

**Conclusion:** Bedside ocular ultrasound provides assessment of intracranial pressures, and guides the treating clinician with a tool to determine what patients are at risk for poor outcomes and provide further management. In future studies, we would like to evaluate the pediatric population with head trauma, as ocular ultrasound could spare the patients from exposure to radiation's cumulative ionizing effects that occur with traditional imaging modalities.

#### 756 Tricuspid Annular Plane of Systolic Excursion for the Assessment of Acute Pulmonary Embolism

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**Objective:** Acute pulmonary embolism (aPE) is a fatal condition that can lead to death if not quickly identified. The gold standard for the evaluation of aPE includes a Computed Tomography scan of the Pulmonary Arteries (CTPA). Despite the accuracy of CTPA, many patients are unable to undergo this test due to renal disease, pregnancy, or risk of radiation. Ultrasonography has shown some promise in obtaining the tricuspid annular plane systolic excursion (TAPSE) measurements to help diagnose patients with aPE. Our goal is to assess if TAPSE measurements are an effective mechanism in assessing patients with a suspicion of aPE.

**Methods:** We prospectively enrolled patients who presented to the Emergency Department with a clinical suspicion of aPE. Each patient underwent a point of care ultrasound (POCUS) to obtain a TAPSE measurement, followed by a CTPA scan. This study consists of a comparative analysis of three cohorts of patients based on the results from CTPA scan. The three groups consisted of patients with no PE, clinically insignificant PE, and clinically significant PE.

**Results:** A total of 87 patients were enrolled in this study. Of these patients, 12 were found to have clinically significant aPE, 10 were found to have clinically insignificant PE, and 65 were found to not have a PE. Of the patients with clinically significant aPE, 58.3% were found to have TAPSE value less than 16mm. Comparatively, of the patients with clinically insignificant PE or no PE, only 10% and 3% of patients were found to have TAPSE values less than 16mm respectively. The average TAPSE values for patients with clinically significant aPE (15.2 mm) was significantly different when compared to the clinically insignificant aPE (22.2 mm) and no aPE (22.8 mm) groups.

**Conclusion:** There was no significant difference in TAPSE measurements between the no PE and clinically insignificant PE, however a significant difference exists between all three groups. This data suggests that emergency physicians can use POCUS to aid in the diagnosis of patients with aPE through TAPSE measurements.

#### 757 Can Ultrasound Identify Traumatic Knee Arthrotomy in a Cadaveric Model?

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**Background:** Traumatic arthrotomy of the knee (TAK) involves the violation of the knee capsule. TAK differs from simple lacerations in that they require operative irrigation and debridement to prevent septic arthritis and related morbidity. Currently, the diagnostic test of choice in the Emergency Department is the saline load test (SLT). SLT has a wide range of reported sensitivities, 34%-99%, with increasing volume of fluid instilled yielding better results. Computed tomography has been investigated as an alternative test using intra-articular air as a diagnostic marker of TAK. Ultrasound can identify air in various tissues given its highly reflective and echogenic nature. It also lacks ionizing radiation and can be utilized in a much more expeditious fashion when compared to computed tomography. We sought to determine the sensitivity and specificity of ultrasound for detecting intra-articular air in knee joints using a cadaver model.

**Methods:** Soft embalmed cadavers were utilized. The knees were block randomized (www.randomizer.org) to either having 1 milliliter of air injected into capsule or sham skin injection. Ultrasound was then used to confirm that the air was injected into the articular space. Two expert emergency physicians who were blinded to randomization scanned the knees with a high frequency linear transducer and were asked to give an interpretation. Two-by-two tables were used to calculate the sensitivity and specificity.

**Results:** Eighteen unique knees were scanned. None of the cadaver knees had prior dissection or intervention. Ten knees were randomized to be injected with air. The sensitivity was 0.65 (95% CI, 0.41-0.84) and specificity was 0.75 (95% CI, 0.47-0.92). The average time taken was 143 seconds.

