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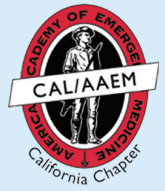
CORD *Abstracts Special Issue*

Supplement to

Western Journal of Emergency Medicine: Integrating Emergency Care with Population Health



Council of Emergency Medicine
Residency Directors Advances in
Education Research and Innovations



A Peer-Reviewed, International Professional Journal



DATES TO REMEMBER

2017

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| August 1 | CORD Award Nominations Open |
| September 18 | 2018 CPC Semi-Final Initial Case Submissions Open |
| October 2 | CORD Faculty, Resident & Coordinator Award Nominations Deadline |
| October 2 | CORD Academic Assembly Abstract Submissions Open |
| October 29 | CPC Final Competition @ ACEP17 |
| October 29-30 | CORD Committee Meetings @ ACEP17 |
| October 30 | CORD Business Meeting (Membership Meeting) @ ACEP17 |
| November 10 | 2018 CPC Semi-Final Initial Case Submissions Deadline |
| November 15 | CORD Board of Directors Nominations Open |
| December 1 | CORD Academic Assembly Registration & Housing Reservations Open |
| December 1 | CORD Academic Assembly Abstract Submissions Deadline |
| December 15 | CORD Board of Directors Nominations Deadline |

2018

| | |
|--------------------|--|
| January 8 | CORD Academy for Scholarship Nominations Deadline |
| January 8 | Longevity Award Nominations Deadline |
| January 22 | CORD Academic Assembly Early Bird Registration Closes |
| April 9 | CORD Academic Assembly Pre Registration Closes |
| April 22-25 | CORD Academic Assembly —San Antonio, TX |

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Council of Emergency Medicine Residency Directors Advances in Education Research and Innovations



The Council of Emergency Medicine Residency Directors Advances in Education Research and Innovations Forum presented a peer-reviewed selection of emergency medicine graduate and undergraduate educational research and innovations in both oral and poster formats at CORD Academic Assembly 2017. Emphasis was placed on novel research questions and designs. Innovation submissions included curricular designs, computer applications, faculty development, recruitment processes or similar topics.

| | |
|-----|---|
| v | Table of Contents |
| xi | Author Index |
| S1 | Research Abstracts |
| S33 | Innovation Abstracts |
| S69 | Best of the Best Presentations |
| S71 | Curricular Innovations Oral Presentations |
| S74 | Educational Soundbites Oral Presentations |
| S76 | Lightning Oral Presentations |

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Research Abstracts

1. **A Brief Online Tutorial to Improve Knowledge of Mass-Casualty Triage Concepts and Participant Preparedness for this Task**
Cristiana Baloescu, MD, Andrew Kamilaris, Katja Goldflam, MD, Anthony Tomassoni, MD, MS, FACEP, FACMT, FAACT
2. **A Descriptive Analysis of Practice Patterns Among Emergency Medicine Residency Programs on Twitter**
David Diller, MD
3. **A Multicenter Study of Grit And it's Relationship to Burnout**
Theodore Gaeta, DO, MPH, Aaron Dam, MD, Thomas Perera, MD, Michael Jones, MD, Tina Dulani, MD
4. **A Prospective Randomized Controlled Trial Comparing Simulation, Lecture and Discussion-Based Education of Sepsis to Emergency Medicine Residents**
Tiffany Moadel, MD, Susan Varga, MD, David Hile, MD
5. **A Quantitative Usability Analysis of the ALiEM Air Score**
Andrew Grock, MD
6. **An Evaluation of Risk Attitudes and Risk Tolerance in Emergency Medicine Residents**
Dimitrios Papanagnou, MD, MPH, EdD(c), Simran Buttar, MD, Nishad Rahman, BS, Tiffani Stanley, BA, Nicholas Governatori, MD, Nicole Piela, MD, Shruti Chandra, MD, Robin Naples, MD, Kory London, MD, Ronald Hall, MD
7. **Are Emergency Department to Emergency Department Transfers at Risk For Diagnostic Errors? A Needs Assessment for a Resident Curriculum.**
Joshua Solano, MD, Leslie Bilello, MD, David Chiu, MD, Carlo Rosen, MD, Edward Ullman, MD
8. **Ballistic Gelatin Training Models versus Human Models for the Training of Emergency Physicians Resident Physicians in the Sonographic Evaluation of Deep Vein Thrombosis**
Michaell Doctor, MD, Patrick Olivieri, MD, Sebastian Siadecki, MD, Gabriel Rose, DO, Nadia Baranchuk, MD, Ryan Tansek, MD, Aaran Drake, MD, Turandot Saul, MD
9. **Can a Cognitive Errors Algorithm Improve Clinical Decision-Making Among Medical Students in a Simulation-Based Course?**
Sumintra Wood, MD, Christopher Strother, MD, Kaushal Shah, MD
10. **Comparison of High-Fidelity Simulation versus Case-Based Discussion on Fourth-Year Medical Student Performance**
Tina Chen, MD, Stephanie Stapleton, MD, Matthew Ledford, MD, Alise Frallicciardi, MD
11. **Consulting with Game: How to Optimize Your Next ED Consultation**
Kyle Couperus, MD, Alex Koo, MD, Jason Bothwell, MD
12. **Curricular and Co-Curricular Social Media-Based Learning During Medical School**
Terrance Lee, MD, Carlo Rosen, MD
13. **Deliberate Apprenticeship in an Emergency Medicine Medical Student Elective, A Pilot Study**
Guy Carmelli, MD, Linda Fan, MD, Richard Sinert, DO, James Willis, MD
14. **Describing the Study Habits of Emergency Medicine Residents, A Preliminary Analysis**
Amanda Murphy, MD, Robert Conley, MD, Vivienne Ng, MD
15. **Developing Grading Guidelines for the NBME® Emergency Medicine Advanced Clinical Examination**
Linette Ross, MA, David Wald, DO, Emily Miller, MD, Kim Askew, MD, Douglas Franzen, MD, MEd, Luan Lawson, MD, MAEd, Elizabeth Fletcher, MS
16. **Development of a Novel Obese Cricothyrotomy Task Trainer**
Judah Hwang, MD, Amanda Crichlow, MD, Jessica Parsons, MD, Srikala Ponnuru, MD, Varsha Goswami, MD, Richard Hamilton, MD, John Vozenilek, MD, Sharon Griswold, MD
17. **Do Attending EPs Change Their Head CT Ordering Practices after Reviewing Their Head CT Utilization Data?**
Daniel Miller, MD, Mark Moubarek, BA, Priyanka Vakkalanka, ScM, Nicholas Mohr, MD, MS
18. **Does USMLE Step 1 & 2 Scores Predict Success on ITE and ABEM Qualifying Exam - A Review of an Emergency Medicine Residency Program from its Inception.**
MATHEW NELSON, DO, Chris Calandrella, DO

19. **Early Clinical Experience in Emergency Department Yields Higher Scores on Standardized Clinical Assessments**
Regina Royan, MPH, Christine Wu, BS, Nik Theyyanni, MD, Sacha Montas, MD, Joseph House, MD, Michael Lukela, MD, Sally Santen, MD, PhD
20. **Educational Needs of Non-EM Residents Rotating in the Emergency Department**
Carolina Veronese, MD
21. **Effect of Commuter Time on Residency Work Hours**
Christopher Sampson, MD, Marc Borenstein, MD
22. **Evaluation of the University of Utah Emergency Medicine Residency Patient Hand-Off Process**
Katie Wells, MD, MPH, Ian Buchanan, MD, Alison Frizell, MD, Ann Porter, MD, Susan Stroud, MD, Troy Madsen, MD, Robert Stephen, MD, Margaret Carlson, BS, Jacob Steenblik, MD, Megan Fix, MD
23. **Geographic Trends in the DO/IMG Emergency Medicine Match**
Zachary Jarou, MD, Joshua Sayers
24. **How do Emergency Medicine Programs Structure Resident Evaluations? A Survey**
Benjamin Cooper, MD, Kevin Beres, DO, Katrin Takenaka, MD, Michael Van Meter, MD, Samuel Lubner, MD
25. **How do Emergency Medicine Residencies Structure Trainees' Administrative Experience: A Survey**
Kelly Williamson, MD, Jeremy Branzetti, MD, Navneet Cheema, MD, Amer Aldeen, MD
26. **Improving Critical Care Documentation and Coding Using an Online Teaching Module**
George Hartstein, BS, Joseph Habboushe, MD, MBA, Erin Muckey, MD, MBA, Tina Wu, MD, MBA, William Goldberg, MD, Robert Femia, MD, MBA
27. **Improving General Surgery Resident Utilization and Confidence in Fast Exam with Emergency Physician Teaching**
Laura Wallace, MD, Deborah Kane, MD, Albert Kim, MD
28. **Investigation of ECG Interpretation Errors by Senior Emergency Medicine Residents**
Leslie Bilello, MD, Celine Pascheles, MD, Kiersten Gurley, MD, Shamai Grossman, MD, Carlo Rosen, MD
29. **Needs Assessment for a Peer Support Network in an Emergency Medicine Residency Program**
Aarti Jain, MD, Ramin Tabatabai, MD, David Diller, MD
30. **Non-Emergency Medicine Residents: Creating an Efficient Workforce**
Leah Heron, MD, Payal Shah, MD, Danielle Turner-Lawrence, MD
31. **Nursing Lectures During Conference Time are Well Received by Both Residents and Faculty**
Taylor Smith, MD
32. **Overtraining in Simulation-Based Mastery Learning - Performance Translation of Ultrasound-Guided Peripheral Intravenous Catheter Placement From a Simulator to Humans**
Amy Kule, MD, Helen Iwasaki, William Adams, MA, Trent Reed, DO
33. **Participation in an Emergency Medicine Bootcamp Increases Self-Confidence at the Start of Residency**
Jason Lewis, MD, David Schoenfeld, MD, MPH, Nicole Dubosh, MD, Edward Ullman, MD
34. **Post-Interview Communication Between EM Residency Programs and Applicants**
Eric Funk, MD, Ashley Sievers, MD, James Colletti, MD
35. **Resident Wellness Curricula: What's Out There? And Who's Doing It?**
Michael Zdradzinski, MD, James O'Shea, MBBS, MA, Michelle Lall, MD, MHS
36. **Residents do Not Find Milestones to be a Useful Component of End-of-Shift Evaluations**
Benjamin Cooper, MD, Kevin Beres, DO, Katrin Takenaka, MD, Michael Van Meter, MD, Samuel Lubner, MD
37. **Residents in Emergency Medicine Comparative Survey on Technology (REMCAST)**
Patrick Grace, BS, Zachary Aust, BS, Christopher Belcher, MD, Sameer Desai, MD
38. **Simulating Sepsis: Can Residents Improve CMS Compliance Through Simulation?**
Zachary Hafez, MD, MS, Christopher Holhaus, MD
39. **Simulation is Now Integral to EM Resident Training Nationwide**
Anneli von Reinhart, MD, Tiffany Moadel, MD, Kelly Dodge, MD, Leigh Evans, MD
40. **Sleep in the Emergency Department: How Shifts Affect Sleep Quality and Quantity**

Brian Ferguson, DO, MPH, Jenny McGowan, MD, Hugh Shoff, MD, MS, Martin Huecker, MD

41. **Social Media and Other Sources of Information Used During the Emergency Medicine Residency Application Process**

Terrance Lee, MD, Carlo Rosen, MD

42. **Survey of Emergency Medicine Residency Quality and Patient Safety Curricula**

Kassandra Cooper, DO, Robert Wolford, MD, MMM

43. **Teaching Osteopathic Manipulative Techniques to Allopathic Emergency Medicine Residents**

Cherian Justin, DO, Deborah Pierce, DO, MS, William Boroughf, DO, Kamran Mohiuddin, MD

44. **Teaching the Emergency Medicine Competencies During a Clinical Shift: Effective and Ineffective Strategies Used by Faculty**

Erin Dehon, PhD

45. **The Effect of a Resident Wellness Program on Burnout and ITE Scores**

Caroline Dowers, MD, Taher Vohra, MD, Nikhil Goyal, MD, Joseph Miller, MD

46. **The Point-of-Care Evidence-Based Medicine Online Resource: Two Year Follow-Up**

Aleksandr Tichter, MD, MS, Alexander Fortenko, MD, Mark Shankar, MD

47. **Validation of a Behaviorally Anchored Evaluation Form for Resident Lectures**

Jeffery Hill, MD, MEd, Matthew Stull, MD, Robbie Paulsen, MD, Brian Stettler, MD, Kimberly Hart, MA, Erin McDonough, MD

48. **What's All the Chatter? A Mixed-Methods Analysis of Emergency Physicians' Tweets**

Alisha Brown, MD, Jeff Riddell, MD, Joshua Jauregui, MD, Jeanette Yang, Rafae Nauman, Lynne Robins, PhD

49. **You've Got Mail: Efficacy of an Electronic Mail System as an Educational Strategy in Residency Training**

Eric VanDePol, MD

2. **A Low Fidelity Model for Teaching Lateral Canthotomy Procedure**

Linda Herman, MD, Brian Koch, MD, John Benauer-Benning, RT

3. **A Novel Approach to Emergency Medicine Resident Orientation Using the Flipped Classroom Model**

Christopher Amick, MD, Michael Barrie, MD, David Way, Jennifer Mitzman, MD, Sarah Greenberger, MD, Sorabh Khandelwal, MD, Andrew King, MD

4. **A Novel Curriculum for Teaching Emergency Medicine Residents How to Break Bad News**

Matthew Hall, MD, Nicole Dubosh, MD, Edward Ullman, MD

5. **A Novel Eye Model for Simulation in Slit Lamp Examination, Ultrasound and Foreign Body Removal Using Animal Tissue**

Keel Coleman, DO, Timothy Fortuna, DO, Damon Kuehl, MD

6. **A Novel Homemade Program to Accurately Record Resident Conference Attendance**

Samuel Dodson, MD, Sarah Greenberger, MD, Sorabh Khandelwal, MD, Andrew King, MD

7. **A Practical Curriculum for Emergency Medicine Intern Orientation Using Near-Peer Teaching**

Randy Sorge, MD, Jean Sun, MD, Trevor Pour, MD, Kaushal Shah, MD

8. **A Shock Workshop for 1st Year Medical Students Using Novel Teaching Methods**

Daniel del Portal, MD, David Wald, DO

9. **Adventures in Didactic Curriculum (Re) Design: Systems Thinking for Core Topics**

Kristi Grall, MD, MHPE, Jessie Nelson, MD

10. **After Action Report: Reflective Practice Beyond the Core Curriculum**

Mert Eroglu, MD, Joshua Schiller, MD

11. **An Advanced Perfusion Elective for Emergency Medicine Residents**

Michael Butterfield, MD, MS, MPH, RDMS, Jason Wilson, MD, MA

12. **An Emergency Medicine Residency Didactics Revolution: The Use of a Multidisciplinary Team and Branding to Inspire and Support Curricular Change**

Robert Huang, MD, Brendan Munzer, MD, Nathan

Innovation Abstracts

1. **A 3D Printed Model for Simulated Arthrocentesis Training**

Cameron Henry, BS, Samuel Corbo, MD, Jonathan Bronner, MD

- Haas, MD, Brendan Byrne, MD, Laura Hopson, MD, Matthew Malone, MD, Mary Haas, MD, Robert Turer, MD, MSE, Mitch Odom, MD, Sally Santen, MD, PhD
13. **An Integrative “Flipped Classroom” Model for Emergency Medicine Residency Education**
William Fox, MD, Lynn Roppolo, MD, Alex Koyfman, MD, Walter Green, MD, Dustin Williams, MD, Larissa Velez, MD
 14. **Capturing Resident Observed Concerns Regarding Both the Patient Safety and the Health Care System: An Innovative Use of Resident Logs**
Bryan Kane, MD, Dawn Yenser, C-TAGME, Gavin Barr, MD, Terrence Goyke, DO, Kathleen Kane, MD, Shawn Quinn, DO, Kevin Weaver, DO
 15. **Clinical Competency Committee by Wiki**
Kelly Barringer, MD
 16. **Combating Patient Depersonalization: Rebuilding The Patient-Provider Relationship With a Simple Communication Tool**
Maia Dorsett, MD, PhD, Elaina DiOrio, MD, Alicia Oberle, MD, Tina Choudhri, MD, Assya Abdallah, MD, Lauren O’Grady, MD, Logan Jardine, MD, MPH, Christopher Sampson, MD
 17. **Critical Conversations: Using Simulation to Improve Comfort & Skill With Goals of Care Discussion.**
Maia Dorsett, MD, PhD, Christopher Lawrence, MD, Alicia Oberle, MD, Michael Galante, MD, Chandra Aubin, MD, Maria Dans, MD
 18. **Data-Driven Evaluation of Residents’ Clinical Competence: Automating The Model of Clinical Practice of Emergency Medicine**
Anneli von Reinhart, MD, Dan Savage, MD, Stacy Sawtelle Vohra, MD
 19. **Development of a Multidisciplinary Curriculum For Education of Trauma Teams During Weekly Emergency Medicine Residency Conference**
Neel Naik, MD, Brenna Farmer, MD
 20. **Development of a Novel Ultrasound Peritonsillar Abscess Model for Simulation Training**
Jennifer Plitt, MD, Vivienne Ng, MD, MPH
 21. **Development of a Palliative Care Curriculum for Yale Emergency Medicine Residents: A Novel Approach**
Susan Varga, MD, Katja Goldflam, MD, Karen Jubanyik, MD, Laura Morrison, MD
 22. **Development of a Sustainable Curriculum on Substance Use Disorders (SUD) for Emergency Medicine Residents at Cooper University Hospital**
Eric Gruber, MD, Zinta Zapp, MD, Richard Pescatore, DO, Andrew Nyce, MD, Matthew Salzman, MD, Rachel Haroz, MD
 23. **Difficult Discussions - A Novel Educational Technique to Teach Professionalism and Interpersonal Skills to Fourth Year Medical Students**
Jeffrey Holmes, MD, Christopher Bowe, MD, Kate Zimmerman, DO, Casey MacVane, MD, MPH, Tania Strout, PhD, RN, MS
 24. **Education Faculty Scorecards as a Method of Ensuring Compliance and Accountability Among Educators**
Alyssa Tyransky, BS, Lori Miller, Jennifer Journy, Sarah Greenberger, MD, Sorabh Khandelwal, MD, Andrew King, MD
 25. **EKG Fundamentals: An Open Access Flipped Classroom Critical EKG Curriculum**
William Burns, MD, Patrick Lank, MD, MS, Kristen Grabow Moore, MD, MEd
 26. **Evaluation of Incoming Emergency Medicine Residents’ Ability to Perform Level One Milestone Tasks as Outlined in “The Emergency Medicine Milestone Project”**
Kevin Dougherty, DO, Jesse Kellar, MD
 27. **FOAM Resources in a Flipped Classroom Educational Series**
Timothy Fallon, MD
 28. **Healthcare Disparities**
Oyinkansola Okubanjo, MD, Elise Lovell, MD, ,
 29. **Identifying Strengths and Weaknesses in 3rd Year Clerkships Through Patient Evaluations And Self-Reflection**
Kara Welch, BA, Lisa Kelly, MPH, Paul Ko, MD
 30. **Implementation of a 360° Assessment Rubric for Level 5 Milestone Anchors for Procedures**
Bryan Kane, MD, Michael Nguyen, MD, Gavin Barr, MD, Nicole Elliott, DO, Terrence Goyke, DO, Kathleen Kane, MD, Steven Johnson, DO, Shawn Quinn, DO, Dawn Yenser, C-TAGME, Kevin Weaver, DO
 31. **Implementation of a Didactic Curriculum for Residents Training in a Dual Residency**
Joshua Schechter, MD

32. **Improving Conference Evaluations via an Electronic Survey Platform**
Lisa Barker, MD, Greg Tudor, MD
33. **Improving Resident Remediation by Building Bridges: Better Recognition and Insight to Define Goals in Education**
Robert Huang, MD, Brendan Munzer, MD, Brendan Byrne, MD, William Peterson, MD, Miguel Arribas, MD, Meg Wolff, MD, Sally Santen, MD, PhD
34. **Intern Passport - Orienting New Travelers to the Emergency Department**
David Masneri, DO, Jamie Wright, MD, Cedric Lefebvre, MD
35. **Introduction of a Wilderness Medicine Curriculum to an Urban Emergency Medicine Residency**
Noah Einstein, MD, John Meyers, MD, Kelly Williamson, MD, Elise Lovell, MD
36. **Ionizing Radiation Knowledge Educational Module**
Latonya T. Gobin, MD, Michelle D. Lall, MD, MHS, David Theriot, MD, Keith D. Herr, MD, Megan C. Henn, MD, Tarek N. Hanna, MD
37. **It is a Reality: Oculus Assists in Seeing Virtually Everything During Interview Sessions**
Scott Crawford, MD, Stormy Monks, PhD, MPH, Radosveta Wells, MD
38. **Junior Faculty Exchange Promotes Regional Presence for EM Faculty**
Nicholas Hartman, MD, MPH, Damon Kuehl, MD, Christina Shenvi, MD, PhD, Sandra Craig, MD, Joshua Broder, MD, Cedric Lefebvre, MD, David Manthey, MD
39. **Learning Moment - An Innovative Experiential Learning Platform**
Alexander Sheng, MD
40. **Low Fidelity Simulation Workshop to Teach Principles of Mass Casualty Management in the ED with Emphasis on Quality Improvement**
Linda Spillane, MD, Jeremy Cushman, MD, MS, EMT-P, Benjamin Sensenbach, EMT-P, Michael Lu, MD, Julie Pasternack, MD, Kathleen Stephanos, MD, Ryan Bodkin, MD
41. **Mental Practice as an Adjunct to Improving Pediatric Resuscitation Skills**
Lee Marks, MD, Linda Spillane, MD
42. **Milestones in Simulation: Mapping Critical Actions in Simulation to the Milestones in Emergency Medicine**
Nicole Elliott, DO, Michael Nguyen, MD, Terrence Goyke, DO, Steven Johnson, DO, Kevin Weaver, DO, Bryan Kane, MD
43. **Military Emergency Medicine (EM) Residency Guide: Demystifying the Military Match and Application Process**
Linda Katirji, MD, Sameer Desai, MD, Emily Hillman, MD, Lucienne Lufty-Clayton, MD, Gillian Schmitz, MD
44. **NEXUS Introduction to Emergency Medicine Course: Resident-Taught Multi-Modality Medical Student Elective**
McVane Ben, MD, Pour Trevor, MD
45. **Novel Cost-Effective Model to Simulate Corneal Foreign Body Removal**
Michael Lu, MD, FACEP
46. **Resident as Expert: A Novel Approach to Teaching and Practicing Quality Improvement**
Daniel del Portal, MD, Michael DeAngelis, MD, Kraftin Schreyer, MD, Zachary Repanshek, MD
47. **Role of Teaching Resident in Emergency Medicine Residency Program**
Justin Mauldin, MD, Paula Mueller, MD
48. **Small-Group Shift for Assessment of Entrustable Professional Activities in an EM Clerkship**
Michael Kiemeney, MD, Sam Matthews, MD, Radu Dudas, MD, Darcy Mainville, MD, Jessica Wickes, MD, Dustin Smith, MD, Tim Young, MD, Tammy Phan, Lynda Daniel-Underwood, MD
49. **Staggering Transitions of Care to Provide Supervised Signouts**
Tina Choudhri, MD, Colleen Roche, MD
50. **Storytelling: A Novel Wellness Initiative for Emergency Medicine Resident**
Glenn Paetow, MD, Joshua Schiller, MD, Arlene Chung, MD, Danielle Hart, MD
51. **The Flipped Classroom in Medical Student Education: Does "Priming" Work?**
Emily Rose, MD
52. **The Quadruple Threat Emergency Medicine Clerkship Curriculum**
Alexis Pelletier-Bui, MD
53. **Using a Case-Based Blog to Supplement**

Emergency Medicine Education: One Residency's Experience

Jennifer Love, MD, Mira Mamtani, MD, Lauren Conlon, MD, Francis DeRoos, MD, Amy Zeidan, MD, Kevin Scott, MD

54. **Utility of Alumni and Resident Survey in Curriculum Evaluation: Resident Perception and Alumni Perspective**

Chung Won, MD, Laurel Yang, MD, Lynn Jiang, MD, Alexander Fortenko, MD, Gina Waight, MD, Neel Naik, MD, Osman Sayan, MD

55. **We are Being Interviewed too: Faculty Development on How to Find and Attract the Best Resident for Your Program**

Tina Choudhri, MD, Colleen Roche, MD

Best of the Best Oral Presentations

1. **Inter-Rater Reliability of Select Emergency Medicine Milestones in Simulation**

Kathleen Wittels, MD, Michael Abboud, MD, Yuchiao Chang, PhD, Alexander Sheng, MD, James Takayesu, MD, MSc

2. **Proceedings From the CDEM Consensus Conference on Clinical Assessment of Medical Students in the ED: introducing the NCAT-EM**

Katherine Hiller, MD, MPH, Douglas Franzen, MD, Julianna Jung, MD, Luan Lawson, MD

3. **ROAR: Resident Ovation and Appreciation Rewards, on the Path to Wellness in Emergency Medicine**

Jessica Rainey, MD, Victoria Klyce, MD, Carter Neugarten, MD, Jeffrey Chien, MD, Sarah Williams, MD, Krista Fukumoto, S.V. Mahadevan, MD

Curricular Innovations Oral Presentations

1. **Cricothyrotomy: An Inexpensive Training Model**

Elizabeth Malik, BS, Mark Deutchman, MD

2. **Incorporating an Interesting Case Discussion Board into an Emergency Medicine Clerkship**

David Wald, DO, Kathleen Fane, MD, Jeffrey Barrett, MD

3. **Student Creation of Social-Media Based Teaching Tools as a Required Component of a Fourth Year Emergency Medicine Subinternship Curriculum**

Jonathan St. George, MD, Christopher Rafie, MD, Gregory Simon, MD, Christopher Tedeschi, MD, MA

4. **The Patient Experience Shift: Enhancing Medical Student Attitudes Toward Patient-Centered Care**

