

**Introduction:** Patients with concussion frequently present to the emergency department (ED). Studies of athletes and children indicate that concussion symptoms are often more severe and prolonged in females compared with males. To-date, study of sex-based concussion differences in general adult populations have been limited. This study examined sex-based differences in concussion outcomes. **Methods:** Adult (>17 years) patients presenting to one of three urban EDs in Edmonton, Alberta with Glasgow coma scale score 13 within 72 hours of a concussive event were recruited by on-site research assistants. Follow-up calls at 30 and 90 days post ED discharge captured extent of PCS using the Rivermead Post-Concussion questionnaire (RPQ), effect on daily living activities measured by the Rivermead Head Injury Questionnaire (RHIQ), and overall health-related quality of life using the 12-item Short Form Health Survey (SF-12). Dichotomous and categorical variables were compared using Fishers exact test; continuous variables were compared using t-tests or Mann-Whitney tests, as appropriate. **Results:** Overall, 130/250 enrolled patients were female. The median age was 35 years; men trended towards being younger (median = 32 years; IQR: 23, 45) than women (median = 40 years; IQR: 22, 52). Compared to women, more men were single (56% vs. 38% (p=0.007) and employed (82% vs. 71% (p=0.055). Men and women experienced different injury mechanisms (p=0.007) with more women reporting injury due to a fall (44% vs. 26%), while more men were injured at work (16% vs. 7%) or due to an assault (11% vs. 3%). Men had a higher return to ED rate (13% vs. 5%; p=0.015). Women had higher RPQ scores at baseline (p<0.001) and 30-day follow-up (p=0.001); this difference was not significant by 90 days (p=0.099). While women reported on the RHIQ at 30 days that their injury affected their usual activities significantly more than men (Median = 5, IQR: 0, 11 vs. median = 0.5, IQR: 0.5, 7; p=0.004), both groups had similar scores on the SF-12 physical composite and mental composite scales at all three measurement points. **Conclusion:** In a general ED concussion population, demographic differences exist between men and women. Based on self-reported and objective outcomes, womens usual activities may be more affected by concussion and PCS than men. Further analysis of these differences is required in order to identify different treatment options and ensure adequate care and treatment of injury.

**Keywords:** concussion, sex-based differences, injury

#### LO47

##### **Incidence of intracranial bleeding in anticoagulated emergency patients with minor head injury: a meta-analysis**

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**Introduction:** The proportion of Canadians receiving anticoagulation medication is increasing. Falls in the elderly are the most common cause of minor head injury and an increasing proportion of these patients are prescribed anticoagulation. Emergency department (ED) guidelines advise performing a CT head scan for all anticoagulated head injured patients, but the risk of intracranial hemorrhage (ICH) after a minor head injury (patients who have a Glasgow coma score (GSC) of 15) is unclear. We conducted a systematic review and meta-analysis to determine the point incidence of ICH in anticoagulated ED patients presenting with a minor head injury. **Methods:** We systematically searched Pubmed, EMBASE, Cochrane database, DARE, google scholar and conference abstracts (May 2017). Experts were contacted. Meta-Analyses and Systematic Reviews of Observational Studies (MOOSE) guidelines were followed with two authors reviewing titles,

four authors reviewing full text and four authors performing data extraction. We included all prospective studies recruiting consecutive anticoagulated ED patients presenting with a head injury. We obtained additional data from the authors of the included studies on the subset of GCS 15 patients. We performed a meta-analysis to estimate the point incidence of ICH among patients with a GCS score of 15 using a random effects model. **Results:** A total of five studies (and 4,080 GCS 15, anticoagulated patients) from the Netherlands, Italy, France, USA and UK were included in the analysis. One study contributed 2,871 patients. Direct oral anticoagulants were prescribed in only 60 (1.5%) patients. There was significant heterogeneity between studies with regards to mechanism of injury, CT scanning and follow up method (I<sup>2</sup> = 93%). The random effects pooled incidence of ICH was 8.9% (95% CI 5.0-13.8%). **Conclusion:** We found little data to reflect contemporary anticoagulant prescribing practice. Around 9% of warfarinized patients with a minor head injury develop ICH. Future studies should evaluate the safety of selective CT head scanning in this population.

