopts the "martial" tone that underlies the stark realities we'll be facing, we encourage you, our colleagues, to not lose sight of the "homefront" while we provide care in the "frontlines". Please remember that we're not just emergency nurses; we're mothers, fathers, sisters, brothers, daughters and sons. We're all being thrust into the limelight, we'll be providing care in hospitals, support to our families, and a source of reassurance to our communities. The importance of our work will be recognized by the sacrifices we make to care for patients, in the support we give to our communities, and how we support each other as a profession. Canadian emergency nurses represent an integral part of our national pandemic response. During this response, providing the best care may look very different than providing usual care; it's hard for us to anticipate what these changes look like; but we have faith that as a profession we will find the right path. None of us know what emergency nursing, or regular life, will look like at the end of this pandemic. We do know this: the most important step will always be protecting ourselves; without doing that we won't be able to care for our patients, our colleagues, or our families.

So as we put our affairs in order and prepare to do what we do best, take the time to tell your loved ones what they mean to you, be kind to your colleagues and neighbours and take the very best care that you can to protect yourself and your family.

All eyes will be on us. Emergency nurses are among the most important providers during this pandemic.

CJEN Editorial Leadership
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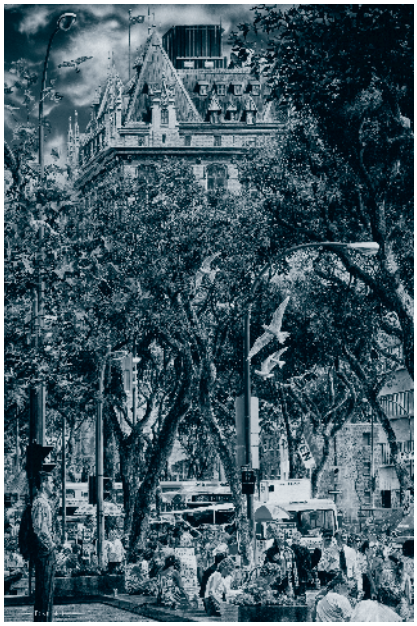

About the cover art

Broadway Vendors

Broadway Avenue, has a mixture of modern office buildings, residential walk-ups and restaurants that make it one of Winnipeg's most attractive areas. It is famous for its canopy of trees that dates back to an era when most of downtown was devoid of green spaces. As soon as the weather warms up, thousands of office workers join with residents, shoppers and equally numerous squirrels and birds to share the fresh air and hotdogs. At the centre is The Hotel Fort Garry. Built by the Grand Trunk Railway in 1913, it is a former railway hotel in the grand tradition. The steeply pitched roof and multiple dormers, characteristic of the chateau style railway hotel that is unique to Canadian architecture.

David Klaus Ristau

David is an award winning Winnipeg artist who works in a variety of styles and mediums, but is best known for his well researched and meticulous paintings. David's interests are varied and it shows in his work. His experience as a draftsman, railcar repairman, city bus driver, and lifetime resident of Winnipeg are evident in his colourful paintings, charcoal drawings, and panoramas.

David was born in Winnipeg's North End and his interest in art began as a child and has never left him. He completed his BFA, with first class honours, at the University of Manitoba, later in life while working full time. He majored in several areas, including Drawing, Sculpture, and English Literature, before completing his thesis in Graphic Design.

Besides art, David is also an avid athlete, particularly cycling. He often competes in road racing, cyclocross, and mountain biking, but his greatest passion is touring and endurance racing. David has done several long solo expeditions, that culminated in a 12,000 km tour of Canada from coast-to-coast and everything in between, as well as completing the gruelling Tour Divide mountain bike race from Banff to Mexico. He is also passionate about winter endurance racing, completing 14 consecutive winter ultras in events such as the Arrowhead 135, the Tuscobia 160, and Manitoba's Actif Epica, and is sometimes on the podium in these events. Currently he is writing a novel that is allegorically based on the 12,000 photos he took on his Canada trip, and working on an art project based on the novel.

Having been active in sports throughout his life, David, unfortunately, has had a few accidents and wound up in the Emergency Room a couple times. David recalls some of his experiences with healthcare quite favourably:

While I do not have fond memories of sitting in the Emergency Room, I was often impressed with the care I received once I found myself in a hospital room. A couple hospital stays come to mind. Once when I broke my jaw, many years ago, after it was wired shut, I always had a nurse sit with me for as long as I was in the hospital. They looked out for me, making sure I was comfortable, and I often had to tell them that I was doing fine. Before I was discharged, several nurses came by to say, "Goodbye," which made me feel specially cared for.

On another occasion, just a few years ago, I broke my shoulder in a crash. Two months later, just as the shoulder was getting better, I took a couple pills I was prescribed for a skin rash, which caused my liver to shut down. Again, I was back in Emergency for a couple days. The doctors came through one after another, but no one could figure out what was wrong with me, or advise me as to whether I would fully recover. I was rather depressed at how that summer was going, but again the nurses would come around often to check on me, and stay and chat to cheer me up whenever they had time. When my liver started functioning normally again and I was to be discharged, again many of them came around again to say, "Goodbye." It always made such a difference in a depressing situation when I felt cared for.

I also have to mention the wonderful care my mother received when she was dying. Naturally, everyone in the family was very distressed at watching her decline, but we always knew that she was attentively watched over.

Emergency nurses' attitudes toward barcode medication administration

Clair Lunt, DHSc, MEd, RN, Kathleen Mathieson, PhD, CIP

Abstract

Background: Barcode medication administration (BCMA) has been widely implemented in the inpatient setting of hospitals throughout the United States, resulting in lower medication administration errors. Understanding nurses' attitudes toward BCMA in the Emergency Department (ED) may assist administrators with creating implementation strategies that will improve medication administration process turnaround time and remove barriers to use ensuring increased compliance and improved patient safety.

Methods: The aim of this descriptive research study was to identify Emergency Department nurses' attitudes towards acceptance of this technology, based on the Unified Theory of Acceptance and Use of Technology (UTAUT). Data collection was carried out using an online, cross-sectional survey of nurses (*n*=55) who were members of the National Emergency Nurses Association of Canada.

Results: The results demonstrated that two-thirds of those surveyed had approximately one year of experience with using BCMA technology. More positive attitudes were found in the following domains: behavioural intent, anxiety, and self-efficacy. Neutral attitudes were perceived regarding facilitating conditions, social influence, and effort expectancy. The most negative attitudes were expressed regarding attitude toward technology and performance expectancy.

Conclusions: The results of this study allow us to conclude that the ED nurse perceived BCMA as easy to master and use and not intimidating or anxiety producing; however, they do not perceive it as useful nor do they perceive it to improve their proficiency or productivity. It is recommended that future studies be conducted on larger samples and also on participants that have had more experience using this technology.

Keywords: *Barcode Medication Administration, Emergency Department, Medication Administration, Attitudes.*

Key Takeaways

- Using BCMA can decrease medication errors up to 90.4%.
- ED nurses need to acknowledge that BCMA is the gold standard of medication administration safety and work to incorporate it consistently in their workflow.
- Both leaders and staff need to work with the information technology group to determine ways to decrease medication administration time when using BCMA.
- Leadership support is paramount to the successful implementation and consistent use of BCMA.

Emergency Nurses' Attitudes Toward Barcode Medication Administration

In the barcode medication administration report by The Leapfrog Group (2018), approximately 7,000 deaths annually were attributed to medication errors. Adverse events associated with medication administration were among the primary causes of harm that result in additional days in a hospital and increasing healthcare costs (Keers, et al., 2013). A medication error is any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the healthcare professional or consumer (National Coordinating Council for Medication Error Reporting and Prevention, 2020). Medication administration errors (MAEs) affect up to seven million patients a year at a cost to the healthcare system of $21 billion annually, and multiple organizations recommend actions be put in place to improve patient safety (Centers for Medicare & Medicaid Services [CMS], 2010; Federal Drug Administration [FDA], 2015; The Leapfrog Group, 2018).

Approximately 34% of medication errors occur during the administration phase and "less than two percent of these errors are intercepted before execution" (Voshall et al., 2013, p. 530). Errors such as wrong patient or wrong medication that occur at a patient's bedside can be attributed to many factors such as negligence, tiredness, lack of knowledge, intensity of patients' needs that often require multitasking or additional work, and even medication packaging (Harkanen et al., 2018). Many organizations recommend the use of two patient identifiers to verify a patient's identification alongside the use of barcode verification technology wherever possible (Institute for Safe Medication Practices, 2011; The Joint Commission, 2016; World Health Organization, 2007).

Barcode medication administration (BCMA) systems are defined as "electronic scanning systems that intercept medication errors at the point of administration" (Leapfrog Hospital Survey, 2018b, p. 1). This technology is used at the point-of-care prior to administering medication and ensures the five rights of medication administration are being followed (Leapfrog Hospital Survey, 2018b). Use of BCMA technology has shown to reduce the number of medication errors associated with the administration of medications by 54-86% and to reduce potential adverse drug events by 50.8% (Strykowski et al., 2013). BCMA use in an emergency department (ED) setting was reported by Bonkowski et al. (2013) to decrease medication administration error (MAE) rates from 6.3% to 1.2% with the wrong dose errors dropping by 90.4%, and in another study by Seibert et al. (2014) wrong dose error rates decreased to zero.

For BCMA technology to be successful, nurses must accept it and use it appropriately. Influences that were found to increase acceptance of BCMA included improved job performance, increased productivity, enhanced speed and effectiveness of work, and improved patient and medication identification (Marini, et al., 2010; Sheikhtaheri & Saravani-Aval, 2018; Taliercio et al., 2014). Barriers to acceptance include decreasing job efficiency mostly due to increased time involved in medication administration (Glover, 2013); however, a study by Hurley et al. (2007) reported that although nurses found BCMA to be time consuming, they acknowledged that BCMA was the safest process for their patients and reported it as time well spent. Therefore, despite some barriers, if BCMA is perceived as useful, easy to use, and if improved patient safety is the outcome, the technology is more likely to be accepted and consistently used (Ketikidis et al., 2012; Hurley et al., 2007).

Barcode medication administration has been introduced into many healthcare areas; however, limited research on its use in the ED environment or ED nurses' attitudes toward BCMA exists. Emergency department nurses' acceptance of the technology is a major factor in the success of BCMA. Understanding ED nurses' attitudes toward this technology may provide administrators with knowledge on barriers to use, which can be used when implementing strategies to improve processes to decrease workarounds, increase compliance, and improve nurses' attitudes towards BCMA. The purpose of this quantitative descriptive study was to determine the attitudes regarding acceptance of BCMA, among ED nurses who currently use the technology.

Method

Study Design and Participants

This study used a cross-sectional, survey design. Data were collected via a survey that was created in SurveyMonkey® and e-mailed to members of the National Emergency Nurses Association of Canada (NENA). Registered nurses who work in an emergency department environment and use BCMA technology as a part of their current workflow were included, all others excluded.

Survey Instrument

A validated tool, the Unified Theory of Acceptance and Use of Technology (UTAUT) questionnaire, created by Venkatesh et al. (2003) and adapted by Spil and Schuring (2006), was used. The tool contains 32 attitude questions related specifically to technology acceptance and use. The survey comprised of 38 questions in total. There were six socio-demographic questions (age, gender, years of experience, etc.), which also included a question on which country the participant currently works in because NENA has an international membership. The 32 UTAUT questions were measured in the following eight domains: performance expectancy [PE] (4 items), effort expectancy [EE] (4 items), attitude towards technology [ATT](5 items), social influence [SI](4 items), facilitating conditions [FC] (4 items), self-efficacy[SE] (4 items), anxiety [ANX](4 items), and behavioural intention to use the system[BI] (3 items). These questions were anchored on a five-point Likert scale with scores assigned as follows: 1= strongly agree, 2 = agree, 3 = neutral, 4 = disagree, and 5 = strongly disagree. For this research BCMA was substituted for "the system" and, as the aim is to study attitudes toward acceptance in nurses presently using the system, questions written in a prospective manner have been changed to actual tense. The original question "using the system is a bad/good idea" has been broken into two questions "using BCMA is a good idea" and "using BCMA is a bad idea" as there is no way to represent an answer to the question as it is currently written when using a Likert scale.

Data Analysis

All data were entered into the IBM Statistical Package for the Social Science (SPSS), version 25.0 for analysis. The socio-demographic and attitude questions were analyzed using descriptive analytics of frequencies and percentages. Composite scoring was calculated for each of the eight domains by examining the internal consistency of each of the items in each domain with Cronbach's alpha. Alpha levels greater than 0.60 were considered acceptable (Gliem & Gliem, 2003). If the internal consistency was acceptable, a composite score was created for the domain by computing a mean score for all of the items in the domain. If the coefficient alpha could not be improved by removing items, a composite score was not created for the domain and items were considered for individual analysis. For each composite score, normality was examined with a Shapiro-Wilks test with an alpha level set at 0.05, and descriptive statistics, including means and standard deviations, were produced. For those domains where scores were not normally distributed, median, minimum and maximum are reported as outcomes, means and standard deviations are reported for normally distributed domains.

Results

Fifty-five nurses participated in the study; the demographic details of the sample are outlined in Table 1. The majority of the sample worked in Canada (98.2%) with one respondent from the United States of America (1.8%). Females represented the majority of respondents at 78.2% with 21.8% being male. The largest category of respondents was in the 31–40- and 41–50-year-old age ranges, totalling 61.8%. A majority of respondents reported more than 5 years of experience in the ED (70.9%) and low levels of BCMA use, with the largest group having one year or less of experience with this technology (67.3%). Approximately 64% of respondents reported BCMA was mandatory in their work environment.

A summary of the reliability analysis is provided in Table 2. Most of the domains, including PE, EE, SI, SE, ANX, and BI yielded a coefficient alpha > 0.60. Domains ATT and FC had coefficient alphas less than 0.70. Removal of one item improved the alpha for the ATT domain from 0.43 to 0.84; however, for the FC domain, removal of items did not improve internal consistency so only individual item responses are displayed (Table 3). The distributions of data (Table 4) in the EE, ATT, and SI domains did not differ significantly from normal (p>0.05). The means for these domains ranged from 2.7-3.5, implying that those in the sample were generally between agreement to disagreement with the idea that BCMA is easy to learn and use, that they were influenced by peers or leaders, and that working with BCMA was fun or a good idea. The distributions of the data in PE, SE, ANX, and BI domains were not normally distributed (p=0.05). The highest-ranking domains in this group were BI (2.0) and SE (2.25) implying that those in the group were agreeable to using BCMA in the future, and reported positive association with being capable to use the system if using the available support.