Louise Prince, MD, Vincent Calleo, MD, Kara Welch, Susan Wojcik, PhD

Educational Soundbites Oral Presentations

1. **Development of an Educational Track to Supplement Emergency Medicine Resident Curriculum**

Michael Craddick, DO, Sara Krzyzaniak, MD

2. **Pharmacist Observation of Residents' Management During Resuscitations: A Novel Direct Observation Assessment of Resident Milestones**

Kelly Barringer, MD

3. **Preparing Emergency Medicine Residents to Disclose Medical Error Using Standardized Patients**

Sherri Rudinsky, MD, Carmen Spalding, PhD, RN, CHSE

Lightning Oral Presentations

1. **Does a Positive Delta From Step 1 to Step 2 Correlate with Board Passage?**

Tina Dulani, MD, Uta Guo, MD, Annette Visconti, MD, Michael Cabezon, MD, Geoff Jara-Almonte, MD, Theodore Gaeta, MD

2. **Does Video Playback Speed Affect Comprehension for Students Listening to Podcasts for Novel Curriculum Delivery?**

Kristine Song, BA, Amit Chakraborty, MD, Adam Dugan, MS, Brian Adkins, MD, Matthew Dawson, MD, Christopher Doty, MD

3. **Training Residents to C.A.R.E. Using Videotaped Unannounced Standardized Patient Encounters**

Arlene Chung, MD, MACM, David Saloum, MD, Clairese Retino, MD, Jared Brazg, MD, Corey Weiner, MD, Illya Pushkar, MPH, Jefferson Drapkin, BS, Antonios Likourezos, MA, MPH, John Marshall, MD

4. **Use of Multidisciplinary Simulation to Improve Communication Skills, Interpersonal Relationships, and Job Satisfaction in Emergency Medicine Residents**

Richard Austin, MD, Jonathan dela Cruz, MD, Jason Kegg, MD, Cassie Jaeger, PhD, Chinmay Patel, DO, Allison Helmerichs, RN, Matthew Helmerichs, RN, Zachary Norman, RN

- Abdallah, A, 43
 Adams, W, 21
 Amick, S, 35
 Arribas, M, 54
 Aubin, C, 44
 Aust, Z, 24
 Baloescu, C, 1
 Baranchuk, N, 6
 Barker, L, 53
 Barr, G, 42, 52
 Barrett, J, 72
 Barringer, K, 42, 74
 Belcher, C, 24
 Ben, M, 62
 Benauer-Benning, J, 34
 Beres, K, 16, 24
 Bilello, L, 5, 19
 Bodkin, R, 58
 Borenstein, M, 14
 Boroughf, W, 28
 Bothwell, J, 8
 Bowe, C, 48
 Branzetti, J, 17
 Brazg, J, 77
 Broder, J, 57
 Bronner, J, 33
 Brown, A, 32
 Buchanan, I, 15
 Burns, W, 49
 Buttar, S, 5
 Butterfield, M, 40
 Byrne, B, 40, 54
 Calandrella, C, 12
 Carlson, M, 15
 Carmelli, G, 9
 Chandra, S, 5
 Cheema, N, 17
 Chen, T, 7
 Chiu, D, 5
 Choudhri, T, 43, 66, 69
 Chung, A, 66, 77
 Coleman, K, 36
 Colletti, J, 22
 Conley, R, 10
 Conlon, L, 68
 Cooper, B, 16, 24
 Cooper, K, 27
 Corbo, S, 33
 Couperus, K, 8
 Craig, S, 57
 Crawford, S, 56
 Crichlow, A, 11
 Cushman, J, 58
 Dam, A, 3
 Daniel-Underwood, L, 65
 DeAngelis, M, 64
 Dehon, E, 29
 del Portal, D, 38, 64
 DeRoos, F, 68
 Desai, S, 24, 60
 Diller, D, 1, 19
 DiOrio, E, 43
 Doctor, M, 6
 Dodge, K, 26
 Dodson, S, 37
 Dorsett, M, 43, 44
 Dougherty, K, 50
 Dowers, C, 29
 Drake, A, 6
 Drapkin, J, 77
 Dubosh, N, 22, 36
 Dudas, R, 65
 Dulani, T, 2, 76
 Einstein, N, 28, 55
 Elliott, N, 51, 58
 Erogul, M, 38
 Fallon, T, 50
 Fan, L, 9
 Farmer, B, 45
 Femia, R, 17
 Ferguson, B, 27
 Fix, M, 15
 Fletcher, E, 10
 Fortenko, A, 30, 68
 Fortuna, T, 36
 Fox, W, 41
 Franzen, D, 10, 70
 Frizell, A, 15
 Funk, E, 22
 Gaeta, T, 3, 76
 Galante, M, 44
 Gobin, L, 55
 Goldberg, W, 17
 Goldflam, K, 1, 46
 Goswami, V, 11
 Governatori, N, 5
 Goyal, N, 29
 Goyke, T, 42, 52, 59
 Grabow Moore, K, 49
 Grace, P, 24
 Grall, K, 39
 Green, W, 41
 Greenberger, S, 35, 37, 48
 Griswold, S, 11
 Grock, A, 4
 Gruber, E, 47
 Gurley, K, 19
 Haas, M, 41
 Haas, N, 41
 Habboushe, J, 17
 Hafez, Z, 25
 Hall, M, 36
 Hall, R, 5
 Hamilton, R, 11
 Hart, D, 66
 Hart, K, 31
 Hartman, N, 57
 Hartstein, G, 17
 Henn, M, 55
 Henry, C, 33
 Herman, L, 34
 Heron, L, 20
 Herr, K, 55
 Hile, D, 3
 Hill, J, 31
 Hillman, E, 60
 Holhaus, C, 25
 Holmes, J, 48
 Hopson, L, 41
 House, J, 13
 Huang, R, 40, 54
 Hwang, J, 11
 Iwasaki, H, 20
 Jain, A, 19
 Jardine, L, 43
 Jarou, Z, 15
 Jauregui, J, 32
 Jiang, L, 68
 Johnson, S, 52, 59
 Journy, J, 48
 Jubanyik, K, 46
 Justin, C, 28
 Kamilaris, A, 1
 Kane, B, 42, 52
 Kane, D, 18
 Kane, K, 42
 Katirji, L, 60
 Kellar, J, 50
 Kelly, L, 52
 Khandelwal, S, 37, 48
 Kiemeney, M, 65
 Kim, A, 18
 King, A, 35, 37
 Ko, P, 52
 Koch, B, 34
 Koo, A, 8
 Koyfman, A, 42
 Kuehl, D, 36, 57
 Kule, A, 21
 Lall, M, 23, 55
 Lank, P, 49
 Lawrence, C, 44
 Lawson, L, 10, 70
 Ledford, M, 7
 Lee, T, 9, 27
 Lefebvre, C, 54
 Lewis, J, 22
 Likourezos, A, 77
 London, K, 5
 Love, J, 68
 Lovell, E, 51, 55
 Lu, M, 58, 63
 Luber, S, 16, 24
 Lufty-Clayton, L, 60
 Lukela, M, 13
 Madsen, T, 15
 Mainville, D, 65
 Mamtani, M, 68
 Manthey, D, 57
 Marks, L, 59
 Marshall, J, 77
 Masneri, D, 54
 Matthews, S, 65
 Mauldin, J, 64
 McDonough, E, 31
 McGowan, J, 27
 Meyers, J, 55
 Miller, D, 12
 Miller, E, 10
 Miller, L, 48
 Mitzman, J, 35
 Moadel, T, 3, 26
 Monks, S, 56
 Morrison, L, 46
 Moubarek, M, 12
 Muckey, E, 17
 Mueller, P, 64
 Munzer, B, 41, 54
 Murphy, A, 10
 Naik, N, 45
 Naples, R, 5
 Nauman, R, 32
 Nelson, J, 39
 Nelson, M, 12
 Ng, V, 10, 45
 Nguyen, M, 52, 59
 Nyce, A, 47
 Oberle, A, 43, 44
 Odom, M, 41
 Okubanjo, O, 51
 Olivieri, P, 6
 O'Shea, J, 23
 Paetow, G, 66
 Papanagnou, D, 5
 Parsons, J, 11
 Pascheles, C, 19

Pasternack, J, 58
 Paulsen, R, 31
 Pelletier-Bui, A, 67
 Perera, T, 3
 Pescatore, R, 47
 Peterson, W, 54
 Piela, N, 5
 Pierce, D, 28
 Plitt, J, 45
 Pour, T, 38
 Pushkar, I, 77
 Quinn, S, 1, 52
 Rahman, N, 5
 Repanshek, Z, 64
 Retino, C, 77
 Riddell, J, 32
 Robins, L, 32
 Roche, C, 66, 69
 Roppolo, L, 41
 Rose, E, 67
 Rosen, C, 5, 9, 19, 27
 Ross, L, 10
 Royan, R, 13
 Saloum, D, 77
 Salzman, M, 47
 Sampson, C, 14, 43
 Santen, S, 13, 41, 54
 Saul, T, 6
 Savage, D, 44
 Sawtelle Vohra, S, 44
 Sayan, O, 68
 Sayers, J, 15
 Schechter, J, 53
 Schiller, J, 39, 66
 Schmitz, G, 60
 Schoenfeld, D, 22
 Schreyer, K, 66
 Sensenbach, B, 58
 Shah, K, 6, 38
 Shah, P, 20
 Shankar, M, 30
 Sheng, A, 57, 69
 Shenvi, C, 57
 Shoff, H, 27
 Siadecki, S, 6
 Sievers, A, 22
 Sinert, R, 9
 Smith, D, 65
 Smith, T, 21
 Solano, J, 5
 Sorge, R, 38
 Stapleton, S, 7
 Steenblik, J, 15
 Stephen, R, 15
 Strother, C, 6
 Stroud, S, 15
 Strout, T, 48
 Stull, M, 31
 Sun, J, 38
 Tabatabai, R, 19
 Takenaka, K, 16, 24
 Tansek, R, 6
 Theriot, D, 55
 Theyyunni, N, 13
 Tichter, A, 30
 Trevor, P, 62
 Tudor, G, 53
 Turner-Lawrence, D, 20
 Tyransky, A, 48
 Ullman, E, 5, 22, 36
 Vakkalanka, P, 12
 VanDePol, E, 33
 Varga, S, 2, 46
 Velez, L, 41
 Veronese, C, 13
 Vohra, T, 28, 44
 von Reinhart, A, 26, 44
 Vozenilek, J, 11
 Waight, G, 68
 Wald, D, 10, 38, 72
 Wallace, L, 18
 Way, D, 35
 Weaver, K, 42, 52, 59
 Weiner C, 77
 Welch, K, 52, 73
 Wells, K, 15
 Wells, R, 56
 Wickes, J, 65
 Williams, D, 41
 Williamson, K, 17, 55
 Wilson, J, 40
 Wolff, M, 54
 Wolford, R, 27
 Won, C, 68
 Wood, S, 6
 Wright, J, 54
 Wu, C, 13
 Yang J, 32
 Yang, L, 68
 Yenser, D, 42, 52
 Young, T, 65
 Zapp, Z, 47
 Zdradzinski, M, 23
 Zeidan, A, 68
 Zimmerman, K, 48

Research Abstracts

1 A Brief Online Tutorial to Improve Knowledge of Mass-Casualty Triage Concepts and Participant Preparedness for this Task

Baloescu C, Kamilaris A, Goldflam K, Tomassoni A /Yale New-Haven Hospital, New Haven, CT; Frank H. Netter MD School of Medicine at Quinnipiac University, North Haven, CT; Yale New-Haven Hospital, New Haven, CT; Yale New-Haven Hospital, New Haven, CT

Background: Appropriate triage is the most important medical task performed at a disaster site to reduce death and disability.^{1,2} Formal training in this skillset for medical students and residents is lacking.^{1,4,5,6} Free online medical education can fulfill the need for brief specific training with the potential to reach a variety of trainees, though little is known of how much of that information is retained long term.

Objectives: This study investigates participants' baseline comfort with and knowledge of mass-casualty triage protocols. We tested whether a brief online tutorial improved participant knowledge immediately after the tutorial and 3 months post intervention.

Methods: This is a prospective survey study of a convenience sample of emergency medicine physicians, medical and nursing students at an academic medical center. An online tutorial on triage methods during mass-casualty incidents was published using a Wordpress platform. Participants were given access to the website and took an initial survey of prior mass-casualty triage experience, subjective preparedness to perform such triage, as well as a test of triage performance using Simple Triage and Rapid Treatment and Secondary Assessment of Victim Endpoint algorithms. After reading through the tutorial, participants completed a post-tutorial survey and were reminded by email 3 months later to complete a third evaluation (Fig. 1).

Results: Fifty-two participants filled out the initial survey. The mean pre-tutorial survey score was 6.4 out of 14 (95% CI: 5.8-6.9). While there was a statistically significant increase in post-tutorial scores ($p < 0.0001$, Fig. 2), the knowledge increase was not maintained at 3 months ($p = 0.03$). Comparison between different trainee groups did not reveal any statistically significant difference in a one-way Anova [$F(3,47) = 1.39$, $p = 0.2$]. Participants felt more prepared and proficient in triaging victims immediately after the training ($p = 0.0003$, $p = 0.001$), but the difference was not maintained at 3 months ($p = 0.05$, $p = 0.06$).

Conclusions: Despite a high attrition rate, results suggest that mass-casualty triage knowledge can be improved in the short term at all levels of training using an

online tutorial. This gain was not sustained at 3 months, raising question about the long-term utility of online training.

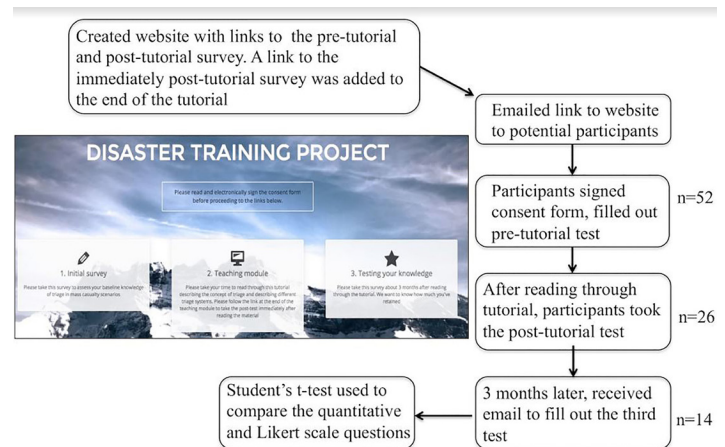


Figure 1. Methods for the study.

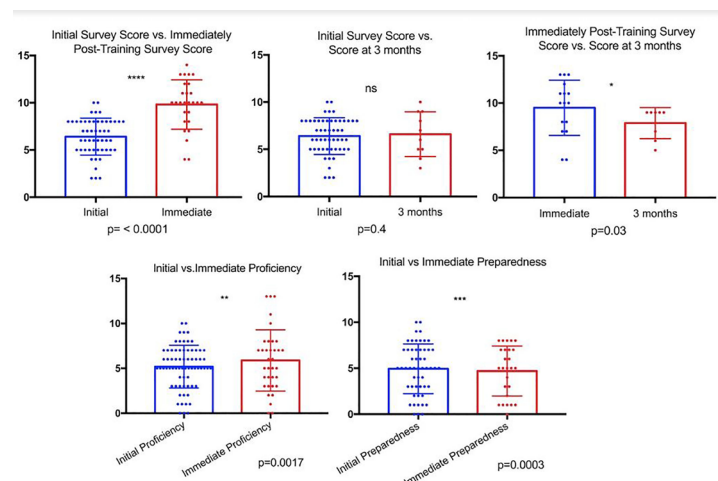


Figure 2. Score comparisons for initial pre-tutorial, immediately post-tutorial, and 3 months past initial training survey.

2 A Descriptive Analysis of Practice Patterns Among Emergency Medicine Residency Programs on Twitter

Diller D /LAC+USC, Los Angeles, CA

Background: Twitter is increasingly being recognized as an instructional tool by the Emergency Medicine (EM) community. In 2012, the Council of Residency Directors (CORD) recommended that EM residency program Twitter accounts be managed by faculty and not trainees, yet since this time, little has been published regarding the actual practice patterns of EM residency programs using Twitter.

Objectives: The purpose of this study was to provide descriptive analysis regarding current practice patterns

among EM residency programs with Twitter accounts. It was hypothesized that practice patterns differed from prior CORD recommendations.

Methods: In this IRB-approved mixed-methods cross-sectional study, a six question anonymous survey was distributed via spaced emails using the online tool SurveyMonkey© to EM residency program directors nationwide. Additionally, a Twitter-based search was conducted and the public profiles for EM residency program Twitter accounts were analyzed. Descriptive statistics and qualitative analysis were performed on the data set.

Results: Of the 168 ACGME-accredited EM residency programs surveyed, 88 programs responded (52% response rate), with 59% of respondents reporting an affiliated EM residency program Twitter account. Residents more commonly served as content managers for their programs Twitter accounts than faculty (43% vs 37%) with chief residents accounting for 28% of all content managers. Most programs (89%) do not publicly disclose the identity or positions of their content managers. A wide variety of applications for Twitter are currently in practice, with EM residency programs most commonly using Twitter for educational and promotional purposes. There is significant variability in the number of followers between EM residency programs' Twitter accounts.

Conclusions: Applications and usage among EM residency programs are varied, but largely inconsistent with prior CORD recommendations.

Figure 1. Survey questions and responses distributed via SurveyMonkey™

1. Does your emergency medicine residency program have a Twitter account?
2. Under this Twitter account, who is responsible for posting “tweets” (Check all that apply)
 - a. Chief resident(s)
 - b. Program coordinator
 - c. Program director
 - d. Other (please specify): _____

| Position | Survey Respondents |
|---------------------------|--------------------|
| Resident(s) | 28 (43%) |
| Faculty(s) | 24 (37%) |
| Administration/Staff | 6 (9%) |
| Mixed Faculty & Residents | 4 (6%) |
| Unclear | 3 (5%) |

3. What type of content is posted on this Twitter account? (Check all that apply)
 - a. Educational conference content
 - b. Non-conference educational content
 - c. Residency or departmental promotional content
 - d. Other (please specify): _____

4. Is this Twitter account used for any other educational or non-educational endeavors? (Check all that apply)
 - a. Asynchronous curriculum for resident training
 - b. Online journal club commentary
 - c. Other (please specify): _____

| Content Type | Survey Respondents |
|---|--------------------|
| Educational Conference Content | 38 (83%) |
| Residency/Departmental Promotional Content | 31 (68%) |
| Educational Non-Conference Content | 28 (61%) |
| Asynchronous Curriculum for Resident Training | 10 (43%) |
| Online Journal Club Commentary | 10 (43%) |

5. What measures are taken to protect the academic integrity and professionalism of the institution represented by this Twitter account? (check all that apply)
 - a. Adherence to institutional social media policy
 - b. Regulation on who is allowed to “tweet”
 - c. Other (please specify): _____

| Measures | Survey Respondents |
|---|--------------------|
| Adherence to an institutional social media policy | 38 (83%) |
| Regulation on who is allowed to “tweet” | 34 (74%) |

6. Please state the position of the person completing this survey
 - a. Program director
 - b. Faculty (please specify academic title)
 - c. Resident (please specify if chief resident or other designated position)
 - d. Administrator/Staff (please specify position)
 - e. Other (please specify): _____

| Position | Number of Respondents |
|------------------|-----------------------|
| Program Director | 29 (63%) |
| Faculty | 8 (17%) |
| Resident | 8 (17%) |
| Administrator | 1 (2%) |

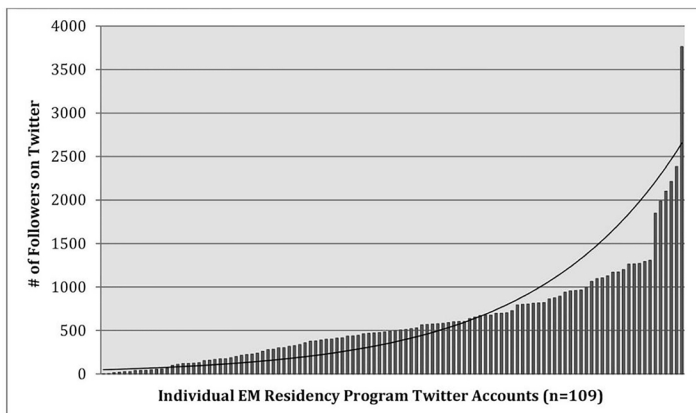


Figure 2. Number of followers per EM residency program Twitter account.

3 A Multicenter Study of Grit And it's Relationship to Burnout

Gaeta T, Dam A, Perera T, Jones M, Dulani T /New York Methodist Hospital, Brooklyn, NY; New York Methodist Hospital, Brooklyn, NY; Hofstra School of Medicine, Manhasset, NY; Albert Einstein College of Medicine, Bronx, NY; New York Methodist Hospital, Brooklyn, NY

Background: Burnout is a syndrome involving mental and psychological exhaustion, a reduced sense of accomplishment and self-esteem, and depersonalization in individuals whose work involves dealing with people. Burnout is common in physicians and the specific emotional and physical challenges of emergency medicine place Emergency Physicians at greater risk. Alternatively, grit, defined as “perseverance and passion for long-term goals,” attempts to quantify the ability of an individual to maintain sustained effort throughout an extended length of time. Grit has been found to be a superior predictor of success in several high-stress, high-achievement fields.

Objectives: We aimed to determine if grit, a novel character trait, is associated with resident burnout.

Methods: In November 2016, we conducted a multicenter cross-sectional survey at 3 large, urban, academically-affiliated emergency departments. EM residents in each centers training program were invited to provide anonymous responses to two validated survey instruments. Perseverance was measured using the Short Grit Scale. Burnout was measured with the Maslach Burnout Inventory. Categorical data are presented as frequency of occurrence; while continuous data are presented as means +/- std deviation, analyzed by two-tailed t-tests and correlation coefficients (Alpha = 0.05).

Results: 146 of 181 eligible residents (81%) completed the study (44 EM1, 42 EM2, 36 EM3, 24 EM4). 98 were males and 45 were females (3 identified as “other”). Grit was predictive of psychological well-being as measured by

the Emotional Exhaustion and Depersonalization subscales of the Maslach Burnout Inventory ($r = -0.32, P < .01$ and $r = -0.35, P < .05$ respectively). Analysis for variation by year in training showed that grit did not significantly differ by year in training but burnout did significantly differ, with EM 2 having higher levels of burnout than EM 1 and EM4 ($P < .05$). There were no differences in grit or burnout when analyzing by gender.

Conclusions: There appears to be an inverse relationship between self-reported measures of passion and perseverance (grit) and burnout. Measuring grit may identify those who are at greatest risk for burnout. These residents may benefit from earlier counseling to provide support and improve resilience.

4 A Prospective Randomized Controlled Trial Comparing Simulation, Lecture and Discussion-Based Education of Sepsis to Emergency Medicine Residents

Moadel T, Varga S, Hile D /Yale School of Medicine, New Haven, CT; Dartmouth Geisel School of Medicine, Hanover, NH; Johns Hopkins School of Medicine, Baltimore, MD

Background: Septic shock is a life-threatening condition that is traditionally taught to Emergency Medicine (EM) residents in a lecture-based format. Studies suggest that simulation may be more effective in creating competence and comfort in students of EM in managing emergent medical conditions as compared to lecture.

Objectives: Our goal was to investigate whether there is a difference in acquisition and retention of medical knowledge and one's comfort level in diagnosis and management of sepsis and septic shock in EM residents taught using simulation (SIM) vs. lecture (LEC) vs. discussion-based learning (DBL). We hypothesized that SIM would improve immediate medical knowledge and confidence levels compared to LEC or DBL.

Methods: Subjects were enrolled in this prospective randomized controlled trial from a convenience sample of 35 EM residents present during a didactic day in April 2015 at a 4-year program. Computer generated randomization assigned subjects to one of three didactics on sepsis and septic shock (SIM, LEC or DBL). Each didactic lasted 30 minutes and was based upon a set of learning objectives. The SIM arm participated in a 15-minute one-on-one mannequin simulation followed by a 15-minute debriefing. The LEC arm obtained a lecture. The DBL arm participated in a case-based discussion. Medical knowledge was assessed using a 24 question multiple choice question (MCQ) test. A survey using a 6-point likert scale assessed comfort in diagnosis and management of septic shock. Assessments were

given right before the intervention (pre-test), immediately post-intervention (initial post-test) and 3-6 months post-intervention (delayed post-test). Performance on the MCQ test was compared using a mixed effects repeated measures model and used a Bonferroni correction. Differences in the comfort questionnaire were obtained using the Kruskal-Wallis test.

Results: All 35 subjects completed the pre-test and initial post-test. MCQ test scores improved in the SIM group compared to the DBL group on the initial post-test (baseline adjusted difference = 2.83, p=0.009). 34 subjects completed the delayed post-test. There was no difference between MCQ test scores comparing SIM with the LEC or DBL groups (p > 0.05). There was no difference in comfort levels between groups on the immediate or delayed post-tests (p>0.05).

Conclusions: Simulation serves as a non-inferior didactic modality to teach EM residents the topic of sepsis. Our study demonstrated superior immediate knowledge gain when comparing SIM to DBL, but not to LEC. There no difference in long-term knowledge retention between the three modalities. Limitations include the variable 3-6 months time period to collect delayed post-test. The long lag-time for subjects responding at the 6 month time point might have eliminated a difference that might have been seen at the 3 month mark. Also, variable exposure to simulation may have affected subjects' comfort level in the simulation, potentially affecting how well one may learn from simulation. Finally, subjects from all years of training were included. More senior residents might have expert knowledge that would minimize an effect that any of the interventions might have had.

5 A Quantitative Usability Analysis of the ALiEM Air Score

Grock A /LAC+USC Department of Emergency Medicine, Los Angeles, CA

Background: Emergency medicine (EM) residents are increasingly utilizing online education resources (OERs), however, they receive little instruction in assessing their quality. Academic Life in Emergency Medicine (ALiEM), an online education website, created the Approved Instructional Resources (AIR) rubric to curate and assess the quality of these OERs. The rubric was found to be reliable within a group of 8-9 experts in EM education. Its acceptability and ease of use by general medical students (MS), EM attendings, and residents has yet to be studied.

