University of Saskatchewan
Department of Emergency Medicine
Research Day Abstracts
May 27, 2020

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Research Day Agenda

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Developing a dashboard to meet the needs of residents in competency-based training program: A design-based research project.

Carey R, Wilson G, Bandi V, Mondal D, Martin M, Woods R, Chan T

Introduction: Competency-based medical education (CBME) is being integrated into training programs around the world. Canadian specialty programs are implementing Competence by Design, a CBME program which requires frequent assessments of entrustable professional activities. Little has been written regarding how residents' use of CBME assessment data can be supported. We aimed to identify resident needs for the presentation of their assessment data through the creation of a web-based dashboard.

Methods: We utilized an iterative design-based research process to identify and address resident needs surrounding the presentation of their assessment data through the development of a CBME dashboard. Data was collected within the emergency medicine residency program at the University of Saskatchewan via four resident focus groups over 10 months. Focus group discussions were transcribed and analyzed using a grounded theory approach and constant comparative technique to identify resident needs. This analysis guided the development and refinement of dashboard elements (data, analytics, and visualizations).

Results: Resident needs were classified under three themes: 1. Provide guidance through the assessment program, 2. Present workplace-based assessment data, and 3. Present other assessment data. Seventeen elements were developed and refined to address these needs that were incorporated into an easily accessible online dashboard.

Conclusions: Our design-based research process identified what residents need from their assessment data and developed dashboard elements to meet them. This work will inform the creation and evolution of CBME assessment dashboards designed to support resident learning.

Brain Natriuretic Peptide (BNP) Use in the Dyspneic Patient: Quality Improvement in an Urban Emergency Department

Butz M, **Bear M,** Degalman M, Kaban G, Ross T

Introduction: Current literature demonstrates BNP is of little clinical and diagnostic utility in the ER, yet it still continues to be ordered regularly by practicing ER physicians in Regina. The Department of Clinical Appropriateness has been tracking the number of BNP tests ordered for many months, independent of this project. With that data as a background, the environment is ripe in Regina ERs for an intervention that would decrease the use of this inaccurate test to improve patient care and save the healthcare system the costs of these unnecessary tests. Based on QI literature, educational interventions can be effective methods of improving quality of care. We are interested in providing an educational intervention to present BNP literature to the ER physicians and monitor the effect it has on the diagnostic use of BNP by ER physicians.

Methods: This research project would involve the generation and administration of an educational intervention, while the Department of Clinical Appropriateness monitors the magnitude of its impact. The educational intervention would be conducted at 'Journal Club', a regularly scheduled event by the ER physicians in which the aim of those attending is to become more up to date with recent and relevant literature. Their very presence at these events implies interest and consent to learn about best medical practice, for which literature surrounding BNP is relevant, and we will simply present at that time.

Primary endpoint: number of BNP tests ordered from the ER pre vs post education

Our data has been delayed by the Covid 19 outbreak but will be available by research day.

The expected results of this QI project is a reduction in the overall number of BNP ordered in the emergency department after our educational intervention.

Systematic Review of Evidence-Based Guidelines for Prehospital Care, Prehospital Emergency Care

Turner S, Lang E, Brown K, Franke J, Workun-Hill M, Jackson, C, **Roberts L,** Leyton C, Bulger E, Censullo E, Martin-Gill C.

Introduction: Multiple national organizations have identified a need to incorporate more evidence-based medicine in emergency medical services (EMS) through the creation of evidence-based guidelines (EBGs). Tools like the Appraisal of Guidelines for Research and Evaluation (AGREE) II and criteria outlined by the National Academy of Medicine (NAM) have established concrete recommendations for the development of high-quality guidelines. While many guidelines have been created that address topics within EMS medicine, neither the quantity nor quality of prehospital EBGs have been previously reported.

Objectives: To perform a systematic review to identify existing EBGs related to prehospital care and evaluate the quality of these guidelines using the AGREE II tool and criteria for clinical guidelines described by the NAM.