**Keywords:** head injury, computed tomography scan, anticoagulation

#### LO48

##### **Does FAST change management of blunt trauma patients?**

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**Introduction:** Despite widespread use of FAST in trauma, there is a lack of data supporting its usefulness. We sought to identify the impact of FAST on clinical management of blunt trauma patients. **Methods:** This health records review was conducted at a single large academic Level 1 trauma center emergency department. Patients with a suspicion of acute blunt traumatic abdominal injury were identified from our health records database. Data were collected regarding FAST utilization, CT scan utilization and timing, need for definitive management, disposition, and length of stay (LOS). **Results:** 285 patients were included, 152 (53.3%) received a FAST examination, with 33 (22%) having a direct impact on clinical management. CT was performed in 112 (73.6%) of the FAST group, with mean time to imaging of 147.4 minutes, time to trauma team assessment of 21.5 minutes, and ED-LOS of 8.6 hours. In the non-FAST group, 33 (24.8%) received a CT, with time to imaging of 133 minutes, time to trauma team assessment of 133 minutes, and ED-LOS of 13.8 hours. 75.6% of the FAST group required admission and 9.2% required definitive management; admission was needed for 38.3% of the non-FAST group and 2.2% required definitive management. **Conclusion:** This is the first study to assess patient outcomes with respect to FAST in the era of early whole body CT in trauma. Although FAST does not directly impact care for the majority of blunt trauma patients, it demonstrates usefulness in some patients by directing CT utilization and expediting disposition from the ED.

**Keywords:** focused assessment with sonography for trauma (FAST), blunt abdominal trauma, point of care ultrasound

#### LO49

##### **Achieving just outcomes: forensic evidence collection in sexual assault cases**

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**Introduction:** Achieving just outcomes in sexual assault cases is one of the most serious and complex problems facing the health care and justice systems. The objectives of this analysis were to determine the

prevalence and correlates of Sexual Assault Evidence Kit (SAEK) completion and release to police among sexual assault cases presenting at the hospital emergency department. **Methods:** Data for this cross-sectional study come from the Sexual Assault and Partner Abuse Care Program (SAPACP) case registry (Jan1-Dec31, 2015) at The Ottawa Hospital, a unique medical-forensic access point and the only facility offering SAEK collection in Ottawa. Bivariable and multivariable logistic regression models were conducted using odds ratios (OR), adjusted ORs, and 95% confidence intervals (CI). **Results:** In 2015 406 patients were seen by the SAPACP and 202 (77.10%) were eligible for a SAEK. Among eligible cases, 129 (63.86%) completed a SAEK and only 60 (29.70%) released the SAEK to police for investigation. Youth cases below 24 years of age (AOR:2.23, 95% CI: 1.18-4.23) and presenting within 24h (AOR:0.93-3.40) were the strongest independent factors contributing to SAEK completion. Cases who were uncertain of the assailant (AOR:3.62, 95% CI:1.23-10.67) and assaults that occurred outdoors (AOR:3.14, 95% CI:1.08-9.09) were the cases most likely to release the SAEK to police. **Conclusion:** Our study has shown high attrition levels along the continuum of care and justice for sexual assault case. Even with access to specialized forensic evidence collection, many do not complete a SAEK and even fewer release the evidence to police for legal investigation.

**Keywords:** sexual assault, forensics

#### LO50

##### **Necrotizing soft tissue infection: diagnostic accuracy of physical examination, imaging and LRINEC score a systematic review and meta-analysis**

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**Introduction:** Necrotizing soft tissue infection (NSTI), a potentially life-threatening diagnosis, is often not immediately recognized by clinicians. Delays in diagnosis are associated with increased morbidity and mortality. We sought to summarize and compare the accuracy of physical exam, imaging, and Laboratory Risk Indicator of Necrotizing Fasciitis (LRINEC) Score used to confirm suspected NSTI in adult patients with skin and soft tissue infections. **Methods:** We searched Medline, Embase and 4 other databases from inception through November 2017. We included only English studies (randomized controlled trials, cohort and case-control studies) that reported the diagnostic accuracy of testing or LRINEC Score. Outcome was NSTI confirmed by surgery or histopathology. Two reviewers independently screened studies and extracted data. We assessed risk of bias using the Quality Assessment of Diagnostic Accuracy Studies 2 criteria. Diagnostic accuracy summary estimates were obtained from the Hierarchical Summary Receiver Operating Characteristic model. **Results:** We included 21 studies (n = 6,044) in the meta-analysis. Of physical exam signs, pooled sensitivity and specificity for fever (49.4% [95% CI: 41.4-57.5], 78.0% [95% CI: 52.2-92.0]), hemorrhagic bullae (30.8% [95% CI: 16.2-50.6], 94.2% [95% CI: 82.9-98.2]) and hypotension (20.8% [95% CI: 7.7-45.2], 97.9% [95% CI: 89.1-99.6]) were generated. Computed tomography (CT) had 88.5% [95% CI: 55.5-97.9] sensitivity and 93.3% [95% CI: 80.8-97.9] specificity, while plain radiography had 48.9% [95% CI: 24.9-73.4] sensitivity and 94.0% [95% CI: 63.8-99.3] specificity. Finally, LRINEC 6 (traditional threshold) had 67.5% [95% CI: 48.3-82.3] sensitivity and 86.7% [95% CI: 77.6-92.5] specificity, while a LRINEC 8 had 94.9% [95% CI: 89.4-97.6] specificity but 40.8% [95% CI: 28.6-54.2] sensitivity. **Conclusion:** The absence of any one physical exam feature (e.g. fever or hypotension) is not sufficient to rule-out NSTI. CT is superior to plain radiography. The LRINEC Score had poor sensitivity,

suggesting that a low score is not sufficient to rule-out NSTI. For patients with suspected NSTI, further evaluation is warranted. While no single test is sensitive, patients with high-risk features should receive early surgical consultation for definitive diagnosis and management.

**Keywords:** necrotizing soft tissue infection, computed tomography, laboratory risk indicator for necrotizing fasciitis

#### LO51

##### **Increased mortality and costs in emergency department sepsis patients with delayed intensive care unit admission**

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**Introduction:** Sepsis remains a major cause of mortality. In the Emergency Department (ED), rapid identification and management of sepsis have been associated with improved outcomes. Following ED assessment, patients with infection may be directly admitted to the Intensive Care Unit (ICU), or alternatively admitted to hospital wards or sent home, with risk of future deterioration necessitating ICU admission. Little is known regarding outcomes and costs of ICU sepsis patients who are initially admitted to a ward or discharged home (delayed ICU admission), as compared to those with direct ICU admission from the ED. **Methods:** We analyzed a prospectively collected registry (2011-2014) of patients admitted to the ICU with a diagnosis of sepsis at two academic hospitals. We included all adult patients with an index ED visit within 72 hours of ICU admission. Patients were categorized into 3 groups: 1) Admitted directly to ICU; 2) Admitted to wards, with ICU admission within 72 hours; and 3) Sent home, with ICU admission within 72 hours. ICU length of stay (LOS) and total costs (both direct and indirect) were recorded. The primary outcome, in-hospital mortality, was analyzed using a multivariable logistic regression model, controlling for confounding variables (including patient sex, comorbidities, and illness severity). **Results:** 657 ICU patients were included. Of these, 338 (51.4%) were admitted directly from ED to ICU, 246 (37.4%) were initially admitted to the wards, and 73 (11.1%) were initially sent home. In-hospital mortality was lowest amongst patients admitted directly to the ICU (29.5%), as compared to patients admitted to ICU from wards (42.7%), or home (61.6%). Delayed ICU admission was associated with increased odds of mortality (adjusted odds ratio 1.85 [1.24-2.76], P<0.01) and increased median ICU LOS (11 days vs. 4 days, P<0.001). Median total costs were lowest among patients directly admitted to the ICU (\$19,924, [Interquartile range [IQR], 10,333-32,387]), as compared to those admitted from wards (\$72,155 [IQR, \$42,771-122,749]) and those initially sent home (\$45,121 [IQR, \$19,930-86,843]). **Conclusion:** Only half of ED sepsis patients ultimately requiring ICU admission within 72 hours of ED arrival are directly admitted to the ICU. Delayed ICU admission is associated with higher mortality, LOS, and costs.

**Keywords:** sepsis, shock, critical care

#### LO52

##### **Predictors of oral antibiotic treatment failure for non-purulent skin and soft tissue infections in the emergency department**

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