Table 1: Demographics of the questionnaire respondents		
Demographic	**Frequency**	**Percent**
Age Group		
21-30	9	16.4
31-40	19	34.5
41-50	15	27.3
51-60	9	16.4
>60	3	5.5
Gender		
Female	43	78.2
Male	12	21.8
No. of years-ED		
0-1	3	5.5
2	1	1.8
3	7	12.7
4	3	5.5
5	2	3.6
>5	39	70.9
No. of years -BCMA		
0-1	37	67.3
2	5	9.1
3	6	10.9
4	3	5.5
5	0	0.0
>5	4	7.3
BCMA Mandatory		
Yes	35	63.6
No	20	36.4
Country		
Canada	54	98.2
USA	1	1.8
Note. No. of years- ED= your number of years' experience as a nurse in the emergency department; No. of years-BCMA = your number of years' experience with BCMA		

Table 2: Reliability Analysis (*n*=55)		
Domain	**Cronbach's Alpha**	**Number of Items**
Performance Expectancy	0.797	4
Effort Expectancy	0.877	4
Attitude Toward Technology	0.840	4
Social Influence	0.751	4
Self-Efficacy	0.790	4
Anxiety	0.887	4
Behavioural Intention	0.936	3

The domains that rated lowest in this group were ANX and PE with medians of 3.25 and 4.25, respectively. These results reflect on average that the sample typically did not agree that BCMA was useful or enabled them to improve efficiency or productivity; however, the group reported neutral to disagreement responses that working with BCMA caused anxiety.

In the FC domain, the results indicate that those in the sample agreed or were neutral toward the attitudes within the domain (Table 4). Approximately 41.8% (*n*=23) agree they have the necessary resources to use the system, 60.0% (*n*=33) agree they have the necessary knowledge, 50.9% (*n*=28) are neutral for the proposition that the system is not compatible with other systems in use, and 40.0% (*n*=22) agree that there is assistance available when system difficulties arise.

Discussion

The objective of this study was to identify ED nurses' attitudes towards BCMA technology using descriptive analysis. Based on the data provided by the 55 respondents, the participants were mostly female and the majority (*n*=34) were within the 31–40- and 41–50-year-old ranges. These groups are congruent with the 2017 National Nurses Workforce survey that reported that although the median age of a registered nurse is 53 years of age, 39.5% of the nursing population is in the 30–50-year age range. It also reported that 90.9% of the nursing workforce are female (Smiley et al. 2018). Our participant base had many years' experience in the ED environment but reported minimal experience with BCMA technology. This lack of experience may be attributed to the limited deployment in this environment of complete electronic medical record systems that enable BCMA technology (Bonkowski et al., 2013).

The evidence of this study reveals that the group had the common opinion that the attitudes outlined in EE, SE, SI, FC, and BI were positive towards acceptance of BCMA technology; with the ANX domain a positive negative was reported, that is the group reported they disagreed that BCMA technology caused anxiety. However, the group reported that attitudes outlined in the PE and ATT domains were not positive towards acceptance of the technology.

The results of this study for the SI domain (mean 2.70) are interesting as most of the participants specified they had only been using the system for approximately one year. This implies that implementation had been recent and implementations usually entail multiple educational sessions, hands-on training, go-live support such as dedicated technical teams, staff super-users, and post go-live support for optimization of the computer-based system. Recent adoption also means that there is leadership support in the use of the technology. So one would expect stronger agreement for the attitudes in this domain.

Approximately 64% (*n*=35) of the sample stated it was mandatory to use BCMA in their department; however, the majority of the participants (*n*=51) reported that they strongly agreed, agreed, or were neutral about their intent to use the system in the future. This denotes that a portion of the sample was willing to use the technology despite it being voluntary. It has been reported that the freedom of choice to use technology has had a positive effect on the intention to use it. In settings where BCMA utilization is voluntary, it would benefit administrators to identify staff members who willingly use this technology, and have positive attitudes regarding its use and train them to be advocates for the technology. This could improve compliance and decrease workarounds, which can impede patient safety (Kijssanayotin et al., 2009).

Unlike other studies (Alam et al., 2018; Holtz & Krein, 2011; Liu et al., 2015; Vollmer et al., 2016), the current research demonstrated that the nurses' attitudes toward the technology were not positive toward performance expectancy. However, this is not an unexpected result as this domain speaks to how useful the system is and how it improves proficiency and productivity (Venkatesh et al., 2003). The ED is a fast-paced dynamic environment and, as mentioned previously, some studies have reported that more time is spent on

Table 3: Frequency scores of items (*n*=55)

Item	Question	1 Strongly Agree	2 Agree	3 Neutral	4 Disagree	5 Strongly Disagree	Mean	SD
PE1	I find BCMA useful in my job	4 (7.3%)	**14 (25.5%)**	**14 (25.5%)**	10 (18.2%)	13 (23.6%)	3.25	1.280
PE2	Using BCMA enables me to accomplish more tasks more quickly	1 (1.8%)	3 (5.5%)	11 (20.0%)	9 (16.4%)	**31 (56.4%)**	4.20	1.061
PE3	Using BCMA increases my productivity	2 (3.6%)	3 (5.5%)	11(20.0%)	11 (20.0%)	**28 (50.9%)**	4.09	1.127
PE4	If I use BCMA, I increase my chances of getting a raise	0 (0.0%)	1 (1.8%)	9 (16.4%)	4 (7.3%)	**41 (74.5%)**	4.55	0.835
EE1	My interaction with BCMA is clear and understandable	8 (14.5%)	**25 (45.5%)**	12 (21.8%)	5 (9.1%)	5 (9.1%)	2.53	1.136
EE2	It was easy for me to become skillful at using BCMA	9 (16.4%)	**16 (29.1%)**	**16 (29.1%)**	9 (16.4%)	5 (9.1%)	2.73	1.193
EE3	I find BCMA easy to use	5 (9.1%)	**16 (29.1%)**	9 (16.4%)	11 (20.0%)	14 (25.5%)	3.24	1.360
EE4	Learning to operate BCMA was easy for me	8 (14.5%)	**27 (49.1%)**	9 (16.4%)	8 (14.5%)	3 (5.5%)	2.47	1.086
ATT1	Using BCMA is a good idea	10 (18.2%)	**21(38.2%)**	11(20.0%)	7 (12.7%)	6 (10.9%)	2.60	1.241
ATT2	Using BCMA is a bad idea	5 (9.1%)	9 (16.4%)	14 (25.5%)	**16 (29.1%)**	11 (20.0%)	3.35	1.236
ATT3	BCMA makes work more interesting	0 (0.0%)	3 (5.5%)	**20 (36.4%)**	15 (27.3%)	17 (30.9%)	3.84	0.938
ATT4	Working with BCMA is fun	0 (0.0%)	2 (3.6%)	15 (27.3%)	17 (30.9%)	**21 (38.2%)**	4.04	0.902
ATT5	I like working with BCMA	2(3.6%)	8 (14.5%)	12 (21.8%)	16 (29.1%)	**17 (30.9%)**	3.69	1.169
SI1	People who influence my behaviour think that I should use BCMA	8 (14.5%)	17 (30.9%)	**19 (34.5%)**	7 (12.7%)	4 (7.3%)	2.67	1.106
SI2	People who are important to me think I should use BCMA	4 (7.3%)	14 (25.5%)	**25(45.5%)**	7 (12.7%)	5 (5.0%)	2.91	1.023
SI3	The senior management of our Emergency Department have been helpful in the use of BCMA	5 (9.1%)	**20 (36.4%)**	10 (18.2%)	13 (23.6%)	7 (12.7%)	2.95	1.224
SI4	In general, the organization has supported the use of BCMA	15 (27.3%)	**19 (34.5%)**	14 (25.5%)	4 (7.3%)	3 (5.5%)	2.29	1.117
FC1	I have the resources necessary to use BCMA	5 (9.1%)	**23 (41.8%)**	12 (21.8%)	7 (12.7%)	8 (14.5%)	2.82	1.219
FC2	I have the knowledge necessary to use BCMA	11(20.0%)	**33 (60.0%)**	9 (16.4%)	0 (0.0%)	2 (3.6%)	2.07	0.836
FC3	BCMA is NOT compatible with other systems I use	2 (3.6%)	8 (14.5%)	**28 (50.9%)**	14 (25.5%)	3 (5.5%)	3.15	0.870
FC4	A specific person or group is available for assistance with system difficulties	1 (1.8%)	**22 (40.0%)**	15 (27.3%)	12 (21.8%)	5 (9.1%)	2.96	1.036
SE1	I could complete a job or task using BCMA if there was no one around to tell me what to do as I go	17 (30.9%)	**21(38.2%)**	9 (16.4%)	7 (12.7%)	1 (1.8%)	2.16	1.067
SE2	I could complete a job or task using BCMA if I could call someone for help if I got stuck	13 (23.6%)	**21(38.2%)**	15 (27.3%)	5 (9.1%)	1 (1.8%)	2.27	0.990
SE3	I could complete a job or task using BCMA if I had a lot of time to complete the job for which the software was provided	17 (30.9%)	**24 (43.6%)**	13 (23.6%)	0 (0.0%)	1 (1.8%)	1.98	0.850
SE4	I could complete a job or task using BCMA if I had just the built-in help facility for assistance	9 (16.4%)	14 (25.5%)	**23 (41.8%)**	8 (14.5%)	1 (1.8%)	2.60	0.993
ANX1	I feel apprehensive about using BCMA	4 (7.3%)	14 (25.5%)	10 (18.2%)	**19 (34.5%)**	8 (14.5%)	3.24	1.201
ANX2	It scares me to think I could lose a lot of information using BCMA by hitting the wrong key	3 (5.5%)	12 (21.8%)	10 (18.2%)	**20 (36.4%)**	10 (18.2%)	3.40	1.180
ANX3	I hesitate to use BCMA for fear of making mistakes I cannot correct	4 (7.3%)	7 (12.7%)	12 (21.8%)	**23 (41.8%)**	9 (16.4%)	3.47	1.136
ANX4	BCMA is somewhat intimidating to me	1(1.8%)	3 (5.5%)	15 (27.3%)	**26 (47.3%)**	10 (18.2%)	3.75	0.886
BI1	I intend to use BCMA in the next month	18 (32.7%)	**19 (34.5%)**	14 (25.5%)	2 (3.6%)	2 (3.6%)	2.11	1.031
BI2	I predict I will use BCMA in the next 6 months	15 (27.3%)	**22 (40.0%)**	14 (25.5%)	1 (1.8%)	3 (5.5%)	2.18	1.038
BI3	I plan to use the system in the next 12 months	16 (29.1%)	**22 (40.0%)**	13 (23.6%)	1 (1.8%)	3 (5.5%)	2.15	1.044

Note. Results reported as N(%). PE=Performance Expectancy, EE=Effort Expectancy, ATT=Attitude Toward Technology, SI=Social Influence, FC= Facilitating Conditions, SE= Self-Efficacy, ANX= Anxiety, BI=Behavioural Intent, SD= Standard Deviation

Table 4: *Composite scores of domains*						
Domain	**Mean**	**SD**	**Median**	**Min**	**Max**	***p* value**
Performance Expectancy			4.25	2.00	5.00	≤ 0.05
Effort Expectancy	2.74	1.02				> 0.05
Attitude Toward Technology	3.50	0.60				> 0.05
Social Influence	2.70	0.84				> 0.05
Self-Efficacy			2.25	1.0	5.00	≤ 0.05
Anxiety			3.75	1.25	5.00	≤ 0.05
Behavioural Intent			2.00	1.00	5.00	≤ 0.05
Note. SD= Standard Deviation, Min=Minimum, Max=Maximum, *p* value for Shapiro Wilk Test of Normality.						

medication administration tasks when using BCMA technology. One explanation for this is the increase in steps needed to complete medication administration workflow when using this technology (Glover, 2013). Therefore, less favourable perceptions of proficiency and productivity may be related to additional time spent on medication administration tasks when using BCMA.

Finally, the results for ATT domain suggest that the participants did not like working with the system. Usually, if a technology improves job performance or increases productivity, attitudes toward the technology are more positive. However, as reported in this study there was not a positive attitude reported on this domain, which is reflected in the low performance expectancy results; this is consistent with the results reported by Ayatollahi et al. (2013). Attitude toward technology has also been reported to have an effect on behavioural intent to use the technology (Dulle & Minishi-Majanja, 2011), yet this study has shown that the attitudes toward the technology did not have a major effect on the attitudes of behavioural intent to use it. Examining the data with correlational analysis may help to explain these phenomena.

Limitations

This study has several limitations. First, the sample for this study was small, limiting its generalizability to a larger population. Our targeted population was ED nurses who used BCMA technology and it is recognized that a limited number of hospitals have yet to implement this technology. This sample was drawn from one organization and participation was limited to those members only. Therefore, it may be that ED nurses who did not belong to this organization could have other attitudes towards BCMA technology. Another limitation was the level of experience participants had with the technology; a majority of the sample had less than one year of experience with the technology, and recent adoption may have influenced perceptions.

Implications and Recommendations

This study provides administrators with the knowledge that ED nurses generally believe that BCMA is easy to use, and had confidence in the system. Some important questions were raised such as: (1) Is there enough organizational support one-year post implementation to ensure compliance with utilization? (2) Is there a way to decrease medication administration time in the ED environment when using this technology, which may improve proficiency?

Finally, this study utilized a descriptive design. Therefore, inferences about relationships between attitudes and other factors, such as tenure in the nursing field and voluntariness of BCMA use, were not explored in this research. Further studies are recommended to replicate the results with either increased professional organizational involvement or involvement of other settings and samples, to understand the similarities and differences regarding attitudes toward BCMA technology among nurses.

Conclusion

BCMA technology is not widely used in the ED so there is minimal literature on ED nurses' attitudes toward BCMA. The current research is a first step in understanding ED nurses' attitudes toward BCMA technology. The results of this study allow us to conclude that BCMA is perceived as easy to master and use and is not intimidating nor does it cause anxiety when being used. However, it was not perceived as useful for the ED nurse nor does it improve their proficiency or productivity. To better understand ED nurses' acceptance of BCMA technology, more research is needed using both qualitative and quantitative methods.

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Initiating buprenorphine/naloxone for opioid use disorder in the emergency department

Keysha Low

Abstract

Opioid use disorder (OUD) is a public health crisis that continues to affect individuals across Canada, and requires a multifaceted approach to minimize its impact. Through the chronic consumption of opioids, many individuals can become dependent on opioids and develop OUD. Buprenorphine/naloxone is the recommended first-line treatment, whenever possible, for patients living with OUD. The Emergency Strategic Clinical Network™ within Alberta Health Services is targeting the crisis in emergency departments by implementing a provincially standardized program. The Buprenorphine/Naloxone Initiations in Emergency Departments program includes identifying OUD, initiating treatment with the medication buprenorphine/naloxone, and providing rapid and reliable referrals to community clinics for titration and continued patient care. This paper provides an overview of opioids, OUD, opioid agonist treatments such as buprenorphine/naloxone, and details the program and protocol available in Alberta.

