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Study Objectives: Extremity hemorrhage remains a leading cause of preventable battlefield death. In addition, there are approximately 17,000 preventable hemorrhagic civilian out-of-hospital deaths worldwide each year. Tourniquets have improved the survivability of our service members and are increasingly used in the out-of-hospital civilian setting. The Committee on Trauma Combat Casualty Care (CoTCCC) has approved several tourniquets for use. The Combat Application Tourniquet Gen 7 (CAT) and the SOF Tactical Tourniquet Wide (SOFTT-Wide) were previously approved but have undergone design changes since their original validation. In addition, the Tactical Mechanical Tourniquet (TMT) is a newer generation tourniquet that has only recently been approved for use. These tourniquets require evaluation of their efficacy, efficiency, and durability during movement and transport of patients.

Methods: This study is a randomized cross-over trial with subjects that were recruited from a pool of active duty United States Navy corpsmen. Each subject applied the tourniquets in a single arm application to the upper extremity and a dual arm application to the lower extremity. The primary outcomes measured were the efficacy of pulse elimination, efficiency of application, and durability during transport. Efficacy was determined by elimination of a pre-marked doppler pulse and efficiency was determined by total time required to place the tourniquet. Durability was determined by assessing pre-achieved pulselessness in the lower extremity after the subject low-crawled prone and was then dragged by a plate carrier supine for 25 feet each. Additionally, subject familiarity and preference for each tourniquet was evaluated by pre- and post-study surveys.

Results: Interim analysis suggests marked differences between the tested devices in the efficacy of pulse elimination, efficiency, and durability. The use of the CAT resulted in a significantly higher rate of pulse elimination and quicker application time when compared to using TMT and SOFTT-Wide. In addition, 54% and 58% of subjects were unable to obtain pulselessness on the arm and leg, respectively, using the SOFTT-Wide and had components of this tourniquet fail during testing. There were no significant differences found when comparing the number of years in practice, age, or sex to a provider’s confidence in prescribing an appropriate PEP regimen for nonoccupational exposure (Table 1). Respondents considered time (27%), connecting patients to follow-up (26%), cost to patients (23%), patients’ perceived interest in HIV counseling (15%), and concern for ongoing risky behaviors (9%) as barriers to prescribing nPEP.

Conclusion: This study identified perceived barriers to administration of nPEP and missed opportunities for HIV prevention in the ED. Although most ED providers were willing to prescribe nPEP and felt it is their responsibility to do so, the majority were not confident in prescribing it. Age, sex, and years in practice did not show a difference in confidence prescribing. In addition, the most commonly cited barriers to prescribing nPEP were time and access to follow-up care. Potential strategies to overcome these barriers could examine establishing protocols for nPEP evaluation, educating providers on nPEP administration, and coordinating care between ED and internal medicine providers.

Table 1. Provider Confidence in prescribing nPEP

| Sex (n [%]) | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | p-value |
|------------|------------------|----------|---------|-------|----------------|---------|
| Male       | 3 (3.16)         | 33 (34.74)| 17 (17.89)| 36 (37.89)| 6 (6.32)       | 0.57    |
| Female     | 2 (3.51)         | 22 (38.60)| 14 (24.56)| 18 (31.58)| 1 (1.75)       |         |

| Years in Practice (n[%]) |      |      |      |      |      |         |
|--------------------------|------|------|------|------|------|---------|
| - <5                     | 1 (1.79) | 18 (32.14) | 11 (19.64) | 22 (39.29) | 4 (7.14) | 0.42    |
| 6 - 10                   | 0 (0.00) | 9 (52.94)   | 2 (11.76)  | 6 (35.29)  | 0 (0.00)  |         |
| 11 -15                   | 0 (0.00) | 3 (27.27)   | 0 (0.00)   | 8 (72.73)  | 0 (0.00)  |         |
| >15                      | 2 (5.41) | 11 (29.73)  | 8 (21.62)  | 13 (35.14) | 3 (8.11)  |         |

| Age (years ± SD) |      |      |      |      |      |         |
|------------------|------|------|------|------|------|---------|
| 41.40 ± 16.00    | 37.05 ± 9.59 | 38.68 ± 10.90 | 40.58 ± 11.11 | 43.00 ± 13.01 | 0.388    |         |
Methods: We performed a prospective cohort study of ED physicians required to use respirators at an academic, level one trauma center. All investigators performing fit testing reviewed OSHA qualitative fit testing guidelines and training and were familiar with the testing protocol. All subjects had purchased commercial elastomeric respirator masks with disposable filters (N95, P95, or P100) for personal use as PPE due to concerns regarding shortages of disposable surgical and N95 medical masks. All masks have a manufacturer-stated filter life of approximately 40-hours of continuous use specifically in industrial application. All subjects chose their mask size independently with no input from employee health regarding appropriate fit. Per study protocol, subjects were fit tested periodically during clinical shifts over the course of the 8-week study period. Data points collected included the age of the mask, subjective assessment of mask seal quality, and fit test results. The data was analyzed using descriptive statistics. The study was approved by the Institutional Review Board.

Results: 88 fit tests were performed on physicians wearing elastomeric masks during their clinical ED shifts. Only eight tests were performed on masks with filters within the 40-hour lifespan per manufacturer specifications. Eighty fit tests were performed on masks with filters that had been in use for greater than 40 hours. There were no fit test failures in any subjects.

Conclusion: Reusable elastomeric respirators have an extremely low failure rate and may be a worthwhile investment as PPE. Further, the filters likely can be safely used well outside of the manufacturer-stated 40 hours of use in health care practice.