Methods: We performed a systematic search of the literature in MEDLINE, EMBASE, PubMed, Trip, and guidelines.gov, through September 2018. Guideline topics were categorized based on the 2019 Core Content of EMS Medicine. Two independent reviewers screened titles for relevance and then abstracts for essential guideline features. Included guidelines were appraised with the AGREE II tool across 6 domains by 3 independent reviewers and scores averaged. Two additional reviewers determined if each guideline reported the key elements of clinical practice guidelines recommended by the NAM via consensus.

Results: We identified 71 guidelines, of which 89% addressed clinical aspects of EMS medicine. Only 9 guidelines scored >75% across AGREE II domains and most (63%) scored between 50-75%. Domain 4 (Clarity of Presentation) had the highest (79.7%) and domain 5 (Applicability) had the lowest average score across EMS guidelines. Only 38% of EMS guidelines included a reporting of all criteria identified by the NAM for clinical practice guidelines, with elements of a systematic review of the literature most commonly missing.

Conclusions: EBGs exist addressing a variety of topics in EMS medicine. This systematic review and appraisal of EMS guidelines identified a wide range in the quality of these guidelines and variable reporting of key elements of clinical guidelines. Future guideline developers should consider established methodological and reporting recommendations to improve the quality of EMS guidelines.

A patient's fitness to drive: ***Assessing the Attitudes and Knowledge of Saskatchewan Emergency Physicians***

Bozdech T, Jensen J, Fettes J, Karreman E, Webster B

Introduction: It is mandatory to report all patients considered medically unfit to drive within Saskatchewan. Physicians may not feel comfortable performing this task for various reasons, such as not feeling confident in their ability to assess a patient's fitness to drive, lack of previous instruction to do so, or the potential impact reporting will have on the patient-physician relationship.

Methods: Our objective was to determine the attitudes and knowledge of Saskatchewan Emergency physicians in regard to the assessment and reporting of medically unfit drivers that present to the Emergency Department. A survey was distributed to all Emergency physicians in Regina and Saskatoon between March 16 and April 20, 2020. Information obtained included level of confidence and knowledge on reporting medically unfit drivers, as well as demographic data (i.e. location of employment, average hours worked in an Emergency Department, postgraduate training completed). Data obtained was then de-identified and stored within a password-protected database.

Expected Results: A total of 39 physicians responded to our survey, 30 from Regina and 9 from Saskatoon. We do not expect any disparities in the confidence level or understanding of responsibility to report medically unfit drivers between the two sites. We predict there may be a difference in confidence of reporting when comparing full time Emergency physicians to those in casual practice. We also predict there may be a knowledge gap in regard to mandatory reporting of specific medical conditions.

Conclusion: Saskatchewan Emergency physicians feel comfortable in assessing a patient's fitness to drive and reporting appropriately. Potential knowledge gaps can be addressed via online educational programs and easy access to applicable information within Saskatchewan Emergency Departments. Further research should be performed to assess other front-line healthcare workers (i.e. NP's, RN's, LPN's, GPs, other physician specialties) and their attitudes and knowledge around a patient's fitness to drive.

A multicenter analysis of the effect of Emergency Department boarding times on hospital length of stay for patients with psychiatric illness

Roberts L, Currie DL, Grimminck R, Lang E

Introduction: Patients with acute psychiatric problems are commonly admitted to the hospital through the Emergency Department (ED), where they may wait for extended periods until a suitable inpatient bed is available. Extended periods in the ED may exacerbate the psychiatric state of these vulnerable patients, increasing the time it takes to stabilize their acute problem. Therefore, this study sought to assess the effect of ED boarding time on hospital length of stay among patients with a primary psychiatric diagnosis.

Methods: ED clinical records were linked to inpatient administrative records for all patients with a primary psychiatric diagnosis admitted to a Calgary, Alberta hospital between April 2014 and March 2018. The primary exposure boarding time, defined as the time from admission decision to admission, and primary outcome was inpatient length of stay. Confounders for this relationship were selected a priori by Psychiatry and ED physicians, and from existing literature, then modelled using Hierarchical Bayesian Poisson regression.

