P062

The feasibility of pertussis immunization in a Canadian emergency department

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Introduction: Despite clear health benefits, and Public Health Agency of Canada recommendations, vaccination rates among Canadian adults are low. Frequent patient contacts, wait times, and the availability of trained staff make the emergency department (ED) a potential location to target specific populations and administer vaccinations. We evaluated the feasibility of two strategies to administer the Tdap vaccine to adult patients presenting to a single referral ED. **Methods:** Two immunization strategies and a control group were randomly ordered from one to three. Data collection for group one started on study day one with data collection for groups two and three on study days two and three respectively. This sequence was repeated over 15 consecutive weekdays (Monday-Friday, 0730-1530), evenly assigning each group to 5 different days. On intervention days, adult patients were screened during the triage process for eligibility to receive the Tdap vaccine. An ED based (EDB) strategy offered patients vaccination during that visit. The second strategy offered eligible patients a public health referral (PHR) to receive the vaccine at a later date. On all study days, patient triage times (TT), as well as markers of ED efficiency (number of patient registrations, time to physician, length of stay, left without being seen, number of admissions, number of boarded patients) were recorded. **Results:** The primary outcome, the proportion of eligible adults immunized, was significantly higher at 66% (n = 81) for the EDB strategy (228 screened, 122 eligible), compared with 21% (n = 20) for the PHR strategy (217 screened, 94 eligible; x2 (2, n = 216) = 43.41, $p < 0.00001$). In addition, 10 participants in the PHR group received a second vaccine (Pneumococcal (7), Influenza (2), Human Papillomavirus (1)). Reasons for vaccine ineligibility included having an up-to-date Tdap (EDB n = 47 (21%), PHR n = 46 (21%)) and being considered in too much distress by the triage nurse (EDB n = 26 (11%), PHR n = 19 (9%)). Triage time was less for the control group (M = 5:55 [mins:secs], SD = 2:48) than for the EDB (M = 6:47, SD = 3:12) and PHR (M = 7:25, SD = 2:45) strategies. **Conclusion:** An ED based screening and immunization strategy was highly effective in providing eligible adult patients with the Tdap vaccine. A resulting small increase in triage time was not clinically significant. Further studies are required to generalize these results.

Keywords: vaccination strategy, public health, emergency medicine

P063

Ultrasound-guided peripheral intravenous access in the emergency department: a randomized controlled trial comparing single and dual-operator technique

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Introduction: Ultrasound-guided intravenous (UGIV) insertion performed by nurses has been shown to be more effective than the blind approach for patients with difficult intravenous (IV) access in the emergency department (ED). While both the single-operator (SO) (where a single operator holds the IV and probe) and dual-operator (DO) (where a second operator holds the probe) techniques have been described, the DO is more resource-intensive, requiring a second operator to be present. The objective of this study is to compare the first-attempt cannulation success rates between a SO and DO technique in ED patients with predicted difficult access. **Methods:** We conducted a randomized controlled non-inferiority trial using a convenience sample of adult ED patients. Participating ED nurses received a one-hour UGIV training session including didactic and practical training on simulated arms. Patients were enrolled if they met any of three criteria for difficult access: (1) history of difficult access, (2) no visible or palpable veins, or (3) two failed blind attempts. Patients requiring active resuscitation, lack of suitable veins on US, or those unable to consent or comply with the procedure were excluded. Eligible patients were randomized to the SO or DO technique and a maximum of two UGIV attempts were allowed. The primary outcome was first-attempt success rate. Additional outcomes included overall success rate, number of attempts, time to successful cannulation, patient pain scores, operator ease of use scores, and complications 30 minutes after insertion. The chi-square test was used to compare success rates between groups and t-tests used for all other secondary outcomes. **Results:** 42 eligible patients have been approached for our study. 14 were excluded due to lack of visible veins on US or due to ongoing resuscitation. A total of 33 UGIV attempts were performed on 28 patients (17 in SO group, 16 in DO group). There was no statistically significant difference in first attempt success rates between the SO group of 76.5% (95% CI [50.1% to 93.2%]) and the DO group of 68.8% (95% CI [41.3% to 89%]) (p = 0.62). There were also no statistically significant differences between the SO and DO groups in time to cannulation (140 vs. 165 seconds, p = 0.36), patient preference on a 10-point scale (7.0 vs. 7.9, p = 0.49), patient pain score (6.3 vs. 6.6, p = 0.87) or nursing ease of use (5.3 vs. 6.5 p = 0.23) respectively. There were no complications noted in either arm of the study. **Conclusion:** To date, the SO technique appears to be non-inferior to the DO technique for successful UGIV cannulation. Our results support the use of the SO technique, reducing the need for additional nursing resources when performing this procedure.