**Conclusion:** Ultrasound appears to have utility in evaluation of the knee joint for intra-articular air, which has previously been shown to be a reliable indicator of traumatic arthrotomy of the joint space. There were several limitations. Some knees had effusions with echogenic material present which could have led to false positive results. It is also unknown how much intra-articular air is typical of TAK, 1 milliliter was used based on previous work with computed tomography. It is likely that larger injuries would lead to more air and be easier to identify. The use of ultrasound in the evaluation of TAK warrants further study.

#### 759 Prevalence of Guideline-Discordant Use of Lidocaine as a First-Line Agent in the United States Prehospital Treatment of Stable Monomorphic Ventricular Tachycardia

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**Background:** Pharmacological treatments for the termination of stable monomorphic ventricular tachycardia (VT) differ significantly in effectiveness: procainamide, 57%-80%; amiodarone, 24%-38%; and lidocaine, 13%-35%. The 2010/2015 American Heart Association (AHA) guideline recommends procainamide as its leading VT-directed agent, except in patients with QTc interval prolongation or congestive heart failure, where amiodarone becomes the drug of choice. Lidocaine, however, was not included in the AHA treatment algorithm as it has a consistently inferior performance in the trial literature. The guideline describes lidocaine as only "occasionally effective" and a "second-line antiarrhythmic therapy for monomorphic VT." The National Model Emergency Medical Services (EMS) Clinical Guidelines also place lidocaine last among recommended treatments. We undertook a study of publicly-accessible U.S. EMS protocols to describe stable VT management in light of the AHA guideline.

**Methods:** Using emsprotocols.org, we selected protocols for stable monomorphic VT or wide-complex tachycardia (WCT) from 16 states, four from each of the four U.S. census regions, selecting states with more complete lists of accessible protocols. We determined the frequency of first-line recommendations for VT-directed medications, as well as for adenosine to treat possible supraventricular tachycardia with aberrant conduction. The relevant protocols were reviewed independently by three investigators, differences arbitrated if needed by consensus.

**Results:** The 16 states that were sampled from across the U.S. in 04/2017 had 61 different EMS protocols, the oldest dating from 04/2012. Seventeen protocols (27%) listed adenosine as a first-line option. The first-line VT-directed drugs, either as a single intervention or as one of multiple alternatives, were amiodarone (42; 69%) and lidocaine (18; 30%). No protocol recommended procainamide as a first-line agent.

**Conclusion:** We found significant variation between EMS agencies across the U.S. in the treatment of stable monomorphic VT/WCT. Nearly one-third of EMS protocols diverged from the AHA guideline by recommending lidocaine, the least effective medication, over higher ranked and more effective alternatives. The reasons for this guideline-discordant preference for lidocaine warrant investigation.

## 760 Do We Really Know Who Receives Bystander Cardiopulmonary Resuscitation Prior to Emergency Medical Services Arrival?

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**Background:** Bystander cardiopulmonary resuscitation (BCPR) improves the outcomes of out of hospital cardiac arrest (OHCA). Improving BCPR is vital to improving rates of cardiac arrest survival, and is a public health activity associated with considerable energy and expense. Accurate identification of BCPR provision by emergency medical services (EMS) is important for risk stratification, prediction of prognosis, and assessment of community CPR education.

**Objective:** To assess agreement of documentation of BCPR provision by EMS providers versus EMS dispatchers in cases of OHCA.

**Methods:** This was a retrospective observational study, with data collection occurring from January 2014 to December 2016. The Michigan Cares Registry, an expanded dataset of the Cardiac Arrest Registry to Enhance Survival (CARES) core and dispatch dataset, was utilized for data extraction. Agencies with > 20 dispatch calls were included, and audios were reviewed by dispatch supervisors to identify dispatch metrics including whether there was CPR performed after instructions. BCPR was defined as CPR by individual, layperson, or healthcare provider, initiated prior to first responder or EMS arrival. Dispatcher identified CPR was either CPR provided before 911 call as recorded by the dispatcher, or CPR initiated after dispatcher instructions. EMS reported BCPR was identified from EMS provider reports as entered into the CARES registry. Cases were excluded if cardiac arrest occurred after EMS arrival or in a health care facility. Kappa statistic was calculated to measure agreement.