Results: A total of 22,477 patients were included in this study, 19,212 (85%) with the primary outcome. The average boarding time for patients was 14 hours (range 0- 186 hours). Patients who were boarded for greater than 14 hours more frequently required a high observation bed (14% vs. 3.5%), received an antipsychotic (44% vs. 14%) or received sedation (55% vs. 33%) while in the ED. The probability that boarding time increased hospital length of stay was 0.92, with a median increase for a patient boarded for 24 hours of 0.01 days.

Conclusion: Boarding in the ED is associated with a high probability of increasing the hospital length of stay for psychiatric patients; however, the absolute increase is minimal. Although slight, this signal for longer length of stay may be a sign of increased morbidity for Psychiatric patients held in the ED.

Emergency Department Ultrasound Concordance with Consultative Imaging in Shock

Pradhan S, Kicia K, Dussault M, Olszynski P

Introduction: Emergency ultrasound (EUS) has become a mainstay of emergency care, with indications including both procedural and diagnostic applications[1]. We chose to assess EUS in shock-like cases to examine both image concordance and the impact EUS had on shock management. Previous similar chart reviews (as part of the continuous quality improvement process within the EUS program) showed a high concordance rate between EUS and consultative imaging.

Methods: This was a retrospective chart review. Using the electronic health record, we reviewed patients who visited Saskatoon emergency rooms from Jan-Nov 2019. We screened triage vital signs to identify patients presenting in shock like states. We reviewed 350 charts and identified 62 patients who met inclusion criteria.

Results: Of the 62 identified cases, 42 had consultative imaging leading to the identification of 1 false negative. Demonstrating a concordance rate of 97.6%. Abdominal (free fluid), lung and obstetrical exams were the most commonly performed ultrasounds. Based on group consensus, 32 (51.6%) patients had expedited care; 21(33.9%) patients' differential diagnosis was narrowed. The effect was unclear in 6 (9.7%) cases and did not impact care in 3 (4.8%) cases. With respect to cardiac ultrasound the most frequent scan was the subxiphoid view (27.4%). The more advanced views were not documented as frequently (parasternal long axis (9.7%); parasternal short axis (4.8%) and apical 4 chamber (6.5%)). Six patients had FoCUS performed of the 39 patients deemed potential candidates for it (15.4%).

Conclusion: Our retrospective chart review demonstrated a high concordance rate between EUS and consultative imaging. Focused cardiac EUS was less commonly used and is an area of further quality improvement to consider. Use of ultrasound in resuscitation is a growing field and as more users become certified/comfortable with scanning, patient care may be improved.

Choice and Perception: ***Factors Affecting Patient Decisions in Choosing an Urban Saskatchewan Emergency Department***

Beaton C, Kapur A, Lee B, Mikha S, Weiler C

Introduction: Patient choice factors when presenting to an emergency department (ED) affect the distribution of ED demand. This study was designed to determine what factors, from a patient's perspective, are most important when choosing an ED and how these can be used to change healthcare delivery.

Methods: A descriptive, cross-sectional 19-item survey of patients attending the 5 tertiary EDs in the province was conducted over two 4-week periods from July to August 2019 and February to March 2020. The survey was administered to a convenience sample of patients who presented to these EDs. Patients were invited to complete the survey in the ED waiting room. Data was collected using REDCap electronic data capture tools. Patients' had to be 18 years of age to complete the survey. Pediatric, elderly and patients with disabilities were also included in the study and had their surveys completed by their parent or guardian. Primary outcomes were the choice factors affecting patient decision to present to an ED.

Results:182 patients completed the survey at the 5 hospitals between Saskatoon and Regina. 83 (46.6%) of these patients indicated that they made the decision to present to an ED. The most common choice factors overall were previous hospital experience (75%), hospital proximity to home (41%), better care for specific complaint (39%), length of time in waiting room (39%), and hospital reputation (39%). Saskatoon patients were more likely to list hospital cleanliness (47%) as being important in their decision making compared with Regina patients (12%). The latter were more likely to rank relative/friend recommendation (46%) than Saskatoon (25%).