Keywords: opioids, opioid use disorder (OUD), opioid agonist treatment (OAT), buprenorphine/naloxone, emergency department (ED)

Background

The opioid crisis continues to affect Canadians of various ages, genders, geographical locations, and socioeconomic statuses. From 2016 to 2019, there were over 13,900 deaths related to opioids in Canada (Government of Canada, 2019). In 2018 alone, there were 4,460 documented apparent opioid-related deaths, equating to one life lost an average of every 2 hours (Government of Canada, 2019). Multiple factors have contributed to the current crisis. From the late 1990s to the early 2000s, certain pharmaceutical companies encouraged healthcare providers to treat patients with opioids, suggesting that they were highly effective and non-addictive (Jones et al., 2018). This resulted in a significant rise in the rate of opioid prescribing in Canada. Along with increasing prescribing rates, has come increasing rates of opioid misuse, abuse, and overdoses. In response, many healthcare providers have tried to reduce or stop prescribing opioids. When patients are no longer able to obtain prescribed opioids, many turn to illicit opioids to manage their pain and/or dependence. Over the last decade, a surge in illicit substances that contain synthetic opioids has further amplified the crisis. These illicit substances often contain unregulated levels of potent opioids, such as fentanyl, making them extremely dangerous. That is, they present a high risk of overdose.

In recent years, Canada has focused on implementing policies and strategies to address this public health crisis. These include legislative and regulatory changes to increase awareness and knowledge among healthcare professionals, increase access to treatment and harm reduction strategies, and increase availability and distribution of naloxone to the public for reversing overdoses (Health Canada, 2017, 2019). At the same time, there has been increasing efforts to enforce laws and regulations that focus on eliminating the manufacturing, distribution, and trafficking of illegal opioids into and within Canada (Health Canada, 2019). Despite these efforts, the rate and the number of overdoses in Canada continues to rise each year.

Many jurisdictions across the country have implemented local initiatives to respond to the opioid crisis. In Alberta, the Emergency Strategic Clinical Network™ (ESCN) within Alberta Health Services (AHS) has been leading the implementation of a province-wide strategy to help address the opioid crisis in emergency departments and urgent care centres (EDs) since March 2018. The ESCN is a group of healthcare professionals and patients working together across the province to improve emergency care and services in Alberta. The ESCN created a provincial expert working group that included physician experts, community/primary care services, and addictions and mental health experts. The team developed a province-wide initiative that starts treatment for individuals living with opioid use disorder (OUD) during an ED visit. The Buprenorphine/Naloxone Initiations in Emergency Departments program includes identifying OUD, initiating treatment with the medication buprenorphine/naloxone, and providing rapid and reliable referrals to community clinics for titration and continued patient care.

Opioids

Naturally found in the opium poppy (*Papaver somniferum*), opioids are manufactured as medications for pain management. Opioids are a class of substances that act on the central nervous system in the same way that endorphins operate through the activation of the opioid receptors mu, kappa and delta. Activation of these opioid receptors inhibits excitability and pain neurotransmission, which results in analgesic and possibly euphoric effects. These receptors also increase dopamine production and may influence the brain reward system. This natural reward system

can cause individuals to repeat compulsive behaviours in order to replicate the dopamine release response. Chronic consumption of opioids may result in a chemical rewiring of the brain that leads to tolerance (needing to have higher doses to achieve the same effect), and physical dependence on opioids. Individuals who use opioids chronically may experience terrible physical and psychological craving and withdrawal symptoms when discontinued (National Institutes of Health, 2019).

Opioid Use Disorder

OUD is a chronic relapsing illness that involves a problematic pattern of opioid use. OUD includes the misuse of prescribed opioid medications, use of diverted prescription opioids, or use of illicitly manufactured opioids (Canadian Research Initiative on Substance Misuse (CRISM), 2018). The current Canadian national guideline recommends evidence-based long-term treatment of OUD using opioid agonist treatment (OAT) with or without psychosocial treatment (CRISM, 2018). The guideline also identifies buprenorphine/naloxone as the recommended first-line OAT for OUD wherever feasible.

OAT is significantly more effective than non-pharmacological treatments, and there is strong evidence that OAT effectively reduces morbidity, mortality, and the risk of HIV and hepatitis C infections among individuals that inject substances (CRISM, 2018). Withdrawal management alone without OAT will reduce a patient's level of opioid tolerance. This is not advisable due to the high rates of relapse that can lead to increased risk of morbidity and mortality (Bruneau et al., 2018; CRISM, 2018). Compared to other OAT medications such as methadone, buprenorphine/naloxone has many advantages. These include fewer side effects and lower risk of toxicity and drug-drug interactions (Bonhomme, Shim, Gooden, Tyus & Rust, 2012; Moody, 2013). Buprenorphine/naloxone allows for greater flexibility and patient autonomy, which results in increased treatment compliance, retention, and reduced substance use (CRISM, 2018; Holland et al., 2014).

Buprenorphine/Naloxone

Buprenorphine/naloxone is a 4:1 ratio combination medication generally taken once a day when patients are on stable maintenance doses. Buprenorphine is a long-acting partial opioid agonist that has a half-life of approximately 24-42 hours (CRISM, 2018). As a partial opioid agonist, buprenorphine provides little to no euphoric effects due to having lower intrinsic activity on opioid receptors than full opioid agonists (for example, fentanyl, morphine, heroin, etc.). When buprenorphine has fully saturated the receptors, it achieves a ceiling effect and additional doses will not increase its effectiveness. This ceiling effect reduces overdose and respiratory depression potential, making it a safer option. In addition to its high safety profile, buprenorphine has a high affinity for the receptor that will out-compete and can even displace other full agonist opioids (National Alliance of Advocates for Buprenorphine Treatment, 2019). Naloxone is an opioid antagonist that has poor bioavailability when administered sublingually or orally. It is included in the medication to lower its abuse potential (Drugbank, 2019). If the medication is diverted and injected, a sufficient dose of naloxone will be absorbed and induce withdrawal symptoms.

Buprenorphine/Naloxone in Emergency Departments

Buprenorphine/naloxone has been in Canada since 2007 but was typically only available in addiction medicine outpatient clinic settings. The ESCN recognized a potential opportunity to help patients by having the medication available in the ED. Due to the rising number of ED opioid-related presentations in Alberta, EDs provide an effective opportunity to intervene and initiate treatment that addresses the underlying condition of OUD, going beyond the extremely important practice of offering naloxone kits. Emergency departments are portals for identifying patients who live with OUD, who may present with an overdose, other concerns related to opioids, or issues not directly related to addictions (Winetsky, Weinrieb & Perrone, 2017). In 2018, 13% of individuals in Alberta with an apparent accidental death related to fentanyl had presented to an ED within 30 days before dying, highlighting the ED opportunity to intervene and the potential to prevent a catastrophic event (Government of Alberta, 2019). ED patients are more likely to continue engaging in treatment if they initiate buprenorphine/naloxone in the ED. In a key study, 78% (89/114) of ED patients randomized to buprenorphine/naloxone treatment remained in treatment 30 days later, compared to 37% (38/102) of patients who were referred to treatment without initiating buprenorphine/naloxone (D'Onofrio et al., 2015).

The Buprenorphine/Naloxone Initiations in Emergency Departments program was the first of its kind in Canada with a provincial scope. The ESCN supported the training and implementation of the standardized treatment protocol for patients who present with OUD in all adult EDs across Alberta. The ESCN team collaborated with multidisciplinary teams at each site, addressed various local needs and concerns, developed local champions, and provided expert front-line education and resources to more than two thousand emergency nurses, staff and physicians. Each local team typically included site and unit managers, emergency and primary care physicians, clinical nurse educators, pharmacists, social workers, and front-line emergency nurses. These local champions established program and protocol expertise, which they use to guide their colleagues on a day-to-day basis to ensure program sustainability over time.

There are programs in other jurisdictions across the country that offer buprenorphine/naloxone and each clinical pathway may vary in dosing, assessments, and treatment options. In the current AHS provincial ED program, there are three key steps (Figure 1):

1. Identify OUD;
2. Initiate buprenorphine/naloxone for eligible patients in or out of the ED; and
3. Provide a rapid community clinic referral for medication titration and continued patient care.

Step 1: Identify Opioid Use Disorder

To be eligible for buprenorphine/naloxone, patients should meet the American Psychiatric Association (2013) Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, (DSM-5) diagnostic criteria for OUD. In clinical practice, ED nurses can easily apply the "4 Cs" of addiction to help identify patients

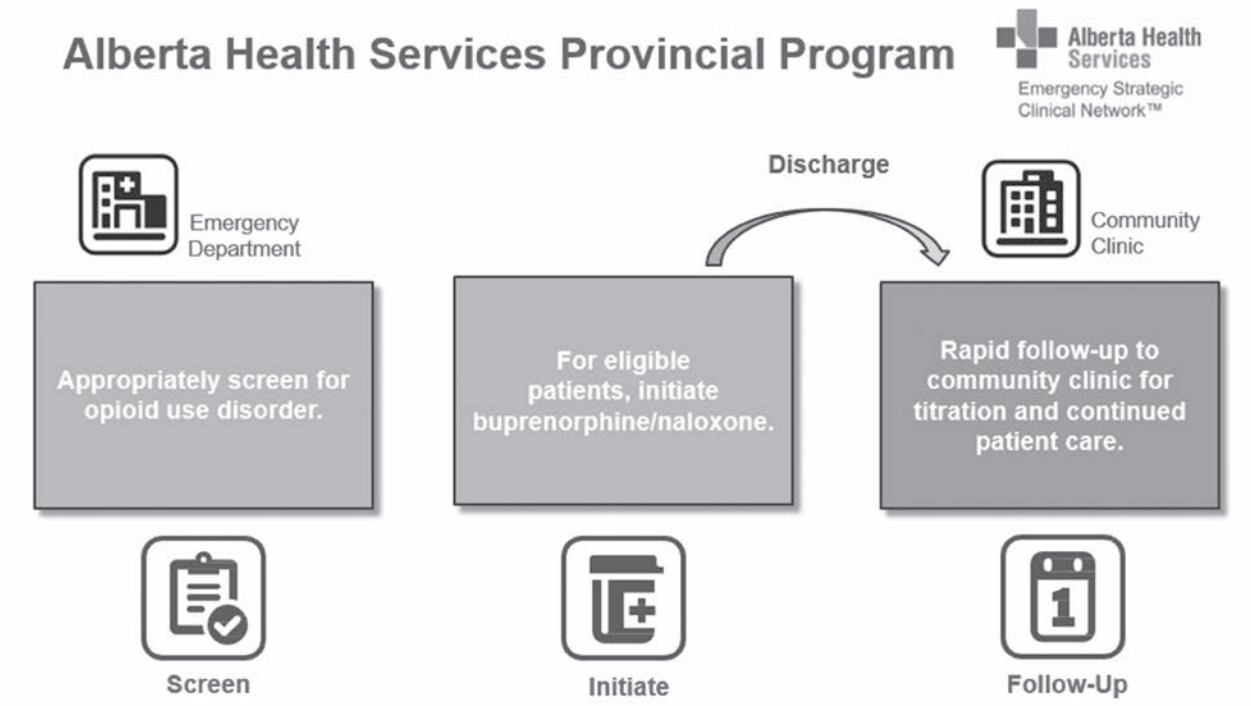

Figure 1. Three key steps in the Buprenorphine/Naloxone Initiations in Emergency Departments program.

with addiction to any substance, including opioids. Problematic opioid use can be recognized by asking patients about *craving*, loss of *control* of amount or frequency of use, *compulsion* to use, and use despite *consequences* (Centre for Addiction and Mental Health, 2019). After the identification of OUD, patients may need encouragement and education from ED healthcare professionals to consider treatment. The ED nurse plays a vital role in establishing a safe and open environment where the patient feels respected and understood in a way that has the potential to motivate change. It is important to view every patient interaction as an opportunity to engage, educate, and offer supports. Some patients may not be ready to make challenging life changes during their ED visit and may need more time to make that decision.

Step 2: Initiate Buprenorphine/Naloxone in or out of the Emergency Department

The next step is to initiate buprenorphine/naloxone in or out of the ED. There is absolute criteria listed in the protocol that patients need to meet (suspicion of OUD, willingness to engage in the medication, and no allergy to buprenorphine or naloxone) before safely receiving the medication. The protocol also identifies relative contraindications for specific patient populations that may benefit from expert consultation prior to initiation, such as pregnant or adolescent patients. If patients meet the absolute criteria, clinicians need also to consider the appropriate timing of initiation, where patients should be in a moderate level of withdrawal before receiving their first dose (Figure 2). Using the Clinical Opiate Withdrawal Scale (COWS) (Wesson & Ling, 2003) assessment tool, nurses are able to assess the patient's level of withdrawal quickly and objectively by finding the sum of 11 criteria (see Appendix A). If the score is 12 or greater, patients qualify for ED induction, receiving initial doses of buprenorphine/naloxone in the ED one hour apart, and is then discharged with additional doses to take at home along with patient teaching and a take home naloxone kit (see Appendix B).

If the score is less than 12, patients may still have another opioid on their receptors and would qualify for home induction. Due to the high affinity of buprenorphine, taking the medication too soon displaces the full opioid agonist and precipitates withdrawal symptoms, making the patient feel worse. In order to avoid precipitated withdrawal, patients are discharged with the instructions to take their doses at home once they start to experience moderate withdrawal symptoms and/or cravings. Home induction patients also receive teaching and a take home naloxone kit prior to discharge (see Appendix C).

Step 3: Provide Rapid Community Clinic Referral for Continued Patient Care

Patients initiating buprenorphine/naloxone usually require titration over two to three days to reach a therapeutic dose. In this protocol, the ED completes day one of the titration, followed by a rapid referral to a community clinic and pharmacy that will follow up the next day for continued medication titration and patient care. Through collaboration with local community resources and pharmacies, there are several guaranteed next day walk-in referral options for patients, which include primary care, brick-and-mortar OUD treatment clinics, and virtual medicine options available across Alberta. As a system, these clinics ensure that Albertans anywhere in the province can receive OAT.

