16 | Virtual Reality Pediatric Megacode Simulation Improves Knowledge Transfer vs. High-Fidelity Manikin Simulation

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Background and Objectives: This study compares whether an asynchronous VR simulation is as efficacious as traditional in-person HFM simulation for improving knowledge of the management of pediatric cardiac arrest. We chose this topic as it is a high acuity yet low occurrence scenario that emergency physicians must be prepared to handle despite rarely encountering it clinically.

Methods: This was a single-center study conducted at the University of Missouri. Emergency Medicine residents (n = 21), Physician Assistant Emergency Medicine Fellows (n = 3) and one medical student first took a pretest on management of pediatric cardiac arrest. They were then assigned to either complete the typical HFM small group simulation or VR simulation. The case was run on a Gaumard Pediatric HAL manikin by Pediatric EM faculty. The VR group was put into a similar megacode-style scenario from the Health Scholars Pediatric Emergency Care application on Oculus Quest 2 headsets. In this scenario, each learner served as team leader for a team of non-player computerized characters that would follow the learner's voice commands. Feedback was given by the automated in-game instructor without any input from faculty. After the case, each group took a 10-item post-test and were surveyed on their opinion regarding the learning modality on a four-point Likert scale.

Results: Twenty-four learners completed the pretest, case, and posttest. This included twenty-one Emergency Medicine residents and three PA fellows. The HFM group (n = 11) improved from a mean score of 5.45 on the pretest to 5.81 on the posttest. The VR group (n = 13) improved from a mean score of 4.83 on the pretest and 6.38 on the posttest. This was a mean difference of 0.36 (and 1.55 for the HFM and VR groups respectively. Using a one-way ANOVA with Tukey's multiple comparison's test we compared the scores between the groups and found HFM had a mean difference of 0.36 (95% CI −0.88 to 1.6, p = 0.86) and VR had a mean difference of 1.55 (95% CI 0.39–2.7, p = 0.005).

Conclusion: Learners who completed a VR pediatric megacode simulation showed a statistically significant increase in their knowledge score while the traditional HFM scenario learners had a non-significant increase. Further study is needed to determine the durability of this effect and if this translates to better performance leading a resuscitation in a simulated or clinical environment.

17 | 30-Day Risk of Major Adverse Cardiac Events After Single High-Sensitivity Troponin T Under Limit of Quantitation

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Background and Objectives: Existing data suggest that for emergency department (ED) patients being evaluated for acute coronary syndrome (ACS), a single high-sensitivity cardiac troponin T (hs-cTnT) below the limit of quantitation (6 ng/L) is associated with a very low risk for acute myocardial infarction (AMI). We evaluate whether a single hs-cTnT < 6 ng/L can also predict a low 30-day risk for major adverse cardiac events (MACE).

Methods: We performed a secondary analysis on patients enrolled in a prospective, observational implementation study of hs-cTnT at a high-volume, urban ED over a 7-month period beginning July 2019. A convenience sample of patients undergoing ACS evaluation were enrolled during their initial visit; clinical variables and troponin values were collected, and the primary outcome of MACE was assessed by telephone at 30 day.

Results: Of the 821 patients enrolled in the study, 225 patients had an initial hs-cTnT < 6 ng/L. Of these patients, the mean age was 49 years, 163 (72.4%) were female, 21 (9.8%) presented within 3 h of symptom onset, 28 (12.4%) had a modified HEART score > 3, and 28 (12.4%) had ECG findings that were considered concerning by their treating physicians. There were 0/225 (0%, 95% CI = 0.0–2.1%) patients diagnosed with AMI at index visit. At 30 day, 2/214 (0.9%, 95% CI = 0.16–3.7%) patients had experience a MACE, none of which were AMI.

Conclusion: Similar to previous research demonstrating that AMI is unlikely when initial hs-cTnT is <6 ng/L, our data suggest that the 30-day risk of MACE is also low in this patient population. This can be integrated into clinical decision making for patient evaluation and disposition.

18 | Stroke Prophylaxis Action After United States Emergency Department Diagnosis and Discharge of Atrial Fibrillation Patients

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Background and Objectives: Oral anticoagulation (OAC) reduces stroke and mortality risk in patients with nonvalvular atrial fibrillation and flutter (AFF). The incidence of US emergency department (ED) OAC initiation is poorly understood, as are the appropriate

actions following discharge. We examined stroke prophylaxis actions on, and shortly following, ED discharge of stroke-prone AFF patients in a large integrated healthcare delivery system.