Duration of Pulse Checks Using Point-of-Care Transthoracic Echocardiography versus Point-of-Care Transesophageal Echocardiography versus Palpation

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Study Objectives: There has been debate over the optimal method of checking a pulse in cardiac arrest; namely palpation vs point-of-care ultrasound (POCUS) transthoracic echocardiography (TTE). In recent years, transesophageal echocardiography (TEE) has emerged as an increasingly used option. However, there is minimal data comparing these modalities, with prior studies being relatively small and including only ultrasound-trained faculty for TEE. This study includes POCUS TTE and TEE performed by attending physicians, residents, fellows, and advanced practice providers. In this retrospective study, the investigators evaluate the duration of pulse checks when using palpation, TTE, or TEE in cardiac arrest.

Methods: This is a retrospective study comparing the duration of pulse checks using palpation, TTE, or TEE. A quality improvement (QI) database managed by the Hennepin County Medical Center (HCMC) emergency department was used to identify cases of cardiac arrest, in which pulse checks were performed with either transthoracic or transesophageal cardiac ultrasound. The cases often included palpated pulse checks as well, which were also included in analysis. Chart review of the selected patients was performed to assure accuracy of the database and for additional information on each case. The last 100 patients before the use of TEE became standard of care, and the first 100 cases after which had video data available were included. QI data, including pulse check durations, were recorded from video review and used for comparisons.

Results: Data from 200 patients included 973 pulse checks (623 with TTE, 313 with TEE, 37 with palpation). Mean duration of TTE pulse checks was 19.28 seconds (95% CI 17.9 - 20.6). Mean duration of TEE pulse checks was 13.93 seconds (95% CI 12.8 - 15.1). Mean duration of palpated pulse checks was 13.93 seconds (95% CI 12.8 - 15.1). TTE pulse checks were significantly longer in duration than both TEE (difference 5.33 seconds, 95% CI 2.89 - 7.78, p < 0.001) and palpation (difference 5.36 seconds, 95% CI -0.61 - 11.33, p = 0.089). There was no significant difference in duration between TEE and palpated pulse checks (difference 0.03 seconds, 95% CI -0.61 - 6.10, p > 0.999).

Conclusion: To our knowledge, this is the largest study to date comparing duration of ultrasound pulse checks. Its inclusion of trainees, APPs, and attendings without ultrasound fellowship training gives broad generalizability. The data demonstrates no significant difference in duration between palpated and TEE pulse checks. Pulse checks by TTE were significantly longer than both palpated and TEE. In combination with the known advantages of ultrasound over palpation, the data suggests that TEE may be the ideal method of performing pulse checks in cardiac arrest.

Pet Friendly: The Role of Animal Care in Patient’s Decisions Regarding Atypical Discharge

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Study Objectives: Animal care is frequently listed as a reason patients choose to sign out of the emergency department or hospital against medical advice. However, the frequency of this issue as a decision point in atypical discharges is unclear. We reviewed all atypical discharges for a 12-month period (January 1, 2019-December 31, 2019) from the ED at Veterans Health Administration medical center to determine the degree to which concerns regarding animal care were involved in an atypical discharge.

Methods: The setting is a 28,000-visit high acuity tertiary Veterans Health Administration medical center ED. All patients with a disposition of atypical discharge (Left without being seen, LWBS: eloped, E; against medical advice, AMA) are contacted within 24 hours of discharge by a nurse case manager. Among the data points collected include reason for leaving. All charts of patients with atypical discharge were reviewed for a primary or secondary category of “pet/animal care” under reason for leaving to determine the freedom with which this issue occurs as a factor in patient’s decision to opt for an atypical discharge. The lead author conducted all reviews of data obtained by the case management staff.

Results: A total of 1,397 charts were identified as atypical discharges. Of these, the majority (908, 65%) were LWBS, with 297 (21%) leaving AMA and 192 elopements. 1253/1397 (89%) were able to be contacted verbally within 48 hours of their atypical discharge. The most common reason for atypical discharge overall was wait time, which was the primary reason given in 998 (79%) of the cases. However, having an animal that needed care accounted for the primary reason for atypical discharge in 71 (24%) of the patients leaving AMA, and was the primary reason for atypical discharge in 49 (5%) of the elopements and 93 (10%) of the LWBS patients. Additionally, need to provide animal care was listed as a secondary reason for atypical discharge in 313 (25%) of the atypical discharges. 44 of the patients who left AMA went to the ED and were readmitted within 24 hours of leaving AMA after securing animal care.

Conclusion: The need to provide animal care was a frequent reason for atypical discharge at our facility, particularly for patients who signed out AMA. A significant number of patients who left AMA returned when they had secured animal care. Lack of animal care is a driver of decisions to leave the emergency department for a significant number of patients in our study.

Does Shock Index, Pediatric Age-Adjusted Help Predict Mortality by Trauma Center Type?

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Study Objectives: Pediatric trauma patients can be seen at adult trauma centers (ATC), mixed pediatric and adult trauma centers (MTC), or pediatric trauma centers (PTC). Shock index, pediatric age-adjusted (SIPA) can be used to prospectively identify severely injured children. This study characterized the differences in mortality and hospital length of stay (LOS) amongst pediatric trauma patients with elevated SIPA at different trauma centers types.

Methods: Pediatric patients (1-14 years) were queried from the 2013-2016 National Trauma Data Bank (NTDB). Patients with elevated SIPA (SIPA+) were included for analysis. The primary outcome was mortality. Secondary analyses included hospital length of stay. Unadjusted frequencies and multivariate regression analyses were performed.

Results: Out of 190,569 patients, 33,149 were SIPA+. The initial unadjusted odds ratio for mortality showed no significant difference at ATC OR 0.93 (95% CI 0.75, 1.17) or MTC OR 1.11 (95% CI 0.88, 1.39) when compared to PTC. The