Keywords: point-of-care ultrasound, intravenous access

P064

Characteristics of physical space that optimize clinical learning in the emergency department: implications for design

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Introduction: Over the last few decades, health care facility design has been studied to look at its effect on many patient-centred outcomes. However, limited data exists on the impact that specific physical features of a clinical space may have on learning and the educational experience. The aim of this study is to develop a set of characteristics which clinicians, clinical teachers and residents believe should be present in a clinical space to maximize trainees learning, using an emergency department (ED) as a context. **Methods:** A qualitative methodology used semi- structured interviews with a purposive sample of twelve attending physicians and residents who work in EDs of varying age and design at several sites of a quaternary university hospital. We explored their perceptions of the physical features in the clinical and learning environment that supported or impeded teaching and learning. The interviews were transcribed and thematically analyzed. **Results:** Preliminary results show that many physical characteristics of the clinical space are perceived to have an impact on trainees learning experience. A design with separation between clinician-learner dyads and the patients, with a visual access; shared clinical space among different health care professionals within a reasonable distance; availability of enough clinical space for specific emergency presentations; features such as adequate size, appropriate light, and control of sound were all perceived to enhance and augment clinical learning. Not surprisingly, non-design factors such as the presence of a functioning team and the availability of adequate equipment and

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technology was considered as important as the characteristics of physical space to optimize learning. **Conclusion:** This study demonstrates the importance and the impact of physical space design on trainees learning in a dynamic clinical environment. It provides teachers and policy-makers with a basis for developing criteria of the physical characteristics of a healthcare facility to maximize learning.
Keywords: clinical learning environment, emergency department, health care facility design

P065

Development and implementation of a postpartum hypertension recognition and management protocol for use in the emergency department.

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Introduction: Hypertensive disorders of pregnancy (HDP), including preeclampsia, can develop or worsen in the early postpartum period, often following discharge from hospital, resulting in severe preventable maternal morbidity and mortality. Due to a lack of routine early out-patient follow-up, many women with postpartum HDP present to the emergency department (ED) with severe hypertension or symptoms of preeclampsia (e.g., headache). In the ED, postpartum HDP can be difficult for clinicians to recognize (due to vague presenting symptom) and manage (due to lower blood pressure targets and concern of medication safety). ED clinicians recognized a need for timely recognition and effective treatments for postpartum HDP in the ED to improve maternal outcomes. As such, as part of a multi-step quality improvement initiative, an interdisciplinary team developed and implemented a postpartum HDP management protocol (consisting of nursing and physician protocols and an electronic order set embedded in the electronic medical record). The aims of this specific project were to assess: 1) the use of this clinical management protocol in the ED; and 2) its impacts on clinical care. **Methods:** This quality improvement project used electronic medical records to identify: 1) ED visits for postpartum HDP for postpartum women ages 20-50; 2) utilization of the postpartum HDP order set; and 3) clinical care outcomes (consultation and admission). Patient population characteristics and clinical care measures were summarized with descriptive statistics and compared using a before and after design. Changes in the utilization of the protocol were assessed using run charts. **Results:** 540 women with postpartum HDP were seen in the four Calgary EDs in the 16-month period following protocol implementation compared with 335 women in the preceding 12 months. The protocol was used in 46% of these 540 women, and increased over the 16 month follow-up period. We found an increase in the frequency of consultation of specialists (47% to 52%) and admissions (26% to 29%) amongst these women after protocol implementation. **Conclusion:** This initial assessment demonstrated good uptake of a postpartum HDP management protocol including referral for consultation and admission to hospital for blood pressure management. Future steps include evaluation of the impacts of this management protocol on important patient outcomes.
Keywords: quality improvement and patient safety, postpartum hypertension, preeclampsia

