

LO24**The checklist for head injury management evaluation study (CHIMES): a cQI initiative to reduce imaging utilization for head injuries in the emergency department**

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Introduction: Over 1 million patients with head injuries (HIs) are seen every year at emergency departments (EDs) in North America, with over 90% being minor HIs. Over-utilization of computed tomography (CT) scans in these patients results in unnecessary exposure to radiation and increases health-care resource utilization. Using recommendations from the Choosing Wisely Campaign (CWC) and quality improvement (QI) methodology, we developed a local initiative targeting this issue. Our aim was to reduce the CT scan rate for patients presenting with HIs by 10% over a 6-month period at two academic EDs. This was considered both achievable and meaningful by our stakeholders. **Methods:** Baseline CT scan rates for patients with HIs were determined through a 10-month retrospective cohort review. We used stakeholder engagement and provider surveys to develop our driver diagram and PDSA cycles, which included: 1) Assessing and improving provider knowledge about the CWC recommendations; 2) Testing, refining and implementing a modified Canadian CT Head Rule checklist in the ED; 3) Developing and giving patients CWC-themed handouts pertaining to HI best practice; 4) Bimonthly reporting of CT scan rates to providers. Our primary outcome measure was the number of CT scans performed for patients with HIs. Process measures included the number of checklists completed and ED length of stay (LOS). Our balance measure was return ED visits within 72 hours. **Results:** Baseline rate of CT scans prior to our interventions was 47.9%. Our QI initiative resulted in a significant shift in the run chart of the weekly CT scan rates, associated with the second PDSA cycle cluster. We observed a 16% relative decrease in CT scans at 3 months (47.9% to 40.5%, $P=0.005$) and 10.4% at 8 months (47.9% to 43.1%, $P=0.02$). Non-sustained trends and shifts were seen in the run chart of median ED LOS for HI patients, but overall before-and-after median times were not significantly different (237min to 225min, $P=0.18$). 33% of total checklists were completed. 72-hr return visits did not change during the 8-month study period (4.0% to 4.16%, $P=0.85$). **Conclusion:** Our local QI initiative was successful in decreasing CT rates for patients presenting with a HI. The decrease in effect at 8 months suggests the need for continued feedback and reminders to ensure long-term sustainability. Other centres could use similar QI methods, as well as the materials we developed, to achieve similar results of improved evidence-based utilization of diagnostic tests.

Keywords: quality improvement and patient safety, Choosing Wisely campaign, emergency department

LO25**The development and implementation of a standardized emergency department handover tool**

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Introduction: There is a high risk for communication breakdown, discontinuity of clinical care, and medical errors during ED physician handover. Locally, there is no standardized handover process to ensure adequate communication of critical information. Our aim was to use a

locally developed handover tool to increase frequency of adequate physician handover during overnight shift change by 50% in 4 months. **Methods:** Using published best practices, local observational data, and stakeholder input, we determined critical components of ED handovers. We developed a structured communication tool for two unique populations in our ED: ED-VITAL for patients receiving active ED care; ED-VSA for patients who are admitted/referred. Strategies used to implement the tool included: engagement of staff physicians to introduce & modify the tool; formal education and training to ED residents; and provision of cognitive aids. A QI coordinator conducted direct observations of handovers using convenience sampling. We provided feedback to staff and resident physicians, and used their input to continuously modify the tool. The main outcome measure was adequate patient handover, defined as verbal communication of 50% of critical handover components, or documentation of key information on an electronic note. Process measures included tool utilization characteristics. Balance measures included time metrics such as hand-over duration. We present run charts and qualitative statistics. **Results:** We assessed 368 individual patient handovers (93 pre- & 275 post-implementation). The median proportion of patients in active ED care who were verbally handed over increased from 75% to 100%. The median proportion of adequate handovers improved from 50% to 72%. The time to deliver handover increased by 13 seconds per patient. Qualitative feedback from end users was positive overall, particularly for communication quality and resident educational value. **Conclusion:** Use of a standardized handover tool improved both verbal and documented communication during shift change. A customized approach, sensitive to local context, was important to successful implementation. Residents play a large role in handovers; strategies to improve handover processes that emphasize medical education appear to enhance success. Future PDSA cycles will focus on interventions to further enhance the utilization of the tool, and to measure direct impact on clinical outcomes.