Objectives: This study aimed to evaluate the AIR rubric's usability in a general population of MS, residents and attendings. We hypothesized that residents and MS would have difficulty assessing the impact and accuracy of OERs.

Methods: A convenience sample of MS, EM residents, and EM attendings were obtained as part of the METRIQ Study through in-person recruitment, social media promotion, and e-mails from prominent OER authors. After evaluating 5 OERs with the AIR rubric, each participant completed a usability assessment as well as which rubric items they found difficult to apply. Of the 330 participants, 21 did not complete the usability analysis.

Results: Table 1 shows the demographics of the raters. Overall, the AIR rubric was rated as very easy to use. Across all three levels, the BEEM score was most frequently reported as difficult. The next two items in terms of difficulty related to article accuracy and the incorporation of EBM. [Table 2]

Conclusions: The ALiEM AIR rubric was designed for a group of EM educators. This was the first attempt to evaluate its usability among a broad population of OER users. The BEEM score component of the ALiEM AIR score was the most difficult for all three populations to use. Medical students and residents reported difficulty analyzing the impact and accuracy of OERs. This data will inform the modification of the AIR score to better facilitate quality assessment of OERs by end users.

Table 1. Population of ALiEM AIR Usability Testing Raters.

| | | |
|----------------------------------|----------------------|----------------------|
| Rank | Attending | 33.0% (109/330) |
| | Resident | 28.8% (95/330) |
| | Medical Student | 38.2% (126/330) |
| Gender Split | Female | 39.4% (130/330) |
| | Male | 60.0% (198/330) |
| | Other | 0.6% (2/330) |
| Age | Average (SD) | 31.2 (+/- 7.3) years |
| Level of Training | Medical Students | 39.1% (126/330) |
| | Resident | 28.8% (95/330) |
| | Attending Physicians | 33.0% (109/330) |
| Manage, Own or Operate own blog? | Yes | 14.5% (48/330) |
| | No | 84.5% (279/330) |
| Country of Origin | United States | 37.9% (125/330) |
| | Canada | 45.2% (149/330) |
| | Other | 16.9% (56/330) |

Table 2. Quantification of Difficult Components of the ALiEM AIR Rubric.

| Component of ALiEM AIR Score | Item Instructions | Total % of Raters that found this item difficult |
|------------------------------|---|--|
| BEEM Rater Scale | Assuming that the results of this article are valid, how much does this article impact on EM clinical practice? | 28.2% (87/309) |
| Accuracy | Do you have any concerns about the accuracy of the data presented or conclusions of this article? | 13.3% (41/309) |
| EBM | Does this article reflect evidence based medicine (EBM) and thus lack bias? | 13.3% (41/309) |
| Educational Utility | Are there useful educational pearls in this article for residents? | 11.0% (34/309) |
| Referencing | Are the authors and literature clearly cited? | 10.7% (33/309) |

6 An Evaluation of Risk Attitudes and Risk Tolerance in Emergency Medicine Residents

Papanagnou D, Buttar S, Rahman N, Stanley T, Governatori N, Piela N, Chandra S, Naples R, London K, Hall R/Thomas Jefferson University, Philadelphia, PA

Background: Risk attitudes and risk tolerance are significant factors that influence decision-making. These attributes are also linked to burnout rates in EM physicians. To date, no prior studies address risk tolerance in EM training. Such data has the potential to inform educational curricula; scaffold practice patterns; and prevent burnout.

Objectives: The authors sought to define the risk profile of EM residents and identify risk patterns that would inform curricular interventions and wellness.

Methods: Current post-graduate year residents (PGY-1-3) of Thomas Jefferson University’s Emergency Medicine Residency Program participated in this study. Residents completed a 7-item pre-survey asking them to predict their respective risk type profile and risk tolerance score, and select areas where they are most comfortable with risk. They then completed the Risk Type Compass (RTC)™, a validated assessment tool offered by Multi-Health Systems, via a web link. The RTC provided their risk type; domains where they are most likely to engage in risky behaviors (i.e., financial, health/safety, recreational, social); and an overall risk tolerance indicator (RTi) score (low [0] to high [100]).

Results: 38 residents completed the RTC (response rate 100%); 24 residents completed the pre-survey (response rate 63%). Results were normed to the general US population. Expected RTi means for PGY-1s (50.5), PGY-2s (58.8), and PGY-3s (45.0) were higher than observed RTi means at 47.2 (95%CI, 40-54), 46.7 (95%CI, 39-54), and 44.8 (95%CI, 31-58), respectively (Table 1). There was no significant change in RTi scores across PGY. Figure 1 illustrates the number of residents across the 9 risk-type profiles. Profiles do not significantly change across PGY; however, PGY-1s are clustered in risk-averse profiles. Risk attitudes showed wide differences between pre-survey and RTC results. Overall, PGY-1s were most risk averse, with particular risk averseness to financial decisions. PGY-3s were most risk taking, specifically with their health and safety.

Conclusions: Results highlight risk patterns in residents and identify domains where they are most comfortable with risk. While residents overestimated their risk tolerance, risk profiles in PGY-3s were relatively more risk tolerant. Patterns of risk tolerance in EM residents may assist with curriculum development and wellness interventions.

Table 1. Mean, median, standard deviation, and confidence intervals of RTi.

| PGY | Expected RTi Based on Pre-survey | | | | Actual RTi Based on RTC | | | |
|-------|----------------------------------|--------|-----------|-------------------------|-------------------------|--------|-----------|-------------------------|
| | Mean | Median | Std. Dev. | 95% Confidence Interval | Mean | Median | Std. Dev. | 95% Confidence Interval |
| PGY-1 | 50.50 | 50.00 | 18.17 | 40.62 - 60.38 | 47.23 | 48.00 | 12.50 | 40.44 - 54.02 |
| PGY-2 | 58.75 | 67.50 | 19.04 | 48.40 - 69.10 | 46.69 | 53.00 | 13.88 | 39.14 - 54.24 |
| PGY-3 | 45.00 | 55.00 | 24.29 | 31.26 - 58.74 | 44.83 | 48.00 | 13.24 | 31.59 - 58.39 |

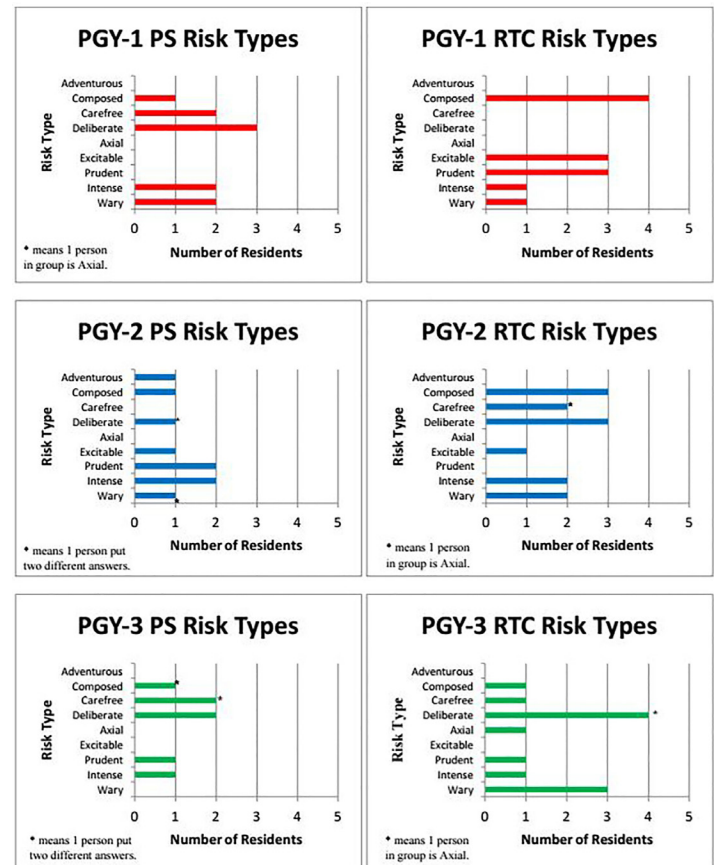


Figure 1. Expected Risk Types from Pre-Survey (PS) and RTC Risk Types.

7 Are Emergency Department to Emergency Department Transfers at Risk for Diagnostic Errors? A Needs Assessment for a Resident Curriculum.

Solano J, Bilello L, Chiu D, Rosen C, Ullman E/Beth Israel Deaconess Medical Center, Boston, MA

Background: ED transfers are common at academic medical centers. Many EM residencies are based at a tertiary care hospital that acts as the hub for a regional referral network. Little is known about the rate of diagnostic errors within this transfer population.

Objectives: Our goal is to determine the rate of diagnostic errors made in the receiving hospital in the

transfer population at our institution. In order to help inform and develop a resident curriculum around ED transfers.

Methods: This is a retrospective chart review with a primary outcome measure of diagnostic error in the ED transfer population. Diagnostic error was defined as a discrepancy between the diagnosis made by the EM attending notes and the final diagnosis made by the admission team on discharge. The study was performed at an urban, academic tertiary care referral center with an affiliated 3 year EM residency. All patients transferred to the ED between 07/2016 and 09/2016 were eligible. There were 1785 ED transfer patients during this time period. We did a power calculation using an error rate of 0.13% (from previous published data from our institution for all-comers) with an expected error rate of 2% in the ED transfer population requiring at least 102 cases for an alpha of 0.05% and power of 80%. Individual records of 143 randomly selected patients were reviewed. Diagnostic discrepancies between these items were reviewed by two blinded attending physicians and adjudicated as errors if the diagnosis occurred within the first 24 hours of the hospitalization, was not documented for in the ED note and if the two reviewers agreed it was a missed ED diagnosis.

Results: The average age was 60 for the population studied and 51% were male. Four errors were found among the 143 patients for an error rate of 2.8% (CI 0.1-5.5). Diagnostic errors from all-comer ED population to the ED transfer population were compared (p= 0.002).

Conclusions: In this single tertiary center study, the diagnostic error rate was found to be 21 times higher in the ED transfer population than all comers to the ED. This could be due to multiple issues, including the fact that many patients are transferred to a tertiary care facility because they are medically complex or hemodynamically unstable. In this unique population an educational curriculum centered around the transfer population, anchoring bias, and cognitive debiasing strategies may improve care.

8 Ballistic Gelatin Training Models versus Human Models for the Training of Emergency Physicians Resident Physicians in the Sonographic Evaluation of Deep Vein Thrombosis

Doctor M, Olivieri P, Siadecki S, Rose G, Baranchuk N, Tasek R, Drake A, Saul T/Mount Sinai St. Luke's Mount Sinai West, New York, NY

Background: Trained emergency physicians can perform DVT diagnostic ultrasound with high sensitivity and specificity. Ultrasound education involves a cognitive as well as a technical component. Live models with pathology may not be readily available and commercially available

phantoms may be prohibitively expensive. Simulation has been shown to increase learner confidence, reduce complications of procedures, decrease costs, and improve patient outcomes in a number of ultrasound applications.

Objectives: To compare the OSCE and written examination scores of emergency medicine residents who trained on a simulation model we created from ballistics gelatin versus human models.

Methods: Prospective study of 32 PGY 1-3 emergency medicine residents. Institutional Review Board approval was obtained. A 30-minute lecturer reviewed probe selection, lower extremity venous anatomy, and the major diagnostic criteria of compressibility. Each PGY class was split into two groups. Residents in the gelatin phantom group scanned the two phantom models, one with patent "veins" and the other with abnormal areas of non-compressibility. Residents in the human model group scanned two patients, one with a DVT and one healthy volunteer. After the training, residents completed an OSCE as well as a written examination interpreting 14 DVT ultrasound examinations.

Results: The live model and simulation trainer groups had a similar number of previous ultrasound scans performed. There was no statistically significant difference between either of the knowledge assessments for those who trained on the live model or simulation trainer. There were no significant differences between the two groups when asked to rate their preparedness and confidence in performing a DVT ultrasound evaluation.

Conclusions: We were able to create DVT phantom models from ballistics gelatin to train EM residents how to perform and interpret a DVT compressibility study. The phantom modes were inexpensive, durable, and easy to use. OSCE and written examination scores from EM residents that practiced on these phantoms were not statistically significant from those that did their hands-on training on human models. For this application, ballistic gelatin phantom models were as effective as training on human volunteers and may be considered as a cheaper, more readily available alternative.

9 Can a Cognitive Errors Algorithm Improve Clinical Decision-Making Among Medical Students in a Simulation-Based Course?

Wood S, Strother C, Shah K /Mount Sinai Hospital, New York, NY; Mount Sinai Hospital, New York, NY

Background: The study of cognitive errors in emergency medicine has become increasingly popular as physicians seek ways to increase patient safety and minimize patient morbidity and mortality. However, most studies that have focused on cognitive errors are retrospective and thus prone to hindsight bias. Furthermore, it is unclear whether

an understanding of cognitive errors alone can prevent emergency physicians from making the same types of biases in thinking while working in the busy, unpredictable atmosphere of the emergency department. A cognitive errors algorithm taught to medical students and resident physicians may be a better approach towards promoting both comprehension of cognitive errors and how to utilize this knowledge when taking care of diagnostically challenging patients.

Objectives: The focus of this pilot study was to introduce a simple cognitive errors algorithm to 4th year medical students in a simulation-based course and evaluate whether it improved their performance in diagnostically challenging SIM cases and enhanced knowledge retention compared to students without prior cognitive errors training.

Methods: This was a prospective randomized study involving 10 4th year medical students enrolled in a simulation course on the management of common floor emergencies. Medical students were randomized using an online tool into group 1 (n = 5), which received an introduction to cognitive errors and use of a cognitive errors algorithm (see attached figure) for their simulation cases, or group 2 (n = 5), which performed their simulation cases before receiving an introduction to cognitive errors. Both groups were evaluated during their simulation cases for completion of critical actions utilizing a standardized checklist. Both groups completed a pre-test assessing their knowledge of the simulation case topics and a one-month delayed post-test assessing for knowledge retention. All medical students completed a survey about the course and their perceptions of cognitive errors in medicine.

Results: There was no change in average score from pre-test to delayed post-test in both groups. On review of the checklists of critical actions undertaken during the simulation cases, group 1 completed more critical actions than group 2 in 3 out of the 4 simulation cases and achieved the correct diagnosis in all of the cases, whereas group 2 determined the correct diagnosis in only 3 out of the 4 cases. 90% (9/10) of medical students surveyed were very interested in learning more about cognitive errors and planned to incorporate their knowledge of cognitive errors into their clinical management. All of the medical students in group 1 (5/5) agreed or strongly agreed that the cognitive errors algorithm was a helpful strategy for the diagnosis and management of patients.

Conclusions: Although there was no difference among the groups in terms of knowledge retention on multiple-choice tests, the group with cognitive errors training performed better at completing critical actions and achieving the correct diagnosis in a simulation setting. Overall, medical students were enthusiastic about the study of cognitive errors and believed that a cognitive errors algorithm could be a helpful diagnostic aid. Larger

studies using different modalities such as video assessment or in-situ simulation to assess trainee performance and knowledge retention are needed.

Cognitive Errors Algorithm

1. Create differential
2. Select most likely or working diagnosis
3. Determine the worst-case scenario
4. Consider potential biases (anchoring, premature closure, context errors)
5. Make plan that addresses worst-case scenario and assesses for key illnesses within differential

10 Comparison of High-Fidelity Simulation versus Case-Based Discussion on Fourth-Year Medical Student Performance

Chen T, Stapleton S, Ledford M, Frallicciardi A /Hartford Hospital, Hartford, CT; Hartford Hospital, Hartford, CT; John Dempsey Hospital, Farmington, CT

Background: Medical students are often prepared for clinical challenges with small group didactics featuring case-based scenarios. In recent years, simulation has also emerged as a valuable training tool. However, there is limited data on which format leads to improved student performance.

Objectives: We hypothesize that high-fidelity simulation allows for improved self-efficacy, knowledge, and clinical performance among fourth-year medical students (MS4s) on their emergency medicine (EM) clerkship, compared to traditional case-based discussion.

Methods: This study is a randomized, prospective, crossover study involving MS4s at an academic institution on their EM clerkship in the 2016-2017 academic year. At this institution, MS4s undergo 12 hours of small group didactics with case-based discussion prior to clinical shifts. At the start of the EM clerkship, MS4s were randomized into two groups: one group had high-fidelity simulation for the altered mental status (AMS) unit and case-based discussion for the chest pain (CP) unit; the second group had case-based discussion for the AMS unit and high-fidelity simulation for the CP unit. Thus far, 45 students have been randomized (Fig 1).

Students completed a self-efficacy survey, as well as a multiple-choice questionnaire (MCQ) featuring content from the CP and AMS units. They were also individually assessed on performance in an AMS and CP simulation scenario with a novel evaluation tool based on ACGME EM Milestones and AAMC Core Entrustable Professional Activities. This video data is still being reviewed.

Results: Students reported increased confidence

managing CP and AMS patients after both high-fidelity simulation and case-based discussion, with greater increases in self-efficacy with simulation ($p < 0.05$, Fig 2). On the MCQ, the AMS simulation group outscored the CP group on AMS content by an average of 7.7% ($p < 0.05$). The CP simulation group outscored the AMS group on CP content by an average of 2.1%; though this trend did not reach statistical significance, data is still being collected through the academic year.

Conclusions: Among MS4s undergoing their EM clerkship, high-fidelity simulation led to greater improvements in self-efficacy and knowledge.

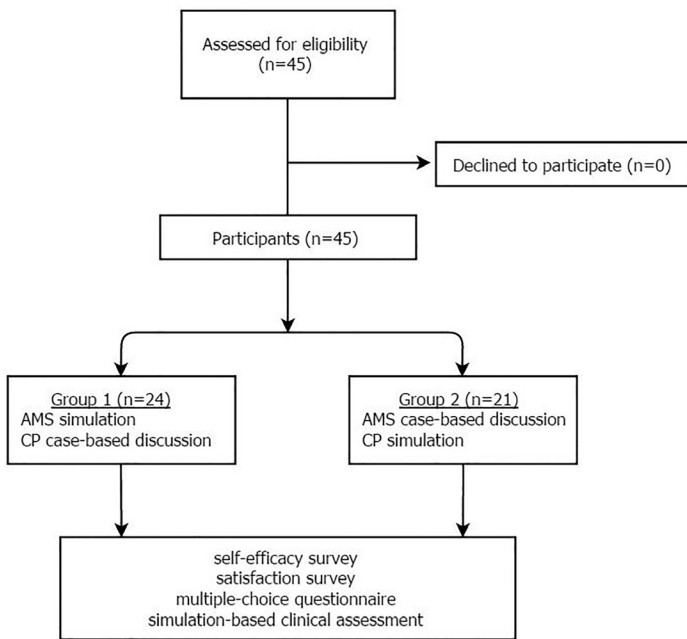


Figure 1.

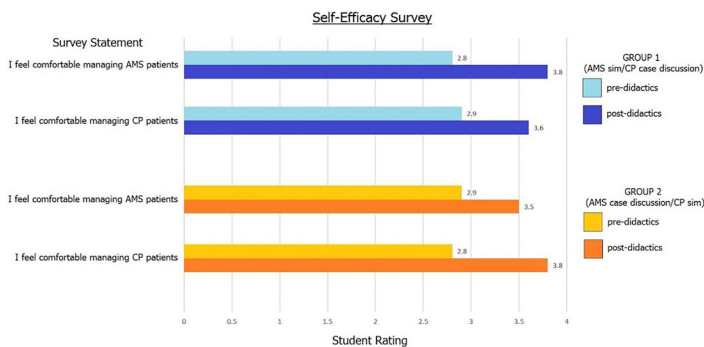


Figure 2.

11 Consulting with Game: How to Optimize Your Next ED Consultation

Couperus K, Koo A, Bothwell J/Madigan Army Medical Center, Tacoma, WA

Background: Emergency Medicine (EM) requires substantial communication with multiple specialties, 20%-40% of all patients have a consult during their stay. Communication is difficult in the chaotic and fast-paced EM environment. Poor communication and inadequate handoffs are associated with unfavorable patient outcomes, increased financial burden on hospitals, and litigation. Until recently, there has been little evidence regarding the optimal structure of consultations, or how to teach future physicians this skill.

Objectives: Present methods to optimize consultations in the emergency department including: structure and content of a good consult, how to teach this skill, how to prevent conflict, and what system factors are involved.

Methods: We completed a systematic review of the literature and performed a qualitative interview -based study within our own institution seeking to identify methods to optimize consultation, teach effective consultation skills, prevent conflict, and improve overall inter-department system factors.

Results: We identified 16 relevant articles incorporating consultations that have been published since the most recent systematic review in 2008. Seven focus on identifying the most important functional aspects of a consultation with two proposing standardized processes. Several (8) present methods and suggested timing to start formal education. Conflict prevention is reviewed in three, and six articles discuss systemic factors that influence consultations. The results from our qualitative interviews (figure 1) offer another guideline on how to optimize communication with a consultant.

Conclusions: The vast spectrum of Emergency Medicine makes a scripted consultation process difficult to develop. However, several standardized processes have been proposed such as the ‘5C’s’ and ‘PIQUED’. The findings in our study solidify the content embodied in each of these methods. The literature supports initiation of structured training as medical students that continues throughout residency. We also identified several systemic factors that minimize conflict and promote overall working relationships, such as joint conferences, pathways, and methods to promote teaching during consultations.

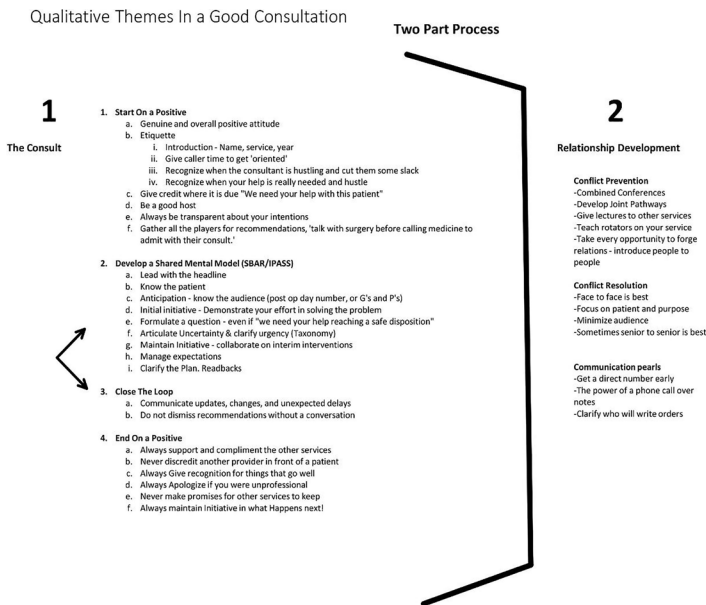


Figure 1.

Conclusions: Medical schools appear to be embracing Web 2.0 technologies, with a majority of applicants reporting that they use online courses or simulation in their formal medical school curriculum. A smaller percentage of applicants report using blogs, wikis, or podcasts in the classroom. However, more than half of students surveyed have supplemented their medical education with these tools. Our study also suggests that more than half of applicants either do not have or do not know if their medical school has a social media policy, representing substantial room for improvement. Medical schools should continue to develop guidelines for social media use and disseminate these among their students, as their online behavior will continue to come under scrutiny by residency program directors, patients, and the public.

12 Curricular and Co-Curricular Social Media-Based Learning During Medical School

Lee T, Rosen C/Beth Israel Deaconess Medical Center, Boston, MA

Background: Social media has had a growing presence in medical school, as this generation of medical students almost universally embrace Web 2.0 technologies in their personal and professional lives.

Objectives: We assessed the presence of curricular and co-curricular social media-based learning in medical school from our emergency medicine residency applicants.

Methods: We conducted a survey of the applicants who interviewed at our emergency medicine residency program. We reported the use of educational technologies in medical school, as well as the presence of a social media policy established by their school. We used proportions and 95% confidence intervals to report our results.

Results: Out of 181 emergency medicine applicants who were sent the survey, 96 students responded, resulting in a 53% response rate. Survey results showed that, in their formal medical school curriculum, 73% (63-81%) of students used online courses or simulation, while 29% (21-39%) of students use podcasts, 14% (8-22%) use blogs, and only 3% (1-9%) use Twitter. Additionally, to supplement their education outside the classroom, 81% (70-86%) use podcasts, 54% (44-64%) use blogs, and 14% (8-22%) use Twitter. Other digital technologies used outside of the classroom include medical mobile apps at 81% (70-86%), Wikis at 71% (61-79%), and online simulation at 49% (39-59%). Finally, 36% (28-46%) of students attend medical schools with formal social media guidelines, 24% (17-33%) do not, and 40% (30-50%) do not know.

13 Deliberate Apprenticeship in an Emergency Medicine Medical Student Elective, A Pilot Study

Carmelli G, Fan L, Sinert R, Willis J/SUNY Downstate/ Kings County Hospital Center, Brooklyn, NY

Background: Apprenticeship is a form of education that opposes the notion of self directed learning for one of a 'legitimate peripheral participation.' A student can learn knowledge, skills and attitudes by working alongside professionals with these skills. The Emergency Department (ED) has a unique learning environment with unstructured workdays, undifferentiated patients and abbreviated work-ups. Although this is daunting for students, it allows a feeling of semi-autonomy, which, if fostered correctly, can be invaluable in their medical training. Educational guidelines for medical students in Emergency Medicine exist, but don't specifically discuss apprenticeship. There has been literature showing resident preference for apprenticeship in medical students, however, there is a paucity of good evidence to support its use for students in the ED from the student's point of view. Deliberate Apprenticeship (DA) is discussed in the ED by Iyer et al showing positive results, however further data is still needed for more conclusive evidence.

Objectives: Compare 2 groups of student's experience in an EM elective, before and after the introduction of the DA program. It is hypothesized that students will prefer the schedule and learning experience significantly with the DA program.

Methods: This is a retrospective study, in which we looked back at 22 medical students, as they performed two rotations in the ED at SUNY Downstate between June- September 2015. The 1st rotation used the current rotation scheduling, a templated schedule with no pre-assigned resident pairings. While the 2nd rotation used DA, where students were matched one-on-one with a senior resident. For the study, we analyzed an anonymous survey (Table 1) that was sent to all students after both rotations.

