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Interrater agreement and time it takes to assign a Canadian Triage and Acuity Scale score in 7 emergency departments

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Introduction: The Canadian Triage and Acuity Scale (CTAS) is the standard used in all Canadian (and many international) emergency departments (EDs) for establishing the priority by which patients should be assessed. In addition to its clinical utility, CTAS has become an important administrative metric used by governments to estimate patient care requirements, ED funding and workload models. Despite its importance, the process by which CTAS scores are derived is highly variable. Emphasis on ED wait times has also drawn attention to the length of time the triage process takes. The primary objective of this study was to determine the interrater agreement of CTAS in current clinical practice. The secondary objective was to determine the time it takes to triage in a variety of ED settings. **Methods:** This was a prospective, observational study conducted in 7 hospital EDs, selected to represent a mix of triage processes (electronic vs. manual), documentation practices (electronic vs. paper), hospital types (rural, community and teaching) and patient volumes (annual ED census ranged from 38,000 to 136,000). An expert CTAS auditor observed on-duty triage nurses in the ED and assigned independent CTAS in real time. Research assistants not involved in the triage process independently recorded the triage time. Interrater agreement was estimated using unweighted and quadratic-weighted kappa statistics with 95% confidence intervals (CIs). **Results:** 738 consecutive patient CTAS assessments were audited over 21 seven-hour triage shifts. Exact modal agreement was achieved for 554 (75.0%) patients. Using the auditor's CTAS score as the reference standard, on-duty triage nurses over-triaged 89 (12.1%) and under-triaged 95 (12.9%) patients. Interrater agreement was "good" with an unweighted kappa of 0.63 (95% CI: 0.58, 0.67) and quadratic-weighted kappa of 0.79 (95% CI: 0.67, 0.90). Research assistants captured triage time for 3808 patients over 69 shifts at 7 different EDs. Median (IQR) triage time was 5.2 (3.8, 7.3) minutes and ranged from 3.9 (3.1, 4.8) minutes to 7.5 (5.8, 10.8) minutes. **Conclusion:** Variability in the accuracy, and length of time taken to perform CTAS assessments suggest that a standardized approach to performing CTAS assessments would improve both clinical decision making, and administrative data accuracy.

Keywords: triage, interrater agreement, reliability

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Emergency department procedural sedation in elderly patients

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Introduction: The use of procedural sedation and analgesia (PSA) for the performance of Emergency Department (ED) procedures has been reported to be safe and effective. However, few studies have evaluated the safety of PSA in the elderly, with conflicting results. Our primary objective was to determine if elderly patients undergoing PSA for the management of an orthopedic injury had an increased risk of adverse events (AEs) during the procedure. **Methods:** This retrospective review of prospectively recorded data between 2006 and 2016 included patients aged ≥ 16 years undergoing PSA at a single institution to facilitate treatment of a fracture or dislocation. Patients were separated into 3 age groups for analysis: young (18-40), middle-aged (41-64) and elderly (≥ 65). Elderly patients were divided into 3 subgroups. The primary AEs

studied include hypoxia ($S_pO_2 < 90$ %) and hypotension (systolic blood pressure <100 mmHg, or >15% reduction from baseline if initial <100 mmHg). Logistic regression (LR) models tested for associations between age and outcome measurements. Effect sizes were described as odds ratios (OR) and 95% confidence intervals. **Results:** 4171 patients were studied, including 1125 patients ≥ 65 years of age. More than 90% of the time, propofol was used as a single agent sedative. Fentanyl was given as an analgesic adjunct in 88% of patients. Medication dosing declined as patients aged. In the young group, the average total propofol dose was 2.34 mg/kg compared to 1.42 mg/kg in the elderly (≥ 85 years subgroup: 1.07 mg/kg). Despite this, hypoxia was more likely to occur in elderly patients (2.3%) compared to younger patients (0.4%). LR models demonstrated that hypoxia was more likely to occur in: the elderly [OR 4.29 (1.58,11.70)], patients with an ASA classification score of 3 or higher [OR 4.71 (1.89,11.70)], and higher dosing of fentanyl in the elderly [OR 2.35 (1.21,4.57)]. Oral or nasal airway, assisted ventilation, and suctioning were required in less than 1% of all patients. Endotracheal intubation was never required. Hypotension was more likely in elderly patients (11.6%) than younger patients (8.3%). **Conclusion:** When performing PSA, clinicians should be aware of the increased risk of AEs in the elderly, particularly hypoxia, and modify selection, dosing, and administration of the PSA medication(s) appropriately. Future study should examine the intermediate and long-term outcomes of elderly patients following ED PSA.

Keywords: procedural sedation, geriatric, fracture

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Compliance of older emergency department patients to community-based specialized geriatric services

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Introduction: The Geriatric Emergency Management (GEM) model has been developed to facilitate identification of older patients that are at higher risk of functional decline, repeat Emergency Department (ED) visits and future hospitalization. Those identified at risk, are referred for more in-depth evaluation and management in community-based specialized geriatric services. Our objective was to: 1) determine the compliance rate to outpatient evaluation following ED recommendation; and 2) identify barriers and facilitators to attendance. **Methods:** We conducted a prospective cohort study at two sites of an academic, tertiary level hospital ED between July and December 2016. We enrolled a convenience sample of ED patients, 65 years and older who were seen by a GEM nurse, referred to outpatient specialized geriatric services and consented to study participation. The GEM nurses conducted targeted geriatric assessments, identifying those who would benefit from further community management. We conducted a chart review and a structured telephone follow-up at 6 weeks. Descriptive statistics were used. **Results:** A total of 101 patients were prospectively enrolled, with 30.4% of eligible participants declining outpatient referral. Enrolled subjects had a mean age of 83.3 years, 58.4% female and 62.0% cognitively impaired. Reasons for referral to specialized geriatric services included: mobility (86.1%), cognition (57.4%), pain (38.6%), mood (34.7%), medication management (33.6%) and nutrition (30.7%). Outpatient referrals were to: geriatric day hospital (51.5%), geriatric outreach (22.7%), falls clinic (11.8%) and geriatric psychiatry (9.9%). Compliance with follow-up within 6 weeks was 64.4%. Barriers to attendance included: patient did not feel specialized geriatric services was needed (52.6%); admitted to hospital (10.5%); reported not called for appointment (15.8%); forgot appointment (5.3%) and transportation (5.3%). Family support with scheduling and transportation to