distinct episodes of feedback were logged using the online form: 9 by emergency medicine faculty, and 27 by senior-level residents. The learner targets included 30 interns and 6 senior-level residents. The feedback scenarios included 4 "Code-1" (high acuity), 2 "Code-2" (medium acuity), and 30 "Code 3" (low acuity) trauma resuscitations. The initial implementation of this innovation was successful in encouraging feedback and providing a favorable, objective framework to provide it. The feedback log suggests more initial enthusiasm for and engagement with the innovation among residents than faculty. Future plans include more targeted education for the physician faculty, and mapping the feedback form to ACGME Milestones for use by the Clinical Competency Committee as a data point to inform milestone assignments. Additionally, for proof-of-concept, this pilot project focused exclusively on trauma resuscitations, but will be expanded to include a pre-identified series of discrete observable behaviors (i.e., providing discharge instructions, calling a consultant, performing a procedure).

20 Effectiveness of Simulation-Based Mastery Learning Curriculum for Tube Thoracostomy in Emergency Medicine (EM) Residents

Max Berger, MD; Laura Weber, MD; Janice Shin-Kim, MD; Jessica Leifer, MD; Soma Pathak, MD; Shannon McNamara, MD

Learning Objectives/Educational Objectives:

1. Diagnose pneumo- and hemothorax on chest x-ray and ultrasound

2. Confidently and competently place a chest tube using sterile technique

Abstract:

Introduction/Background: For rare, high-risk procedures in EM, simulation is an ideal modality to supplement clinical training. Simulation allows for deliberate practice of procedural skills without concern for patient harm. Simulation-based mastery learning is the gold standard for procedure training, and has been used to successfully train residents in a variety of procedures.

Curricular Design: We developed a simulation-based mastery learning course for tube thoracostomy to train residents at our institution. The course consists of independent pre-work followed by a 2-hour hands-on session. The rubric used for assessing competence was based on the published, validated TUBE-iCOMPT checklist. The in-person session consists of 1)baseline assessment; 2) deliberate practice on individual aspects of the procedure; 3) final assessment. If a minimum passing score is not achieved, additional coaching and practice occur until the learner achieves the minimum passing score.

Impact/Effectiveness: 23 PGY-2 residents have completed the course. There was a statistically significant increase in learners' modified TUBE-iCOMPT score out of 79 points (pretest M=60.04, SD=8.35 to posttest M=74.26, SD=4.68, $p<0.001$). Learners' confidence in their ability to correctly place a chest tube also increased on scale from 1 to 10 (precourse M=4.38, SD=1.95 to postcourse M=7.78, SD=0.95). Our course was well received by learners and effective in improving their directly observed procedural skills in simulation. A next step will be to assess outcomes data to see if our course has any effect on complications rates for chest tubes placed at our institution. We are also implementing a similar course for pigtail catheter placement.

21 Emergency Medicine Clerkship Curricular Revision Using a Targeted Needs Assessment

David Wald, DO

Learning Objectives: Our objective was to perform a curriculum renewal for our EM clerkship using a targeted needs assessment.

Abstract:

Prior updates of our EM clerkship curriculum have been based largely on perceived need. A review of the published national curriculum set the groundwork for a formal approach to curriculum renewal using a targeted needs assessment. We felt this approach would provide us with valuable information as we moved forward with the curriculum renewal process.

A two part targeted needs assessment was developed. We first surveyed stakeholders; chief residents, clerkship and residency leadership to identify concepts, complaints, procedures / tasks, conditions and clinical decision rules perceived as important for all students to be exposed to during their required 4 week EM rotation. Responses were reviewed to identify patterns. A follow up needs assessment was distributed to a larger group of faculty, residents and students. This prioritized response options based on perceived level of importance; very, somewhat or less important.

All (n-14) participants responded to the initial survey. Data obtained populated responses for the follow up survey. Fifty three (87%, n-61) responded to the follow up needs assessment. Four key concepts were felt to be "Very Important" to emphasize during the clerkship; approach to the undifferentiated patient, performing a focused H&P, recognizing "Red Flag" symptoms, sick vs. not sick. These are now a focal point of discussion during orientation. Four complaints were felt to be "Very Important"; abdominal pain, altered mental status, chest pain and shortness of breath. These are incorporated into didactic cases used during the clerkship. Additional cases have been developed to reflect the importance of conditions identified through the needs assessment. Key clinical decision rules have been

incorporated into our evidence based medicine assignment.

Pre / post curricular renewal learner evaluations have been positive and a trend in improved end of rotation exam scores were noted after the curricular changes we made.

22 Emergency Medicine Residency Milestones Incorporated into First and Second Year Medical Student Elective

Christina Cantwell, MS; Jonathan Lee, MD; Soheil Saadat, MD, PhD; Nicholas Bove, MD; Sangeeta Sakaria, MD, MPH, MST; Alisa Wray, MD, MAEd; Shannon Toohey, MD, MAEd

Learning Objectives: We describe an ACGME level 1 milestones-based elective curriculum for first and second year medical students interested in emergency medicine. The elective is designed to better prepare students in pre-clinical years for meeting level 1 milestones prior to graduation.

Abstract:

Background: The ACGME and American Board of Emergency Medicine describe 23 sub-competencies with milestones ranging from level 1 (expected of an incoming resident) to level 5 (demonstrates abilities of an attending). Studies of incoming interns have found that many fall short of meeting level 1 milestones. To address this gap, we developed the Milestones Elective, a level 1 milestones-based curriculum offered to first and second year medical students in pre-clinical years to better prepare them to meet these milestones prior to graduation.

Objective: To prepare first and second year medical students who complete the elective to meet level 1 milestones.

Curricular Design: The elective was designed with a faculty advisor closely involved with residency training and consisted of 15 events hosted by the school's Emergency Medicine Interest Group during the academic year. Each event was assigned sub-competencies based on content and format (lecture or procedure-based). Four of the 23 sub-competencies were omitted because they were better suited for third and fourth year medical students. Elective credit was earned by attending a combination of events to satisfy all 19 sub-competencies and at least eight events. Students self-reported perceived preparedness in satisfying level 1 milestones through anonymous pre- and post-curriculum surveys.

Impact: We found statistically significant increases in self-reported preparedness in 16 of the 19 level 1 milestones included in the elective and more broadly in the competencies of: patient care, medical knowledge, system-based practice, and practice-based performance improvement. This elective can be readily recreated in other programs. Implementing a milestones-based curriculum during pre-clinical years may better prepare students interested in EM for meeting level 1 milestones prior to residency by enhancing their learning experience and potentially improving self-confidence prior to entering clinical rotations.

Table 1. Categorizations of ACGME milestones included in the EMIG Milestones Elective.

Competency	Sub-competency	Level 1 Milestone
1: Patient Care	PC1: Emergency stabilization	Recognizes abnormal vital signs
1: Patient Care	PC2: Performance of focused H&P	Performs and communicates a reliable, comprehensive history and physical exam
1: Patient Care	PC3: Diagnostic studies	Determines the necessity of diagnostic studies
1: Patient Care	PC4: Diagnosis	Constructs a list of potential diagnoses based on chief complaint and initial assessment
1: Patient Care	PC5: Pharmacotherapy	Knows the different classifications of pharmacologic agents and their mechanism of action. Consistently asks patients for drug allergies
1: Patient Care	PC6: Observation and reassessment	Recognizes the need for patient re-evaluation
1: Patient Care	PC7: Disposition	Describes basic resources available for care of the emergency department patient
1: Patient Care	PC8: Multi-tasking	Manages a single patient amidst distractions[a]
1: Patient Care	PC9: General approach to procedures	Identifies pertinent anatomy and physiology for a specific procedure Uses appropriate Universal Precautions
1: Patient Care	PC10: Airway management	Describes upper airway anatomy Performs basic airway maneuvers or adjuncts (jaw thrust/chin lift/oral airway/nasopharyngeal airway) and ventilates/oxygenates patient using BVM
1: Patient Care	PC11: Anesthesia and acute pain management	Discusses with the patient indications, contraindications and possible complications of local anesthesia Performs local anesthesia using appropriate doses of local anesthetic and appropriate technique to provide skin to sub-dermal anesthesia for procedures
1: Patient Care	PC12: Other diagnostic and therapeutic procedures: Goal-directed Focused Ultrasound	Describes the indications for emergency ultrasound
1: Patient Care	PC13: Other diagnostics and therapeutic procedures: Wound management	Prepares a simple wound for suturing (identify appropriate suture material, anesthetize wound and irrigate) Demonstrates sterile technique Places a simple interrupted suture
1: Patient Care	PC14: Other diagnostics and therapeutic procedures: Vascular access	Performs a venipuncture Places a peripheral intravenous line Performs an arterial puncture
2: Medical Knowledge	MK: Medical knowledge	Passes initial national licensing examinations (e.g., USMLE Step 1 and Step 2 or COMLEX Level 1 and Level 2)

[a]Indicates level 1 milestone not included in the elective.

Table 2. Milestones assigned to each event and event descriptions.

Event	Description	Sub-competencies
Wilderness Medicine	Camping weekend and educational conference in the San Bernardino Mountains instructed by EM physicians	PC1, PC5, PC6, PC7, PC9, PC10, PC13, PC14, MK, ICS1, ICS2
Intro to EM Talk	EM attendings introduce the field and dynamic flow in the emergency department	PC3, PC5, PC6, MK, PROF1, ICS1
Procedures Workshop	Four rotating stations of suturing, ultrasound-guided IV insertion, IV access, intubation	PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC9, PC10, PC11, PC12, PC13, PC14, PBLI
Talk Shops with EM Attendings	Five dinners held throughout the year at ED attendings' house	PC7, SBP2, PROF1, ICS1, ICS2
Research Opportunities Dinner	Dinner with ED attendings where ongoing research projects are introduced	MK, SBP2, PBLI
Shadowing	ED shadowing scheduled by students based on availability	Varied. Students were allowed to choose up to 7 milestones per day of shadowing for credit with a brief description of cases seen that satisfy the milestones chosen.
Jeopardy	Test-your-knowledge of EM related topics	PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC10, PC11, PC12, PC13, PC14, MK, PBLI, ICS1, ICS2
Matching into EM Panel	Attendings describe the path to matching into EM	SBP2, PROF1, ICS1, ICS2
Disaster Medicine Talk	Lunch talk with EM physician describing the role of disaster medicine	PC1, PC4, PC9, PC13, ICS2
Cadaver Workshop	Procedures demonstrated on fresh tissue from cadaveric donors	PC1, PC2, PC4, PC9, PC10, PC11, PC12, MK, PBLI
Post-Match Panel	Graduating MS4s discuss their path to matching into EM	SBP2, PROF1