Results: The 2 groups of students used a Likert scale from 1-10 to rate their satisfaction on multiple aspects of the rotation. There was no statistical difference in satisfaction scores when the rotation format was changed to a DA. The p-values and confidence intervals are included in Table 2.

Conclusions: In this small cohort of students there was no difference in student’s preference or satisfaction from our traditional rotation to DA.

Table 1.

| Questions | Pre- median (25%, 75%) | Post- (median, 25%, 75%) | p-Value |
|-----------------------------|------------------------|--------------------------|---------|
| Satisfaction with Schedule | 9.0 (7.25, 9.0) | 8.0 (7.0, 9.0) | 0.44 |
| Navigation Through ED | 9.0 (7.0, 9.0) | 9.0 (7.0, 9.0) | 0.73 |
| Level of Responsibility | 8.0 (7.0, 9.0) | 7.0 (5.75, 8.25) | 0.36 |
| Overall Learning Experience | 9.0 (8.0, 10.0) | 8.5 (7.0, 10.0) | 0.49 |
| Part of the Team | 8.5 (7.0, 10.0) | 9.0 (7.75, 10.0) | 0.94 |
| Overall Experience | 9.0 (8.0, 9.25) | 9.0 (8.5, 10.) | 0.39 |

Table 2.

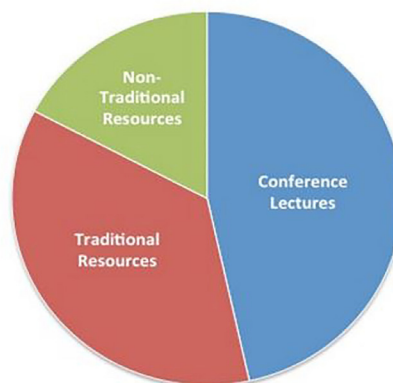
| Questions | Pre- median (25%, 75%) | Post- (median, 25%, 75%) | p-Value |
|-----------------------------|------------------------|--------------------------|---------|
| Satisfaction with Schedule | 9.0 (7.25, 9.0) | 8.0 (7.0, 9.0) | 0.44 |
| Navigation Through ED | 9.0 (7.0, 9.0) | 9.0 (7.0, 9.0) | 0.73 |
| Level of Responsibility | 8.0 (7.0, 9.0) | 7.0 (5.75, 8.25) | 0.36 |
| Overall Learning Experience | 9.0 (8.0, 10.0) | 8.5 (7.0, 10.0) | 0.49 |
| Part of the Team | 8.5 (7.0, 10.0) | 9.0 (7.75, 10.0) | 0.94 |
| Overall Experience | 9.0 (8.0, 9.25) | 9.0 (8.5, 10.) | 0.39 |

using traditional (books, journals, question banks) and non-traditional resources (free open access medical education), hours of didactic lecture attended, number of textbook chapters read, study questions completed, and weekly study sessions. We present descriptive data of the resident cohort.

Results: Sixty-three of 77 participants (82%) completed an average of 5.4 (range 1-22) weekly surveys from a maximum of 33 weeks. Participation varied from 1-32 residents/week. On average, individual residents attended 3.3 (0-5) hours of weekly conference lecture and spent 2.6 (0-12) and 1.2 (0-6) hours/week studying traditional and non-traditional resources, respectively. Residents read 0.3 (0-3.1) textbook chapters, completed 22 (0-200) study questions, and studied at an average frequency of 2.7 (0-7.9) times weekly.

Conclusions: Initial trends indicate that EM residents use weekly conference lectures as their primary source of learning, followed by traditional, then non-traditional resources. Data collection is limited by recall bias and highly variable participation rates. For further study, we plan to report study habit trends of top ITE scorers, as defined by a projected >90% likelihood to pass the QE, after the February 2017 ITE exam.

Proportion of Resource Utilization EM Residents



14 Describing the Study Habits of Emergency Medicine Residents, A Preliminary Analysis

Murphy A, Conley R, Ng V/Banner- University of Arizona, Tucson, Tucson, AZ

Background: Physicians must be independent learners to mature into responsible practitioners. As the variety of available resources expands, physicians must identify effective study strategies. We sought to describe the learning habits of EM residents, specifically the type and quantity of methods utilized, leading up to the 2017 EM In-Training Exam (ITE). As the ITE is predictive of first pass success on the ABEM Qualifying Exam (QE), we aim in the future to provide residents effective strategies that may lead to QE success by analyzing the habits of top ITE scorers.

Objectives: The purpose of this preliminary study is to describe resident study habits, which will allow us to know areas of study that can be improved upon.

Methods: University of Arizona EM residents provided consent for participation and are de-identified by study number assignment. Each resident received a weekly survey on which they reported their study practices from the prior week. Data was collected from February through October 2016 and included the number of hours spent

15 Developing Grading Guidelines for The NBME® Emergency Medicine Advanced Clinical Examination

Ross L, Wald D, Miller E, Askew K, Franzen D, Lawson L, Fletcher E/National Board of Medical Examiners, Philadelphia, PA; Lewis Katz School of Medicine at Temple University, Philadelphia, PA; Harvard Medical School, Boston, MA; Wake Forest School of Medicine, Winston-Salem, NC; University of Washington School of Medicine, Seattle, WA; East Carolina University, Greenville, NC

Background: The National Board of Medical Examiners (NBME®) provides guidelines to medical schools that

administer the clinical science subject exams to assist clerkship directors in determining grading standards for their students. In 2013, the NBME introduced the Emergency Medicine (EM) Advanced Clinical Examination (ACE) as an end-of-clerkship assessment for fourth-year medical students. The EM ACE was developed by an NBME task force of EM medical student educators. The exam was designed to assess the knowledge of medical students following a required 4th year EM clerkship.

Objectives: Our objective was to conduct a webcast standard setting study to develop grading guidelines that would assist clerkship directors in analyzing performance and determining passing and honors standards for the EM ACE.

Methods: In 2015, 27 EM medical student educators from 26 U. S. medical schools participated as judges in one of three webinar training sessions. Judges were trained in two standard setting methods; the Modified Angoff content-based method, a criterion referenced approach utilizing a panel of subject matter experts and the Hofstee Compromise method which incorporates both a relative and an absolute standard setting model. Judges also had the opportunity to discuss borderline examinee performance and practice item ratings. Judges independently reviewed the exam content and rated the difficulty of each item on one form of the EM ACE. Results were summarized and integrated across the two procedures and recommended standards reported on the subject exam score scale.

Results: The recommended minimum passing score using the Modified Angoff method is 57. This score fell within the range of minimum passing scores (53 - 62) when using the Hofstee method. This suggests that any passing score selected within this range is acceptable. The recommended minimum passing score when using the Hofstee method is 59. The recommended acceptable minimum scores for honors based on the Hofstee method fell between a score of 74 and 91.

Conclusions: Proposed passing and honors standards based on an item-by-item analysis of the exam content, as well as a global analysis of the content by EM medical student educators should provide helpful grading guidelines to assist clerkship directors in setting fair and valid standards for the EM ACE.

Table 1. Demographics of Emergency Medicine Expert Judges and Participating Medical Schools.

| Number of Judges | Years of Experience | Number of Schools | Use CDEM National Curriculum | Pre-clinical School Curriculum | | School Clerkship Length |
|------------------|---------------------|-------------------|------------------------------|--------------------------------|------------|-------------------------|
| | | | | Traditional | Integrated | |
| 27 | 1 – 20 | 26 | 93% | 22% | 56% | 2 - 4 weeks |

Table 2. EM ACE Grading Guidelines for Passing and Honors Standards (Mean Scaled Scores).

| Modified Angoff | | Hofstee Compromise Procedure | |
|---------------------------|--|------------------------------|---|
| Recommended Passing Score | Range of Acceptable Minimum Passing Scores | Recommended Passing Score | Range of Acceptable Minimum Honors Scores |
| | 57 | | 53 to 62 |

16 Development of a Novel Obese Cricothyrotomy Task Trainer

Hwang J, Crichlow A, Parsons J, Ponnuru S, Goswami V, Hamilton R, Vozenilek J, Griswold S/Drexel University College of Medicine, Philadelphia, PA

Background: Cricothyrotomy is a rare but emergent procedure. Consequently many task trainers have been developed. However, many represent patients with normal body mass indexes (BMIs). In 2011-2012 the percentage of the US population who were considered overweight or obese was 68.5% (34.9% obese).

Objectives: Due to these statistics and a request from Emergency Medicine (EM) faculty members for cricothyrotomy training, we developed an obese patient cricothyrotomy model. It was integrated into a cricothyrotomy training faculty session and we surveyed participants' views about it.

Methods: IRB exempt status was obtained. We used a 3-D printed base model developed by Jump Simulation. A pig trachea was attached to the 3-D base. A 1.5 cm thick synthetic layer of subcutaneous tissue was placed over the trachea. The synthetic layer of subcutaneous tissue was obtained from the subcutaneous layer of the abdominal tissue set from the TraumaMan Surgical Simulator®. A layer of synthetic skin was placed over the subcutaneous layer. 3 different skin layers were trialed: skin from the Simulab® Catastrophic Event Team Training Package, from the TraumaMan Surgical Simulator®, and a combined skin-subcutaneous tissue set using ballistics gel developed by Jump Simulation. A balloon was placed at the distal end of the pig trachea to simulate lung expansion. EM faculty members from an urban, resource limited hospital volunteered to participate. They performed 2 traditional surgical and 2 needle cricothyrotomies using the Melker® cricothyrotomy kit. Pre and post survey data was collected.

Results: 20 participated in the session. The majority (14 (70%)) performed a cricothyrotomy at least once in their clinical practice. 83% of respondents stated that model was "very realistic". The criticisms focused on using it to practice needle cricothyrotomy due to the needle becoming clogged with ballistics gel and difficulty interpreting the location of the needle due to aspiration of air from potential spaces between the layers of the trainer.

Conclusions: We developed a hybrid obese cricothyrotomy task trainer. This is a unique and valuable task trainer as the need to be facile with this procedure in this population is paramount. In future iterations, modification of the thickness of the subcutaneous layer can vary the difficulty of the task trainer highlighting its potential for health professional education.

17 Do Attending EPs Change Their Head CT Ordering Practices After Reviewing Their Head CT Utilization Data?

Miller D, Moubarek M, Vakkalanka P, Mohr N/University of Iowa Hospitals and Clinics, Iowa City, IA

Background: CMS proposed OP-15 as an efficiency measure of whether head CT (HCT) scans ordered in the ED were indicated. We instituted a modified OP-15 as a quality assurance (QA) effort.

Objectives: Did HCT ordering decrease after Emergency Physicians (EPs) reviewed data on their imaging practice, and was any observed change correlated with a change in the rate of missed diagnosis or death?

Methods: This was an observational retrospective study conducted at a tertiary referral center comparing attending EP's rates of HCT during pre-intervention (PI) (April-Aug 2012), post-education (PE) (Dec 2013-March 2014), and post-review periods (PR) (April -Aug 2014). For each phase of the study we collected the most recent ten headache visits seen by each EP. In April 2013 we educated EP's on appropriate HCT ordering through a series of lectures, discussions and emails. Over Jan-Feb 2014 all EPs individually reviewed their HCT ordering metrics during annual performance reviews. In the summer of 2016 we queried the EMR for all patients sampled during the QA effort and reviewed all notes from ED, Primary Care, Neurology, Neurosurgery, and Radiology for the 21.5 month periods following each index ED visit to determine whether significant intracranial conditions not known during the initial visit were later diagnosed or if death from any cause occurred. We excluded transfer patients and those with a history of ventriculoperitoneal shunt.

Results: We reviewed a total of 598 medical records and observed a head CT rate of 36% in both the PI and PE periods vs 26% in the PR period ($p = 0.036$). We observed a total of 12 deaths (3 in PI, 5 in PE, and 4 in PR) and 29 intracranial conditions diagnosed after the index ED visit. An attending EP reviewed each of these charts and found that only six of the subsequently diagnosed intracranial conditions may have been diagnosable at the index visit (2 in PI, 3 in PE and 1 in PR). No deaths appeared related to missed diagnoses. There were no statistically significant differences in death or missed diagnosis between periods.

Conclusions: We did not observe a difference in physician head CT ordering practices after educational intervention, but after all physicians reviewed their individual performance data we observed a decrease in head CT utilization of 10%. This was not associated with a change in rate of missed diagnosis or death.

Table 1. Outcome rates by epoch.

| Epoch (number of patients) | Pre-intervention (183) | Post-education (215) | Post-review (200) |
|-----------------------------|------------------------|----------------------|-------------------|
| CT ordering rate percentage | 36% | 36% | 26% |
| Death after ED visit (%) | 3 (1.6%) | 5 (2.3%) | 4 (2.0%) |
| Missed diagnosis (%) | 2 (1.1%) | 3 (1.4%) | 1 (<0.5%) |

18 Does USMLE Step 1 & 2 Scores Predict Success On ITE and ABEM Qualifying Exam - A Review of an Emergency Medicine Residency Program from its Inception.

Nelson M, Calandrella C /North Shore University, New York, NY

Background: Over the years, Emergency Medicine has become a very competitive specialty with regards to the match process. This has led to program directors viewing more and more applications for the same limited residency positions. Given this daunting task of reviewing hundreds of applicants in order to select only the best fit for the program, many in residency administration have used applicant's standardized scores as a screening process to choose which applicants they will interview. The belief is that if an applicant is successful on these standardized exams they should be successful on exams during their residency (Inservice Training Exam), as well as their post-graduate exams (ABEM Qualifying exam). Minimal literature has suggested only mild to moderate correlation¹.

Objectives: Our goal was to see if this accepted preconceived notion was based in any truth. We attempted to do this by looking at USMLE scores, ITE scores and success on ABEM Qualifying Exam in an Emergency Medicine Residency over a 20 year span of time. The qualifying examination is a criterion-referenced examination. Therefore, anyone scoring 75 or higher passes the examination. This score was determined by ABEM by looking at the relationship between the ABEM ITE scores from the final year of residency and the ABEM Qualifying examination performance².

Methods: We collected scores of USMLE Step1 & 2, ITE score from the PGY -3 yr and whether or not the resident successfully passed the ABEM Certification Exam on the 1st attempt from our archives of all residents who have graduated from our three year EM residency over the last 20 years. We compared the mean scores of each of the groups based on whether or not they passed the ABEM Qualifying exam, as well as whether or not they scored above a 75 on their graduating year ITE. We compared the two groups using the t-test to assess for significance

Results: There is a significant difference between mean USMLE step 1 and step 2 scores, respectively for residents who passed the qualifying exam (220.4) and residents who failed the qualifying exam (step 1 - 220.4/207.9, $p < 0.05$ and step 2 - 228.8/ 208.9, $p < 0.05$). There is also significant difference between mean USMLE step 1 scores for residents who scored greater than or equal to 75 on ITE (220.0) and residents who scored below 75 on the ITE (209.0), $p < 0.05$. However there is not a significant difference between mean USMLE step 2 scores for residents who scored greater than or equal to 75 on the ITE (227.2) and residents who scored below 75 on the ITE (218.7), $p > 0.05$.

Conclusions: Our results seem to validate that higher scores on USMLE step 1 and 2 both seem to correlate with a higher rate of success in passing the ABEM Qualifying Exam. It also supports that higher Step 1 scores seems to correlate with success on the ITE. Surprisingly, we did not see a significant difference in USMLE step 2 scores with relation to ITE. These results represent the information from the entire breadth of a residency program over 20 years. With an increase in the competitiveness of the Emergency Medicine Residency Match, there continues to be an increase in the overall USMLE scores, and thus the statistical significance may need to be reexamined

19 Early Clinical Experience in Emergency Department Yields Higher Scores on Standardized Clinical Assessments

Royan R, Wu C, Theyyanni N, Montas S, House J, Lukela M, Santen S/University of Michigan Medical School, Ann Arbor, MI

Background: The Clinical Reasoning Elective (CRE) is a student-led program which provides pre-clinical students exposure to real patients and the opportunity to practice building differential diagnoses. The program, now entering its fifth year, has been a supplement to the pre-2016 University of Michigan Medical School (UMMS) curriculum. Each year, the CRE has received overwhelming positive feedback from students, however little is known about the objective benefit of the CRE with respect to students' clinical skills.

Objectives: Assess the influence of participation in the CRE on students' clinical skills.

Methods: In the 2015-2016 academic year, 120 pre-clinical students were matched with 55 physician-mentors at the UMMS and Veteran's Administration Health System. Students completed histories and physical exams on patients who presented to the ED, with an emphasis on the organ systems they were currently studying. Students were expected to formulate a differential diagnoses, which they

presented and discussed with their faculty member who would provide feedback on their history and exam.

Self-reported participation in the CRE was compared with students' individual scores on the M2 Comprehensive Clinical Assessment (CCA). This exam covers 12 domains of physical exam skills, history taking, verbal presentation, and patient communication. All students who took this exam in 2016 (N=171) were included in the analysis.

Results: 107 out of 120 CRE participants completed an average of 10 sessions over the course of the program (range=1-20). Students who participated in CRE performed better on the clinical skills examination. Participation in the CRE as a continuous measure was significantly correlated with 5 domains of the M2 CCA including: abdominal history($r=.23$), pulmonary physical exam($r=.169$), communication($r=.159$), and overall scores for physical exam($r=.159$), and history taking($r=.209$).

Conclusions: There is a measurable improvement in clinical skills performance for UMMS students who participated in the Clinical Reasoning Elective. In addition to the popularity of the CRE and the desire to make it an accessible experience for all students, expanding pre-clinical learning within the emergency department also proved to be a successful tool to teach communication, history, and physical exam skills on real patients.

20 Educational Needs of Non-EM Residents Rotating in the Emergency Department

Veronese C/UNC Hospital, Chapel Hill, NC

Background: Most academic institutions in the US have non-EM residents (NEMR) providing patient care in the Emergency Department (ED). Despite this, little is known about their learning goals or most valuable educational resources. These residents have diverse backgrounds based on their specialty which include Medicine, PM&R, Orthopedics, Surgery, ENT, Neurology, Psychiatry, Pediatrics, and ObGYN. Given this diversity, we aimed to assess their learning goals and needs in order to assist in the development of a more robust curriculum.

Objectives:

- To determine their educational goals for the rotation.
- To gauge the level of comfort of NEMR on basic EM medical knowledge and procedures pre and post rotation.
- To identify the most useful resources in their education.

Methods: A total of 40 NEMR rotating through UNC Hospital ED between January and November 2016 were surveyed anonymously pre and post rotation. IRB approval was obtained.

Results: 45% and 47.5% answered the pre and post-rotation survey respectively. NEMR were asked to rate their comfort level in 10 basic EM chief complains and procedures pre and post rotation (Fig 1). NEMR were asked to rate the most valuable learning resources in the ED. 95% rated ED attendings as the most valuable followed by EM residents at 89%. 50% and 39% felt that EM conferences and online curriculum were the least helpful respectively. When asked whether their educational goals were met during their ED rotation 16% said very much, 42% moderately, and 0% not at all. Suggested improvements for the rotation included more shifts on higher acuity bays, less switching between day and night, more bedside ultrasound teaching, and pre-rotation orientation.

Conclusions: In conclusion, NEMR in general felt very uncomfortable and poorly prepared to handle common patient complaints and procedures in the ED revealing a knowledge gap that these residents have. Survey results showed increasing level of comfort in all 10 procedures/knowledge criteria after the rotation reinforcing the importance of the EM rotation to their ongoing education. While most residents felt that their learning goals were met, this knowledge will help us improve and modify their experience to help better meet their goals.

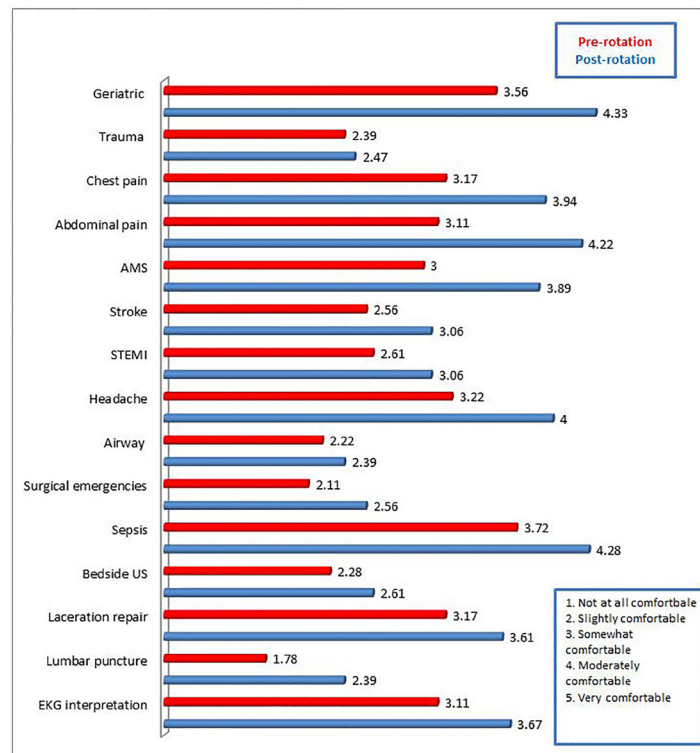


Figure 1. Pre and Post-rotation Level of Comfort of NEMR.

21 Effect of Commuter Time on Residency Work Hours

Sampson C, Borenstein M /University of Missouri-Columbia, Columbia, MO; Brookdale University Hospital, Brooklyn, NY

Background: The impact of work hours on resident well-being and patient safety have long been a controversial issue. What has not been considered in resident work hour limitations is whether resident commuting time has any impact on a resident’s work week, well-being, and whether resident commuting time should be considered in calculating total resident work hours.

Objectives: We sought to investigate resident commuter time, methods of commuting, and potential consequences of extended commute.

Methods: A self-administered electronic survey was generated and distributed to all 174 allopathic emergency medicine program directors on a national academic listserv. Participation was voluntary. The study received institutional board review approval. The survey instrument consisted of twelve multiple-choice questions.

Results: Survey response rate was 8% of all possible residents.

Commuter time was found to be 30 minutes or less in 70% of respondents. 16% of residents reported commuter time of 31-45 minutes and 11% reported 46-60 minutes. 0.4% reported a commuter time of 76-90 minutes and 1 resident had a commuter time of 91-105 minutes.

The resident who reported having a commuter time of 91-105 minutes used train as method of commuting and also reported working 12 hour shifts. Of the two residents with 76-90 minute commute times, one commuted by car and the other by train. The former worked 8 and 12 hour shifts. The latter worked various shift of either 8, 10 or 12 hours shifts.

Most concerning was the 29.3% of residents reported falling asleep while driving their car home from work. We found 12% of respondents reporting being involved in a car collision commuting to or from work.

When asked their opinion on the effect of commute time, those with commute times greater than 1 hour 75% of residents responded it was detrimental.

Conclusions: While the majority of emergency medicine residents in this survey have commuter times of 30 minutes or less, there is small population of residents with commuter times of 76-105 minutes. Given that these residents often work 12 hours shifts, at times residents whose commute is up to 105 minutes each way could be traveling a total of more than 3.5 hours for each round trip to/from work. These extended commuter times may be having detrimental effects on resident health and well-being.

22 Evaluation of the University of Utah Emergency Medicine Residency Patient Hand-Off Process

Wells K, Buchanan I, Frizell A, Porter A, Stroud S, Madsen T, Stephen R, Carlson M, Steenblik J, Fix M/ The University of Utah School of Medicine- Division of Emergency Medicine, Salt Lake City, UT

Background: Recent studies suggest that structured hand-offs improve patient care and decrease poor patient outcomes in addition to decreasing post-shift length of stay for providers.

Objectives: We sought to evaluate the perception of our current informal patient hand-off process prior to developing and implementing a structured hand-off process.

Methods: A needs assessment was conducted and a Hand-off Evaluation Committee was assembled (PD, APDs, and residents (RES)). An electronic literature based 5-point likert scale survey was created and distributed anonymously and retrospectively (REDCAP software) to all RES and attendings (ATT) at our academic hospital site. The survey assessed perceptions of giving and receiving hand-offs, interruptions, and effectiveness. Additionally, a research associate observed and timed RES hand-offs in the ED. The survey assessed perceptions from the past two months.

Results: Response rate was 100% by ATT (n=21) and 96% by RES (n=27). Most respondents (90%) felt that a structured hand-off would be helpful. 61% of RES and ATT felt their informal hand-off process was effective, while 22% of RES and 0% of ATT felt it was not effective. Of the 77% of RES who noted compromised patient care secondary to a hand-off issue, 73% of those noted they did not review vital sign trends (p=0.0001). Non-matched RES and ATT shift schedules (RES= 1.63, ATT= 2.7) was a major barrier. RES who felt their hand-off was not effective reported high ED volume (1.61, p=0.001) and nurse interruptions (1.77, p=0.0002) as additional barriers. Most RES (77%) reported their hand-off differed (2.11) from ATT as compared to ATT reporting occasional differences (3.24). Thirteen hand-offs were observed with an average time = 692 seconds (min 33 sec; max 1860 sec) and interruption rate = 3.84 times/hand-off (min 0; max 15).