Conclusions: The quality of the experience patients perceive when visiting an ED is overall the most important factor they consider when choosing a location for subsequent visits. Further studies with a larger sample are required to change healthcare delivery.

Implementing Emergency Department Take-Home Naloxone*: A Systematic Scoping Review*

Koh JJ, O'Brien DC, Slater L, McLaughlin K, Hyshka E

Introduction: Distributing take-home naloxone (THN) kits from Emergency Departments (EDs) is an important strategy for preventing opioid overdose deaths. However, there is a lack of clear operational guidance for implementing ED-based THN programs. This scoping review aimed to 1) identify key strategies for THN distribution in EDs; and 2) develop a theory-informed implementation model that can optimize the effectiveness of ED-based THN programs.

Methods: We systematically searched health science databases through April 18, 2019. The search strategy combined terms representing the ED, naloxone, and take-home kits/bystander administration. Two reviewers independently screened the search results. We included all peer-reviewed articles that described THN distribution within EDs and used a standardized form for data extraction. Included studies were coded by two reviewers using the Consolidated Framework for Implementation Research (CFIR). A third reviewer with content expertise adjudicated disagreements in screening and coding.

Results: Database searching retrieved 717 records after duplicates were removed. 87 full-text studies were assessed for eligibility. Two studies were added through other sources. A total of 21 studies included in the final review, of which 14 studies evaluated existing ED-based THN programs. We synthesized themes that emerged within each CFIR domain and identified four implementation strategies: 1) develop ED policies on harm reduction; 2) collaborate with community and government partners to ensure programs meet patient needs; 3) address provider attitudes and knowledge gaps through training; and 4) establish guidelines to identify and engage at-risk patients to maximize THN acceptance.

Conclusions: ED-based THN programs must adapt to local community needs and available hospital resources. Innovative implementation strategies are needed to promote ED provider engagement, and reduce barriers to patient acceptance of THN in the ED. This scoping review highlights key implementation considerations that can guide EDs to establish new THN programs or refine pre-existing THN programs and maximize their effectiveness.

Identification of Potential Missed Diagnosis of Delirium in Elderly Emergency Department Patients

Hoffman L., Vander Ende, J., Hendin, A. Donald, B., Ellis, B.

Introduction: Delirium has been shown to be present in up to 10% of patients ≥65 years who attend the emergency department[1]. Missed diagnosis of delirium in the ED is associated with increased morbidity and mortality, increasing length of hospital stay and increased health care costs[2,3,4]. Despite this, the diagnosis of delirium is frequently missed in the ED. The goal of this project was to determine the rate of potential missed diagnoses of delirium in patients ≥65 who presented to one of the three Saskatoon EDs.

Methods: A retrospective chart review was conducted including ED charts: age ≥65 years, between 11/2019 and 01/2020, containing keywords shown to have significant positive predictive value for the diagnosis of delirium in an inpatient setting[3]. Two independent physicians determined if 1) delirium was present and 2) delirium was diagnosed by the bedside physician. Delirium diagnosis was present if the patient met criteria: an acute and fluctuating change in attention, awareness or cognition, and not explained by a pre-existing neurocognitive disorder. Discrepant results were reviewed by a third reviewer. Exclusion criteria included patients that were not assessed by an emergency physician (e.g. direct to another service,) charts where the keywords were not used in the correct context (e.g. AMS keyword because of 'exams' in chart) and if there was not enough information included to determine if delirium was present. The incidence of patients not diagnosed with delirium by the emergency physician when the reviewers agree that delirium was likely present were considered missed cases of delirium.

Results and Conclusion: The search resulted in 765 charts meeting search criteria: 218 were excluded for inappropriate key word use (110,) patient not assessed by an ED physician (95) and inadequate information to declare the presence of delirium (13). A total of 547 charts were included in the review: 233 were determined not to have delirium. The remaining 314 were felt to have delirium. Of these 57 were diagnosed by the ED physician and 257 were missed diagnosis. Statistical analysis and final conclusions are still outstanding. These results will be used in further research and policy development for dealing with delirium.