

Objective: Successful intubation in the emergency department relies on rapid and accurate confirmation of endotracheal tube (ETT) placement. An unrecognized esophageal intubation can delay effective resuscitation of critically ill patients and those in cardiac arrest. Ultrasound has been used as a tool to identify tracheal or esophageal location of an ETT. Imaging can be visualized in a static manner or assisted by performing a side-to-side “twisting” maneuver of the tube directly after intubation to induce motion artifact. However, no prior studies have determined whether ETT twisting improves diagnostic accuracy. The objective of this study was to investigate the effect of the twisting technique on the use of ultrasound for intubation confirmation.

Methods: Ultrasound exams were performed on two cadavers with varying neck circumference. Cadavers were randomized to either esophageal or tracheal intubation. Ultrasound examinations were performed by three sonographers blinded to the location of the ETT. Sonographers were instructed to either gently twist the ETT side-to-side or avoid any ETT movement during the examination. We recorded accuracy in the identification of ETT location, the time it took to perform the exam, and operator confidence.

Results: A total of 540 intubations were performed, with 270 tracheal intubations (Figure 1) and 270 esophageal intubations (Figure 2). Each was assessed with both static and ETT twisting techniques. Ultrasound was 97.8% accurate (95% confidence interval [CI], 95.2% to 99.0%) using the static imaging technique and 100% accurate (95% CI, 98.6-100%) in the ETT twisting group. The mean time to ETT identification was significantly longer in the static group (6.87 seconds [s] [95% CI, 6.30 to 7.44 s]) as compared to the ETT twisting group (4.97 s [95% CI, 4.36 to 5.57 s]). The mean operator confidence level was significantly lower with the static technique [4.71/5.0 (95% CI, 4.63 to 4.78)] as compared to the twisting technique [4.84/5.0 (95% CI, 4.79 to 4.90)].

Conclusion: The diagnostic accuracy for ultrasound-assisted identification of ETT location was similar when using the static and ETT twisting techniques. However, the twisting maneuver resulted in shorter time to identification of tube location and increased operator confidence compared to the static ETT technique.

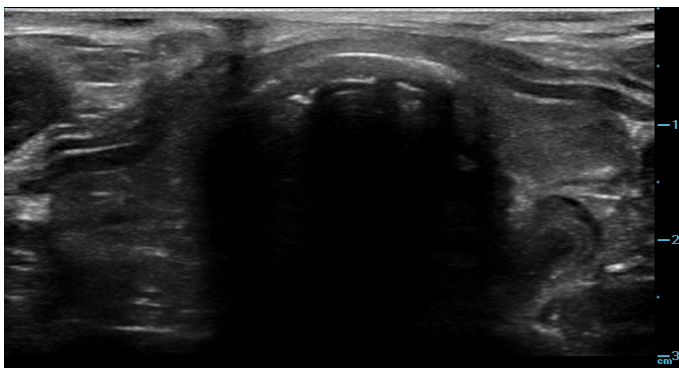


Figure 1. Endotracheal intubation.

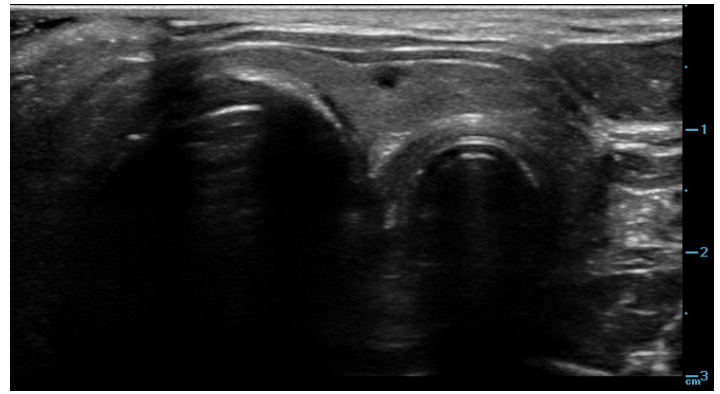


Figure 2. Esophageal intubation.

14 Impact of Universal Non-Targeted Hepatitis C Screening in an Urban Emergency Department

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Objective: The Centers for Disease Control and Prevention recommends hepatitis C virus (HCV) screening for adults born between 1945 - 1965 and for those who have engaged in high-risk activities. While not recommended, universal, non-targeted screening may be a more ideal approach to reach vulnerable, high-risk populations in the emergency department (ED).

Design and Method: A program evaluation of universal, non-targeted HCV screening was conducted on patients presenting to an urban ED between June 6 - November 27, 2018. All adults 18 and older were offered HCV testing during initial nursing engagement. Patients who declined the nurse testing offer were re-engaged by health educators to encourage testing. Reactive HCV Ab tests were reflexed to viral load (VL). Patients found to be VL+ were linked to care.

Results: During the evaluation period, there were 40,679 ED visits representing 23,857 unique adult patients. Nurse testing offer responses were as follows: 16,573 (70%) declined testing; 4421 (19%) accepted testing; 309 (1%) were known HCV+; 1187 (5%) lacked capacity to consent; 758 (3%) had a life-threatening emergency; 451 (2%) responses were categorized as “other.” Of those who accepted the nurse offer of testing, most (92%) had an HCV test performed. Of those who had declined the nurse offer, 6% had an HCV test performed. HCV tests were also performed on 11% of patients known to be HCV+, 4% of those who initially lacked capacity, 4% of those who initially presented with a life-threatening emergency, and 11% whose initial response was categorized as “other.” In total, 5270 HCV Ab tests were performed of which 94.3% (4,970) were non-reactive and 5.7% (300) were reactive. One-third of reactive HCV Ab tests were VL+ (100), 54% (162) were VL-, and 13% (39)

were categorized “quantity not sufficient.” Of those tested 44% were male, 20% were White, 20% Black, 6% Asian, and 54% other. Most had Medicaid (41%) Medicare (20%) or commercial insurance (22%). A minority (16%) were uninsured. Risk-factor information was collected on 157 of 300 patients (52%) with reactive HCV Ab tests of whom 23% had no identified risk factors. Targeted HCV screening based on risk factors and age would have missed 4% (12/300) of those with a reactive Ab test and 4% (4/100) of those with a positive VL.

Conclusion: Universal, non-targeted HCV screening identified a large number of patients with HCV (6% prevalence) and viremia (1.8% prevalence). Targeted screening would have missed a small but significant number of patients with active infection.

15 Impact of Trauma Levels on Survival of Patients Arriving with No Signs of Life to U.S. Trauma Centers

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Objective: Trauma level designation and verification are examples of healthcare regionalization aimed at improving patient outcomes. This study examines the impact of trauma levels on survival of patients arriving with no signs of life to trauma centers in the United States.

Design and Method: This retrospective study used the U.S. National Trauma Data Bank (NTDB) 2015 dataset. We performed a descriptive analysis followed by a bivariate analysis comparing variables by the trauma designation levels. A multivariate analysis assessed the effect of the trauma designation on survival to hospital discharge after controlling for potential confounding factors.

Results: We included 6160 patients without signs of life. The average age was 40.66 years (± 19.96) with male predominance (77.3%). Most patients were transported using ground ambulance (83.5%) and were taken to Level I (57%) and Level II (32.4%) trauma centers. Blunt injuries were the most common (56.9%). Motor vehicle transport (38.5%) and firearm (33.8%) were the most common mechanisms of injury. Survival to hospital discharge among patients with no signs of life ranged from 13.7% at Level I to 27.9% at Level III. After adjusting for confounders, including the Injury Severity Score (ISS), higher survival was noted at Level II compared to Level I trauma centers.

Conclusion: Patients presenting without signs of life to Level II trauma centers had higher survival to hospital discharge compared to Level I and Level III centers. These findings can guide future prehospital triage criteria of trauma

patients in structured emergency medical services (EMS) systems and highlight the need for more outcome research on trauma systems.

16 Safety And Efficacy of Prehospital Paramedic Administration of Ketamine In Adult Civilian Population

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Objective: Opiates are addicting and have a high potential for dependency. Opiate-related overdoses now claim 130 American lives each day, and the opiate epidemic costs nearly \$80 billion annually. In past decades, opiates were a mainstay of prehospital treatment for acute traumatic pain in the civilian population. Ketamine is a N-methyl-d-aspartate receptor antagonist that has analgesic properties and may serve as an alternative agent for the treatment of acute traumatic pain in the prehospital setting. This study aimed to assess the safety and efficacy of ketamine administration by paramedics in a civilian prehospital setting for the treatment of acute traumatic pain.

Design and Method: This was a prospective, observational study conducted in the counties of San Bernardino, Riverside and Stanislaus in the state of California. The inclusion criteria were patients > 15 years of age with complaint of traumatic or burn-related pain. We excluded patients if they had received opiates prior to or concurrently with ketamine administration. Dose administered was 0.3 milligrams per kilogram (mg/kg) intravenously over five minutes with maximum dose of 30mg. Option to administer a second dose was available to paramedics if the patient continued to have pain after 15 minutes following the first administration. We conducted paired-T tests to assess the change in the primary outcome (pain score) and secondary outcomes (eg, systolic blood pressure [SBP], respiratory rate, and pulse). P value <0.05 was considered to be statistically significant.

Results: We included 368 patients in the final analysis. The average age was 52.9 \pm 23.1 years old, and the average weight was 80.4 \pm 22.2 kg. There was a statistically significant reduction in the pain score (9.13 \pm 1.28 vs 3.7 \pm 3.4, delta = 5.43 \pm 3.38, p<0.0001). Additionally, there was a statistically significant change in SBP (143.42 \pm 27.01 vs 145.65 \pm 26.26, 2.22 \pm 21.1, p = 0.0440), pulse (88.06 \pm 18 vs 84.64 \pm 15.92, delta = -3.42 \pm 12.12, p<0.0001), and respiratory rate (19.04 \pm 3.59 vs 17.74 \pm 3.06, delta = -1.3 \pm 2.96, p<0.0001).

Conclusion: This study suggests that the administration of a subdissociative dose of ketamine by paramedics in the