P066

Methotrexate in the management of suspected ectopic pregnancy

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Introduction: Early detection of ectopic pregnancy and careful management is critical to prevent adverse clinical outcomes, including fallopian tube rupture and future decreased fertility, in patients presenting to the ED with symptoms suggestive of ectopic pregnancy. Methotrexate therapy is widely accepted as a first line treatment of ectopic pregnancy, with success rates greater than 90% if used according to published guidelines. This study aims to determine the outcomes of pregnant women who presented to the ED with suspected ectopic pregnancy whom received methotrexate as first line treatment. **Methods:** This was a retrospective chart review of pregnant (<12 week gestational age) women from an academic tertiary care ED with a diagnosis of ectopic pregnancy, rule out ectopic pregnancy, or pregnancy of unknown location (PUL) over a 7 year period. **Results:** Of 612 included patients, 30 (4.9%) were diagnosed with a ruptured ectopic pregnancy at the index ED visit. Of the remaining 582 patients, 256 (44.0%) were diagnosed with an ectopic pregnancy at the index ED visit, the Early Pregnancy Clinic, or a subsequent ED visit. Of these patients diagnosed with ectopic pregnancy, their initial treatments at time of discharge from the index ED visit were as follows: 102 (39.8%%) received methotrexate, 132 (51.6%) underwent expectant management, and 22 (8.6%) underwent surgical management. Of the 132 patients discharged with an expectant management plan, only 42 (31.8%) had a final outcome of expectant management; the others went on to be treated surgically or with methotrexate. Of the 165 patients treated with methotrexate at index visit or in follow-up, 30 (18.2%) went on to require surgical management with 17 (10.3%) documented as having ruptured on surgical evaluation. Clinical characteristics of patients treated with methotrexate include the following: mean age 32.8 years (SD 5.7), gestational age of 6.2 weeks (SD 1.2) and serum beta human chorionic gonadotropin level of 2702 mIU/mL (SD 8800). **Conclusion:** The proportion of patients receiving methotrexate as first-line treatment that resulted in rupture or required further surgical management is higher than reported literature at this institution. Further investigation is needed to determine if there was a relationship between methotrexate failure and non-adherence to recommended guidelines. Given the risk of a possible rupture, patient education of these risks is critical on discharge from the ED.
Keywords: ectopic pregnancy, patient outcomes, emergency department

P067

Ectopic pregnancy outcomes in patients discharged from the emergency department

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Introduction: The objective of this study was to determine the proportion of women who had a ruptured ectopic pregnancy after being discharged from the ED where ectopic pregnancy had not yet been excluded. **Methods:** This was a retrospective chart review of pregnant (<12 week gestational age) women discharged home from an academic tertiary care ED with a diagnosis of ectopic pregnancy, rule out ectopic pregnancy, or pregnancy of unknown location (PUL) over a 7 year period. **Results:** Of the 550 included patients, 83 (15.1%) had a viable pregnancy, 94 (17.1%) had a spontaneous or missed abortion, 230 (41.8%) had an ectopic pregnancy, 72 (13.1%) had unknown outcomes and 71 (12.9%) had other outcomes which included therapeutic abortion, molar pregnancy or resolution of HCG with no location documented. Of the 230 ectopic pregnancies, 42 (7.6%) underwent expectant management, 131 (23.8%) were managed medically with

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