Keywords: quality improvement and patient safety, handovers

LO26**Reduction of CT scan use in emergency department patients with recurrent renal colic**

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Introduction: CT scan is the most common imaging modality for suspected renal colic and is used for about 80% of presentations. Cumulative ionizing radiation exposure from repeat CT scans increases long-term cancer risk. Despite a 10-fold increase in CT use to detect kidney stones in the ED in just over a decade, there has been no increase in the proportion of kidney stones diagnosed, number of significant alternate diagnoses or admissions to hospital. Choosing Wisely recommends to avoid ordering CT of the abdomen/pelvis in otherwise healthy patients < age 50 presenting to the ED with known history of kidney stones and with symptoms consistent with uncomplicated renal colic. The aim is that >90% of patients < age 50 with a history of renal stones arriving in Sunnybrook ED with symptoms consistent with renal colic will be managed without a CT abdomen/pelvis. **Methods:** Emergency physicians were engaged in the process at various stages, including a brainstorming session to perform a root cause analysis. A Driver diagram was created to generate change ideas. Outcome Measure Number of CT scans ordered for target population (Results: Results to date indicate that there is a non-sustained decrease in the number of CT scans performed on ED patients < age 50 with recurrent renal colic. The STONE score was infrequently used, thus making it

difficult to standardize CT ordering for presumed renal colic. **Conclusion:** As a result of this QI initiative, there is awareness amongst emergency physicians of a patient population that is over imaged with CT scan, often with no change in management. Introduction of a low dose CT scan order was the greatest gain from this QI initiative. In order to decrease CT utilization, physicians need to be shown the lack of benefit of CT use and a safe alternative diagnostic approach.

Keywords: quality improvement and patient safety, renal colic, computerized tomography

LO27

Improving emergency department management of acute opioid withdrawal

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Introduction: With the current opioid crisis in Canada, presentations of acute opioid withdrawal (AOW) to emergency departments (ED) are increasing. Undertreated symptoms may result in relapse, overdose and death. Buprenorphine/naloxone (bup/nal) is a partial opioid agonist/antagonist used to mitigate symptoms of AOW, approved by Health Canada in 2007 for opioid use disorder. It is superior to clonidine, and increases follow up with addiction treatment programs when initiated in the ED. Nevertheless, in our inner-city ED in 2014, bup/nal was rarely prescribed. We aimed to increase ED physician prescribing of bup/nal for AOW by 50% over a 26-month period. **Methods:** Commencing in 2014, an interprofessional team of ED physicians, nurses (RN), pharmacists and QI specialists collaborated to improve the care of patients with AOW. PDSA cycles included: (1) needs assessment of emergency physicians knowledge and practices in 2014; (2) Grand Rounds and a web based information sheet in 2015; (3) ED stocking of bup/nal; (4) convenience order set to standardize AOW management; (5) Grand Rounds in 2016 and (6) peer-coaching for RNs, including case-based discussions and pocket card cognitive aids. The outcome was the number of times bup/nal was prescribed per month by ED physicians between Sept, 2015 and Oct, 2017. Data included the prescriber and use of order set as the process measure. The balancing measure was the number of patients referred to the Addiction Medicine Team who subsequently received bup/nal. **Results:** Bup/nal was prescribed by ED physicians 70 times, and 14 times by the Addiction Medicine Team. With each PDSA cycle, there was an increase in prescribing, with no significant shifts or trends. By all physicians, the median number of prescriptions per month was 3, and increased from 2 to 4 prescriptions/month after nursing education. There was a smaller increase in the median from 2 to 3 prescriptions/month by ED physicians alone. The order set was used 97% of the time. **Conclusion:** Bup/nal is safe, effective, and increases follow up with addiction programs for comprehensive assessment and treatment planning. We met our goal of increasing bup/nal prescribing in the ED for AOW by 50%. Moreover, prescribing increased by 100% with the addition of patients who received bup/nal after a referral to the Addiction Medicine Team. The intervention with the greatest impact was RN education, demonstrating that peer-coaching and teaching by an interprofessional team is key to changing practice. Unfortunately, overall prescribing remains low, and ED physicians may still be hesitant to prescribe bup/nal and defer to the specialists. It is unclear if this is due to a low number of patients presenting with AOW, patients with contraindications to bup/nal, or ED physician factors. The next step is an audit of all patients with