Conclusions: Most survey participants felt a structured hand-off process would benefit patient care, safety and workflow efficiency in an academic ED. The survey identified improvements for a structured hand-off process including more congruent timing of ATT and RES shifts and formal review of vital sign trends. Evaluation of current practice prior to implementing a formalized hand-off process is necessary to identify areas of improvement.

| | How effective is your hand-off ^a | Structured hand-off helpful ^b | Average time spent after a shift ^c | Average time after hand-off providing care ^c | ED volume too high ^b | Residents/ Attendings coming at different times ^b | Nurse interruptions ^b | Last 2 months forgotten to pass important info after hand-off ^d | Last 2 months review the patients vital sign trends while signing out ^d | Average time per patient on hand-off ^e | Received a hand-off missing important information ^f | Compromised patient encounter secondary to hand-off ^g |
|-------------------|---|--|---|---|---------------------------------|--|----------------------------------|--|--|---|--|--|
| PGY-2&3 Average | 3.38 | 2.27 | 3.44 | 2.29 | 1.61 | 1.94 | 1.77 | 2 | 4 | 2.27 | 2.11 | 3.72 |
| Attending Average | 3.64 | 1.95 | 2.77 | 1.8 | 2.1 | 2.7 | 2.7 | 3.93 | 3.4 | 2.1 | 3.31 | 3.8 |

| | | | | | |
|---|--------------------|------------------|-----------------|---------------|----------------------|
| a | 1=Very ineffective | 2= Not Effective | 3= Neutral | 4= Effective | 5=Very Effective |
| b | 1= Strongly Agree | 2= Agree | 3= Neutral | 4= Disagree | 5= Strongly Disagree |
| c | 1= 0-30 min | 2= 30-60 min | 3= 60-90 min | 4= 90-120 min | 5= >120 min |
| d | 1= almost always | 2= usually | 3= Occasionally | 4= Rarely | 5= not at all |
| e | 1=Never | 2=1-5 | 3= 5-10 | 4= 10-15 | 5= >20 |

23 Geographic Trends in the DO/IMG Emergency Medicine Match

Jarou Z, Sayers J /Denver Health Medical Center, Denver, CO; Ross University School of Medicine

Background: Each year hundreds of osteopathic (DO) and international medical graduates (IMG) match into ACGME accredited emergency medicine (EM) residency programs, making up respective averages of 11% and 6% of EM residents over the past 5 years. Previous data has shown that despite a relatively stable applicant pool compared to the number of intern positions available each year, applicants are applying to more programs than ever before to secure the same number of interviews.

Objectives: The purpose of this study was to determine if there are certain geographic areas in which DO and U.S. IMG students are more likely to match into EM.

Methods: The number of DO and U.S. IMG students matched per state per year were extracted from the 2012-2016 NRMP “Match Results by State, Specialty, and Applicant Type” reports. The number of residency programs in each state each year was determined using the NRMP “Main Residency Match: Results and Data” reports. The average number of DO/IMG students per ACGME program per year by state over a five-year period was calculated.

Results: Indiana, Iowa, Mississippi, Ohio, and Texas matched the most DO students, matching an average of greater than or equal to two DO residents per ACGME program per year. Louisiana, Michigan, Mississippi, and New Jersey matched the most U.S. IMG students, matching an average of greater than or equal to one U.S. IMG resident per program per year. The biggest limitation that must be considered when interpreting this data is that the heterogeneity of DO or IMG “friendliness” within a state is unknown and thus the “friendliness” of one or a few programs may be overshadowed by the statewide average.

Conclusions: Rather than applying to every program in the country, DO and IMG students may benefit from focusing on geographical areas which have historically matched higher percentages of their applicant type. Future studies examining the DO and IMG acceptance rates of individual EM residency programs may provide further guidance to applicants.

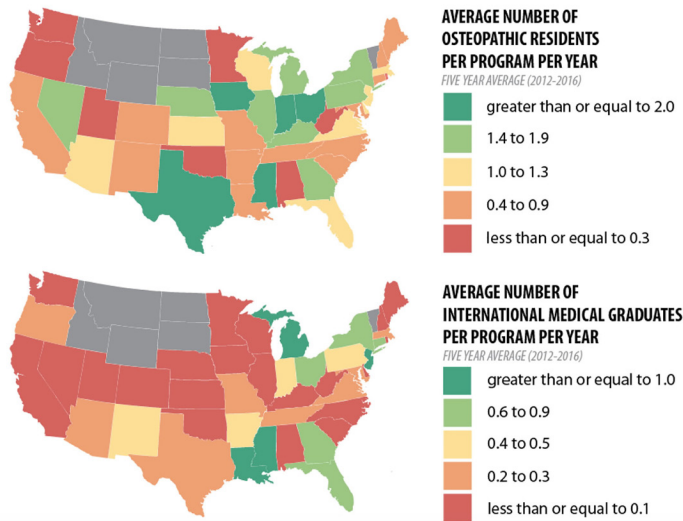


Image 1. Average Number of Matched Osteopathic (DO) and U.S. International Medical Graduates (IMG) Per ACGME Accredited Residency Program Per Year By State From 2012-2016.

Table 1. Average Number of Matched Osteopathic (DO) and U.S. International Medical Graduates (IMG) Per ACGME Accredited Residency Program Per Year By State From 2012-2016.

| State | DO | IMG | State | DO | IMG |
|----------------------|-----|-----|----------------|-----|-----|
| Alabama | 0.2 | 0.0 | Missouri | 0.8 | 0.3 |
| Arizona | 1.0 | 0.2 | Nebraska | 1.6 | 0.0 |
| Arkansas | 0.4 | 0.4 | Nevada | 1.4 | 0.0 |
| California | 0.5 | 0.1 | New Hampshire | 0.6 | 0.0 |
| Colorado | 0.4 | 0.0 | New Jersey | 1.1 | 1.4 |
| Connecticut | 0.7 | 0.6 | New Mexico | 0.4 | 0.4 |
| Delaware | 1.0 | 0.0 | New York | 1.6 | 0.9 |
| District of Columbia | 0.2 | 0.0 | North Carolina | 0.4 | 0.1 |
| Florida | 1.3 | 0.6 | Ohio | 2.1 | 0.8 |
| Georgia | 1.6 | 0.6 | Oklahoma | 0.0 | 0.0 |
| Illinois | 1.5 | 0.1 | Oregon | 0.0 | 0.2 |
| Indiana | 2.3 | 0.4 | Pennsylvania | 1.8 | 0.4 |
| Iowa | 2.4 | 0.0 | Puerto Rico | 0.0 | 1.2 |
| Kansas | 1.0 | 0.0 | Rhode Island | 0.0 | 0.0 |
| Kentucky | 1.4 | 0.0 | South Carolina | 0.5 | 0.0 |
| Louisiana | 0.4 | 1.3 | Tennessee | 0.4 | 0.3 |
| Maine | 0.4 | 0.0 | Texas | 2.3 | 0.3 |
| Maryland | 0.6 | 0.3 | Utah | 0.2 | 0.0 |
| Massachusetts | 1.2 | 0.2 | Virginia | 1.1 | 0.2 |
| Michigan | 1.4 | 1.1 | Washington | 0.0 | 0.0 |
| Minnesota | 0.3 | 0.1 | West Virginia | 0.0 | 0.0 |

24 How do Emergency Medicine Programs Structure Resident Evaluations? A Survey

Cooper B, Beres K, Takenaka K, Van Meter M, Luber S /McGovern Medical School at the University of Texas Health Science Center at Houston (UTHealth), Houston, TX

Background: Timely resident evaluation is not only important for residents’ progress and development, but also a requirement of the Accreditation Council for Graduate Medical Education (ACGME). In 2013, the ACGME and the American Board of Emergency Medicine introduced the Emergency Medicine (EM) Milestone Project, a collection of competency-based developmental outcomes intended to demonstrate resident progression during training. Our program expects faculty to complete milestone-based end-of-shift evaluations (ESEs) for each resident shift. It is unknown what evaluation methods other programs utilize.

Objectives: We sought to determine what methods Council of Emergency Medicine Residency Directors (CORD) member programs use to evaluate residents, and to determine whether the use of ESEs is associated with higher satisfaction with the evaluation process.

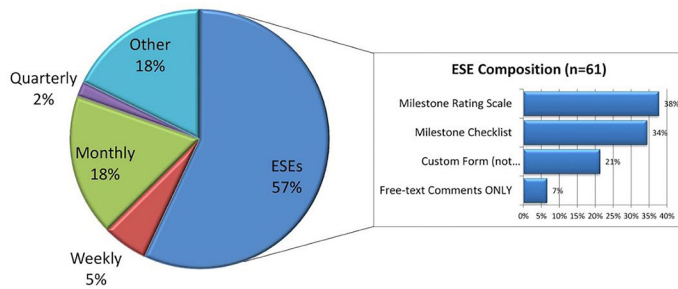
Methods: An 11 item survey was distributed via the CORD listserv and was open from July through October 2016. Each member program was asked questions about the structure of their resident evaluation process. Responses were analyzed with simple descriptive statistics and Likert satisfaction scales using the Student’s t-test. Missing data was omitted from analysis (i.e. skipped questions).

Results: 107 of 170 programs responded, yielding a 63% response rate. 57% (61/107) expected faculty to complete ESEs for every shift worked with a resident, 19% used monthly evaluations, and the remainder utilized evaluations ranging from semi-annually to eight times per month. Of programs that employ ESEs, 38% use milestone rating scales (levels 1 through 5), 34% use a milestone checklist with a binary response, 24% employ a custom form that is not milestone-based, and 7% employ free-text only ESEs. 62% (38/61) reported that their ESEs provide useful information to the Clinical Competency Committee. Programs utilize a plethora of additional evaluation tools. 17 programs reported using a financial incentive to encourage faculty compliance. Overall, 60% (58/96) of programs reported being at least “somewhat satisfied” with their evaluation process. There was no association between the use of ESEs and level of satisfaction (p=0.57).

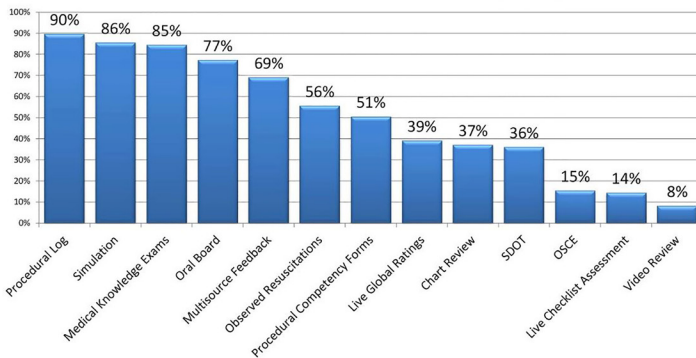
Conclusions: EM programs employ a plethora of strategies to evaluate residents, with a slight majority using ESEs. There is no association between the use of ESEs and level of satisfaction.

Frequency of Evaluation

(n=107)



Other Evaluation Tools Utilized (n=97)



25 How do Emergency Medicine Residencies Structure Trainees' Administrative Experience: A Survey

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Background: While the Accreditation Council for Graduate Medical Education (ACGME) mandates that emergency medicine residencies provide an educational curriculum that includes administrative seminars and morbidity and mortality conference, there is significant variation as to how administrative topics are implemented into training programs.

Objectives: No best practices exist for emergency medicine resident administrative experience. We seek to determine the prevalence of dedicated administrative rotations and details about the components of the curriculum.

Methods: In this descriptive study, a 12-question survey was distributed via the CORD listserv in the winter of 2016. Each member program was asked questions concerning the presence of an administrative rotation and details about its components. These responses were then analyzed with simple descriptive statistics.

Results: A total of 114 of the 168 programs responded with complete information, leading to a 68% response rate. Of responders, 73% have a dedicated administrative rotation (95% CI 64.0 to 80.4). Of the programs with an administrative rotation (n=81), 56.8% (95% CI 45.9 to 67.0) had a 4 week rotation, 23.5% (95% CI 15.6 to 33.8) had a 2 week rotation, 9.9% (95%CI 5.1 to 18.3) had a three week rotation; the remaining programs had either one week rotations or longitudinal experiences. A majority of 61.7% of the programs with an administrative rotation dedicate this time in the third year (95% CI 50.8 to 71.6). The content areas covered by the majority of programs with a dedicated program include performance improvement (68), patient safety (n=64), ED operations (n=58), patient satisfaction (n=54), billing and coding (n=47), and inter-professional collaboration (43). Experiential learning activities include review of patient safety reports (n=66) and addressing patient complaints (n=45); only 40 programs report presenting a morbidity and mortality conference as part of the administrative experience. Most of the teaching on the rotation is either in-person (n=65) and/or self-directed reading assignments (n=48). The most commonly attended meetings during the rotation include performance improvement (n=60), ED operations (n=59), and ED faculty (n=44).

Conclusions: Most EM residencies offer a dedicated administrative rotation, but content, duration, and curricula vary significantly.

26 Improving Critical Care Documentation and Coding Using an Online Teaching Module

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Background: Emergency medicine professional reimbursement - in particular, the Evaluation and Management levels - is based on Medicare's rules defining the complexity of care. Services are only reimbursable if they are properly recorded. Therefore detailed documentation is essential for optimal compensation. Critical care follows a different set of rules than other Evaluation and Management levels and a lack of clinician awareness of these rules leads to incomplete documentation and under billing.

Objectives: The goal of this study is to:

1. Identify gaps in critical care documentation knowledge among emergency physicians.
2. Determine if these gaps can be filled via a self-administered online training module.
3. Determine whether improvement in knowledge can improve documentation and enhance reimbursement.

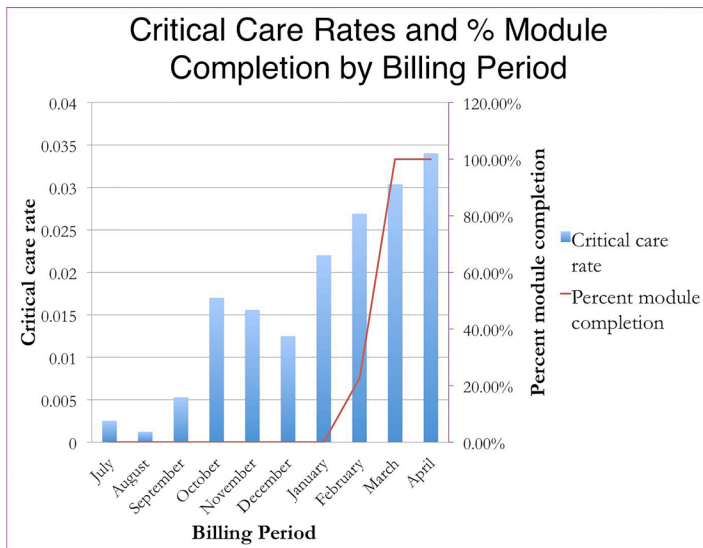
Methods: Critical care charts were examined in an

urban tertiary care center with approximately 68,000 ED visits per year. Pre-intervention, 1.2% of charts were coded as “critical care”; less than the national average of 2.5%. Physicians completed a pre-module assessment, followed by a 15-minute online educational module, followed by a post-module assessment. Critical care rates were measured during the months preceding and following module completion.

Results:

1. Gaps in knowledge were defined when average correct pre-assessment response was < 75%, revealing deficiencies in specific aspects of critical care documentation, which may be reflected in the critical care rate.
2. Post-module assessments had an overall higher correct response rate (65.9% to 84.8%, $p < 0.001$). Specifically for knowledge gap questions, the correct response rate increased from 53% to 86.5% ($p < 0.001$).
3. After all clinicians completed the teaching module, ED critical care rates increased from 1.4% (Nov-Dec, 2015) to 3.22% (Mar-Apr, 2016), an increase of 129% that trended towards statistical significance ($p = 0.058$). This extrapolates to an annual increase in reimbursement of \$103,900, based on the ED’s specific average collection rates.

Conclusions: The training module was able to identify and correct gaps in critical care knowledge, likely leading to an increase in proper charting and coding and a subsequent increase in revenue. Additionally, the effectiveness of a short, easily distributed teaching module carries broad implications for future physician education initiatives.



27 Improving General Surgery Resident Utilization and Confidence in Fast Exam with Emergency Physician Teaching

Wallace L, Kane D, Kim A/Washington University in St. Louis School of Medicine, St Louis, MO

Background: The Focused Assessment with Sonography for Trauma (FAST) has been utilized by Emergency Physicians (EPs) since the 1980s for rapid assessment of free fluid in the pericardial or peritoneal spaces. In addition, the FAST is part of the Advanced Trauma Life Support protocol developed by the American College of Surgeons. Unfortunately, the FAST may be underutilized, particularly by surgeons, due to lack of familiarity or lack of confidence in exams obtained by EPs.

Objectives: Our goal is to demonstrate that education of surgical residents by Ultrasound Fellowship trained EPs will increase understanding and familiarity with the exam, and will increase confidence in EP performed exams and EP trauma management.

Methods: This was a pre/post-intervention trial of FAST education of general surgery residents in an urban, tertiary-care Department of General Surgery by four Ultrasound Fellowship trained EPs. 22 PGY 1-2 residents participated in a convenience sampling based on clinical scheduling. Intervention consisted of didactic lectures and a multi-station teaching exercise using high-fidelity ultrasound simulators and a standardized patient. Both pre- and post-intervention, a questionnaire assessed confidence in performing and interpreting FAST exams, as well as attitudes toward EP performed FAST exam and EP trauma care. Responses were in the format of a 5-point Likert scale (1=strongly disagree, 5=strongly agree).

Results: 36% (8/22) had not performed a FAST exam on a live patient pre-intervention. Average confidence in performing FAST exams increased significantly post-intervention, from 2.2 to 3.9. Participants noted improved likelihood of using EP obtained FAST in practice post-intervention, from 2.0 to 4.0. The intervention increased confidence in EP obtained FAST exams, from 3.7 to 4.2. Finally, surgery resident attitudes toward EP trauma care improved. Pre-intervention responses regarding EP capability of management of trauma patients averaged 3.8, increasing to 4.4 post-intervention. All results were statistically significant ($p < 0.05$).

Conclusions: Dedicated instruction by EPs leads to increased confidence with and utilization of the FAST exam by general surgery residents. It also increases residents’ confidence in FAST exams performed by EPs and improved attitude towards EP management of trauma patients overall.

28 Investigation of ECG Interpretation Errors By Senior Emergency Medicine Residents

Bilello L, Pascheles C, Gurley K, Grossman S, Rosen C /Beth Israel Deaconess Medical Center, Boston, MA

Background: In our Emergency Department (ED), senior third-year emergency medicine residents (EM3) are the initial interpreters of all ED ECGs, which provides both increased exposure and practice in interpreting ECGs. While this is an integral part of emergency medicine (EM) resident education, the accuracy of ECG interpretations is unknown. Additionally, to our knowledge, there are no published studies investigating error rates of ECG reading by EM3s.

Objectives: The goal of this study was to analyze the error rate associated with senior EM resident ECG interpretations.

Methods: Retrospective study of all ED ECGs read by EM3s between 10/13/15-9/14/16 at an urban, tertiary care, academic medical center with a three-year residency that treats 56,000 patients per year. We reviewed all cases referred to the ED Quality Assurance (QA) Committee during this time period. Referred ED cases were evaluated by an 8-point Likert scale assessing for error, preventable and non-preventable adverse events. Cases perceived to have an error or the potential for patient harm were referred to a 20-member committee of ED leadership, attendings, residents and nurses for further consensus review. 95% confidence intervals (CI) were calculated.

Results: 27,034 ECGs were read by EM3s between 10/13/15-9/14/16. Of the 920 ED QA cases reviewed during this time period, an error was identified in 103 cases (11.2%; CI 9.2-13.2%). Three of the 103 errors involved a resident ECG interpretation or failure to act on an ECG abnormality (2.9%; CI 0-6.14%).

One case involved a senior resident who did not recognize evolving ECG changes during an ED visit, while another error resulted when a senior EM resident did not request an immediate evaluation of a patient in triage with an ECG that demonstrated sinus tachycardia at 140 bpm. The only case that had an adverse outcome involved a missed posterior ST-segment elevation myocardial infarction (STEMI).

Conclusions: There appears to be a low error rate associated with ECG interpretation among the EM3s at this single academic tertiary care facility. We believe this supports the continued use of senior EM residents as the initial interpreter of ED ECGs.

29 Needs Assessment for a Peer Support Network in an Emergency Medicine Residency Program

Jain A, Tabatabai R, Diller D /LAC+USC Medical Center, Los Angeles, C

Background: The most well-established model of mentorship in residency programs involves a faculty-resident relationship. Existing concerns with this model include resident discomfort discussing personal issues with faculty members and the inherent difficulties that arise when a faculty advisor is also assessing resident performance.

Objectives: To perform a targeted needs assessment for the development of a peer support network to supplement existing faculty mentorship at the LAC+USC Emergency Medicine (EM) residency program. We hypothesize that residents would perceive a peer support network to better address topics related to personal issues and wellness compared to faculty mentorship.

Methods: This cross-sectional study was conducted using an anonymous survey sent to all 68 EM residents. Survey questions gathered demographic information and degree of social isolation. Respondents then evaluated faculty mentorship on its ability to address specific personal and academic issues, and predicted how well these issues would be addressed by a peer support network of assigned teams of residents.

Results: Fifty-seven of 68 (84%) residents completed the survey. Despite 81% of respondents reporting family, friends, or support networks nearby, 60% felt isolated either "some of the time" or "often", and 35% struggled with mental health, substance abuse, or relationship issues during residency. Additionally, less than 12% of residents were willing to turn to a program director or faculty mentor for assistance with these issues. The majority of residents (86%) felt that problems with personal relationships would be well-addressed by a peer support network, while only 46% of residents felt these issues were well-addressed by the faculty mentor. Similar trends between the two mentorship models were seen with regards to substance abuse (74% vs 53%), imposter syndrome (93% vs 49%) and isolation from the residency community (91% vs 54%).

Conclusions: Many residents experience some degree of social isolation or personal hardship during residency and prefer not to approach the residency office or faculty mentors for support. Though there are limitations in comparing established and theoretical mentorship models, this needs assessment suggests a role for a future peer support network to improve resident wellness and discuss issues not well-addressed by current mentorship.

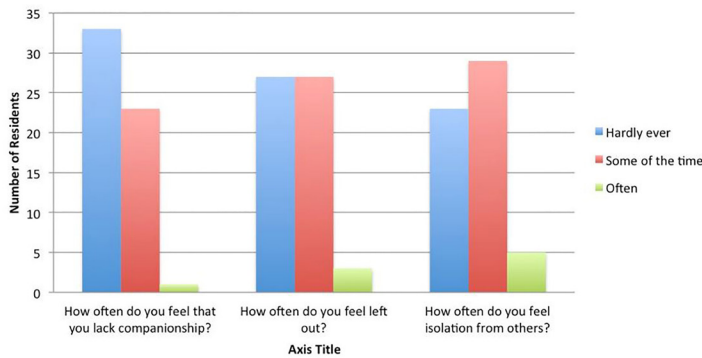


Figure 1. Social Isolation.

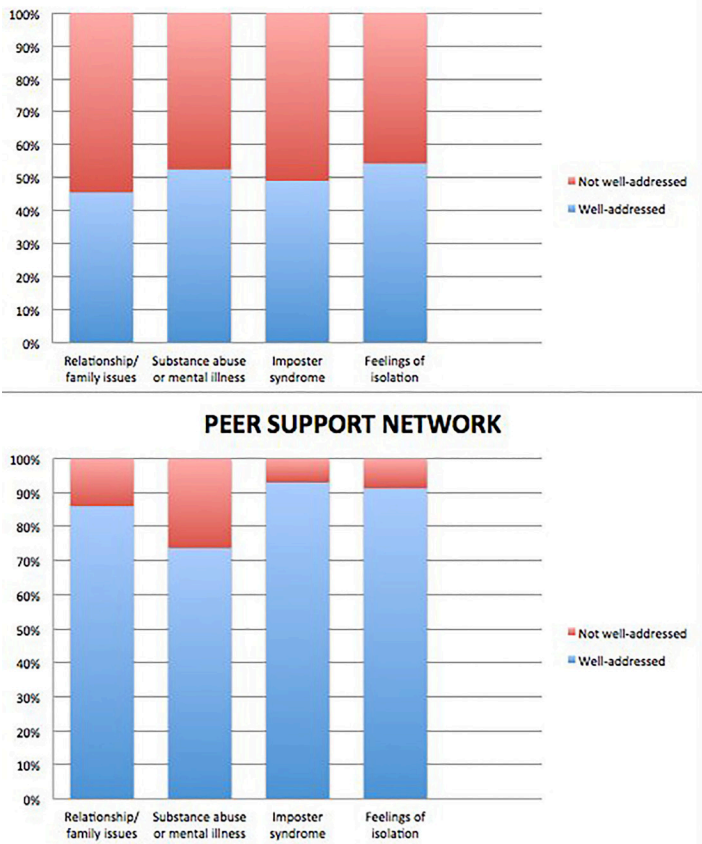


Figure 2. Comparison of Mentorship.

30 Non-Emergency Medicine Residents: Creating an Efficient Workforce

Heron L, Shah P, Turner-Lawrence D/Beaumont Health, Royal Oak, MI

Background: Non-Emergency Medicine (EM) residents make up to one fourth of the resident workforce. While educational objectives vary by specialty and differ from traditional EM objectives, assessing and improving

efficiency remains constant. Current literature has established a correlation between a trainee’s specialty and its relation to primary care leading to clinical success during an EM rotation, but does not discuss how this relates to efficiency.

Objectives: We aim to assess productivity of non-EM residents from various specialties and to develop a model that describes efficiency, defined as patients seen per hour (pts/hr), weighted by month of training.

Methods: We performed a retrospective review of non-EM resident patient logs from July 2014 to June 2016. Current training month and the average patients seen per hour were extracted. Rotating residents, who hail from Anesthesia (Anes), Internal Medicine (IM), Medicine/ Pediatrics (M/P), Obstetrics/Gynecology (Ob/Gyn), Physical Medicine and Rehabilitation (PMR), Transitional Year (TY), spent one month rotating within our suburban Emergency Department (ED) whose annual patient volume exceeds 120,000. For each resident, the mean number of patients per hour and standard deviation (SD) was calculated. Linear regression was used to develop a model that describes expected efficiency for a non-EM resident per month of training.

Results: We analyzed data from 110 non-EM residents over 24 months. We found the average pts/hr was similar amongst specialties, except for IM PGY2, whose average pts/hr was higher (Table 1). An inexperienced non-EM resident sees 0.873 pts/hr. In addition, non-EM resident efficiency increases quarterly (Table 2) and they are able to see an additional 0.012 pts/hr based on their current month of training. Linear regression was used to develop a model to describe predicted efficiency for a non-EM resident. The model predicts that $pts/hr = 0.873 + (0.012 \times \text{training month})$ ($F(1, 108)=59.10, p=0.00, R^2$ of 0.35).

Conclusions: An efficiency prediction model allows for individual goals and expectations to be set for ED staffing and non-EM resident workflow. Residents rotating in the ED later in training are more productive. This model may assist strategic placement of the EM rotation in a non-EM resident’s curriculum.

Table 1. Mean patients per hour by specialty.

| Specialty | PGY | n | Pts/Hr | SD |
|-----------|-----|----|--------|-------|
| Anes | 1 | 10 | 0.913 | 0.152 |
| IM | 1 | 14 | 1.024 | 0.074 |
| IM** | 2 | 26 | 1.102 | 0.083 |
| M/P | 1 | 6 | 0.963 | 0.149 |
| M/P | 2 | 5 | 1.049 | 0.088 |
| Ob/Gyn | 1 | 12 | 0.999 | 0.081 |
| PMR | 1 | 6 | 0.948 | 0.148 |
| TY | 1 | 31 | 0.935 | 0.105 |

** Statistically different than Anes, PM&R, and TY

Table 2. Patients per hour based on training quarter.

| Quarter | n | Pts/hr | SD |
|---------|----|--------|-------|
| 1 | 11 | 0.898 | 0.092 |
| 2 | 22 | 0.941 | 0.113 |
| 3 | 23 | 0.957 | 0.129 |
| 4 | 23 | 1.014 | 0.091 |
| 5 | 7 | 1.081 | 0.073 |
| 6 | 6 | 1.075 | 0.079 |
| 7 | 12 | 1.072 | 0.079 |
| 8 | 5 | 1.181 | 0.87 |

31 Nursing Lectures During Conference Time are Well Received by Both Residents and Faculty

Smith T /Morristown Medical Center - Atlantic Health System, Morristown, NJ

Background: As a way of increasing department cohesiveness between nursing staff and faculty/residents quarterly nursing lectures were added to the resident weekly conference curriculum. Nursing was given leeway to discuss topics which they thought were areas of concern in the department.

Objectives: To determine the quality/receptiveness of lectures given by nursing during resident conference compared to those given by faculty/resident.

Methods: A retrospective observational study. Location: a suburban teaching hospital with an annual census of 90,000 patients. Study period: July 2016 through November 2016. One month prior to nursing lectures the topics of discussion were forwarded to the associate and program director to assure validity to resident training. Upon agreement, nursing would give a 45 minute lecture with an additional 10 minutes for questions. Following the completion of the lecture the residents/faculty were given a closed end questionnaire to evaluate their performance. Areas of evaluation include: content, organization, style/effectiveness, knowledge, professionalism, interpersonal skills/communication, and practice based learning. All lectures were evaluated on a 1-6 scale. A 1 indicating "expectation not met" and 6 meaning "expectations exceeded". Nursing lectures were compared to other lectures presented on that same day. Statistics: Two-tailed Wilcoxon signed-rank test. This study was considered to be exempt from IRB approval.

Results: A total of 100 lecture evaluations were examined. Only 48% of evaluation forms completed, evaluated nursing lectures. The overall score for nurses was

5.7 (6 to 5.8 95% CI) versus the faculty/resident score of 5.8 (6 to 5.5 95%CI) (p=NS). With respect to the individual evaluation areas of content, organization, style, knowledge, professionalism, interpersonal skills/communication, and practice based learning nursing versus resident/faculty score were: (5.8, 5.9), (5.7, 5.9) (5.7, 5.9), (6, 5.8) (6, 5.9) (6, 5.9) (6, 5.8), respectively (P=NS). Of note, only 2% (N=2) of evaluations had any derivation from the different evaluation areas with most assigning the same numeric value across the complement of questions.

Conclusions: Overall nursing lectures were well received and scored equivalently to resident/faculty lectures.

32 Overtraining in Simulation-Based Mastery Learning - Performance Translation of Ultrasound-Guided Peripheral Intravenous Catheter Placement from a Simulator to Humans

Kule A, Iwasaki H, Adams W, Reed T/Loyola University Chicago, Stritch School of Medicine, Maywood, IL

Background: Competency-based medical education, such as mastery learning, is increasingly recognized as a more effective technique than the traditional fixed curriculum. Simulation-based mastery learning (SBML) has been shown to improve skill translation from simulators to humans. Although there is interest in exploring the effect of overtraining, there hasn't been an investigation assessing whether overtraining in SBML impacts skill translation to humans.

Objectives: Evaluate the impact of overtraining in ultrasound-guided peripheral intravenous catheter (USGPV) placement with SBML on skill translation to humans.

Methods: This was a prospective, randomized study of 48 medical students naive in USGPV placement who received SBML instruction using a blue phantom simulator. Sample size was determined based on initial estimates for 80% power. All students pretested, watched an instructional video, received hands-on skills training using deliberate practice with feedback, and post-tested until MPS was met on a 19 item checklist developed by 6 experts using the patient safety approach to standard setting. Subsequently, students were randomized to 0, 4 or 8 successful extra simulation attempts to MPS, after which USGPV placement on a human subject was assessed by a blinded rater-trained expert.

Results: Success rates within each of the three extra attempt group were analyzed using a generalized linear mixed effect model that accounts for clustering of students within their class year. Those assigned to 0 and 4 extra attempt groups achieved a 50% success rate of IV placement on the human volunteer; students assigned to 8 extra attempts achieved a 62.5% success rate. For all

possible pairwise comparisons, there wasn't a significant difference in the probability of success among the three treatment groups ($p = .58$).

Conclusions: In this study, we found that for novice medical students who underwent SBML instruction in USGPV placement and achieved MPS on a simulator once, there was no evidence that any extra attempts resulted in a higher probability of successful USGPV placement in a human volunteer. USGPV success rates were in line with other studies assessing trained providers. These results support the impact of SBML training on skill translation and question the need to over-train on a simulator if SBML is employed in an era of increasing cost and time consciousness.

| Assignment | Valid N | Successfully Placed IV | Odds Ratio (95% CI) | P |
|------------------------|---------|------------------------|---------------------|-----|
| 0 attempts (reference) | 16 | 8 (50%) | -- | -- |
| 4 attempts | 16 | 8 (50%) | 1.00 (0.22 - 4.50) | .99 |
| 8 attempts | 16 | 10 (63%) | 1.96 (0.43 - 8.85) | .38 |

Note: Valid N is the number of cases used to compute the estimate. IV = Intravenous therapy. CI = Confidence interval for the estimate.

33 Participation in an Emergency Medicine Bootcamp Increases Self-Confidence at the Start of Residency

Lewis J, Schoenfeld D, Dubosh N, Ullman E /Beth Israel Deaconess Medical Center, Boston, MA

Background: The transition from medical student to resident physician can be a difficult and stressful period. An emerging trend in medical education is the development of specialty-specific electives or "bootcamps" designed to review critical topics and skills prior to the start of residency. We developed a 4-week bootcamp with over 120 hours of intensive EM specific training including simulation cases, procedural skills sessions and case based lectures, which was offered during the last month of medical school with the goal to increase clinical and procedural experience prior to residency. The effect of participation in an EM bootcamp on participant confidence remains relatively unstudied.

Objectives: The goal of this study was to determine the effect of the EM bootcamp on intern confidence at the start of residency.

Methods: This was a prospective survey-based study of new EM interns who graduated from our affiliated medical school. Surveys were sent to all affiliated students who matched in EM from the classes of 2015 and 2016. Each intern was asked to assess their confidence as compared to their co-residents one month into the start of residency on a 1-5 Likert scale, with "1" being the lowest, "3" average and "5" the highest. Responses were confidential and contained no program or personal identifiers. Results were dichotomized to ≥ 3 or < 3 and a

Fisher's exact test performed.

Results: Our affiliated school matched 23 students into 18 EM residency programs from the classes of 2015 and 2016. Thirteen participated in the EM bootcamp. The survey was completed by 91.3% of graduates. Thirteen participants and 8 non-participants responded. Self-assessed confidence was significantly higher in participants compared to non-participants (13/13 vs 4/8 = 3, $p < 0.02$).

Conclusions: Graduating medical students matching in EM who participate in the bootcamp had higher self-assessed confidence compared to non-participants at the start of residency. Half of non-participants rank their confidence significantly lower than average compared with their peers. Future studies with subsequent graduating EM matched students are needed to assess the effect of the bootcamp on resident confidence in specific domains and ultimately overall performance in residency.

34 Post-Interview Communication Between EM Residency Programs and Applicants

Funk E, Sievers A, Colletti J/Mayo Clinic, Rochester, MN

Background: In August of 2013 the NRMP published the Match Communication Code of Conduct. As part of this code of conduct there is a section on discouraging unnecessary post-interview communication. This section states "Program directors shall not solicit or require post-interview communication from applicants, nor shall program directors engage in post-interview communication that is disingenuous for the purpose of influencing applicants' ranking preferences." There is much variability in interpretation of NRMP Match Communication Code of Conduct.

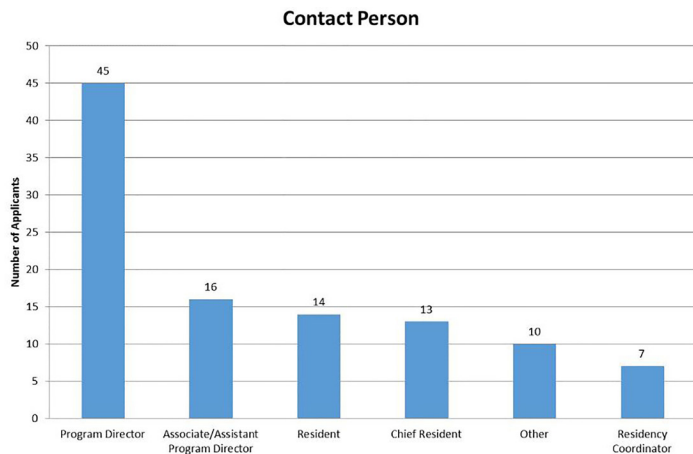
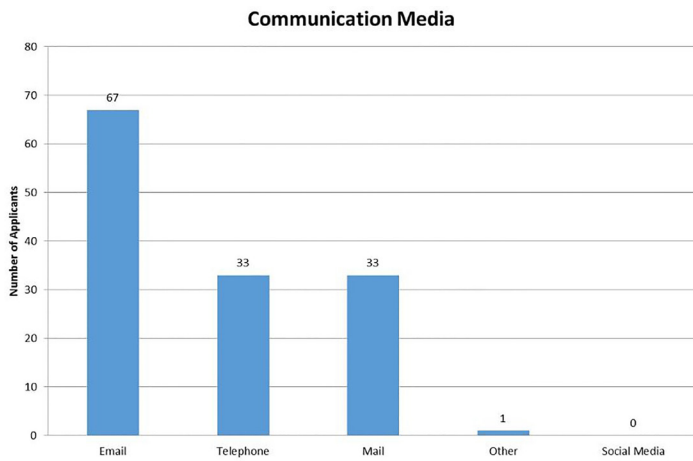
Objectives: This study sought to determine the frequency in which EM programs are communicating with applicants, the communication medium, and the communicator. Our hypothesis is that despite the Match Communication Code of Conduct there are applicants who are contacted by EM program directors.

Methods: We undertook a cross-sectional bi-site study in which applicants to two EM residency programs were surveyed following the 2015-2016 application cycle. An anonymous and voluntary internet-based surveying service was used to collect data. All applicants at the two EM residency programs were invited to participate. This study was deemed IRB exempt.

Results: 81.3% (65/80) of applicants were contacted by EM programs. The majority of applicants were contacted by email, followed by phone and mail. The majority of applicants, 65.2% (45/69) were contacted by the program director.

Conclusions: A majority of applicants surveyed were contacted by EM residency programs, primarily by the program director. Further clarification of this NRMP rule

is needed. Is any type of contact appropriate? If contact is appropriate, what type of contact and by whom is appropriate?



35 Resident Wellness Curricula: What's Out There? And Who's Doing It?

Zdradzinski M, O'Shea J, Lall M /Emory University, Atlanta, GA

Background: Physician wellness and burnout are a focus in medicine. Current literature informs us that physicians at all levels are suffering from burnout, from medical students to career faculty physicians.

Objectives: We performed a comprehensive literature review in search of wellness/resilience curricula for residents.

Methods: A PubMed search was executed using the following terms: resident wellness; resident wellness curriculum; resident wellness program; residency wellness curriculum; residency wellness program; residency

wellness; graduate medical education wellness; graduate medical education wellness curriculum; graduate medical education wellness program. These results were sorted by relevance, the first 300 articles were reviewed, and 13 were used for in-depth review. A MedEdPORTAL search was executed with the following search terms: resident wellness; resident resilience; mindfulness; well-being; and wellness curriculum; with the health profession specialties and professional interests filters. The results (393 citations) were sorted by relevance and 8 citations were reviewed in-depth.

Results: There are few published wellness curricula for residents, and none are from Emergency Medicine programs. One curriculum included sessions on developing self-awareness, setting life goals, positive psychology, mindfulness, time management, and balancing personal and professional life. A second curriculum involved residents utilizing a self-study curriculum focusing on mindfulness. Another consisted of 3 workshops focusing on resilience, response to stress, and gratitude. A fourth curriculum involved identification of and reflection on stressful clinical events and resilience-enhancing exercises, including setting realistic goals, managing expectations, letting go after medical errors, and finding gratitude. Other articles proposed an exercise and dietary improvement program and a financial management curriculum for surgical residents.

Conclusions: There are very few published wellness curricula for residents, and little research has been performed on the effectiveness of current curricula. A wellness curriculum designed by the authors is outlined below (Table 1). A comprehensive wellness curriculum may help to foster a resilient resident workforce and combat burnout.

Table 1. Curriculum modules and wellness domains.

| Wellness Domain | Modules |
|-----------------|---|
| Emotional | Change Management; Stress Management; Time Management; Conflict Management and De-escalation; Burnout and Resilience; Emotional Regulation on Shift |
| Occupational | EM for the Long Haul; Demands of Professionalism; The Job Search; Tips from the Pros; How to Handle a Deposition |
| Financial | Loan Repayment and Financial Advice; Financial Planning |
| Physical | Self-care; Shift Preparation and Shift Recovery |
| Intellectual | National Engagement and Leadership |
| Social | Positive Coping Strategies |
| Spiritual | Mindfulness; Reflection |

*Many modules overlap in multiple domains but are listed under the primary domain

36 Residents do Not Find Milestones to be a Useful Component of End-of-Shift Evaluations

Cooper B, Beres K, Takenaka K, Van Meter M, Lubner S /McGovern Medical School at the University of Texas Health Science Center at Houston (UTHealth), Houston, TX

Background: In 2013, the ACGME and the American Board of Emergency Medicine introduced the Emergency Medicine (EM) Milestone Project, a collection of competency-based developmental outcomes intended to demonstrate resident progression during training. Many programs expect faculty to complete milestone-based end-of-shift evaluations (ESEs) for each resident shift utilizing a rating scale (levels 1 to 5). Commonly cited problems with this approach include faculty variation in reporting milestone levels, lack of perceived relevance, and poor compliance.

Objectives: We aim to address concerns about the utility of milestone-based ESEs by creating a new evaluation tool - one that de-emphasizes rating scales by using a binary milestone checklist and requires comments; and to determine whether the new tool is associated with improved resident satisfaction.

Methods: This is a prospective observational study including voluntarily participating residents at a single EM residency. In March 2016, an 8 item survey was sent to gauge resident satisfaction with the milestone-based rating scale ESE employed at the time, and to recruit suggestions for how to improve or change it. In July 2016, a new ESE tool was implemented, and the survey was repeated in November 2016. The primary outcome was resident satisfaction as defined by a 5-point Likert scale. Comparison was made using a t-test to evaluate for statistical significance.

Results: A total of 41/54 (76%) residents responded to the first survey, and 42/54 (78%) to the second survey. Mean satisfaction scores improved after implementation of the new ESE by 0.46 points (3.48 versus 3.02; 95% CI 0.05 to 0.85). Although satisfaction improved, residents consistently rated the milestone component of ESEs poorly with only 2/41 (4.9%) and 2/42 (4.8%) finding them useful in the first and second surveys, respectively. Written and in-person feedback were consistently recognized as the most useful forms of evaluation with 34/41 (83%) and 29/41 (73%) endorsing their utility in the first survey, and 31/42 (74%) and 33/42 (79%) in the second survey, respectively.

Conclusions: Written and verbal comments are the most useful components of resident evaluation, while milestone rating scales and checklists are not perceived as useful. ESEs that de-emphasized rating scales and encourage comments are associated with improved resident satisfaction.

37 Residents in Emergency Medicine Comparative Survey on Technology (REMCAST)

Grace P, Aust Z, Belcher C, Desai S /University of Kentucky College of Medicine, Lexington, KY

Background: Innovations in medical education have been occurring rapidly in the field of EM. Traditional educational resources are being supplemented by a variety of electronic educational resources. One of the most impactful changes has been the growing popularity of educational podcasts. EM residents utilize these medical education podcasts but little data exists to determine whether it is more worthwhile to listen to podcasts or spend this time learning in more traditional manners.

Objectives: The purpose of this study was to correlate time spent utilizing textbooks, questions banks, and medical education podcast media to scores on the ABEM in-service exam for EM residents.

Methods: A confidential survey created with SurveyMonkey was sent to EM program directors via the CORD listserv with instructions to distribute the survey to their residents. 134 EM residents responded to the survey, with 104 residents providing their ABEM in-service exam score. The survey asked them to indicate how many hours in a typical week they read EM textbooks, use Rosh Review, and use medical education podcasts. The survey also asked the respondents for their year in residency training and to qualify which podcasts they utilized. A Kendall's Tau value was calculated to correlate each question response with exam scores.

Results: Having more years of residency training was associated with a higher in-training exam score ($p < 0.0001$). Listening to EM Basic was associated with a higher in-training exam score ($p = 0.0194$). Listening to EM:RAP was associated with a lower in-training exam score ($p = 0.0482$). Total hours per week listening to podcasts ($p = 0.6060$), using Rosh Review ($p = 0.6940$), or utilizing textbooks ($p = 0.0574$) did not reach statistical significance.

Conclusions: Our findings indicate that there was no significant difference in exam scores based upon total hours per week spent utilizing textbooks, question banks, or podcasts. Larger studies may be needed to find a significant difference between the different modalities. EM Basic's positive correlation with exam scores is likely due to its emphasis on content most likely to be tested by ABEM. EM:RAP emphasizes cutting edge new research, which is less likely tested on the ABEM in-service exam. The C3 project from EM:RAP may fill a more relevant role for core content teaching in the future.

Table 1. ABEM Exam Scores by Resident Demographics. N= 134.

| | Overall Incidence, N (%) or Median (IQR) | Exam Scores, Median (IQR), if applicable | Kendall's Tau Correlation (p-value) |
|--------------------------------|--|--|-------------------------------------|
| Total No. of Responders | N=134 | N/A | N/A |
| ABEM Exam Score | 75.0 (70.0 – 85.0) | 75.0 (70.0 – 85.0) | N/A |
| Missing Data | N=30 | | N/A |
| Year of Residency | | | |
| PGY 1 | 14 (10.7%) | 74.5 (74.3 – 74.8) | 0.321 (p < 0.0001) |
| PGY 2 | 53 (40.5%) | 72.0 (69.0 – 75.0) | |
| PGY 3 | 56 (42.7%) | 82.0 (75.0 – 88.0) | |
| PGY 4 | 8 (6.1%) | 82.0 (76.0 – 84.0) | |
| Missing Data | N=3 | | |
| Listened to At Least 1 Podcast | 124 (92.5%) | 75.0 (71.0 – 85.0) | 0.110 (p = 0.1788) |
| Particular Podcasts | | | |
| EMCrit | 77 (57.5%) | 75.0 (72.0 – 85.0) | -0.065 (p = 0.4269) |
| EMRAP | 112 (83.6%) | 76.0 (72.0 – 86.0) | -0.168 (p = 0.0482) |
| Ultrasound | 16 (11.9%) | 75.0 (70.0 – 81.0) | -0.029 (p = 0.7252) |
| EM Basic | 47 (35.1%) | 74.0 (70.0 – 75.8) | 0.192 (p = 0.0194) |
| Core ME | 8 (6.0%) | 75.0 (73.0 – 79.0) | 0.009 (p = 0.9172) |
| ERCast | 19 (14.2%) | 82.0 (74.0 – 90.0) | -0.136 (p = 0.0973) |
| FOAMCast | 15 (11.2%) | 75.0 (74.0 – 88.0) | -0.078 (p = 0.3409) |

Table 2. ABEM Exam Scores by Time Spent Using Study Materials. N= 134.

| | Overall Incidence, N (%) or Median (IQR) | Exam Scores, Median (IQR), if applicable | Kendall's Tau Correlation (p-value) |
|-------------------------------|--|--|-------------------------------------|
| Total No. of Responders | N=134 | N/A | N/A |
| ABEM Exam Score | 75.0 (70.0 – 85.0) | 75.0 (70.0 – 85.0) | N/A |
| Missing Data | N=30 | | N/A |
| Hours per Week of Podcast | | | |
| <1 | 36 (27.1%) | 75.0 (70.5 – 83.0) | 0.038 (p = 0.6060) |
| 1–2 | 45 (33.8%) | 76.5 (70.0 – 86.0) | |
| 2–3 | 18 (13.5%) | 78.0 (70.0 – 81.0) | |
| 3–4 | 13 (9.8%) | 74.5 (68.3 – 77.3) | |
| 4–5 | 9 (6.8%) | 74.0 (72.0 – 84.0) | |
| 5–6 | 2 (1.5%) | 92.0 (92.0 – 92.0) | |
| 6–7 | 2 (1.5%) | | |
| 7–8 | 0 (0.0%) | | |
| 8–9 | 0 (0.0%) | | |
| 9–10 | 4 (3.0%) | 88.0 (85.0 – 89.0) | |
| 10–11 | 2 (1.5%) | 80.0 (74.5 – 85.5) | |
| 11–12 | 0 (0.0%) | | |
| 12–13 | 1 (0.8%) | 85.0 (85.0 – 85.0) | |
| 13–14 | 0 (0.0%) | | |
| 14+ | 1 (0.8%) | 56.0 (56.0 – 56.0) | |
| Hours per Week of Rosh Review | | | |
| <1 | 48 (36.4%) | 75.0 (70.0 – 85.0) | -0.030 (p = 0.6940) |
| 1–2 | 46 (34.8%) | 79.0 (73.0 – 85.0) | |
| 2–3 | 17 (12.9%) | 70.0 (65.0 – 74.0) | |
| 3–4 | 8 (6.1%) | 78.5 (68.3 – 86.5) | |
| 4–5 | 3 (2.3%) | 90.0 (90.0 – 90.0) | |
| 5–6 | 3 (2.3%) | 86.0 (71.0 – 88.5) | |
| 6–7 | 4 (3.0%) | 74.5 (73.0 – 79.3) | |
| 7–8 | 0 (0.0%) | | |
| 8–9 | 0 (0.0%) | | |
| 9–10 | 1 (0.8%) | | |
| 10–11 | 0 (0.0%) | | |
| 11–12 | 1 (0.8%) | 82.0 (82.0 – 82.0) | |
| 12–13 | 0 (0.0%) | | |
| 13–14 | 0 (0.0%) | | |
| 14+ | 1 (0.8%) | 74.0 (74.0 – 74.0) | |
| Hours per Week of Textbooks | | | |
| <1 | 72 (54.1%) | 77.0 (73.0 – 86.0) | -0.148 (p = 0.0574) |
| 1–2 | 31 (23.3%) | 75.0 (68.5 – 82.0) | |
| 2–3 | 15 (11.3%) | 68.0 (61.0 – 72.0) | |
| 3–4 | 7 (5.3%) | 78.0 (70.5 – 85.5) | |
| 4–5 | 4 (3.0%) | 72.0 (71.0 – 81.0) | |
| 5–6 | 3 (2.3%) | 80.5 (74.8 – 86.3) | |
| 6–7 | 0 (0.0%) | | |
| 7–8 | 0 (0.0%) | | |
| 8–9 | 0 (0.0%) | | |
| 9–10 | 0 (0.0%) | | |
| 10–11 | 0 (0.0%) | | |
| 11–12 | 0 (0.0%) | | |
| 12–13 | 0 (0.0%) | | |
| 13–14 | 0 (0.0%) | | |
| 14+ | 1 (0.8%) | 74.0 (74.0 – 74.0) | |

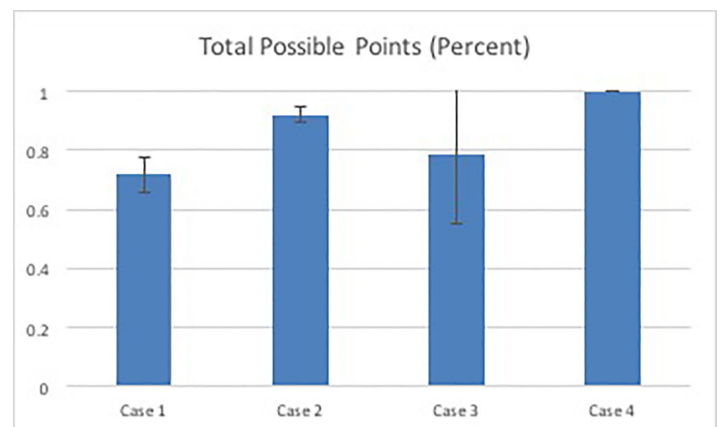
to 50%. Emergency Medicine residents are taught to recognize and treat septic patients, however, there is little teaching on proper documentation to be compliant with CMS sepsis core measures.

Objectives: Our objective was to improve resident compliance with CMS sepsis core measure documentation. We hypothesized that residents would improve their overall documenting efficiency and compliance through simulated cases.

Methods: 40 EM residents ranging from PGY 1 - PGY4 were randomly assigned to 6 groups . Residents were given a brief tutorial on CMS quality measures: SEP-1, Early Management Bundle, Severe Sepsis and Septic Shock. Residents were presented 4 clinical vignettes (SIRS without infection, severe sepsis, 2 septic shock) on power point slides. Using the institution's EMR in training mode, resident groups were timed and points awarded for each proper medication administered, reassessments, and final diagnoses.

Results: The overall total time required to meet CMS quality measures improved significantly from case 1 (377 +/- 88 sec) to case 4 (173 +/- 37 sec), p=0.001. Resident accuracy improved from 71% of total available points in case 1, to 100% of available points in case 4, p<0.001. Repetition via shock cases 3 and 4 showed a trend toward improved accuracy (79% vs. 100%, p=0.07) without a significant difference in time (150 +/- 119 sec vs. 174 +/- 38 sec, p=0.65).

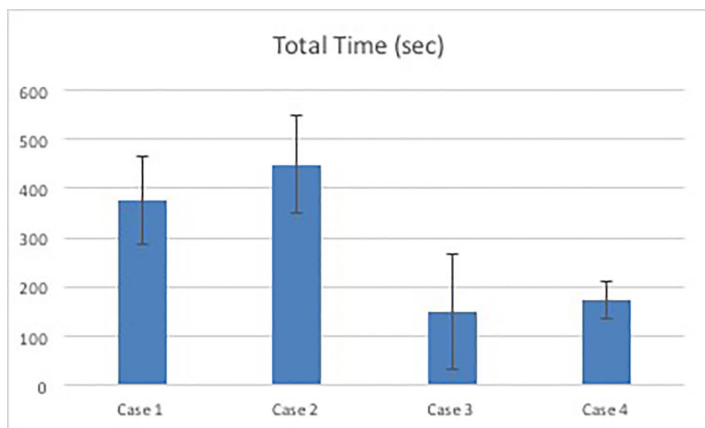
Conclusions: Through a 4 case clinical vignette simulation, residents can become more efficient and accurate in complying with CMS sepsis quality metric documentation. This type of resident simulation may help improve CMS documentation compliance, improve patient care, and improve hospital reimbursement.



38 Simulating Sepsis: Can Residents Improve CMS Compliance Through Simulation?

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Background: Over 1 million patients each year are diagnosed with sepsis with mortality ranging from 28%



39 Simulation is Now Integral to EM Resident Training Nationwide

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Background: Simulation-based education has grown rapidly in the 21st century. In 2003 McLaughlin found that only 29% of EM residency programs in the US were using high-fidelity mannequin-based (HFMB) simulation to train residents. By 2008, Okuda found use of HFMB sim had risen to 85% of programs, and 43% owned their own mannequin simulators, up from 8% only 5 years earlier.

Objectives: To describe the current role of simulation in the education and evaluation of EM residents in the US.

Methods: A national survey of EM residency program directors was conducted. The study received exemption from review by Yale Institutional Review Board. The survey consisted of 39 multiple-choice questions developed by the study authors. It was administered electronically, via surveymonkey.com, and distributed via email to the CORD listserve in Fall 2015.

Results:

- 99 programs completed the survey, from 35 states, Puerto Rico and District of Columbia. 91 were allopathic programs, constituting 54% of ACGME-accredited residencies. 7 osteopathic programs responded, out of 44 accredited by AOA. (1 respondent declined to indicate DO vs MD.)
- 100% of respondents reported that simulation is incorporated in their curriculum in some fashion. 80% indicated plans to expand sim curricula in the next 5 years. Table 1 details current uses for simulation in EM curricula.
- 71% of residents participate in sim at least once a month, 23% “once every few weeks,” and 4% only 1-2 times per year.
- 84% of programs have on-site facilities dedicated

to simulation, and 20% indicated they plan to build new sim facilities in the next 5 years.

- 97% of programs are using sim to teaching procedural skills; Table 2 details which procedures. Central venous catheter insertion is taught via sim at 96% of programs, indicating that simulation is now a universally standard part of teaching this critical procedure.
- 53% of programs use simulation for milestone assessment, and a further 27% plan to do so in the near future.

Conclusions: Though our study was limited by its response rate, our findings show that HFMB simulation has become a ubiquitous part of EM residents’ training in the US. It is particularly well-integrated into procedural teaching and skills assessment, as seen in the example of CVC insertion. We must continue to explore and expand on the possibilities of simulation-based modalities for training the next generation of EM physicians.

Table 1. Uses for Simulation.

| Application | # of respondents, n = 98 (%) |
|---|------------------------------|
| Education | 96 (98%) |
| Procedural Skills | 95 (97%) |
| Team Training | 81 (83%) |
| Evaluation/Assessment | 69 (70%) |
| Interdisciplinary sessions with other departments/healthcare providers (e.g., RNs, techs) | 65 (66%) |
| Milestone Assessment | 58 (59%) |
| Remediation | 56 (57%) |
| Quality Improvement/Quality Assurance | 26 (27%) |
| Credentialing | 19 (19%) |
| Other (both described forms of interprofessional team training) | 2 (2%) |

Table 2. Procedures Taught Via Simulation.

| Procedure | # of respondents, n = 83 (%) |
|--|------------------------------|
| Central Venous Catheter Insertion | 80 (96%) |
| Cricothyroidotomy | 75 (90%) |
| Cardioversion/Defibrillation | 67 (81%) |
| Thoracostomy | 65 (78%) |
| Lumbar Puncture | 64 (77%) |
| FAST and ultrasound skills | 62 (75%) |
| Pericardiocentesis | 60 (72%) |
| Vaginal delivery | 43 (52%) |
| Peripheral IV placement | 41 (49%) |
| Arthrocentesis | 27 (33%) |
| Paracentesis | 16 (19%) |
| Foley catheter insertion | 14 (17%) |
| Other | 14 (17%) |
| “Other” procedures described by respondents: intubation and airway management (3), cardiac pacing (3), intra-osseous placement (2), thoracotomy (2), arterial lines, umbilical lines, fasciotomy, lateral canthotomy | |

40 Sleep in the Emergency Department: How Shifts Affect Sleep Quality and Quantity

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Background: Optimal sleep hygiene represents a critical component of a healthy lifestyle. Physicians who advocate for comprehensive health in their patients still find quality sleep elusive. Long calls and rotating shifts leads to sacrificing sleep quality. Unknown is to what detriment of physician wellness.

Objectives: This study explores the effect of shift work on quality and quantity of sleep. We analyzed sleep patterns in emergency medicine residents and attending physicians during their assigned time in the emergency department. We hypothesized that participants with sleep onset in the daytime hours would have suboptimal sleep duration and quality.

Methods: Twenty-nine participants (twenty-six residents and three attendings) volunteered to participate in this study, wearing a fitness tracker to monitor sleep and activity level for three months. Time of sleep onset was categorized into three interval groups: interval 1 (0600-1400hrs), interval 2 (1400-2200hrs), or interval 3 (2200-0600hrs). Mean length of sleep for each interval group, sleep latency, and proportion of time spent in light and deep sleep, were analyzed.

Results: Sleep sessions with onset in interval 1, had mean total sleep duration of 5.26 hours, significantly less than 7.31h for interval 2, and 7.06h for interval 3. There was no significant difference in proportion of light sleep versus deep sleep amongst interval groups. Sleep latency was greatest for sessions with onset in interval 2, at a median of 36.54 minutes, in contrast with interval 1(24.87 m), and interval 3 (22.09).

Conclusions: Sleep onset in the morning hours (0600-1400) was correlated with a 23.5% decrease in overall sleep duration. Proportions of light and deep sleep appear to be unaffected by interval time of sleep onset. Participants had a 61% increase in sleep latency from the median when sleep onset occurred during the afternoon/evening hours (1400-2200).

41 Social Media and Other Sources of Information Used During the Emergency Medicine Residency Application Process

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Background: During the residency selection process, applicants gather information from a variety of sources, including medical student colleagues, residents and faculty at their home institutions, flyers, websites, and social media.

The world of social media is rapidly changing and little has been published recently on how emergency medicine applicants are using social media to follow residency programs that they are applying to.

Objectives: The objective of this study was to describe the impact of social media on the resident application and selection process.

Methods: We conducted a survey of the applicants who interviewed at our emergency medicine residency program. We reported the use of online tools, including social media, to research potential residency programs. We used proportions and 95% confidence intervals to report our results.

Results: Out of 181 emergency medicine applicants who were sent the survey, 96 students responded, resulting in a 53% response rate. Survey results confirmed that a program's website is almost universally used as 94% (87-97%) reported accessing the website for information when applying to a program. Furthermore, 74% (64-82%) of students cite faculty advisors as having a substantial influence, as well as other medical students at a rate of 58% (48-68%). Nearly half of applicants or 45% (36-55%) used Student Doctor Network. Only 7% (4-14%) used FREIDA, and only 3% (1-9%) of applicants used the EMRA site. Finally, 21% (14-30%) of applicants follow EM programs on social media. Specifically, of these applicants who use social media, 60% (36-80%) follow programs on Twitter and 40% (13-64%) follow programs on Facebook.

Conclusions: Our study finds that many applicants are using Student Doctor Network and engage in social media to learn about residency programs in addition to more traditional sources such as the program website and word-of-mouth from their immediate peers and medical school faculty. Our results suggest that the percentage of applicants using social media to follow programs is still modest, but this number may change as the social media sphere continues to evolve and users adopt new technologies.

42 Survey of Emergency Medicine Residency Quality and Patient Safety Curricula

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Background: Long required by the American Council of Graduate Medical Education (ACGME) Emergency Medicine Program Requirements, the importance of resident training in quality improvement and patient safety (QIPS) has been highlighted by the ACGME: Milestones and CLER initiatives, and recently proposed revisions to the Common Program Requirements.

Objectives: Describe current QIPS curricula of Emergency Medicine Residency Programs.

Methods: A 32 question survey (SurveyMonkey®) was distributed to CORD members (February to August, 2016). Surveys were voluntary, anonymous, and results analyzed using descriptive statistics. The project was reviewed by the IRB and found to be exempt.

Results: Of ~205 programs, 91 (44%) responded. (Table 1) A formal QI\PS curriculum was reported by 84% (74\88), 54% (54\87), implemented 2012-2016, and most commonly 5-10 didactic hours\year, 45% (39\87). The following activities were reported by > 50% of 86 responding programs: Morbidity & Mortality (M&M) conference (90%, 77), Didactic Sessions (87%, 75), Resident QI\PS project (84%, 72), Continuous Process Improvement (58%, 50), and Root Cause Analysis (58%, 50). Required resident QI\PS projects were evenly divided between team and individual projects (49%\51%) and most often completed outside of dedicated conference time or during an administrative \ QI month (54% (43\80), 33% (26\80) respectively). 58 Programs reported project abstract submissions to professional meetings: local (16), regional (9), and national (34). Factors considered critical for a successful QI\PS program included an experiential component and faculty with QI\PS experience. The top barriers identified were: lack of time within the residency, lack of resident interest, and lack of funding\support. When asked how satisfied they were with their curriculum (Likert scale 1-5, 5 highly satisfied) the largest response was 3 (43%, 39\91).

Conclusions: Most residency programs have a formal QI\PS curriculum with M&M conferences, didactic sessions, and resident QI\PS projects. Critical success factors included the resident project and faculty with QI\PS experience while barriers were: lack of time, lack of resident interest, and funding\support.

Table 1. Demographics.

| Program Type | | | Program Length | | Location | | | | Residency Complement (total#) | | | | |
|--------------|-----|----------|----------------|-----|----------|---------|-------|-----------|-------------------------------|-------|-------|-------|-----|
| ACGME | AOA | Combined | 3yr | 4yr | West | Central | South | Northeast | ≤20 | 21-30 | 31-40 | 41-50 | ≥51 |
| 86% | 8% | 6% | 60% | 40% | 15% | 35% | 20% | 30% | 12% | 25% | 19% | 19% | 25% |

43 Teaching Osteopathic Manipulative Techniques to Allopathic Emergency Medicine Residents

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Background: Osteopathic manipulative therapy (OMT) has been shown to reduce or eliminate common ED complaints, and can be performed in the ED in a time-efficient manner. These procedures significantly increase patient satisfaction and are billable through Medicare and Medicaid. As the ACGME single accreditation system is

implemented, it raises the question of how OMT will be received by Allopathic residents.

Objectives: At our dually-accredited (AOA and ACGME) EM residency program with 60 residents (30 DO, 30 MD), we held a 4 hour lab to train all of our residents in 4 specific OMT techniques easily applicable to treat common EM patient complaints. Our goal was to determine if we could effectively teach MD residents to perform these procedures with confidence and acceptance of their usefulness in their practice.

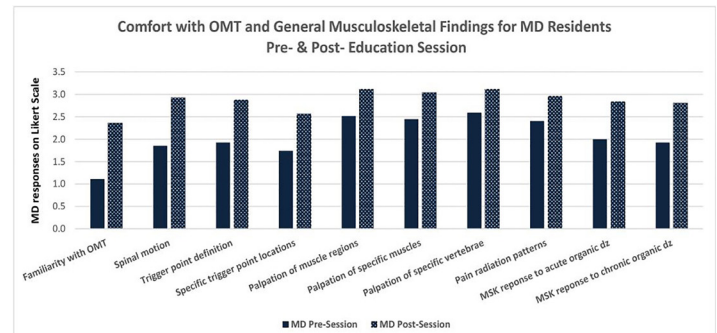
Methods: All residents were given a pre-session survey assessing their comfort with OMT and Osteopathic principles in practice (OPP) using a 1-5 Likert scale. 10 areas were assessed (eg - palpation of muscle groups, spinal motion, trigger points), and the results were averaged to provide a novel OMT/OPP comfort score. Also, residents were asked about their perception of use of OMT for treatment of common ED complaints.

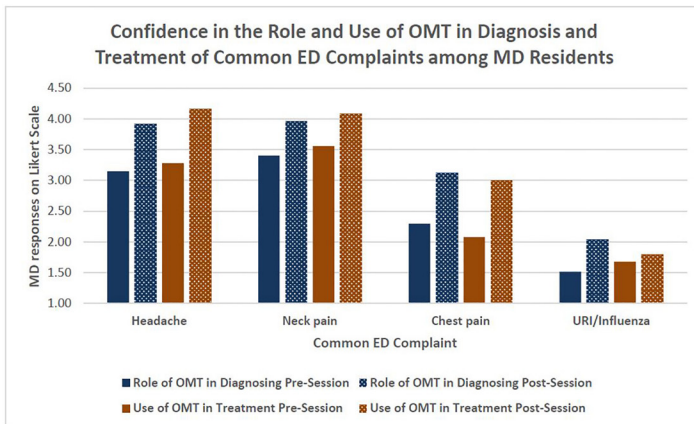
All residents then participated in a 4 hour lab (2 hrs didactics, 2 hrs hands-on) including instruction on OPP, surface anatomy review and guided palpation, identification of simple somatic dysfunction, and OMT techniques. Residents were given the same survey post-session.

Results: 57 residents (27 MD, 30 DO) completed the pre-survey, and 54 (25MD, 29 DO) completed the post-survey.

As expected, the comfort with OMT/OPP was higher among DOs than MDs pre-training. However, after the lab there was significant improvement in MDs' perception of OMT/OPP among all 10 areas. The OMT/OPP comfort score significantly improved (95% CI= 1.16, 0.05; p=0.032). The role and use of OMT in the treatment of common ED complaints also resulted in significant improvement among the MDs. Specifically, they believed they can use OMT to successfully treat ED complaints of headache (95% CI= 1.31, 0.22; p=0.01), neck pain (95% CI= 1.05, 0.04; p=0.03), chest pain (95% CI= 1.28, 0.36; p=0.001), and URI (95% CI= 0.89, 0.15; p=0.01).

Conclusions: OMT education was enthusiastically received by our MD residents and resulted in confidence to use specific procedures to treat their ED patients.





44 Teaching the Emergency Medicine Competencies During a Clinical Shift: Effective and Ineffective Strategies Used by Faculty

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Background: Throughout training, emergency medicine residents are expected to reach milestones across a range of specialty specific subcompetencies. Yet little is known about how these skills are taught in the emergency department.

Objectives: The objective of this study is to identify specific teaching strategies that faculty use in the clinical setting that facilitate resident learning of fundamental skills.

Methods: The nominal group technique, a structured method used to generate items and reach group consensus, was used to elicit responses from faculty and residents regarding effective teaching strategies. Two separate groups of faculty and resident participants were convened. Participants independently generated responses to specific questions aimed to identify effective and ineffective strategies for teaching skills in the following areas: 1) clinical decision making, 2) procedures, 3) interpersonal and professional, and 4) multitasking. Responses were shared with the group in a round robin fashion and privately voted on as being important/not important. Responses were analyzed using qualitative data analysis and descriptive statistics. Investigators developed a code sheet listing the overarching competencies that were identified during the groups, then items were coded by two investigators independently and interrater reliability was assessed.

Results: Six EM residents and 6 EM faculty participated in the groups. A total of 112 specific strategies were identified in the resident and faculty group. These strategies were collapsed into nine themes. Interrater reliability for the item analysis was high with 5 discrepancies out of 112 items (96% concurrence). The most important theme (comprising 43/112 items) was teacher engagement and enthusiasm.

Compared to faculty, residents more frequently mentioned the importance of a safe learning environment, and being available, supportive, and nonjudgemental. Both residents and faculty had a difficult time listing effective strategies for teaching multi-tasking.

Conclusions: Resident and faculty perceptions of effective clinical teaching strategies were remarkably similar. Findings highlight the importance of active engagement and enthusiasm in clinical teaching.

45 The Effect of a Resident Wellness Program on Burnout and ITE Scores

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Background: Burnout is a pervasive problem in resident physicians. Burnout affects residents' sense of well-being, and those who experience burnout are more likely to provide sub-optimal patient care. There is very little research on the effect of wellness programs for residents.

Objectives: We tested the hypothesis that a wellness intervention would decrease burnout and improve medical knowledge among residents.

Methods: This was a randomized, non-blinded experimental study conducted over a five-month period. Subjects worked at an Urban Level 1 trauma center with an Emergency Medicine (EM) and combined Emergency Medicine-Internal Medicine (EM/IM) residency program. Subjects were EM and EM/IM residents (50 residents). They were block randomized into a control and intervention group accounting for training level. The intervention began on 12/1/2015 and ended on 2/23/2016. The intervention group received emails regarding exercise, burnout, relationships and nutrition and were encouraged to journal three things that made them happy each day. The control group received no intervention. We used the Maslach Burnout Inventory (MBI) and ProQOL-5 to assess burnout and the In-Training Exam (ITE) to assess medical knowledge. All subjects were administered the MBI and PROQOL-5 twice, first in November and again in March. The distributions of baseline responses differed between the groups, and these differences were evaluated with the Wilcoxon Rank Sum test due to the potential lack of normality. Rank sum tests were used to assess the change in the survey responses between the groups and the change in ITE scores from 2015 to 2016.

Results: 39 of 50 subjects completed both surveys. The 11 who did not complete both were excluded from data analysis. 20 were in the intervention group, and 19 were in the control group. 38 residents took the ITE in 2016. The differences between control and intervention group values for the ProQOL-5 and MBI and 2015 ITE scores were not

statistically significant. When comparing the change from baseline to post-intervention, there was not a significant difference between the control and intervention group survey responses or ITE scores.

Conclusions: Our wellness intervention did not make a statistically significant difference in burnout components or medical knowledge among residents. Our study was limited by the number of participants.

Table 1. Comparison of baseline responses and ITE scores between control and intervention groups.

| Variable | Control Group Median (IQR) | Intervention Group Median (IQR) | P-value |
|-------------------------------|-------------------------------|------------------------------------|---------|
| Compassion Satisfaction Score | 35.0 (31.0, 38.0) | 36.0 (33.0, 42.5) | 0.132 |
| Burnout Scale | 28.0 (25.0, 33.0) | 24.5 (21.0, 30.0) | 0.105 |
| Secondary Traumatic Stress | 22.5 (19.0, 26.0) | 20.0 (18.5, 22.0) | 0.197 |
| Emotional Exhaustion | 33.0 (26.0, 39.0) | 27.0 (19.5, 36.0) | 0.152 |
| Depersonalization | 24.0 (17.0, 27.0) | 19.0 (15.0, 24.5) | 0.210 |
| Personal Accomplishment | 32.0 (25.0, 36.0) | 34.0 (29.0, 36.5) | 0.342 |
| 2015 ITE Score | 69.0 (67.0, 80.0) | 75.0 (72.0, 79.0) | 0.416 |

The values in the control and intervention group columns show the median and interquartile range of the assessment summary variable or ITE score.

Table 2. Comparison of changes from baseline to post-intervention between control and intervention groups.

| Variable | Control Group Median (IQR) | Intervention Group Median (IQR) | P-value |
|-------------------------------|-------------------------------|------------------------------------|---------|
| Compassion Satisfaction Score | 1.0 (-2.0, 4.0) | 0.0 (-2.0, 3.0) | 0.695 |
| Burnout Scale | -1.0 (-4.0, 1.0) | -1.0 (-3.5, 2.0) | 0.557 |
| Secondary Traumatic Stress | -2.0 (-5.0, 3.0) | 0.0 (-2.5, 2.5) | 0.284 |
| Emotional Exhaustion | 0.0 (-6.0, 2.0) | -1.0 (-4.0, 3.0) | 0.769 |
| Depersonalization | -1.0 (-2.0, 1.0) | -1.0 (-4.5, 4.5) | 0.634 |
| Personal Accomplishment | 2.0 (-2.0, 4.0) | 1.0 (0.0, 3.5) | 0.855 |
| ITE Score | 3.0 (1.0, 8.5) | 1.5 (-1.0, 10.0) | 0.523 |

Changes were calculated by subtracting the baseline ProOOL or MBI summary variable from the corresponding post-intervention value and similarly, subtracting the 2015 ITE score from the 2016 ITE score. A positive value in the above table signifies that the score increased.

46 The Point-of-Care Evidence-Based Medicine Online Resource: Two Year Follow-Up

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Background: Evidence-based medicine (EBM) is a professional core competency, the purpose of which is to inform decisions about the care of individual patients. Most residencies fail to provide formal EBM instruction due to inadequately trained personnel and incomplete awareness of EBM resources, relying instead on teaching modalities that are asynchronous relative to the bedside. The result is often inconsistent application of EBM towards cases which incited

the original clinical question. We previously described a novel online resource which simultaneously mitigates lack of local expertise by delivering knowledge through information literacy and process experience, and promotes point-of-care (POC) EBM for direct, real-time patient benefit. This two-year follow-up analyzes the archived clinical questions and results of literature searches facilitated by the guidance of our POC EBM tool.

Objectives:

1. To understand the types of clinical questions most commonly asked by bedside EM providers.
2. To evaluate the influence of an online, POC EBM tool on rates of searching pre-appraised resources relative to unfiltered resources hierarchically lower on the EBM pyramid.
3. To determine where target literature is most often found, and what types of study designs ultimately inform clinical practice.

Methods: This is a retrospective analysis of our POC EBM registry. Questions are posed by EM providers during patient care activities. Searches are carried out in real-time by senior EM residents working an “educational shift”, who also enter questions, search strategies and results into the POC EBM registry for archival. Descriptive statistics were used to characterize the types of clinical questions asked, which resources were used in the course of the literature search, which resources yielded the target article, and which types of articles ultimately informed clinical practice.

Results: There were 304 records entered into the POC-EBM resource registry over the two-year period since its inception. The most common clinical questions related to the to cardiovascular (19.60%) and infectious disease (14.62%) subspecialties, and the therapy (52.96%) and diagnosis (23.68%) EBM action domains. Searches most commonly involved unfiltered sources of single studies (e.g. Pubmed/Medline) (79.54%) and “other” sources (e.g. Google) (57.43%). Searches least commonly involved pre-appraised resources for syntheses (e.g. DARE) (10.23%) or single studies (e.g. ACP Journal Club) (4.29%). Target articles were most commonly identified using Pubmed/Medline (36.18%), and the most common study type which answered the clinical question was a review article (23.84%).

Conclusions: The most common bedside EM questions relate to the therapy action domains, and the cardiovascular system. While our POC-EBM tool was developed with the goal of guiding users through the process experience of a hierarchical literature search, most questions were investigated using unfiltered, non-appraised resources and answered using review articles.

Table 1. Question Type.

| | Proportion (%) | Confidence Interval (%) |
|----------------------|----------------|-------------------------|
| Action Domain | | |
| • Therapy | 52.96 | 47.30, 58.54 |
| • Diagnosis | 23.68 | 19.22, 28.82 |
| • Prognosis | 9.54 | 6.70, 13.42 |
| • Harm | 13.82 | 10.36, 18.20 |
| Organ System | | |
| • Neuro | 11.63 | 8.45, 15.79 |
| • CV | 19.60 | 15.48, 24.50 |
| • Pulm | 8.64 | 5.94, 12.41 |
| • GI | 10.30 | 7.32, 14.30 |
| • GU | 7.31 | 4.85, 10.87 |
| • Heme | 5.32 | 3.27, 8.52 |
| • ID | 14.62 | 11.04, 19.10 |
| • Tox | 4.65 | 2.77, 7.72 |
| • Trauma | 4.98 | 3.02, 8.12 |
| • Other | 11.96 | 8.74, 16.16 |

Table 2. Search sources and results.

| | Proportion (%) | Confidence Interval (%) |
|---------------------------------|----------------|-------------------------|
| Sources searched | | |
| • Summaries | 46.53 | 40.95, 52.20 |
| • Guidelines | 14.85 | 11.26, 19.34 |
| • Synopses of syntheses | 10.23 | 7.27, 14.21 |
| • Syntheses | 34.00 | 28.85, 39.54 |
| • Synopses of studies | 4.29 | 2.50, 7.27 |
| • Studies | 79.54 | 74.59, 83.73 |
| • Other | 57.43 | 51.76, 62.91 |
| Source of target article | | |
| • UTD, ACP Pier, Dynamed | 7.89 | 5.34, 11.53 |
| • NGC | 2.30 | 1.10, 4.77 |
| • DARE, Annals of EM SRS | 0.66 | 0.16, 2.61 |
| • Cochrane | 12.83 | 9.50, 17.11 |
| • ACP Journal Club | 0.33 | 0.05, 2.32 |
| • Pubmed/Medline | 36.18 | 30.95, 41.77 |
| • Trip | 8.55 | 5.88, 12.29 |
| • Google | 21.38 | 17.11, 26.38 |
| • Other | 4.28 | 2.49, 7.25 |
| • Not Found | 5.59 | 3.49, 8.83 |
| Type of target article | | |
| • Review article | 23.84 | 19.35, 29.00 |
| • Guideline | 5.96 | 3.78, 9.28 |
| • Synopsis of synthesis | 7.28 | 4.83, 10.84 |
| • Synthesis | 14.57 | 11.00, 19.04 |
| • Synopsis of single study | 0.33 | 0.00, 2.34 |
| • RCT | 10.60 | 7.58, 14.63 |
| • Cohort | 15.23 | 11.59, 19.77 |
| • Cross-sectional | 3.97 | 2.26, 6.89 |
| • Case-control | 4.30 | 2.51, 7.29 |
| • Other | 10.26 | 7.30, 14.25 |
| • Not found | 3.64 | 2.02, 6.48 |

47 Validation of a Behaviorally Anchored Evaluation form for Resident Lectures

Hill J, Stull M, Paulsen R, Stettler B, Hart K, McDonough E /University of Cincinnati, Cincinnati, OH; University of Michigan, Ann Arbor, MI

Background: Developing and delivering high quality lectures is a critical skill for residents seeking a career in academic Emergency Medicine. Validated tools for assessing resident lectures currently do not exist.

Objectives: We developed and tested a behaviorally anchored tool for assessing resident lectures.

Methods: We used a literature-based, consensus-building methodology to derive a lecture assessment tool (Fig. 1). We obtained resident baseline characteristics including training level and comfort with lecturing using a 1-5 Likert scale. During conference, faculty and senior resident evaluators used the assessment tool for all resident lectures. Performance in each domain of the lecture assessment was compared to training level and comfort with lecturing using ANOVA with a post-hoc Bonferroni correction. Generalizability theory testing was used to assess reliability of the scoring. A post-intervention survey was sent to faculty and residents to assess the quality of the feedback and the usability of the assessment tool.

Results: The baseline survey was completed by 64 residents. First-year residents performed worse than more advanced residents in the domains of content expertise and lecture presence (Fig. 2). Residents who felt uncomfortable with lecturing on the baseline survey performed more poorly in the domain of lecture presence than those who indicated they were comfortable with lecturing ($p < 0.0001$). There was fair reliability for all domains (G coefficients 0.445 to 0.529) except Goals & Objectives (G coefficient 0.198). On the post-intervention survey, 87% of 39 evaluators indicated they found the form to be usable and 92% indicated they were able to complete the form during the resident lecture. 96% of lecturers indicated the feedback they received was at least somewhat specific, 96% indicated the quality of the feedback was adequate to excellent, and 92% indicated the amount of feedback was adequate or more than they would have expected.

Conclusions: The derived lecture assessment tool is easy to use and provides specific, quality feedback. Scoring on the behaviorally anchored assessment displays fair reliability. Lecturer performance in the content expertise and lecture presence domains correlate with training level. Performance in the domain of lecture presence correlates with subjective comfort with lecturing.

PRESENTER: _____ DATE: _____
 TOPIC: _____
 LECURE ASSESSMENT FORM
 LEADERSHIP • EXCELLENCE • OPPORTUNITY

Please use this space to provide narrative feedback to the lecturer.

Please select the level *most consistent* with the performance/preparation of the lecturer

| Competency Domains | Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
|---|---|--|---|---|---|
| Goals & Objectives / Content Relevance | <ul style="list-style-type: none"> Does not state the goals of the lecture Goals not relevant to the clinical practice of the audience, or stated goals unrealistic Subject matter not specific or relevant to audience | <ul style="list-style-type: none"> Goals/objectives implied but not clearly stated Goals/objectives are relevant but not achievable in either lecture format or time frame | <ul style="list-style-type: none"> Goals and objectives clearly stated Goals and objectives achievable in time frame allotted Content of the topic somewhat relevant to the audience | <ul style="list-style-type: none"> Goals and objectives clearly stated and successfully met by the lecture All content within the lecture is relevant and/or of interest to the audience | <ul style="list-style-type: none"> Specific, stated goals relevant to clinical practice of learners of all levels of training Subject matter specifically tuned to audience interest and skill level Goals and objectives focused on clinical implications of content |
| Content Expertise | <ul style="list-style-type: none"> Speaker has superficial knowledge of the topic Unable to answer simple questions from the audience Presented lecture content inaccurate or not representative of latest evidence | <ul style="list-style-type: none"> Able to answer basic fund-of-knowledge questions, but has difficulty with more complex questions Presents less relevant or less current evidence to support lecture content | <ul style="list-style-type: none"> Able to answer some questions from audience, defers to available expertise when appropriate Appropriate use of evidence to support lecture content | <ul style="list-style-type: none"> Able to answer most questions without external support Content representative of latest available evidence | <ul style="list-style-type: none"> Recognized by peers as expert on topic Seamlessly answers all questions Responses to questions reflect a breadth and depth of knowledge Content reflects a mix of evidence-based discussion and appropriate experiential input |
| Competency Domains | Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
| Presentation Design/ Structure | <ul style="list-style-type: none"> Audiovisuals that are unrelated to the topic, or lack professionalism Material difficult to read Multiple text errors/typo Disorganized or unclear presentation structure | <ul style="list-style-type: none"> Audiovisuals are professional but superficial to the presentation Few text errors/typo | <ul style="list-style-type: none"> Uses a balance of text and audiovisual materials Uses material as a roadmap for presentation without over-reliance on materials Appropriate use of audiovisuals (avoids extraneous materials) Logical presentation structure | <ul style="list-style-type: none"> Appropriately discusses and interprets audiovisuals for audience Minimizes text, uses audiovisual material as cue | <ul style="list-style-type: none"> Audiovisual content enhances concepts being taught and spoken presentation Introduces new concepts early in lecture Provides closure at the end of lecture Creative and effective use of novel design modalities |
| Audience Engagement | <ul style="list-style-type: none"> Speaker has minimal interaction with the audience Reads from script | <ul style="list-style-type: none"> Questions directed to the audience ineffective in stimulating discussion Addresses to rigid teaching plan Attempts to interact with audience, but unsuccessfully | <ul style="list-style-type: none"> Encourages audience participation through open-ended questioning or by inviting questions from the audience Uses simile/analogy/metaphor/ anecdotes | <ul style="list-style-type: none"> Effectively manages off-topic questions Questions audience to monitor acquisition of knowledge/ learner engagement Uses silence effectively to allow for audience response | <ul style="list-style-type: none"> Allows audience to take active role in lecture (small group exercises, directed questioning, encourages dialogue) Uses simile/analogy/metaphor/ anecdotes that meaningfully connect with audience Audience inspired to learn more about lecture content |
| Lecture Presence | <ul style="list-style-type: none"> Does not leave oneself physically open to the audience (back to audience/ anchored to lectern) Excessive or distracting postulations Multiple verbal placeholders (umms) Voice does not project Inappropriate dress Inappropriate language or humor Directly reads from materials | <ul style="list-style-type: none"> Monotonous verbal tone Does not respect lecture timing Casual dress Leans on podium/poor posture Reads from materials rarely or recites lecture by rote memory | <ul style="list-style-type: none"> Few verbal placeholders Effective eye contact with audience Most content delivered without reliance on notes Appropriately dressed for lecture setting Lecture prepared to fit the allotted time Voice projects well | <ul style="list-style-type: none"> No verbal placeholders Uses inflection and changes of cadence of speech to highlight key points Effective time management despite unexpected interruptions Moves throughout lecture space with purpose | <ul style="list-style-type: none"> Presenter a role model for more junior lecturers Inspires others through presentation Audience eager for additional lectures by speaker |

EVALUATOR: _____

Fig. 1.

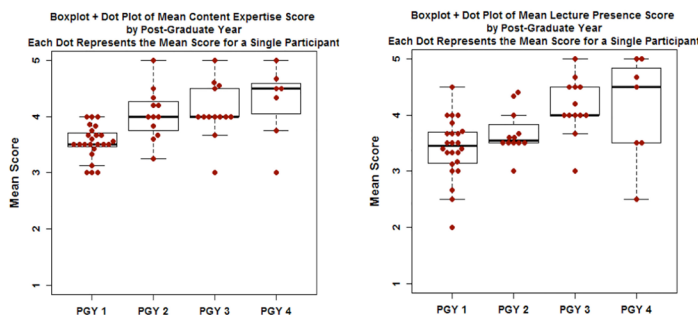


Fig. 2.

48 What's All The Chatter? A Mixed-Methods Analysis of Emergency Physician's Tweets

Brown A, Riddell J, Jauregui J, Yang J, Nauman R, Robins L /University of Washington, Seattle, WA

Background: Twitter is growing in popularity and influence among emergency physicians (EP), with over 2,200 self identified EP users. Despite this popularity, there are competing ideas about its value for EPs. Some argue that social media is time wasted. Others assert a virtual community of practice exists among EPs on Twitter sharing a common domain, community, and practice. Deep exploration of the conversation, culture, and content of Twitter use among EPs can help us better understand its value while promoting mindful social media engagement.

Objectives: To explore the nature of EPs conversations on Twitter.

Methods: We performed a mixed methods analysis of publicly available tweets from the 62 most influential EPs on Twitter defined in a previous study. We analyzed tweets from a sample of random days in 2015. In addition to recording quantitative data, we performed qualitative thematic analysis to analyze tweets. We followed best practices in qualitative research, including reflexivity, memoing, and using a diverse team of coders.

Results: 1084 unique tweets were analyzed. The majority of tweets (75%) had some engagement in the form of re-tweets, likes, or replies. Messages were split evenly between new initiations of conversation and replies to other tweets (52%, 48% respectively). Most were related professionally to the broad domain of medical practice (70%), while fewer were social (30%). 79% of tweets were statements, 9% were questions, and 12% answers to questions. We identified several distinct types of tweets. Common observed themes among tweets are presented in Table 1. Self promotion and advertisements were rare, occurring in less than 5% of tweets.

Conclusions: Influential EPs are engaging in professional and social conversations on Twitter. Resources and opinions are being shared and rapport is being built. This data may help inform mindful social media engagement. Next steps include exploring perceptions of value of Twitter to individual faculty and resident users.

Table 1. Observed themes among tweets of influential emergency physicians.

| Code | Definition | Exemplary Tweet |
|------------------|--|---|
| Resource summary | A mostly-sterile accounting of the main points of something - including the title of a linked to resource or the summary of a case. | The problem with calf clots? Everyone handles them differently...and @emergencypdx explains why http://blog.ercast.org/the-problem-with-calf-clots/ ... #FOAMed |
| Rapport Building | Explicitly pursuing relational connection, especially harmonious or sympathetic relation. | @JohnPurakal @mksheehy @UICBrownCoat Really great idea and stellar start. Can't wait for the next video! Keep up the good work |
| Illumination | A statement that adds substantially to, clarifies, explains, reveals, or enlightens - including their interpretation of data, conclusions, and results. Often in the middle of a conversation. | @FireEMSCchief There was probably a little leeway between 30 and 60. Also the breathalysers were reasonably inaccurate for this sort of thing |
| Opinion | The substantive idea that a person has about something or someone, which is based mainly on their feelings, beliefs, or personal views. | agree w @ketaminh bad hypotension with verapamil I have good results with dilt @MDaware @RAGEpodcast @stemlyns |
| Humor | Attempting to offer a funny or comical slant to a topic in discussion | As everyone leaves for #smaccus, ketamine use plummets in EDs around the world.. |
| Reflection | Meditation or serious thought about one's character, actions, professional practice, and motives with purpose of understanding self or situation. | Sitting amongst the debris of Monday, picking up pieces of rubble & turning them over. My hands are grubby with start of week dust & decay. |
| Networking | Interacting to meet professionally, exchange information, or develop contacts - especially to further one's career. | .@PEMEMS @artangelo I'd be happy to look at what you sent, but I meant he should DM me too. I'd be happy to send him resources. |

49 You've Got Mail: Efficacy of an Electronic Mail System as an Educational Strategy in Residency Training

VanDePol E /Grand Rapids Medical Education Partners (GRMEP) / Michigan State University Emergency Medicine Residency Program, Grand Rapids, MI

Background: Computer-assisted instruction (CAI) has been used in many areas of medical education to improve teaching and compares favorably with lectures or reading. Our emergency medicine (EM) residency program has

been sending a daily emergency medicine-based question electronically to all learners since July 2010.

Objectives: To assess a computer-based teaching program utilizing multiple-choice questions sent daily to EM learners. Our study hypothesis was that daily CAI throughout residency training would lead to higher scores on qualifying examinations.

Methods: A prospective, self-administered online survey sent to residents, graduates and mid-level providers affiliated with one EM residency program. The survey instrument had 13 open-ended and closed questions to assess the level of training, clinical experience, recommendations, satisfaction with electronic mail system and quality (content) of the CAI. A secondary outcome measure was the annual composite scores on resident inservice exams and written board exams for the past 7 years. To assess the statistical significance of trends in exam scores, we used weighted ?2 test for trend.

Results: Sixty-six respondents completed the survey (50% response rate), and included board-certified physicians (59%), residents (26%), mid-level providers (9%), and board-eligible physicians (6%). Respondents have been receiving daily CAI for approximately 4 years, and that they read the CAI daily (54%) or weekly (43%). The majority (97%) felt the content of the CAI was “of high quality and relevant to my practice” and 98% believed the content would “help in preparation for the national written exams.” Overall, 98% replied that the content was balanced across all of the core topics in Emergency Medicine. The main reason for reading the CAI was to keep current with the medical literature (60%), followed by preparing for written tests (29%), and “just for fun” (11%). Despite the overwhelming acceptance of CAI by respondents, the secondary outcome measures (annual composite scores on resident inservice exams and written board exams) showed no significant long-term impact over the last seven years.

Conclusions: CAI using a daily question format was well received by clinicians in our residency program. Surprisingly, the majority of respondents used the questions to keep current with medical literature rather than to prepare for written qualifying examinations.

Innovations Abstracts

1 A 3D Printed Model for Simulated Arthrocentesis Training

Henry C, Corbo S, Bronner J/University of Kentucky, Lexington, KY

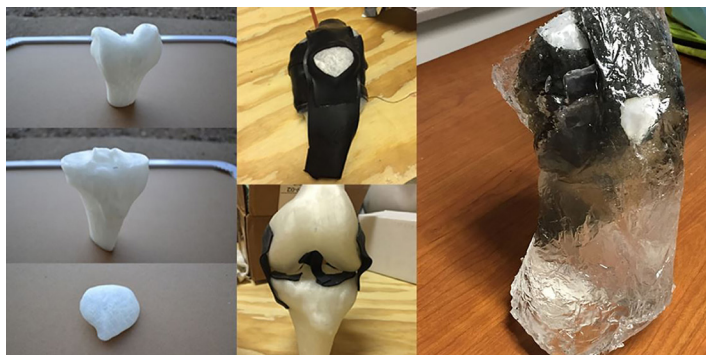
Background: Arthrocentesis is a commonly performed emergency department procedure. Improper performance

can lead to complications including patient discomfort and damage to surrounding tissues. Current low cost models lack the anatomical fidelity required to replicate the procedure. Cadavers are costly and the number of procedures that can be performed on each is limited. High fidelity simulation models are expensive, making them less suitable for repeated training by inexperienced learners. A low cost, reusable, high fidelity model is conducive to repeated simulation of this important procedure, allowing the learner to become familiar with proper technique prior to performing arthrocentesis on a patient.

Educational Objectives: The objective was to design an anatomically accurate, low cost, reusable model, providing the learner an opportunity to learn the procedure in a low-risk environment. This method can serve as an excellent tool for developing learner proficiency while also maximizing patient safety.

Curricular Design: A de-identified CT scan of a knee was converted to a printable format using specialized 3D printing software. This image was then sent to an outside facility for print into a durable plastic model of the bony structures. The plastic pieces were then attached using rubber compression bands to replicate ligaments, tendons, and a joint capsule. A small hose was placed into the joint capsule to allow for refilling of the joint space, and a watertight seal was created around the joint capsule using epoxy. This structure was then encased in ballistics gel to simulate soft tissues while allowing for palpable underlying anatomical landmarks.

Impact/Effectiveness: The 3D printed arthrocentesis simulator provides a cost effective, realistic model. Given its anatomical fidelity, this model allows for parapatellar, suprapatellar, and infrapatellar approaches. The total cost of the initial model was \$215, with an estimated cost of \$35 for each subsequent “rebuild”. Each “build” was able to be punctured with up to 50 needle sticks by learners of multiple experience levels during our trial. This model also highlights the potential of 3D printing for use in other procedural simulations.



2 A Low Fidelity Model for Teaching Lateral Canthotomy Procedure

Herman L, Koch B, Benauer-Benning J /Kaweah Delta Health Care District Emergency Medicine Program, Visalia, CA

Background: Lateral canthotomies are infrequent procedures performed on actual patients but is listed as a procedure by the EM Model of Clinical Practice that EM physicians must be able to perform. There are an edible model, a porcine model, a human cadaver model, and a ping pong ball and athletic tape model described but either they are not real-life or too expensive. To our knowledge no high-fidelity models of eyes on which lateral canthotomies can be performed.

Educational Objectives: The objective was to develop a life-like task trainer for hands on practice performing lateral canthotomies and provide an inexpensive simulator which was reusable

Curricular Design: The model was created using a ping pong ball as the eye. Eye sockets were formed by hollowing out a foam manikin head. A rubber band was placed inside the eye socket with the ping pong ball securing it into place. The rubber band was attached with straight pin laterally to the eye socket simulating the superior and inferior crura of the lateral canthal tendon. The area was covered with 2 layers of foam tape, simulating fascial layer and facial skin. The procedure was demonstrated by the faculty instructor and then each resident performed a lateral canthotomy with new rubber bands being inserted until all residents had practiced the procedure.

The materials used to create 1 training model which would allow for 4 individual cantholyses are readily available and inexpensive to purchase. Costs included 12 ping pong balls = \$5, 350 dressmaker pins = \$ 2-3 dollars, 6 foam mannequin heads \$ 17, 200 Rubber bands = \$7, foam tape roll = \$9, suture kit = \$8. Six trainers with 12 lateral canthal tendons = \$50 dollars.

Impact/Effectiveness: Thirty-three healthcare providers, 9 PGY1 transitional (TYR) residents, 2 physician assistants, 10 PGY1 EM, 5 PGY2 EM, and 6 medical students (MS) practiced the procedure and completed an assessment of the model employed. A five-point Likert scale was used to rate knowledge and comfort with the procedure before and after practice. The mean knowledge assessment increased from 2.69 to 3.69. The mean comfort level assessment increased from 2.34 to 3.5. The rating as life-like was 3.09. The model is inexpensive, easily rebuilt and highly life-like that allows multiple learners to practice a procedure that is infrequently performed.

3 A Novel Approach to Emergency Medicine Resident Orientation Using the Flipped Classroom Model

Amick C, Barrie M, Way D, Mitzman J, Greenberger S, , King A/The Ohio State University Wexner Medical Center, Columbus, OH

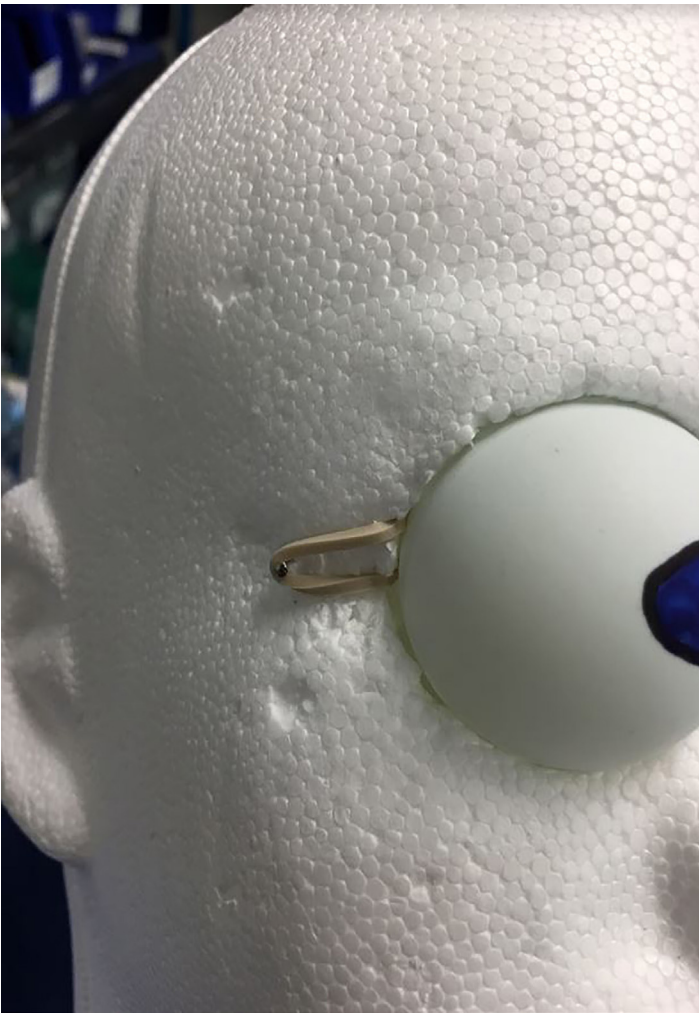
Background: Emergency Medicine (EM) residencies perform an orientation for new interns. There does not seem to be consensus among programs regarding the length, content, or objectives of orientation curricula. Our goal for intern orientation was to offer a sufficient amount of time, guidance, and educational content to provide new interns with baseline knowledge of emergency medicine core content, enable them to work efficiently in our emergency department, and provide learners with the skills to succeed in residency.

Educational Objectives:

1. Bridge knowledge gaps of EM core content and ensure all learners meet our minimum medical knowledge and level one milestone requirements irrespective of their prior educational background
2. Provide administrative strategies, professionalism standards, and efficiency tools to succeed in EM residency and to complete milestones.

Curricular Design: Orientation was performed throughout the month of July 2016. The orientation curriculum included small group core content sessions using the “flipped classroom model,” clinical shifts in our emergency departments, a clinical and citywide scavenger hunt, ultrasound training, airway management, and charting efficiency workshops. Core faculty and third year EM residents created content based on common chief complaints and topics including chest pain, abdominal pain, shortness of breath, airway management, headache, back pain, etc. The content was presented in 55-minute case based interactive small group sessions. These included 2-3 cases where differential diagnosis, management, and disposition were discussed for each case. Prior to each session, interns were given the cases and targeted readings. Interns were also encouraged to use FOAMED resources.

Impact/Effectiveness: We provided core content material in a way that was interactive and improves retention in adult learners. Medical knowledge scores from the annual intern exam administered both before and after the curriculum showed a significant improvement in fund of knowledge (see figure and tables). General survey data indicated that interns felt more comfortable with core content after completing orientation; however, charting lectures did not prepare interns enough for the medical decision making portion of charting, which we intend to improve.



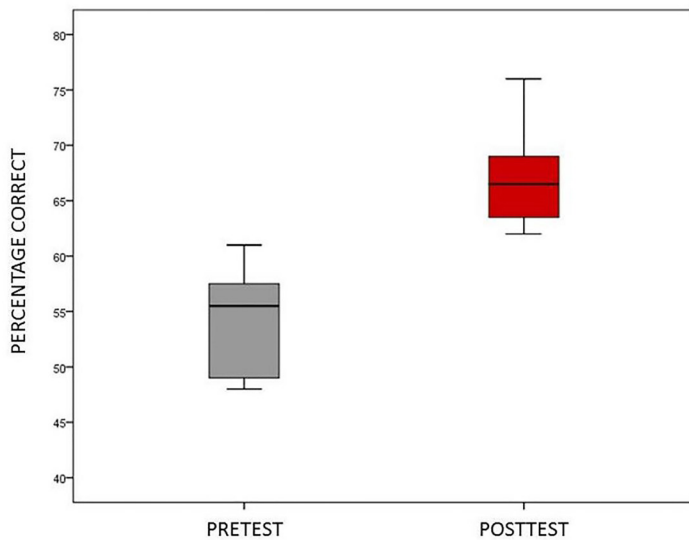


Figure 1. Examination Scores for 12 Interns before (Pre) and after (Post) Orientation Program.

Table 1. Descriptive statistics and paired t-test results for twelve emergency medicine interns on their before (pre) and after (post) orientation examination.

| | Mean Scores | Standard Deviation | Mean Difference | t-value | df | p | ES* |
|-----------|-------------|--------------------|-----------------|---------|----|------|-------|
| Pre-Test | 54.33 | 4.83 | -12.58 | -6.78 | 11 | .000 | -2.73 |
| Post-Test | 66.92 | 4.38 | | | | | |

*ES=Cohen's D effect size

4 A Novel Curriculum for Teaching Emergency Medicine Residents How to Break Bad News

Hall M, Dubosh N, Ullman E/Beth Israel Deaconess Medical Center, Boston, MA

Background: Breaking bad news in the ED is a critical part of Emergency Medicine. Previous research has called for increased teaching of communication skills to EM residents. Recent research has found that few EM providers were trained to deliver bad news during their residency training. There has been previous work describing death notification in the ED and talking with families of critically ill patients in the ICU setting but little has been published describing how to discuss critically ill patient in the ED.

Educational Objectives: To develop a multidisciplinary team approach to teach EM residents how to deliver bad news (both death notification and sudden critical illness) specifically in the ED setting and to study its implementation.

Curricular Design: EM residents participated in a simulation case where a patient became critically ill and

then expired. Twice during this encounter they updated a family member, played by a volunteer actor they had never met, about the case. All cases were videotaped and the interactions was graded by independent reviewers. Residents then participated in a novel curriculum aimed at teaching critical elements of breaking bad news. This session was led by ED attendings and social workers and was comprised of lecture, video presentation, small group roll playing, and discussion. The initial presentation gave an introduction to the topic while the small groups allowed the residents to practice their new skills with real-time feedback. Following the didactic session, residents again participated in a simulation case with hospital volunteer “family members” and their skills discussing the case were again graded. These pre/post evaluations were compared to evaluate the success of the teaching session.

Impact/Effectiveness: Outcome measures are not yet available. Previous projects regarding breaking bad news in the ED have focused on only death notification or used techniques developed in non-ED settings. A recent survey of attendings demonstrated that few received EM specific training in breaking bad news. All EM doctors will unfortunately have to deliver bad news frequently during their careers and increasing training during residency will improve this necessary skill.

5 A Novel Eye Model for Simulation in Slit Lamp Examination, Ultrasound and Foreign Body Removal Using Animal Tissue

Coleman K, