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Impact of Endotracheal Tube Twisting on the Diagnostic Accuracy of Ultrasound for Intubation Confirmation

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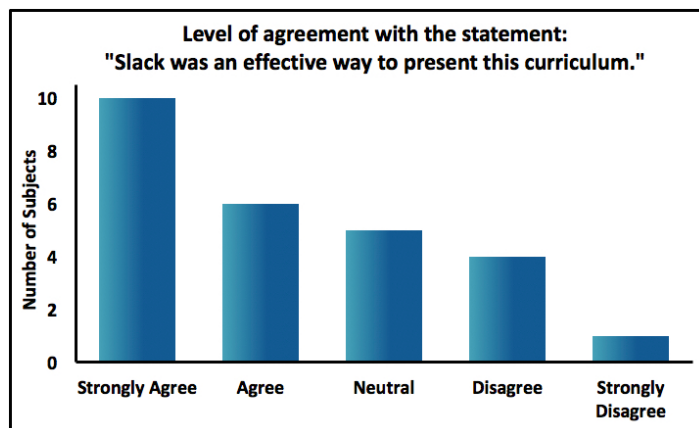
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pre-survey assessing comfort with several aspects of EM. The curriculum was implemented between Match Day and the first day of internship in 2018. Interns completed a post-survey that re-assessed comfort and elicited feedback on the curriculum.

Results: All 36 interns completed the pre-survey and 26 completed the post-survey (Table 1). Participants reported a statistically significant increase in comfort with identifying airway anatomy and physiology ($p = 0.01$). Mean comfort increased, but was statistically significant for all other objectives. Sixteen of 26 post-survey participants agreed that Slack was an effective way to present the curriculum, and only five disagreed (Figure 1).

Conclusion: When presented prior to the start of residency, the curriculum significantly increased self-reported intern comfort with one EM learning objective. A majority of interns felt that Slack was an effective way to present the curriculum. Limitations included small sample size, possibly hindering detection of statistically significant changes. Interns who found the curriculum less useful may have been less likely to complete the post-survey. This study was not designed to measure improvements in clinical knowledge. Future directions will address these issues.

Assessed Aspect of Emergency Medicine	Pre-Slack Mean	Post-Slack Mean	Difference	Standard Error	T-Value	95% CI	P-Value
Determining Necessity of Diagnostic Studies	3.56	3.85	0.29	0.20	1.45	3.43–4.26	0.16
Interpreting Radiographs	3.39	3.39	0.00	0.23	-0.18	2.91–3.86	0.99
Interpreting Ultrasounds	2.81	3.15	0.35	0.26	1.33	2.61–3.70	0.20
Interpreting CT Images of Head	3.06	3.35	0.29	0.27	1.08	2.79–3.90	0.29
Constructing a Differential Diagnosis	3.92	4.04	0.12	0.15	0.84	3.74–4.34	0.41
Identifying Airway Anatomy and Physiology	2.86	3.65	0.79	0.27	2.99	3.11–4.20	0.01
Describing Basic Biostatistic Principles	2.75	3.08	0.33	0.30	1.09	2.46–3.70	0.29



12 Which Wellness Activities Correlate with Lower Resident Physician Burnout?

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Objective: Studies show a high burnout level among resident physicians. Many different activities have been recommended to improve burnout. Researchers also describe

the importance of culture and work efficiency in employee wellness. This study aimed to evaluate the correlation between resident burnout and various wellness activities.

Design and Methods: Each year, the University of Kansas Medical Center Graduate Medical Education Wellness Subcommittee administers a wellness survey to all 560 residents and fellows. The 71-question, electronic survey, which was originally developed at Stanford University Medical Center, received institutional review board approval.

Results: Of the 560 residents who received the survey 393 (70% response rate) completed it, including 147 female residents (37%) and 246 males (63%). The overall resident burnout rate was 20.4%. Sixteen emergency medicine residents completed the survey with a reported burnout rate of 37.5%. Several activities and program attributes correlated with statistically lower resident burnout. Survey results indicated the following: 258 of 383 residents regularly engaged in hobbies outside of work (burnout 15.5% vs 31.2%, chi square p value = 0.0004); 294 out of 381 regularly scheduled protected time with partner/family/friends (burnout 17.4% vs 32.2%, p value = 0.0027); 329 of 379 felt their residency programs had a supportive culture with respect to wellness (burnout rate of 15.2% vs 54%, p -value = <0.0001); and 232 of 388 responded that it was "very true" or "completely true" that their residency programs engaged in initiatives aimed at improving the efficiency of their healthcare delivery (burnout rate of 11.2% vs 40.0%, p -value = <0.0001). Residents who regularly engaged in physical activity more often than once per week trended toward lower burnout (burnout rate of 17.7% vs 32.8%, p value = 0.14). Practicing meditation/mindfulness or considering oneself to be a spiritual person did not correlate with lower burnout in our survey.

Conclusion: Our study demonstrates evidence of several factors that may be protective against resident physician burnout. These findings are important for emergency physicians, who typically suffer from higher burnout than other specialties. Leaders of academic emergency departments should ensure that they foster a supportive culture, undertake initiatives to improve efficiency, and empower their resident physicians to protect time outside of work and engage in activities that increase wellness.

13 Impact of Endotracheal Tube Twisting on the Diagnostic Accuracy of Ultrasound for Intubation Confirmation

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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.

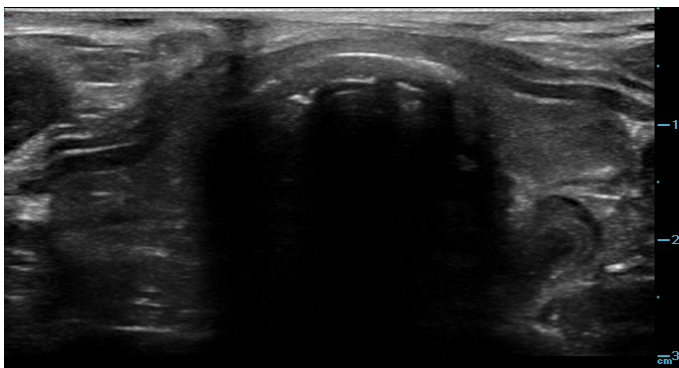


Figure 1. Endotracheal intubation.

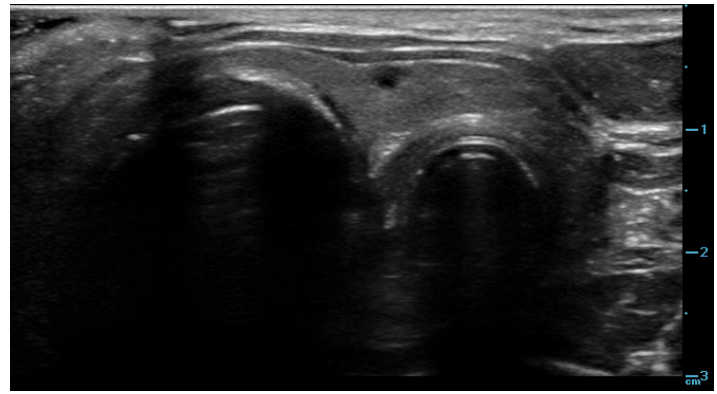


Figure 2. Esophageal intubation.

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)