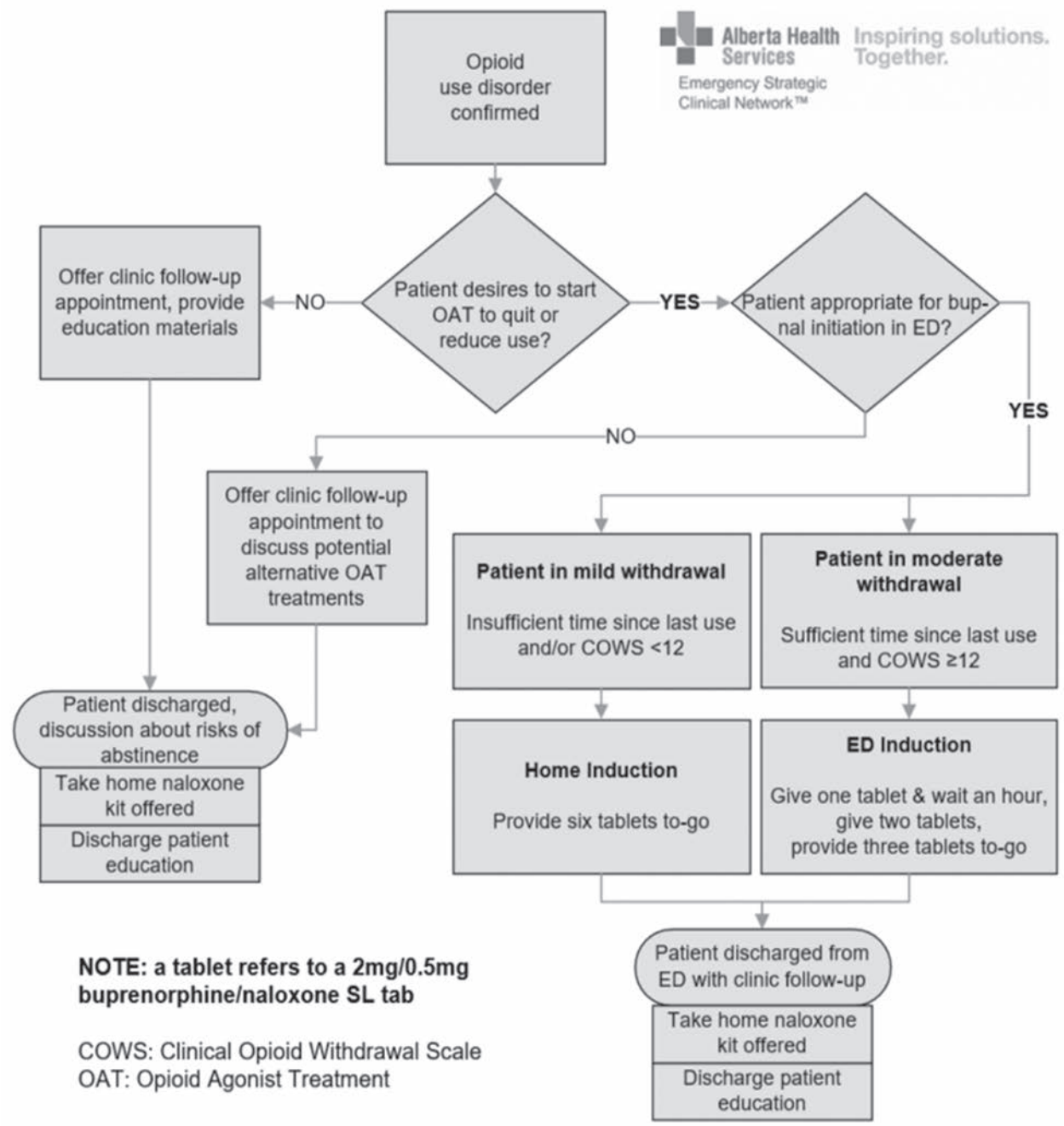

Figure 2. Standardized buprenorphine/naloxone initiation protocol in all adult EDs across Alberta.

Future of the Opioid Crisis

At the time of publication, the ESCN has helped over 100 sites implement the protocol and is currently supporting the remaining sites to complete program implementation by early 2020 (see Appendix D). Identifying OUD and starting patients on buprenorphine/naloxone is not difficult or time intensive. The healthcare system as a whole in Alberta has made significant efforts to bring the medication to a variety of settings, such as correctional facilities, homeless shelters, and primary care. The province has also been working on improving accessibility and support for Indigenous patients and higher risk populations.

Although the future of the opioid crisis is unknown, it is predicted to continue over the coming years (Chen et al., 2019). While the crisis is complex and requires a multifaceted approach, providing patients with easy access to buprenorphine/naloxone can have significant effects in limiting the crisis across the country. Emergency nurses play a key role throughout every patient's visit, and influence each step of the OUD treatment protocol. ED nurses across Canada are encouraged to advocate for patients living with OUD and support the effective initiation and use of buprenorphine/naloxone. We should not overlook this valuable opportunity to prevent deaths related to OUD and to help our patients stabilize their lives, be safe and stay healthy.

Declarations

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Appendix A: Clinical Opiate Withdrawal Scale (COWS) Tool

The COWS assessment tool used to identify the patient's level of opioid withdrawal.

Alberta Health Services

Clinical Opiate Withdrawal Scale

Last Name	First Name
Personal Health Number	Date of Birth *(yyyy-Mon-dd)*
Phone Number	Site

For each item, check (✓) the number that best describes the patient's signs or symptom. Rate on just the apparent relationship to opiate withdrawal. For example, if heart rate is increased because the patient was jogging just prior to assessment, the increase pulse rate would not add to the score.

Patient's Last Name	Patient's First Name	Date *(yyyy-Mon-dd)*	Time *(24hrs)*
Reason for this assessment			

Resting Pulse Rate: _____beats/minute *Measured after patient is sitting or lying for one minute* ☐ 0 pulse rate 80 or below ☐ 1 pulse rate 81 - 100 ☐ 2 pulse rate 101 - 120 ☐ 4 pulse rate greater than 120	**GI Upset**: *over last 1/2 hour* ☐ 0 no GI symptoms ☐ 1 stomach cramps ☐ 2 nausea or loose stool ☐ 3 vomiting or diarrhea ☐ 5 multiple episodes of diarrhea or vomiting
Sweating: *over past 1/2 hour not accounted for by room temperature or patient activity.* ☐ 0 no report of chills or flushing ☐ 1 subjective report of chills or flushing ☐ 2 flushed or observable moistness on face ☐ 3 beads of sweat on brow or face ☐ 4 sweat streaming off face	**Tremor** *observation of outstretched hands* ☐ 0 no tremor ☐ 1 tremor can be felt, but not observed ☐ 2 slight tremor observable ☐ 4 gross tremor or muscle twitching
Restlessness *Observation during assessment* ☐ 0 able to sit still ☐ 1 reports difficulty sitting still, but is able to do so ☐ 3 frequent shifting or extraneous movements of legs/arms ☐ 5 unable to sit still for more than a few seconds	**Yawning** *Observation during assessment* ☐ 0 no yawning ☐ 1 yawning once or twice during assessment ☐ 2 yawning three or more times during assessment ☐ 4 yawning several times/minute
Pupil size ☐ 0 pupils pinned or normal size for room light ☐ 1 pupils possibly larger than normal for room light ☐ 2 pupils moderately dilated ☐ 5 pupils so dilated that only the rim of the iris is visible	**Anxiety or Irritability** ☐ 0 none ☐ 1 patient reports increasing irritability or anxiousness ☐ 2 patient obviously irritable or anxious ☐ 4 patient so irritable or anxious that participation in the assessment is difficult
Bone or Joint aches *if patient was having pain previously, only the additional component attributed to opiates withdrawal is scored* ☐ 0 not present ☐ 1 mild diffuse discomfort ☐ 2 patient reports severe diffuse aching of joints/muscles ☐ 4 patient is rubbing joints or muscles and is unable to sit still because of discomfort	**Gooseflesh skin** ☐ 0 skin is smooth ☐ 3 piloerrection of skin can be felt or hairs standing up on arms ☐ 5 prominent piloerrection
Runny nose or tearing *Not accounted for by cold symptoms or allergies* ☐ 0 not present ☐ 1 nasal stuffiness or unusually moist eyes ☐ 2 nose running or tearing ☐ 4 nose constantly running or tears streaming down cheeks	Total Score _____ Total score is the sum of all 11 items Initials of person completing assessment: _____

Score: 5-12 = mild; 13-24 = moderate; 25-36 = moderately severe; more than 36 = severe withdrawal

20900 (2017-08) Source: Wesson, D. R., & Ling, W. (2003). The Clinical Opiate Withdrawal Scale (COWS). J Psychoactive Drugs, 35(2), 253–9.

Appendix B: ED Induction Discharge Teaching

MyHealth.Alberta.ca

Emergency Department Buprenorphine/Naloxone (Suboxone)

Instructions for Leaving the Hospital

The Emergency Department gave you buprenorphine/naloxone (Suboxone) to help treat an opioid use disorder. You were given 3 more doses of buprenorphine/naloxone to take with you.

It's important that you keep taking this medicine. Congratulations on taking this step!

What is buprenorphine/naloxone and how does it work?

Buprenorphine/naloxone (Suboxone) is a pill that has 2 medicines. The goal of this medicine is to help you use other opioids less, so you are safer and healthier.

Buprenorphine is a type of opioid (like morphine, heroin or methadone) but it works differently than other types of opioids. Buprenorphine helps treat withdrawal and can get rid of cravings more safely than other medicines. Once you get the right dose of buprenorphine, it will prevent withdrawal symptoms and can help you stop taking other prescription or purchased opioids.

Naloxone (Narcan) is added to buprenorphine to prevent people from injecting it. When the pill is dissolved under the tongue, the naloxone doesn't do anything. If the pill is injected, the naloxone can cause withdrawal symptoms or prevent opioids from working.

How do I take buprenorphine/naloxone?

Take buprenorphine/naloxone by mouth and dissolve it under your tongue. This medicine may take 15 to 30 minutes to dissolve. It's important to dissolve this medicine under your tongue as it won't work if you swallow it. After you take the medicine, wait at least 30 minutes before you eat or drink.

When should I take buprenorphine/naloxone at home?

Take this medicine only when you are in moderate withdrawal. This is the point when you feel like you want to use or inject to prevent more withdrawal symptoms.

It's important that you feel really sick before you take your first dose of buprenorphine/naloxone. If you take it before you feel really sick, it can make your symptoms much worse.

Dosing

Each dose of buprenorphine/naloxone is 2 mg. Be sure to wait at least **1 hour** in between doses. Record the time you take each dose on a piece of paper or in the notes app on your phone.

Don't take your next dose if you feel worse, sleepy, sedated, or have a hard time focusing. If this happens, call the clinic as your dose may be too strong.

You should feel a little better or about the same after you take each dose.

First Dose

Take your first dose. It will take 30 to 45 minutes for this medicine to start working.

Second Dose

About 1 hour after your first dose, check to see how you feel. Remember, only take your second dose if you feel better, about the same, or not much worse.

Third Dose

Wait 1 hour after your second dose before you take your third dose. This is your last dose until you go to your community clinic appointment.

What else do I need to know?

When you start taking buprenorphine/naloxone, it usually takes 2 to 3 days to get the right dose of this medicine into your body. Your body will be ready for a higher dose of this medicine tomorrow. Until then, you will likely have some cravings and withdrawal symptoms.

While you're taking buprenorphine/naloxone:

- **Don't** use another type of opioid ("dope" or "down") such as heroin, fentanyl, morphine, dilaudid, hydromorphone, Percocet, or methadone. If you use other opioids while you're taking buprenorphine/naloxone, you may overdose. If you choose to use other opioids, use as little as possible to lower the risk of an overdose.
- **Don't** take it with other medicines that make you sleepy or relaxed such as benzodiazepines ("benzos"), alcohol, sedatives, or sleep aids.
- Arrange for someone to drive you home from the hospital after you take this medicine.
- Be careful doing any activity where you need to be alert.
- Stop taking it if it makes you feel worse, sleepy, or you have a hard time focusing.

If you have side effects that you're worried about after you leave the Emergency Department, call Health Link at **811**, go back to the Emergency Department, or call **911** for help.

For 24/7 nurse advice and general health information call Health Link at 811.

Current as of: May 17, 2019

Author: Emergency Strategic Clinical Network, Alberta Health Services

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Appendix C: Home Induction Discharge Teaching

MyHealth.Alberta.ca

Emergency Department Buprenorphine/Naloxone (Suboxone)

Home Dosing Information

The Emergency Department gave you buprenorphine/naloxone (Suboxone) to help treat an opioid use disorder. It's important for you to take this medicine.

You were given 6 doses of buprenorphine/naloxone to take with you.

What is buprenorphine/naloxone and how does it work?

Buprenorphine/naloxone (Suboxone) is a pill that has 2 medicines. The goal of this medicine is to help you use other opioids less, so you are safer and healthier.

Buprenorphine is a type of opioid (like morphine, heroin or methadone) but it works differently than other types of opioids. Buprenorphine helps treat withdrawal and can get rid of cravings more safely than other medicines. Once you get the right dose of buprenorphine, it will prevent withdrawal symptoms and can help you stop taking other prescription or purchased opioids.

Naloxone (Narcan) is added to buprenorphine to prevent people from injecting it. When the pill is dissolved under the tongue, the naloxone doesn't do anything. If the pill is injected, the naloxone can cause withdrawal symptoms or prevent opioids from working.

How do I take buprenorphine/naloxone?

Take buprenorphine/naloxone by mouth and dissolve it under your tongue. This medicine may take 15 to 30 minutes to dissolve. It's important to dissolve this medicine under your tongue as it won't work if you swallow it. After you take this medicine, wait at least 30 minutes before you eat or drink.

When should I take buprenorphine/naloxone at home?

Take this medicine **only** when you are in moderate withdrawal. This is the point when you feel like you want to use or inject to prevent more withdrawal symptoms.

It's important that you feel sick before you take your first dose of buprenorphine/naloxone. If you take it before you feel really sick, it can make your symptoms much worse.

Before you take your first dose, wait at least:

12 hours since you last used a short-acting opioid (fentanyl, heroin, crushed OxyContin, Percocet).

24 hours since you last used a long-acting opioid (OxyContin taken orally, Hydromorph Contin, OxyNeo).

72 hours since you last used methadone.

Dosing

Each dose of buprenorphine/naloxone is 2 mg. Be sure to wait at least **1 hour** in between doses. Record the time you take each dose on a piece of paper or in the notes app on your phone.

Don't take your next dose if you feel worse, sleepy, sedated, or have a hard time focusing. If this happens, call the clinic as your dose may be too strong.

You should feel a little better or about the same after you take each dose. As long as you don't feel much worse, you can take your next dose.

First Dose

Take your first dose. It will take 30 to 45 minutes for the medicine to start working.

Second Dose

About 1 hour after your first dose, check to see how you feel. Remember, only take your second dose if you feel better, about the same, or not much worse.

Third Dose

Wait at least 1 hour after the second dose before you take your third dose.

Fourth Dose

Wait at least 1 hour after the third dose before you take your fourth dose.

Fifth Dose

Wait at least 1 hour after the fourth dose before you take your fifth dose.

Sixth Dose

Wait at least 1 hour after the fifth dose before you take your sixth dose. This is your final dose until your community clinic appointment.

While you're taking buprenorphine/naloxone:

- **Don't** use another type of opioid ("dope" or "down") such as heroin, fentanyl, morphine, dilaudid, hydromorphone, Percocet, or methadone. If you use other opioids while you're taking buprenorphine/naloxone, you may overdose. If you choose to use other opioids, use as little as possible to lower the risk of an overdose.
- **Don't** take it with other medicines that make you sleepy or relaxed such as benzodiazepines ("benzos"), alcohol, sedatives, or sleep aids.
- Be careful doing any activity where you need to be alert.
- Stop taking it if it makes you feel worse, sleepy, or you have a hard time focusing.

If you have side effects that you're worried about after you leave the Emergency Department, call Health Link at **811**, go back to the Emergency Department or call **911** for help.

For 24/7 nurse advice and general health information call Health Link at 811.

Appendix D: Sites with Implemented Protocol at Time of Publication by Zone

Calgary Zone

- Airdrie Community Health Centre Urgent Care Centre
- Banff Mineral Springs Hospital
- Canmore General Hospital
- Claresholm General Hospital
- Cochrane Community Health Centre Urgent Care Centre
- Didsbury District Health Services
- Foothills Medical Centre
- High River General Hospital
- Oilfields General Hospital
- Okotoks Health and Wellness Centre Urgent Care Services
- Peter Lougheed Centre
- Rockyview General Hospital
- Sheldon M. Chumir Urgent Care Centre
- South Calgary Health Centre Urgent Care Centre
- South Health Campus
- Strathmore District Health Services
- Vulcan Community Health Centre

Central Zone

- Coronation Hospital & Care Centre
- Daysland Health Centre
- Drayton Valley Hospital & Care Centre
- Drumheller Health Centre
- Hanna Health Centre
- Hardisty Health Centre
- Innisfail Health Centre
- Killam Health Centre
- Lacombe Hospital and Care Centre
- Lamont Health Care Centre
- Olds Hospital and Care Centre
- Our Lady of the Rosary Hospital
- Ponoka Hospital and Care Centre
- Provost Health Centre
- Red Deer Regional Hospital
- Rimbey Hospital and Care Centre
- Rocky Mountain House Health Centre
- St. Joseph's General Hospital
- St. Mary's Hospital
- Stettler Hospital and Care Centre
- Sundre Hospital and Care Centre
- Three Hills Health Centre
- Tofield Health Centre
- Two Hills Health Centre
- Vermilion Health Centre
- Viking Health Centre
- Wainwright Health Centre
- Wetaskiwin Hospital and Care Centre

Edmonton Zone

- Devon General Hospital
- East Edmonton Health Centre
- Fort Saskatchewan Community Hospital
- Grey Nuns Community Hospital
- Leduc Community Hospital
- Misericordia Community Hospital
- North East Community Health Centre
- Royal Alexandra Hospital
- Stony Plain Westview Health Centre
- Strathcona Community Hospital
- Sturgeon Community Hospital
- University of Alberta Hospital

North Zone

- Athabasca Healthcare Centre
- Barrhead Healthcare Centre
- Beaverlodge Municipal Hospital
- Bonnyville Healthcare Centre
- Boyle Healthcare Centre
- Central Peace Health Complex
- Cold Lake Healthcare Centre
- Edson Healthcare Centre
- Elk Point Healthcare Centre
- Fairview Health Complex
- George McDougall - Smoky Lake Healthcare Centre
- Grande Cache Community Health Complex
- Grimshaw/Berwyn & District Community Health Centre
- High Prairie Health Complex
- Hinton Healthcare Centre
- La Crete Community Health Centre
- Manning Community Health Centre
- Mayerthorpe Healthcare Centre
- Northern Lights Regional Health Centre
- Northwest Health Centre
- Peace River Community Health Centre
- Redwater Health Centre
- Sacred Heart Community Health Centre
- Seton - Jasper Healthcare Centre
- Slave Lake Health Centre
- St. Theresa General Hospital
- St. Therese - St. Paul Healthcare Centre
- Swan Hills Healthcare Centre
- Wabasca – Desmaris Healthcare Centre
- Westlock Healthcare Centre
- Whitecourt Healthcare Centre
- William J. Cadzow – Lac La Biche Healthcare Centre

South Zone

- Bassano Health Centre
- Big Country Hospital
- Bow Island Health Centre
- Brooks Health Centre
- Cardston Health Centre
- Chinook Regional Hospital
- Coaldale Health Centre
- Crowsnest Pass Health Centre
- Fort Macleod Health Centre
- Medicine Hat Regional Hospital
- Milk River Health Centre
- Pincher Creek Community Health Centre
- Raymond Health Centre
- Taber Health Centre

Research to action: Nurse practitioners in the emergency department, Emergency Department Transition Clinic and Intravenous Therapy Clinic at Strathcona Community Hospital

Wesley Shand, Daris Klemmer, Shereen Grubb, Susan Chesney, Ben Olsen, Lawrence So

Abstract

This article is about nurse practitioners effectiveness working in the Strathcona emergency department (ED), as well as the efficacy of two nurse practitioner-led clinics that run parallel to the ED. Prior to opening Strathcona Community Hospital in 2014, site leadership were tasked with developing an innovative care model with the aim of improved patient safety and quality of care delivered, incorporating a nurse practitioner (NP) model. There are NPs in three areas at Strathcona Community Hospital. NPs work directly in the ED, assessing and treating patients autonomously and with emergency physician collaboration. They also complete diagnostic and microbiology reviews and perform triage liaison nurse practitioner duties. There is also an NP led Emergency Department Transition Clinic for urgent or emergent follow up patients from the ED. Lastly, the NP-led Intravenous Therapy Clinic was developed to see patients previously attended through the ED for IV antibiotic and other IV non-antibiotic treatments, while supporting increased community access to IV treatments. Evaluation of the three areas was completed using qualitative and quantitative methods over the period of 2015–2018. Statistical analysis was completed by the Alberta Health Services workforce team. Outcomes included reduced patient return visits, decreased wait times and patients leaving without treatment, and high patient satisfaction. Other results included improved staff satisfaction, facilitation of continuity of care and avoiding unnecessary ED visits.

Introduction

Nurse practitioners (NPs) need to be more fully integrated into the healthcare system to ensure the sustainability and quality of healthcare expected by today's population. Current health system constraints result in inconsistent primary healthcare services and suboptimal health teams (El-Jardali & Lavis, 2011). Nurse practitioners are able to contribute to the health system from primary care to acute care including emergency departments (ED). With gaps in healthcare services, some patients will present to ED for emergent and non-urgent reasons. According to Jennings, Clifford, Fox, & O'Connell (2015), "The delivery of quality care in the ED is emerging as one of the most important service indicators in health delivery." NPs are well suited to care for patients in ED and ambulatory care settings. This article describes the integration of NPs into a suburban hospital with a stand-alone emergency department and two separate ambulatory care settings. Intravenous Therapy Clinic (IVT) is an outpatient clinic providing 16 hour/day IV therapy services and Ambulatory Care Clinic (ACC) where there is a NP-run Emergency Department Transition Clinic (EDTC) that runs five days per week to provide follow-up appointments for patients recently seen in the ED. The three areas will be discussed separately under three headings: ED/IVT/EDTC.

Demographics of Sherwood Park/Strathcona County

Strathcona Community Hospital (SCH) is a hospital that opened in 2014 to meet an increased health need in Sherwood Park, Strathcona County, and surrounding areas (Tessera & Gibbons-Reid, 2015). It has a variety of services including: ED, laboratory, diagnostic imaging (including a computerized tomography (CT) scanner); Ambulatory Care Clinics (ACC); and mental health. Sherwood Park has a population of 83,555 people (2016); Strathcona County has a population of 18,232 (2016) for a total population of 101,787 served by SCH (Government of Alberta, 2017). The geographical area served is located approximately 30 km outside the urban area of Edmonton, Alberta; population 932,546 (Canada, 2016). Sherwood Park and Strathcona Country are affluent communities compared to the rest of Alberta with 43% having an income of greater than $100,000 after tax compared to the rest of Alberta at 27% (Government of Alberta, 2017). Sherwood Park residents have an above average completion of high school and post-secondary education. It has a similar population of First Nations/Indigenous compared to the rest of Alberta (Government of Alberta, 2017).

Strathcona Community Hospital

Prior to opening SCH, site leadership were tasked with developing an innovative care model: "do it different" with the aim of improved patient safety and quality of care delivered. The three pillars to SCH are: 1. Collaboration; 2. Multidisciplinary; and 3. Integration. The NP model of care was incorporated into the site integrating the pillars with an innovative model of care that has been implemented in ED, Intravenous Therapy Clinic (IVT) and ACC settings. Having a NP in all three services is integral at a hospital site that is a stand-alone ED with no in-patient beds.

Nurse practitioners are Masters- and/or PhD-level registered nurses with additional educational preparation and clinical experience. They possess and demonstrate the competencies to autonomously diagnose, order and interpret diagnostic tests, prescribe pharmaceuticals and perform specific procedures within their legislated scope of practice (Canadian Nurses Association, 2006). Nurse practitioners practising in Alberta have a broad autonomous and independent scope of practice and are accountable and responsible for their own practice (CARNA, 2017). To ensure NPs could be fully integrated in all areas, SCH NPs are rostered/trained in Family All Ages and are able to care for patients across the spectrum from birth to death.

Involving NPs in all care areas at SCH, allows for acute and emergent issues to be assessed, and the transition and follow-up back to primary care completed. Nurse practitioners can act as the touch point throughout the patient's healthcare experience, allowing appropriate community services and referrals completed as necessary.

NP Service areas

Emergency Department: Nurse practitioners work directly in the ED, assessing and treating patients triaged as Canadian Triage Acuity Scale (CTAS) 4/5 autonomously and with emergency physician collaboration as needed and for CTAS 2/3. They also complete the diagnostic and microbiology review and perform triage liaison provider (TLP) duties. The TLP duties involve engaging patients in the waiting room and initiating diagnostics and symptomatic treatments to promote comfort, decrease wait times in the ED, and decrease the number of patients who leave without treatment (Nestler, et al., 2012).

Intravenous Therapy Clinic (IVT): The NP-led IVT was developed to manage patients previously seen through the ED, for intravenous antibiotic and non-antibiotic infusions. The NPs in IVT clinic also have a collaborative partnership with Infectious Disease (ID)/Internal Medicine. In collaboration with the medical director and the ID physician clinical practice guidelines were developed for presentations that can be managed autonomously by the NP, as well as patients that would initially be followed by the NP while waiting for ID consultant review. The IVT NP also reviews/triages referrals from zone specialists and community General practitioners (GPs) for both antibiotic and non-antibiotic patients. The NP completes initial history and physical exam on all patients accepted into the clinic, plus appropriate scheduled reassessments on patients managed autonomously by the NP. The NP also manages acute/urgent concerns with any IVT patient, for example pain management, antibiotic changes based on culture sensitivities, and nausea management. In other sites, IV services are often provided via the ED/in-patient units. This model provides high-quality medical care, while keeping patients out of hospital and at home. It also allows for patients to be treated outside of the emergency department, thus freeing up time/resources/providers in the ED and likely decreasing overall costs associated with the ED visit.

Ambulatory Care Clinic (ACC):
The ACC provides outpatient services for a variety of subspecialty consulting services. The EDTC is an innovative NP-led clinic open five days per week. The EDTC provides timely, high-quality care for patients seen in the emergency department that require ongoing and transitional care. This ensures patients do not get lost during follow-up. Patients who are unable to get timely GP follow-up or don't have a GP can be referred to this clinic. Examples of patients seen in this clinic are those needing diagnostic imaging follow-up; repeat laboratory tests; and those who require reassessment of common ED presentations including chronic obstructive pulmonary disease, asthma, bronchitis, dehydration, abdominal pain, and acute wound care (burns, complex lacerations, and debridement).

Methods

The evaluation of the nurse practitioner model at the Strathcona Community Hospital has been ongoing annually beginning in 2014. All evaluations have been assisted by the Alberta Health Services (AHS) evaluation team or more recently AHS Clinical Workforce Planning within the AHS Health Professions Strategy and Practice team. The first year evaluation was completed using quantitative methods. Years two and three were quantitative and qualitative data. Year four utilized quantitative methods with added outcomes measures, workforce metrics and cost analysis.

Statistical analysis was completed by AHS Clinical Workforce Team. Statistical data was extracted from multiple sources including: Emergency Department Information System (EDIS), physician billing, National Ambulatory Care Reporting System (NACRS), Tableau [Seattle, Washington, United States of America], and e-CLINICIAN [Calgary, Alberta, Canada]. Year one, patient interviews were completed on patient satisfaction and the overall care received in ED from either the NP or emergency physician. Year two and three, the mixed method approach continued and focused on service delivery utilizing patient and caregiver surveys, staff and physician surveys, and focus group discussion with SCH NPs. Year four utilized a comparative approach to determine how SCH compared to other EDs and Urgent Care Centers throughout Alberta.

Ethical considerations were incorporated throughout the annual evaluations. No specific patient data was utilized but ethical considerations were considered for the survey questions and focus group. Specific to the patient satisfaction surveys, the survey tools were reviewed by a Second Opinion Reviewer as part of the Alberta Research Ethics Community Consensus Initiative (ARECCI) process [http://www.aihealthsolutions.ca/arecci/screening].

Results

Emergency Department (ED)

Year one data showed that NPs improve access to care and efficiency at SCH. It was also shown that NPs improve patient healthcare outcomes directly in the ED by providing direct patient care, reducing the number of patients who left without treatment (LWOT) and by reviewing DI and microbiology results. NPs provide care that is satisfying to patients; there was no statistical difference in patient satisfaction rates between NPs and emergency physicians (Tessera & Gibbons-Reid, 2015).

Year two evaluation data also proved NPs improve access to care and improve patient flow in the ED. Surveys were completed by patients, caregivers, staff and physicians. Positive feedback from the patient/caregiver survey indicated that NPs treatment was prompt and that the patients felt treated with respect and with the highest level of professional expertise (Tessera & Gibbons-Reid, 2016). The staff and physician survey had positive comments, such as NPs provide collaborative service, reduce ED wait times and can spend more time with the patients to provide additional supports/explanations.

Year 4 evaluation statistics/data include daily follow-up of all ED providers' results by the Emergency Pharmacist (EP) and NP for microbiology results; as well as, by the NP for diagnostic imaging results if radiology reporting was not completed prior to discharge (Olsen, Yu, & So, 2018). In 2018–2019, 5,395 lab reports were reviewed and 751 follow-up calls were completed to patients with positive lab results. Examples of results requiring a telephone call included Group A streptococcus-positive throat swabs not empirically treated and urine cultures for urinary tract infection where the empiric therapy is resistant to the organism. In 2018–2019, 7,143 diagnostic imaging reports were reviewed and 287 calls to patients were completed. Patients would be called to be made aware of missed fractures on x-ray or CT scan. Appropriate referral/reassessments/consultation would be completed by the NP. These secondary consults and clinical supports highlight some of the invisible work that the NPs are providing to support the patients through the emergency department (Lutze, Fry, O'Connell, & Coates, 2018).

As SCH is a relatively new ED, there were many LWOT patients when the hospital first opened. Nurse practitioners in the ED are tasked with following up on patients who leave before being seen by a provider or prior to completing treatment. Some patients that leave the ED are at risk due to delays in receiving medical care or for risk of decompensating at home (Rowe, et al., 2006). Communications with LWOT patients allows the opportunity for the NP to review the presenting complaint as well as current patient status, thus allowing for the most appropriate follow-up plan to be suggested. There were 1,748 of these calls made in 2018–2019.

The year-four NP evaluation also included revisits to the emergency department. Revisits were defined as the proportion of return visits to the ED within 72 hours. The revisit rate was one of the lowest amongst comparator sites in the Edmonton Zone (Olsen, Yu, & So, 2018). This outcome has also been noted by (Lutze et al., 2018) also showed that emergency nurse practitioners had lower revisit rates. The year 4 data also showed the lowest time to physician for CTAS 2&3 and some of the lowest wait times in the Edmonton zone. The collaborative/integrative model at SCH has shown reduced patient return visits, decreased wait times and patients who LWOT. Other results in the NP evaluation data include improved staff satisfaction, facilitation of continuity of care and avoiding unnecessary ED visits with high patient satisfaction.

Intravenous Therapy Clinic (IVT)

The Strathcona Community Hospital IV Clinic was opened in Aug 2015. During the first year (June 2015–May 2016) 894 patients were seen (Tessera & Gibbons-Reid, 2016). The number of patient's seen/unique visits/clinic capacities has steadily grown in the past four years. In the most recent evaluation year, 2017–2018, 1,162 patients were assessed/treated by nurse practitioners (Olsen et al., 2018). These patients include antibiotic related diagnoses and non-antibiotic medical therapies. Most patients are referred to IVT from the emergency department such as cellulitis, dental abscess, pneumonia, and pyelonephritis patients. Other patients include IV iron sucrose, intravenous immunoglobulin, blood transfusion, phlebotomy for hemochromatosis patients from the community. Three hundred and twenty consultations to other providers were completed, the majority to infectious diseases specialty to ensure optimal patient care was delivered. Daily assessments are completed for unwell patients who might otherwise be admitted to hospital (such as: pneumonia, pyelonephritis, or peritonsillar abscess). According to Claeys et al., a decreased rate of ED revisits/hospitalization supports the use of outpatient IV clinics for low acuity acute bacterial superficial skin infections requiring initial IV therapy (2015).

Ambulatory Care Clinic (ACC)

Year one evaluation data was positive and concluded utilization of the EDTC, by providing follow up of emergency patients, ensured that patients were not lost in the vast healthcare system (Tessera & Gibbons-Reid, 2015). The SCH EDTC was opened when the SCH ED was opened in 2014. Since inception on opening of SCH EDTC, the clinic has increased in numbers: Year one; 1,114; Year two: 1,372; Year three: 1,484; Year four: 1,787; and year five: 2,300+ with a subsequent 250+ patients referred to this clinic but booked and seen as out patients through other clinics. The majority of these patients were referred from the ED, with a small amount being sent from the IVT for reassessments post-completion of IV therapy. Recently added to the EDTC NP duties is the review of ultrasounds ordered in the ED, to be completed urgently as an outpatient investigation. Between March 2018 and March 31, 2019, 685 patients were seen for ultrasound results and reassessments. Diverting these patients from the ED builds capacity in the ED. Dr. Tubman (SCH ED chief) noted that since this process has begun the overall numbers in ED have decreased (2019). Presentations to EDTC have had an impact on overall ED numbers and has helped to build capacity in the ED.

Patient Experience

Overall there is high satisfaction among patients receiving care at SCH ED and the supporting clinics-IVT and ACC. Year one evaluation data included 95% of patient satisfaction with the care in ACC. In the ED, there was no statistical significant

difference between emergency physicians and NPs in patient satisfaction (Tessera & Gibbons-Reid, 2015). Year two evaluation data included patient comments that they felt like the NP treated them with courtesy and respect. They also felt that medical information was explained in a way that they could understand. Eighty-nine percent of patients surveyed in the ED were satisfied with the quality of care they received by NPs in ED (Tessera & Gibbons-Reid, 2016).

Quality, Safety and Staff Feedback

Taking into consideration the AHS six quality indicators: accessibility, acceptability, appropriateness, effectiveness, efficiency, and safety, our site has performed exceptionally well. The year three NP evaluation included a questionnaire to site staff, including physicians, regarding the NPs improving access to health services for SCH patients. Results included 92% of staff and physicians believing that NPs add value to SCH, 90% believed that NPs improve access to services and 82% believe that NPs improve patient flow in the emergency department (Tessera & Gibbons-Reid, 2017).

Discussion

The three different areas that NPs work in the Strathcona Community Hospital prove that NPs can be integrated into a hospital. Emergency department NPs provide direct patient care, triage liaison practitioner duties, complete diagnostic imaging and microbiology review and follow-up. This ensures that no patients are lost to follow-up and ensures that high-quality safe care is delivered. The IV outpatient therapy clinic directly offloads patients from ED. Daily assessments of the higher acuity patients in the IV clinic provides for decreased hospital admissions. The patients are closely monitored for follow-up and consultation as required to ensure patient safety. The IV clinic also ensures appropriate resource allocation and medical collaboration. The EDTC clinic has many valuable attributes for improving the patient experience. They ensure urgent referral follow-up in an appropriate time. The NPs connect to specialists and complete referrals as necessary. The ultrasound follow-up builds extra capacity for ED. The clinic as a whole strives to ensure that no patient is lost in follow-up, while delivering quality patient care and enhancing patient satisfaction.

Learnings

There have been many learnings over the four-year-long course of evaluation. Recommendations were discussed for NP role implementation in different settings, i.e., hospitals. Nurse practitioner focus-group discussions and review of evaluation data highlighted several system challenges that should be considered prior to implementing the NP role at other sites. Some included system challenges, staff education on scope of practice, as well as NP clinician turnover. The role must be seen as value added, rather than competition with physicians. The overarching focus should be on appropriate patient care. All staff, including clinicians and non-clinicians, need to be educated about the role including NPs' education, skill set, and competencies. Site leadership support, both verbally and in action is also integral to proper integration of NPs. It should also be ensured that there is a support team/evaluation team to assist with data collection and analysis.

Conclusion

In conclusion, NPs are in a position to provide support and promote high-quality patient care in the ED setting to ensure patients are managed in an efficient and timely manner. NP-led clinics can also support the ED by ensuring timely follow-up, including medical assessments and changes as needed post ED visit, re-connection/initiation to primary care provider, and connection to specialist care as required. An NP-led IVT clinic allows the NP to be first point of contact into IVT. From triage to initial assessment of all IVT the NP is involved in both independent and collaborative practice providing safe and effective care. Overall, the finding of Tessera & Gibbons-Reid (2015) indicate that NPs optimize services at SCH, improve access and patient flow, not only at SCH, but throughout the healthcare system in the Edmonton Zone.

Take away points

1. NPs improve patient flow through the ED by initiating treatments and diagnostics in the ED waiting room.
2. NPs follow up on diagnostics and laboratory results to ensure appropriate treatment was provided and to increase the ability for ED providers to see patients.
3. NPs provide care to patients in the IVC, which helps to decrease hospital admissions and prevent return visits to the ED.
4. NPs provide follow-up for ED patients in the EDT and prevent return visits to the ED.

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Daris has worked as a Nurse Practitioner in a variety of environments, including most recently as the NP Clinical Lead at Strathcona Community Hospital. She holds a Bachelor of Nursing and a Master of Nursing: Advanced Nursing Practice, both from Athabasca University. Daris has diverse Nurse Practitioner and overall nursing experience in both urban and rural settings. She

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Shereen has worked as a nurse practitioner for the past 15 years. She spent 9 years working in Urgent Care in Sherwood Park before moving over to the Strathcona Community Hospital for opening day. She was tasked with the implementation of the Emergency Department Transition (EDT) clinic being involved in process and guidelines development for triage through to discharge/community resources. Her previous RN experience includes Labor & Delivery, Special Care Nursery, Orthopaedic and General Surgery nursing in Edmonton, Grande Prairie and Lloydminster. She completed both her BScN (1997) and MN (2005) at the University of Alberta.

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The continuity of care: From admission to the recovery at home

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Abstract

The treatment and support patients receive in their transition from the emergency department (ED) to the patient care unit (PCU), and eventually the community, have clinical consequences, psycho-social outcomes, and financial ramifications. This quality improvement report provides recommendations intended to improve patient experiences and outcomes, in the context of ED crowding. The recommendations provided are informed by the findings of a master's project that examined the transfer of patients from admission in a crowded ED, to a select PCU, and then to the community, using process mapping and patient surveys. The purpose of this project was to examine the sequence of care from the ED to the PCU (McHugh et al., 2011) using a systems' approach (Villa, Prenestini, & Giusepi. 2014). We believe that by understanding process successes and failures, between EDs and PCUs, we can make improvements to ensure efficient, effective, and streamlined transitions to promote continuity of care.

Introduction

The treatment and support patients receive during a hospital admission have clinical consequences, psycho-social outcomes, and financial ramifications. Informed by the findings of a master's project, this paper examines the transfer of patients from admission in a crowded emergency department (ED), to a selected patient care unit (PCU), and then to the community, by means of a paper-and-pencil questionnaire and patient interview. This quality improvement report includes recommendations to improve patient experiences and outcomes, in the context of and beyond the walls of, the ED (McHugh, Van Dyke, McClelland, & Moss, 2011), by using a comprehensive systems approach (Villa et al., 2014). Only by understanding the successes and failures of the process, between the ED and PCU, can clinicians make improvements to ensure effective, and streamlined transitions that promote continuity of care.

Background

Patients seeking care in the ED often encounter extended wait times for assessment, diagnosis, and treatment. Too often, according to the Canadian Association of Emergency Physicians (2003), wait times lead to "a situation in which the demand for emergency services exceeds the ability of a department to provide quality care within acceptable time frames" (para. 11). As a result, hospitals now regard crowding as a major component in the manner and quality of patient care in the ED and associated specialty units (Flabouris, Jeyadoss, Field, & Soulsby, 2013; Hoot & Aronsky, 2008; Sun et al., 2013).

Researchers often depict ED crowding by means of a framework, developed by Asplin et al., (2003), which delineates crowding according to three components: *input*, *throughput*, and *output*. *Input* corresponds to the common factors associated with crowding; *throughput* speaks to ED operations; and *output* relates to patient discharge alternatives. In brief, delays in throughput slow the output, thus adding to crowded environments, further affecting all three components (Korn & Mansfield, 2008; Solberg, Asplin, Weinick, & Magid, 2003).

Delays in ED output contribute to delays in the hospital system, leading to unpleasant and harmful hospital experiences for patients and their families, such as lower quality of care, increased costs, and compromised community trust (McHugh et al., 2011). As the number of patients held in the ED increases, other patients face delays that increase their risk for adverse outcomes (White et al., 2012). For example, long holding times and crowding in EDs are associated with increased mortality rates after admission (Hoot & Aronsky, 2008; Huang, Thind, Dreyer, & Zaric, 2010; Sun et al., 2013). Holding high-dependency or intensive care patients, especially elderly ones, in the ED substantially increases their risk of mortality (Flabouris et al., 2013; Huang et al., 2010).

Lengthy wait times often frustrate patients and their families (Hoot & Aronsky, 2008; Solberg et al., 2003; Sun et al., 2013). They detract from positive patient experiences (Boudreaux & O'Hae, 2003), which can result in emotional distress (Boudreaux, Cruz, & Baumann, 2006).

Lengthy wait times also increase financial costs associated with longer lengths of stay (Huang et al., 2010). Alternatively, reducing ED holding times can lead to a decrease in overall hospital costs (Foley, Kifaieh, & Mallon, 2011) and additional system-wide savings (Huang et al., 2010). Addressing ED crowding could support more inpatient beds and healthcare providers (Huang et al., 2010).

Using formal evaluation methods to measure the effect of ED crowding can guide research questions, shape policy, and promote operational management strategies to alleviate the consequences of overcrowding (Asplin et al. 2003). Moreover, such improvements would ensure that patients "receive the right care at the right time" (Cirrone, Di Pietro, La Corte, & Torrisi, 2016, p. 232).

Project Questions

This paper, part of a larger project, addresses two questions:

1. How do patients and their families describe their hospital experience?
2. What changes to current practice could improve the experience of patients as they transition from ED to a PCU and then to recovery in the community?

Methods

Design

The project used mixed methods (quantitative and qualitative) to collect data. The quantitative data came from a paper-and-pencil questionnaire (Appendix A available at www.CJEN.ca), and the Patient Continuity of Care Questionnaire (PCCQ-short), designed by Hadjistavropoulos, Biem, Sharpe, Bourgault-Fagnou, & Janzen (2008). It collected patient perceptions about their hospital experience. In addition to the PCCQ-short, the project team added three open ended questions (Appendix B available at www.CJEN.ca) that ask patients to describe their hospital care—analysis of the transcripts constituted the qualitative portion.

The project also included an observational exercise, detailing the patient journey from ED admission until discharge into the community. The quality improvement (QI) principles of Alberta Health Services Improvement Way (AIW) provided a framework to record the aforementioned observations and construct a value process map (Appendix C). AIW incorporates the most effective quality improvement tools including *Lean* and *Six Sigma* and provides a common language and approach to improvement and problem solving processes in its operations (AHS, 2012).

Procedure and Participants

This project enlisted a convenience sample of patients (n=10) admitted to the ED, between January 23 and April 4, 2018, and scheduled for unplanned surgery (requiring appendectomy or cholecystectomy), at a tertiary teaching hospital, in a large Canadian city. The project leader, a registered nurse, directly observed the transfer of the patients from the ED to the PCU. She also administered Part One (Before Discharge) of the PCCQ-short. One week post-discharge, she phoned participants, at a mutually convenient time, and administered Part Two (After Discharge) of the PCCQ-short as well as three open-ended questions.

Upon receiving approval from the Conjoint Health Research Ethics Board, emergency medicine research assistants recruited eligible participants in the ED. Eligibility criteria included: adults, between the ages of 18 and 89 inclusive, admitted for appendectomy or cholecystectomy. They had basic English language skills, had a primary physician, and planned to return home within the city for their recovery. Exclusion criteria included those with complex clinical problems or co-morbidities that required extensive care. The participants averaged 38.5 years of age. They included an equal number of female (n=5) and male (n=5) participants, with the mean hospital stay of 2.8 days. A majority (70%) of the participants (n=7)—they included four females and three males—had cholecystitis. The remainder (n=3, 30%)—they included two males and one female—had appendicitis.

Results

Quantitative Data

Due to the small convenience sample (n= 10), simple descriptive data analysis of PCCQ items suffices. Consequently, quantitative analysis of the PCCQ-short (Part One) includes mean and standard deviation calculations for sixteen items. On an ascending scale of 1 to 5, participants rated their overall care as 4.7 on average—a rating of < 4 indicates an area for improvement, according to the designers of the PCCQ (Hadjistavropoulos et al., 2008). As stated above, administration of the PCCQ-short takes place in two parts (before discharge and after discharge). Analysis of the data, however, examines results in terms of three factors (informational care, relational care and continuity of care). Of the three, the first two refer to events in the hospital, which remain the focus of this paper. Consequently, this paper does not contain data regarding the period after discharge, or items #17 to #25 inclusive. In place of these data, the researchers asked three open-ended questions, which then underwent qualitative analysis.