AOW to see what percentage of those eligible are treated with bup/nal. A follow up survey to determine ongoing barriers will inform further PDSA cycles.

Keywords: quality improvement and patient safety, acute opioid withdrawal, buprenorphine/naloxone

LO28

Utilité diagnostique des D-dimères pour le diagnostic du syndrome aortique aigu: une revue systématique et méta-analyse

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Introduction: Le syndrome aortique aigu (SAA) est une condition potentiellement létale et nécessitant une prise en charge immédiate et fréquemment chirurgicale. L'utilisation d'un test de D-dimère a été proposé afin d'exclure ce diagnostic suite à de nombreuses études récentes sur le sujet. Dans ce contexte, l'objectif de la présente revue systématique et méta-analyse était d'évaluer et de synthétiser l'évidence disponible quant à la valeur diagnostique d'un dosage de D-dimères pour le SAA. **Methods:** Les bases de données Medline, Cochrane, ACP Journal Club, DARE, Health technology assessment, NHS Economic evaluation et Embase ont été fouillées en utilisant les mots clés «D-Dimers» et «Acute aortic». Les bibliographies des articles retenus ont également été consultées. Les résultats des études incluses ont été regroupés pour calculer la sensibilité, la spécificité, le rapport de vraisemblance positif (RV+) et négatif (LR-) du test de D-dimères aux seuils choisis par les auteurs. Les sensibilités et spécificités sont présentées avec leurs intervalles de confiance (IC) à 95% et les RV+ et RV- sont donnés à titre indicatif. **Results:** À partir des 6942 articles initialement identifiés, 34 études portant sur l'utilité diagnostique des D-dimères en SAA, incluant un total de 7938 patients, ont été retenues. La prévalence globale de SAA était de 27,1%, mais variait considérablement d'une étude à l'autre (médiane = 38,5%; intervalle interquartile = 29%; prévalence minimale = 0,7% ; prévalence maximale = 100%). Les seuils de positivité des tests de D-dimères variaient également selon l'entreprise les fabriquant. La sensibilité d'un test de D-dimères selon le seuil proposé par leur fabriquant était de 91% (IC 95% 86-96) et la spécificité 46% (IC 95% 39-54). Le RV+ était de 1,69 et le VR- était de 0,2. **Conclusion:** La prévalence très variable du SAA dans la population regroupée par ces études laisse présager une différence entre ces populations et celles rencontrées en médecine d'urgence. Un test de D-dimères a une sensibilité acceptable, mais imparfaite, qui ne semble pas permettre d'exclure une pathologie aussi grave que le SAA.

Keywords: syndrome aortique aigu, D-dimère, revue systématique et méta-analyse

LO29

Création d'une règle de décision clinique pour le diagnostic d'un syndrome aortique aigu avec les outils d'intelligence artificielle: phase initiale de définition des attributs communs aux patients sans syndrome aortique aigu chez une population à risque

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Introduction: Les outils de prédiction disponibles (score clinique, ratio des neutrophiles sur lymphocytes et dosage des D-dimères) dans le diagnostic du syndrome aortique aigu (SAA) demeurent imparfaits. Dans ce contexte, avec l'objectif de développer une règle de décision