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Knife to the Chest: Development of a Realistic Emergency Thoracotomy Simulation Model

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42 Isopropyl Alcohol Nasal Inhalation Intervention of Nausea in the Emergency Department: a Randomized Placebo-Controlled Human Trial

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Objectives: To evaluate nausea and vomiting (NV) relief, pain relief, and satisfaction with treatment with nasally inhaled isopropyl alcohol (ISO) vs. saline placebo in emergency department (ED) patients before access to traditional antiemetics. We hypothesized all would be better in the ISO group.

Background: ISO has been shown to alleviate NV postoperatively. This study is the first to examine ISO for NV in the ED.

Methods: Randomized, prospective, blinded placebo-controlled trial in an urban military level-I trauma center ED. Subjects were blinded by masked substance packets and ignorance of the identities of the study substance and placebo. Investigators were blinded by masked packets and by distance from open packets. A convenience sample of 84 patients aged 18-65, able to breathe nasally, English literate, and complaining of NV was enrolled. Exclusions were pregnancy, ISO allergy, use of medications with antiemetic or disulfiram effect, recent upper respiratory infection, or clinical intoxication. Subjects described pain and nausea on an 11-point Verbal Numerical Response Score (VNRS) at 0, 2, 4, 6, and 10 minutes (min). At 0, 2, and 4 min subjects inhaled from the study packet for 60 seconds. A 3-point change on the VNRS was set as significantly different. Patient satisfaction was recorded on a 5-point Likert Scale at the study conclusion.

Results: 80 subjects completed the trial. 4 withdrew. None were excluded after enrollment. No adverse events were noted. 72.9% had significant nausea relief within 4 min of inhalation with ISO vs. 4.6% with placebo ($p < 0.001$). 56% had nausea relief at 10 min with ISO vs. 2.3% with placebo ($p < 0.002$). Pain relief was not different between groups ($p > 0.05$). 64.8% were satisfied with ISO vs. 2.3% with placebo ($p < 0.001$).

Conclusions: Nasally inhaled ISO is a safe and effective treatment for NV in the ED with relief onset by 4 min and persisting through the 10 min study duration.

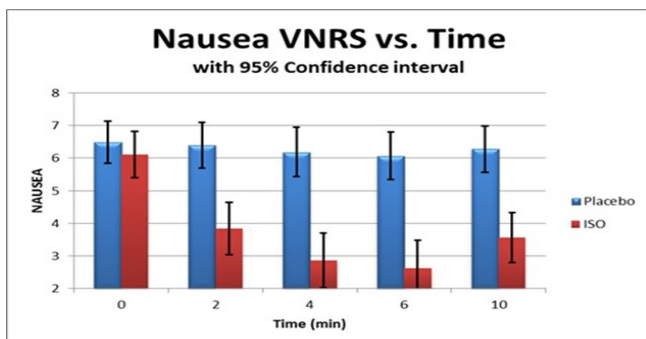


Figure 1. VNRS, verbal numerical response score; ISO, isopropyl alcohol

43 Knife to the Chest: Development of a Realistic Emergency Thoracotomy Simulation Model

Byars D, Williams K, Clingenpeel J, Burhop J / Eastern Virginia Medical School, Norfolk, VA; Eastern Virginia Medical School and The Children's Hospital of the King's Daughters, Norfolk, VA

Introduction: Clinical encounters involving emergency thoracotomy after penetrating trauma are lifesaving interventions. Emergency medicine physicians must maintain expert proficiency at these critical procedures. Performing emergency thoracotomy remains rare, even among those working in trauma center settings. The infrequency of these critical procedure encounters, along with the importance of maintaining expert proficiency highlights the necessity of developing a realistic simulation model and scenarios and is paramount to procedure retention.

Objective: The objective was to design a medical simulation model that was life size, low cost, with realistic feel, rapidly replaceable parts and features to teach emergency thoracotomy in a safe and controlled education environment.

Design: The performance features of an adult head and thoracic simulation model were modified and retrofitted with flexible anatomic ribs, subcutaneous adipose, replaceable skin and swine heart with a knife through the left ventricle. The model was outfitted with low cost replaceable parts to create an accurate stepwise simulation. The emergency thoracotomy was described and demonstrated in small groups with 4 learners. Afterward, demonstration questions about the procedural steps and instruments were addressed. The model was refitted with new skin and adipose and the swine heart was suspended in a simulated pericardial membrane in fluid with a knife driven through the anterior chest and into the left ventricle. Each participant went through a hands-on simulation performing an emergency thoracotomy with cross-clamping of the aorta. Debriefing occurred after each simulation.

Impact: The emergency thoracotomy model provides a realistic simulator at a low cost with reusable components that enhance critical procedure training in a safe educational environment. The model enables educators to assess graduate medical education competencies including approach to therapeutic procedures through medical simulation.

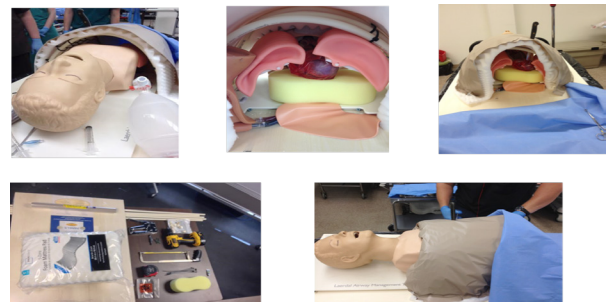


Figure 1.



Figure 2.

44 Low-Cost, Ultrasound-Compatible Paracentesis Model for Medical Trainees

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Introduction/Background: Paracentesis is an important procedure as physicians are poor predictors of spontaneous bacterial peritonitis. Simulation-based education has improved procedural skills training and decreased morbidity associated with invasive procedures. Deliberate practice with an ultrasound-compatible paracentesis simulator significantly improved resident procedural competence. Low-cost, ultrasound-compatible models for pericardiocentesis have been developed. We developed a low-cost, ultrasound-compatible model for medical trainees to perform paracenteses.

Objectives:

1. Review and model anatomic considerations when performing bedside paracentesis.
2. Develop a reproducible, ultrasound-compatible model that is efficient to use as an educational intervention.

Curricular Design: A prototype of our model was tested by medical students at Oregon Health and Science University under faculty supervision and all trainees obtained “peritoneal fluid.” The model was then revised to make it ultrasound-compatible. We propose that this model be utilized in conjunction with additional education interventions including an online video paracentesis tutorial; an educational session reviewing indications for, benefits/risks of, and procedure set-up for paracentesis; and an outcome measurement of self-perceived competence and improved understanding of the tactile feedback necessary for this procedure.

Materials:

Whoopie cushion (12 pk \$7)
 Animal Twist and Shape Balloons (25/pk \$2.50; 144/pk \$10)
 Vegetable oil (\$1.50)
 Sink
 60mL syringe
 Flesh-colored 9x11 sheets of felt (\$0.99/sheet)
 1-inch Binder Clip (24/pk \$3)
 12-inch basin (Medline \$3)
 Paracentesis kit (18 G needle, syringe)
 Ultrasound

Impact: Simulation training can improve procedural skills and patient care. Prior non-commercial, paracentesis models are limited by their expense, time, faculty commitment and tool availability. Our simulator is low-cost, easy-to-assemble, ultrasound-compatible, and well-received by medical trainees.

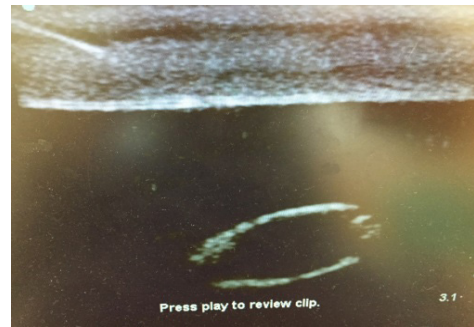


Figure 1.

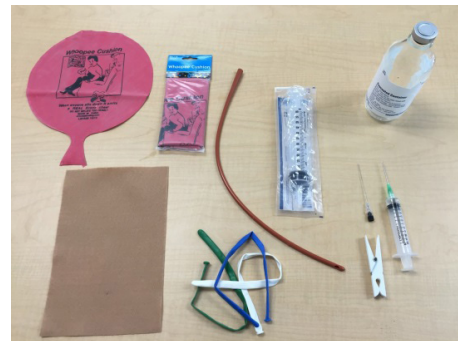


Figure 2.

45 Mapping Emergency Medicine Milestones to an Existing Simulation Curriculum

Turner J, McIntosh B, Cooper D, Perkins A, Rodgers K / Indiana University, Indianapolis, IN; Integris Baptist Medical Center, Oklahoma City, OK; University of Arkansas, Tucson, AZ

Background: The Accreditation Council for Graduate Medical Education defines milestones that all residents are expected to meet. Program directors must develop methods to