Methods: This retrospective cohort study included ED encounters among adults with a primary diagnosis of nonvalvular AFF, high stroke risk (CHA2DS2-VASc ≥ 2), and no recent (<90 days) OAC from 21 community EDs between 2010–2017. Actions included OAC prescription by an ED or follow-up clinician or a referral to an anticoagulation management service <14 day of discharge. We compared OAC action rates between groups with t-tests, and chi-square tests, and used ANOVA and Cramer's V to estimate effect size. We used Poisson GEE models to estimate rates of OAC action, with confidence intervals (CIs) adjusted for repeated measures by clinician/facility/patient cluster and an exchangeable correlation structure.

Results: Among 9603 eligible ED discharges, mean age was 73.1 years (SD 11.4), 38% were female, and mean CHA2DS2-VASc was 3.5 (SD 1.5). From 2010 to 2017, OAC action increased significantly from 19.6% to 37.9%. In the adjusted model, encounters with females aged 75–84 years were less likely to result in OAC action than encounters with males aged < 64 years (estimate of mean: 23.9%, 95% CI 14.1%–33.8%; 18.7%, 95% CI 13.4%–23.0%, respectively). OAC action was associated with moderate stroke risk, with encounters with CHA2DS2-VASc 4 to 5 receiving OACs at rates 4.6% above (95% CI 2.4%–6.9%) those with CHA2DS2-VASc 2–4. Absolute rates of OAC action in 2017 were 15.8% (95% CI 12.1–19.5%) above those in 2010 in the adjusted model.

Conclusion: While OAC action increased over the 7-year study, there remains an opportunity for improvement as a majority of eligible patients in 2017 were not receiving appropriate OAC action. Additionally, female gender and those >84 years were less likely to receive appropriate action compared to men and those <65 years. The undertreatment of those >84 years suggests a misunderstanding of the net clinical benefit associated with OAC in the elderly. Furthermore, opportunities to address gender disparities exist as we seek to improve stroke prophylaxis in AFF patients discharged from the ED.

19 | Women With Chest Pain Have Lower Hospitalization, Cardiac Testing, and Adverse Outcome Rates

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Background and Objectives: Sex-based disparities are well known in cardiovascular care delivery. However, data on sex disparities from emergency departments (ED) using high sensitivity troponin algorithms for chest pain evaluations are limited. The objective of this analysis is to compare cardiovascular outcomes and healthcare utilization rates in men versus women in a multisite ED cohort of patients with acute chest pain.

Methods: We conducted a multisite observational study using the Wake Forest Chest Pain Registry, including patients ≥18 years old who were evaluated for possible acute coronary syndrome from January 1st to December 31st of 2021 across five EDs utilizing high sensitivity troponins. Sex was determined by patient self-report as recorded in the electronic health record. The primary cardiovascular outcome was 30-day all-cause death or myocardial infarction (MI). Healthcare utilization outcomes included 30-day hospitalizations and objective cardiac testing (OCT: stress testing, coronary computed tomography angiography, invasive coronary angiography). Outcomes were compared between sexes using chi-squared tests. Multivariable logistic regression models were used to assess the association between sex and outcomes adjusting for race, ethnicity, age, obesity, smoking, prior coronary artery disease, diabetes, hypertension, hyperlipidemia, insurance status, and initial troponin.

Results: Among 10,908 patients 53.0% (5778/10,908) were female. In women 30-day death or MI occurred in 4.3% (250/5778) compared to 9.1% (467/5130) in men (p < 0.001). Hospitalizations at 30 day were less frequent in women compared to men, occurring in 27.8% (1605/5778) versus 35.8% (1835/5130) respectively (p < 0.001). Among women OCT occurred in 12.8% (739/5,778) compared to 18.3% (937/5130) in men (p < 0.001). After adjusting for potential confounders, female sex remained associated with decreased rates of 30-day death or MI (aOR: 0.79, 95% CI: 0.65–0.96), hospitalizations (aOR: 0.87, 95% CI: 0.79–0.97), and OCT (aOR: 0.83, 95% CI: 0.74–0.93).

Conclusion: Women with acute chest pain were less likely to be hospitalized or receive OCT compared to men, even after adjustment for initial troponin. However, women were also less likely to have 30-day death or MI.

20 | Nonwhite Patients With Acute Chest Pain Have Lower Hospitalization, Cardiac Testing, and Adverse Outcome Rates

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Background and Objectives: Race-based disparities are common in cardiovascular care delivery. However, data on race disparities from emergency departments (ED) using high sensitivity troponin algorithms for chest pain evaluations are limited. The objective of this analysis is to compare safety and healthcare utilization outcomes in white versus non-white patients with chest pain in a multisite ED cohort.

Methods: We conducted a multisite observational study using the Wake Forest Chest Pain Registry, including patients ≥18 years old who were evaluated for possible acute coronary syndrome from 1/1/2021–12/31/2021 across five EDs utilizing high sensitivity troponin assays. Race was determined by patient self-report in the