The respective averages for two of the sub-factors, informational and relational, differ marginally. Table 1 arranges the 16 responses, corresponding to the two sub-factors, as they pertain to the patient experience before discharge. One, informational care, before discharge, averages 4.62. The other, relational care, again before discharge, averages 4.86 (all numbers rounded to the hundredth place). Both averages, as it happens, lie above 4.0. Consequently, even though item #5, found under informational care, has an average score of 4.13, none of the scores indicates room for improvement, an equivocal term when it comes to quality of care.

Patients indicate that three items score below the overall average (4.62) for informational care (Table 1). That is, item #3 averages 4.38—it states, "I was told about non-urgent symptoms that may occur and how I should cope with these." Item #4 averages 4.50—it states, "I was given information on symptoms that may signal a need to seek urgent medical attention & whom to contact for these symptoms (e.g., specialist, family physician, homecare)." Item #5 averages the lowest, 4.13—it states, " I was given complete information on my medications (e.g., type, purpose, how given, when, how often, for how long, how much, side effects, drug interactions, nature and frequency of blood work)." Contrariwise, the majority of items, five in all, have individual scores higher than the overall average for the sub-factor. Three of these items (1, 2, and 6) score substantially higher. The remaining two items (7 and 16) score marginally higher—in the case of item #16, the difference amounts of one hundredth of a point.

The other sub-factor, relational care, with an average of 4.86, has a higher average than its correlate, informational care (4.62). Among the eight items, under relational care, five in all, have lower averages than 4.86 (Table 1). Item #8 averages the lowest, 4.50—it states. "Providers understood my expectations, beliefs and preferences". Items #9 and #14 scored the same, 4.63. Item #9 states, "I felt 'known' (e.g., current clinical condition and events) by the providers involved in my care." Item #14 states, "The different providers appeared to communicate well with each other while I was in hospital." Two other items shared the same, if higher, score (4.75). Item #11 states, "I was satisfied with the information from the providers involved in my care." And item #12 states, "I was satisfied with the emotional support from the providers involved in my care." An explanation for the higher

Table 1. Mean and standard deviation of responses, arranged according to informational and relational sub-factors, to sixteen items (Part One) of the PCCQ-short (n= 10)
(A refers to Appendectomy. C refers to Cholecystectomy)

Item Question Per participant	C002	C003	A001	C004	C005	C006	A002	A003	C007	C008	Mean
1. I was provided with clear information on my diagnosis.	5	5	5	5	5	5	5	4	5	5	4.88
2. I was provided with clear information on my prognosis.	5	5	5	5	5	4	5	5	5	5	4.88
3. I was told about non-urgent symptoms that may occur and how I should cope with these.	5	5	5	3	5	2	5	5	5	4	4.38
4. I was given information on symptoms that may signal a need to seek urgent medical attention & whom to contact for these symptoms (e.g., specialist, family physician, homecare).	4	5	5	3	5	4	5	5	5	5	4.50
5. I was given complete information on my medications (e.g., type, purpose, how given, when, how often for how long, how much, side effects, drug interactions, nature and frequency of blood work).	5	5	5	3	4	2	5	4	5	4	4.13
6. I was given information on follow-up appointments that have been made for me and appointments I have to schedule for myself.	5	5	5	5	5	5	5	4	5	5	4.88
7. I was informed of ongoing treatment that may be required after discharge (e.g., purpose, how, when) and whether I will have ongoing contact with providers of my care (e.g., physicians, etc.).	5	5	5	4	5	N/A	5	4	5	5	4.71
8. Providers understood my expectations, beliefs and preferences	5	5	4	4	5	3	5	5	5	4	4.50
9. I felt "known" (e.g., current clinical condition and events) by the providers involved in my care.	5	5	5	4	4	5	5	4	5	4	4.63
10. I had confidence in the providers involved in my care.	5	5	5	5	5	4	5	5	5	4	4.88
11. I was satisfied with the information from the providers involved in my care.	5	5	5	4	5	4	5	5	4	4	4.75
12. I was satisfied with the emotional support from the providers involved in my care.	5	5	5	4	5	4	5	5	5	5	4.75
13. I was satisfied with the opportunity to talk and raise questions with the providers involved in my care.	5	5	5	5	5	4	5	5	4	5	4.88
14. The different providers appeared to communicate well with each other while I was in hospital/convalescent care.	5	5	5	5	5	4	4	4	5	4	4.63
15. A well-developed and realistic follow-up plan was prepared and explained to me.	5	5	5	4	5	5	5	5	5	5	4.88
16. I felt adequately prepared for discharge.	5	5	5	4	5	4	5	4	5	5	4.63
Mean	4.94	5.00	4.94	4.19	4.94	3.89	4.94	4.60	4.88	4.56	4.68

overall average for relational care derives from the fact that the remaining three items, of the eight sub-factor items, all have a high score of 4.88. They include item #10 ("I had confidence in the providers involved in my care"), item #13 ("I was satisfied with the opportunity to talk and raise questions with the providers involved in my care") and lastly, item #15 ("A well-developed and realistic follow-up plan was prepared and explained to me)." Comparatively, the item averages for the relational sub-factor show more variation than the informational sub-factor. That is, the respective averages for five of the eight items lie below the overall average for the entire sub-factor.

Qualitative Data

Thematic analysis of the transcripts indicated three themes. The team arranged the results of the analysis under three headings.

Theme 1: Providing appropriate pain management.

Participants appreciated the protocols of the triage process. That is, they understood that a physician had to perform an assessment before they could receive any pain medication. Nevertheless, they expressed their dissatisfaction about delays in receiving treatment for their pain. One patient remarked,

> *"They [physicians] see pain everyday right? And even if you are in a lot of pain, um, they make sure that you know it's not life threatening; its only pain. And I know they have a lot of people to take care of. So, you kind of have to wait your turn even if you are in pain." Participant C005.*

The participants felt they could have benefited from better pain management while they waited for an assessment. One participant pointed out,

> *"Once the pain is under control, maintain it, don't let it slip away. It is very uncomfortable. Like once I got things under control I was good for quite a while. … listen to the patient when they say the pain is coming back." (Participant C007).*

Theme 2: Communicating about the waiting process.

The process of waiting in the ED or for surgery proved particularly frustrating for other patients. Notwithstanding their complaints, the participants indicated that the nurses communicated effectively about the process and any delays in waiting for surgery. One patient stated,

> *"They took me to the [unit]. They give me all the information. Like why they don't make the surgery immediately? They explained it very well. Why I have to wait, right? Because they called the emergency surgery, and then they check the primary people that the Emergency receive, right, which is the soonest emergency. Well, stuff like that. So everything was very clear." (Participant C003).*

Theme 3: Providing anticipatory guidance.

Four participants believed that the staff discharged them too soon after surgery. Although they had recovered sufficiently, they wanted more time to prepare for their post-surgical recovery at home. One believed,

> *"So you know I was ok to be discharged. Right. It's just it may have been a little bit too fast. But I have seen other patients in the room. They were discharged; they were operated at 10 o'clock at night, and then at 10 o'clock in the morning they were gone. So, right. It's the way it's done now….[Y]ou don't stay long in the hospital. They send you home very fast." (Participant C005).*

Regardless of the early discharge, all the participants expressed a high level of satisfaction with the information provided to them at discharge. One stated,

> *"The papers they gave me for discharge had all the information on them so I didn't have any questions after they gave me." (Participant A002).*

Most of the participants indicated that the standardized discharge information sheets included everything that they needed to know, but two participants asked for more time to ask questions. They wanted more information about any deviations from the regular expectations, specifically around eating.

Some Observations

The sample (n=10) includes a small subsection of patients in the ED and does not always reflect the average times that are commonly measured. The time from triage until physician assessment, diagnosis, specialty consultation, admission, bed allocation and transfer to the unit were all below the hospital average times. The most significant difference in times was the time a bed was allocated—the average time for the project participants was only 30 minutes, whereas the average for the hospital was 414 minutes. This was likely due to the fact that the PCU was somewhat anomalous due to its very specific admitting criteria (short surgical stays). This, along with the staff's willingness to take report from the ED with little or no push back towards the ED, patients experienced quick transfer times. As a result, the PCU had fast patient turnover—beds become allocated quickly if patients meet the unit criteria.

Once a patient no longer requires hospital care the actual discharge of patients presents some problems when it comes to measurement. The decision to discharge from the admitting service to the time an order is processed and the time a patient leaves the hospital is not commonly measured. Adding the time it takes for housekeeping to arrive and clean the bed can substantially increase the time to have the bed ready for the next patient. Although the department of housekeeping and porters track the times for their services closely and continue to make staffing adjustments to accommodate demands during the peak hours, discharge time can vary widely.

The hospital process includes an extensive use of personnel, resources, and time. Addressing the complexities within the process can make a difference for patients in the ED and the rest of the hospital.

Recommendations

The following recommendations result from an analysis of the different components of the project.

Emergency Department

1. Provide timely and appropriate pain management strategies. Registered nurses should initiate nursing protocols, especially when waiting for physician assessment. One participant stated "Four hours passed nobody give me something

for pain until I was just ready to scream, and I say please, I need something for the pain now."

2. Provide patients and their families more information about the waiting process in a friendly format such as videos playing in the waiting rooms explaining the wait time and care prioritization.
3. Eliminate duplicate processes to ensure a more seamless transition. This could involve establishing collaborative relationships with the information technology department to alter or upgrade existing electronic charting processes.
4. Utilize QI processes to identify inefficiencies that might affect the experiences and transition of patients during their hospital admission. This could include efficient patient transport throughout the facility by redeploying unit specific porters and minimizing paperwork delays, such as waiting for admission packages.
5. Work collaboratively with departments outside of the ED, specifically the PCU's and the surgical suites, to develop processes for eliminating unnecessary transportation of patients waiting for surgery while in the ED.

Patient Care Unit and Transition to the Community

1. Share patient experiences with the managers, educators, and staff of the PCU to encourage their commitment to excellent patient care and ways to make identified improvements. One participant stated …."I think it was really good. Very helpful, very clear. They explained everything. They were very good to me."
2. Improve the discharge process for patients by working collaboratively with physicians and management to make it more thorough and efficient. This includes re-evaluating existing discharge material to provide patients more specific information on medications commonly used in post-operative care. This would provide anticipatory guidance on potential complications that can occur when recovering from surgery. One participant suggested "… maybe a little bit more about diet and how your digestive system takes a little while to get going again (laughs). You know? Like a bit about, even if you didn't have abdominal surgery, it's just it takes your body a while to get functioning again, so maybe something along that line."
3. Enter discharge orders during morning rounds, use conditional discharge orders, and arrange discharge appointment times to encourage family participation in the discharge teaching.

Conclusion

This project examined the experience of hospital patients, diagnosed and treated for appendicitis and cholecystitis. Understanding their interests and concerns provided advance thinking about the current sequence of care or flow of patients between the ED and PCU and then to the community. The above recommendations offer a value-based approach in the continuity of care.

Author's Take-aways

1. Look for inventive ways to mitigate the stressful consequences associated with crowding.
2. Provide patients and their families information about the waiting process and what to expect so they do not feel forgotten in the crowding.
3. Provide patients with early and ongoing pain management strategies.
4. Promote collaboration between ED and PCU to facilitate smooth transitions in care.
5. Remember that Quality Improvement benefits both patients and staff.

About the author

Kara graduated from the University of Calgary in 2005 with her Bachelor of Nursing. Kara has worked General Surgery/Surgical Oncology, Trauma Surgery and the last 12 years in the Emergency Department. Kara has been involved in various committees while in the ED and completed her Masters of Nursing in summer of 2018 with a cap-stone project that studied the continuity of care for surgical patients admitted from the Emergency Department. For fun Kara likes to hang out with her two kids and anything outdoors including: running, biking, camping, hiking, skiing/snowboarding etc. She also enjoys reading, good food and spending time with friends/family.

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Appendix A
Patient Continuity of Care Questionnaire-Short (PCCQ-Short)

***INSTRUCTIONS*:** These statements are designed to assess the care you received around the time of discharge from hospital. Please complete on your own or with assistance. An informal caregiver (e.g. family, friends) can also complete on behalf of a patient.

Read each statement and circle a number between 1 and 5 to indicate whether you 1 (strongly disagree), 2 (somewhat disagree), 3 (cannot decide whether you agree or disagree), 4 (somewhat agree), or 5 (strongly agree) with the statement.