**Results:** In this dataset, 2,697 eligible cases of OHCA from 27 different EMS agencies had EMS and dispatch data and were available for analysis. Of these cases, EMS identified that 1077 (39.9%) received BCPR before EMS arrival. Dispatchers identified 858 (265 prior to 911 call, 593 after dispatch instructions received, 31.8% in total) cases of CPR starting before EMS arrival. A Kappa of 0.42 (95% CI 38.3% - 45.3%) for agreement was found between these groups.

**Conclusion:** Across one state, there was fair to moderate agreement of EMS and dispatcher documentation of BCPR. Although a standardized definition of BCPR provision exists, EMS leaders and agencies need to invest substantial energy to assure the accurate, reproducible documentation of BCPR provision.

## 761 An Analysis of Mental Health Among Collegiate Emergency Medical Services Providers

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**Background:** Incidents of mental illness and suicide are increasing on college campuses. Collegiate emergency medical technicians (EMTs) are both students and frontline emergency medical services (EMS) providers, potentially exacerbating the already high rates of stress, depression, and burnout previously demonstrated in EMS providers. However, how the dual role of student and EMT affects collegiate EMTs is largely unknown. Our objective was to evaluate the prevalence of mental illness in collegiate EMTs and to assess contributing factors.

**Methods:** Collegiate EMTs were surveyed during the 2017 National Collegiate Emergency Medical Services Foundation Conference. The survey inquired about mental health history, EMS experiences, and demographics. Statistical tests including Pearson's chi-square test and Fisher's exact test were performed.

**Results:** Four hundred seventy-four responses were collected (58% response rate). Freshmen composed 6% of respondents, sophomores 23%, juniors 34%, and seniors 27%. Overall, 32% (95%CI 28%-36%) of respondents self-reported depression and 20% (95%CI 15%-25%) reported thoughts of self-harm. Of those who reported depression or self-harm, 68% had never been treated, 58% had never sought help, and 33% did not feel comfortable seeking help. Respondents at smaller institutions were more likely to report depression and self-harm and were less likely to feel comfortable seeking help. Most (90%) felt that their symptoms are not related to their work as medical providers. However, those who had transported a self-injurious patient were more likely to report that their symptoms are related to their work (16% vs. <2%).

**Conclusion:** Our study, to our knowledge the first to evaluate the mental health of collegiate EMTs, suggests that collegiate EMTs are vulnerable to high rates of depression and self-harm, and may not be comfortable seeking help. While rates of self-reported depression are on par with national averages, specific factors contributing to depression in this unique population warrant further evaluation. Potential contributors suggested by this study include student population size, job exposure, and concerns related to confidentiality and trust. Further research is needed to better understand not only these factors, but also the impact of EMS work on mental health and barriers to care.

## 762 Accuracy of Prehospital Triage to Identify Large Vessel Occlusion Strokes

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**Background:** With mechanical thrombectomy for large vessel occlusion (LVO) strokes becoming more widespread, there is increased onus on prehospital personnel to identify LVOs, as this could influence their decision to preferentially transport LVO strokes to a comprehensive stroke center. As the 4th largest in the state, our county EMS system has over 800 pre hospital providers and takes over 116,000 calls. For stroke calls, we use the Los Angeles Motor Scale (LAMS) as our evaluation tool, which identifies 3 areas of potential deficit: facial droop (absent/present), arm drift (absent/drifts down/falls rapidly), and grip strength (normal/weak grip/no grip).

**Methods:** Data from all stroke transports to a comprehensive stroke center during the immediate previous 12-month period were abstracted from our IRB approved prehospital research registry. Data abstracted included demographics such as age and gender, prehospital variables such as blood pressure, LAMS and Rankin scores, and outcomes including whether the patient received intravenous tPA or mechanical thrombectomy (MT) at the receiving facility.

**Results:** The cohort consisted of 157 patients, of which 53% were female. The median age was 68, with an interquartile range of 58-79. The median dBp=93, IQR 76-114, range 30-189 EMS rankin scores varied from 0 to 4: 60%- 0, 26%- 1, 7%- 2, 3%- 3, 3%- 4. A higher dBp, was significantly associated with having a better (lower) EMS rankin (p= 0.0162). 37 patients received MT. There was no significant difference in gender, age, Rankin score, or whether a CT perfusion