How strongly do you agree or disagree with this statement?	Strongly Disagree	Somewhat Disagree	Hard to Decide	Somewhat Agree	Strongly Agree	Not Applicable
BEFORE DISCHARGE						
1. I was provided with clear information on my diagnosis.	1	2	3	4	5	NA
2. I was provided with clear information on my prognosis.	1	2	3	4	5	NA
3. I was told about non urgent symptoms that may occur and how I should cope with these.	1	2	3	4	5	NA
4. I was given information on symptoms that may signal a need to seek urgent medical attention & whom to contact for these symptoms (e.g. specialist, family physician, homecare).	1	2	3	4	5	NA
5. I was given complete information on my medications (e.g., type, purpose, how given, when, how often for hour long, how much, side effects, drug interactions, nature and frequency of blood work).	1	2	3	4	5	NA
6. I was given information on follow-up appointments that have been made for me and appointments I have to schedule for myself.	1	2	3	4	5	NA
7. I was informed of ongoing treatment that may be required after discharge (e.g., purpose, how, when) and whether I will have ongoing contact with providers of my care (e.g., physician, etc.).	1	2	3	4	5	NA
8. Providers understood my expectations, beliefs and preferences.	1	2	3	4	5	NA
9. I felt "known" (e.g. current clinical condition and events) by the providers involved in my care.	1	2	3	4	5	NA
10. I had confidence in the providers involved in my care.	1	2	3	4	5	NA
11. I was satisfied with the information from the providers involved in my care.	1	2	3	4	5	NA
12. I was satisfied with the emotional support from the providers involved in my care.	1	2	3	4	5	NA

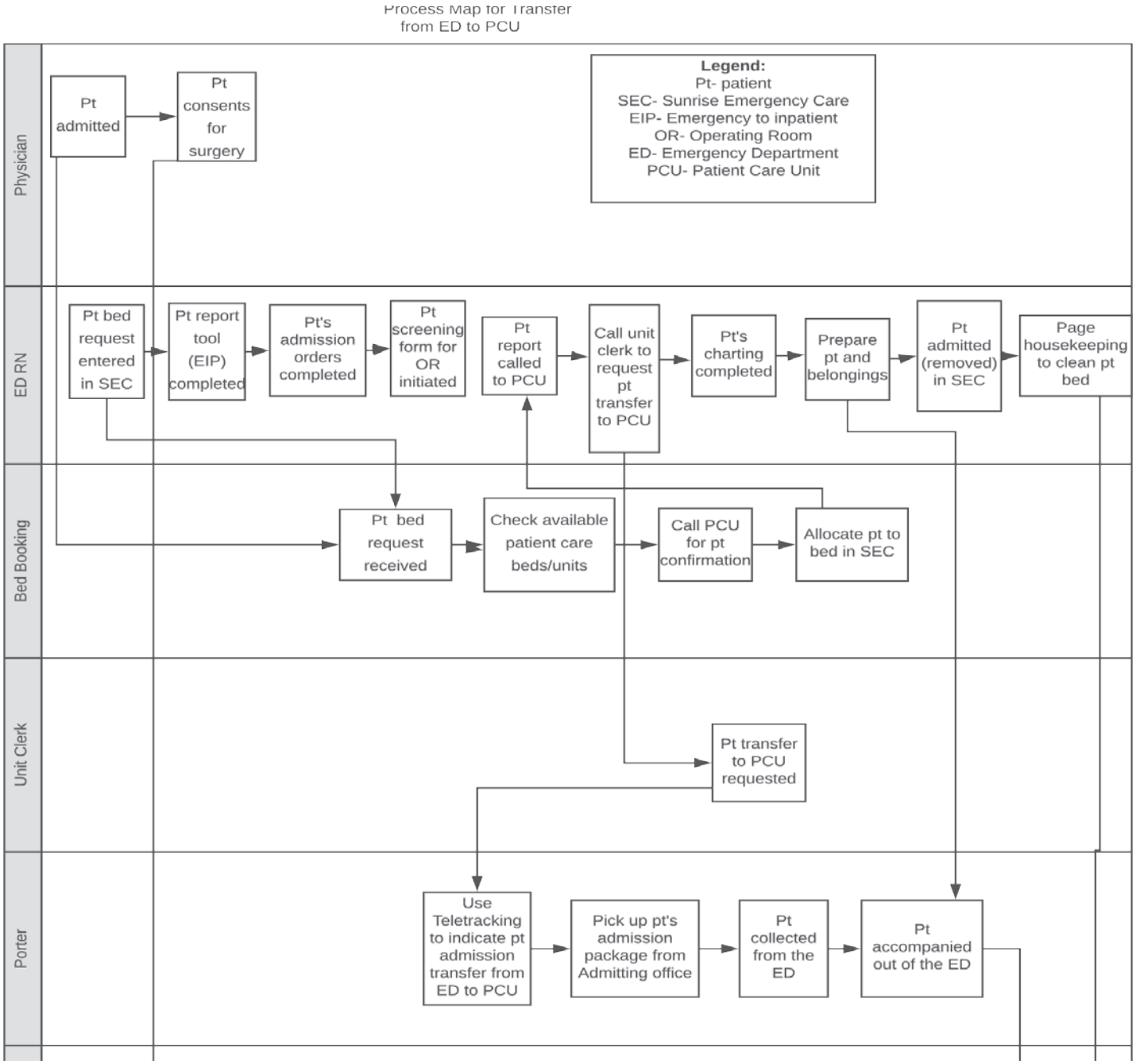
How strongly do you agree or disagree with this statement?	Strongly Disagree	Somewhat Disagree	Hard to Decide	Somewhat Agree	Strongly Agree	Not Applicable
13. I was satisfied with the opportunity to talk and raise questions with the providers involved in my care.	1	2	3	4	5	NA
14. The different providers appeared to communicate well with each other while I was in hospital/convalescent care.	1	2	3	4	5	NA
15. A well-developed and realistic follow-up plan was prepared and explained to me.	1	2	3	4	5	NA
16. I felt adequately prepared for discharge.	1	2	3	4	5	NA
AFTER DISCHARGE						
17. I feel "known" (e.g. current health condition) by my present providers who have taken over my care since discharge.	1	2	3	4	5	NA
18. I have confidence in my present providers who have taken over my care since discharge.	1	2	3	4	5	NA
19. I am satisfied with the information from my providers who have taken over my care since discharge.	1	2	3	4	5	NA
20. I am satisfied with the opportunity to talk and raise questions with my providers who have taken over my care since discharge.	1	2	3	4	5	NA
21. As far as I am aware, the different health care providers in hospital have communicated well with those in the community about my care.	1	2	3	4	5	NA
22. As far as I am aware, my family physician or other key provider was contacted and informed about the important aspects of care that I received (e.g. diagnosis, prognosis, treatment, medications, etc.).	1	2	3	4	5	NA
23. As far as I am aware, necessary forms were all completed.	1	2	3	4	5	NA
24. As far as I am aware, necessary forms were sent to all appropriate places/providers.	1	2	3	4	5	NA
25. As far as I am aware, no forms or information were lost when I was discharged.	1	2	3	4	5	NA

Appendix B

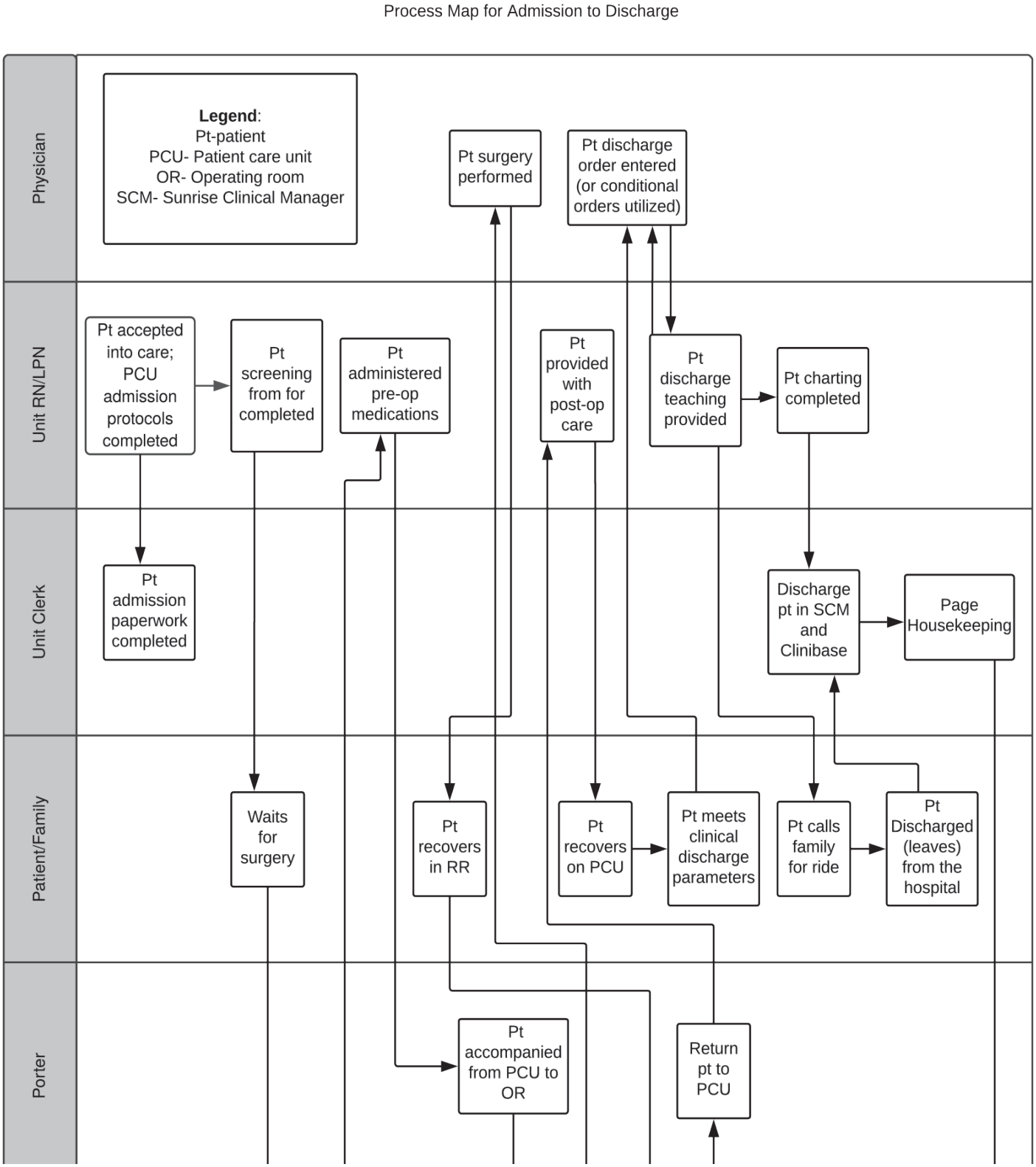
Three open-ended questions posed to patients after discharge.

1. How would you improve the admission process in the Emergency Department?
2. How would you help people prepare for surgery?
3. How would you improve the discharge process to help people recover better?

Appendix C: Process Map: ED to PCU



Process Map: PCU Admission to Discharge



Research Review

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Citation

Fuenzalida, C., Hernández, G., Ferro, I., Siches, C., Ambrós, À., & Coll-Vinent, B. (2017). Long-term benefits of education by emergency care nurses at discharge of patients with atrial fibrillation. *International Emergency Nursing, 35*, 7–12. https://doi.org/10.1016/j.ienj.2017.03.006

Background

As patients are discharged from the emergency department the teaching information they receive may not be consistent or understood well enough to prevent complications.

Purpose of the study

The purpose of this study was to examine the effectiveness of an education intervention for preventing complications with patients diagnosed with atrial fibrillation (AF) and discharged from the emergency department.

Research approach and methods

The researchers used a prospective randomized study design. The control group received no intervention. The treatment group was given education specific to their disease process. Clinical records were reviewed for both groups during a one year follow-up with the primary variable being AF or treatment related complications and the secondary variable being emergency department (ED) visits.

Setting and sample

The study looked at patients over the age of 18 who presented to their emergency department in Barcelona, Spain that were diagnosed with atrial fibrillation (AF) and discharged from the ER, patients with cognitive impairment were excluded. The study began with both control and intervention groups being interviewed using closed-ended questions focused on demographic information, clinical variables, and the patient / caregiver knowledge about atrial fibrillation at the time of presentation. Both groups also got standardized discharge teaching from the responsible physician. The intervention group also received education from a select group of nurses who provided information about the dysrhythmia, complications, precautions to consider, how to do a self-assessment of pulse and when to return to either their physician or the emergency department. This was summarized with personalized written documents. Follow-up was conducted one year post-intervention for both groups with a review of medical records looking for complications of AF.

Findings

The study included 240 patients with approximately even distribution between the control and intervention groups. Participants in the intervention group had lower rates of heart failure, the most common complication in both groups, at three, six, and twelve month follow-up.

The difference between the control and intervention group when looking at ED visits, death, or other primary and secondary complications did not reach statistical significance.

The researchers noted that some follow-up care might not have been captured if the patients presented to a private facility or in a different part of the country where their records would not have been available.

Commentary

Although this study recognizes that discharge teaching is typically the role of the emergency physician, not the emergency nurse in this department, the importance of patient education following a visit to the emergency department is recognized as a core competency by NENA (NENA, 2014). Canadian ED nurses are expected to provide discharge teaching so the findings of this study should be of interest to Canadian ED nurses.

This study protocol cannot be exactly replicated in Canadian ED's because the study institution is not in the practice of nurses doing discharge teaching and because they don't articulate the cognitive impairment exclusion criteria. Additionally, the study failed to describe how patient literacy levels were assessed and how comprehension of the information was evaluated. Ensuring that patients understand and can comply with instructions is an important component of effective discharge teaching (Riar, Carrasco, Olibrice & Ayinla, 2016).

Despite the mentioned weakness, this is an important study because of the care taken to validate, standardize, and share their foundational discharge teaching materials, as well as to provide education and ongoing support to the nurses who would be providing the discharge teaching. The provision of written instructions to reinforce verbal instructions have been demonstrated to improve both comprehension and retention of discharge teaching information (Taylor & Cameron, 2000; Alberti & Nannini, 2013), and this study offers a concrete example of the difference in outcome teaching can have.

Key messages

- Discharge teaching for new diagnosis atrial fibrillation may reduce morbidity.
- Nurse directed discharge teaching is a core competency for ED nurses, and is important for patient compliance with instruction and reduction of complications.
- Written materials reinforce verbal discharge teaching and aids with retention and compliance.
- Use of expert resources to support emergency nurses can lead to more consistent teaching that is maintained over time.

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RECOGNIZING HS

DO YOU RECOGNIZE PATIENTS WITH HIDRADENITIS SUPPURATIVA (HS)?

DR. NEIL SHEAR
Head of Dermatology, Sunnybrook Hospital

"HS is a chronic, painful, inflammatory skin disease that affects 1-4% of the general adult population. It is characterized by boils usually occurring where certain sweat glands are located, such as under the breasts, buttocks, and inner thighs."

"People with HS come to the emergency room in severe pain and discomfort requiring assistance with the draining of the boils during a flare-up. It's not unusual for patients to go home undiagnosed."

DR. VU KIET TRAN
ER physician at University Health Network

DR. RALPH GEORGE
Associate Professor, University of Toronto, Division of General Surgery

"There is currently no cure for HS. Early diagnosis and proper management is important for a patient's quality of life. The first step for those with HS is to speak to their dermatologist to get an accurate diagnosis."

To learn more about HS from these specialists, go to www.RecognizingHS.com/CJEN

WHEN YOU SEE THESE LESIONS, DO YOU SUSPECT HS? DO YOU ASK ABOUT RECURRENCE?

Photo compliments of Dr. Afsaneh Alavi.

Photo compliments of Dr. Marc Bourcier.

ASSESSING PATIENTS WITH RECURRENT BOILS

Most HS cases can be recognized with high reliability by the presence of 3 main features:[1-3]

1. **Typical lesions:** nodules, sinus tracts, abscesses, scarring
2. **Typical anatomical location:** axilla, groin, genitals, under the breasts, others (perianal, neck, abdomen, buttocks)
3. **Relapses and chronicity:** ≥2 times per 6 months

Questions to ask your patients with suspected HS:[2]

1. Have you had outbreaks of boils during the last 6 months?
2. Where were the boils and how many did you have?

To confirm an HS diagnosis, please refer your patient to a dermatologist.

References: 1. Zouboulis CC, *et al.* European S1 guideline for the treatment of hidradenitis suppurativa/acne inversa. *JEADV* 2015;29:619-44. **2.** Lockwood SJ, *et al.* Diagnostic workup. In: Kimball AB, Jemec GBE, eds. *Hidradenitis Suppurativa: A Disease Primer.* Cham, Switzerland: Springer; 2016:27-37. **3.** Poli F, *et al.* Clinical presentation. In: Jemec GBE, Revuz J, Leyden JJ, eds. *Hidradenitis Suppurativa.* Berlin, Germany: Springer; 2006:11-24.

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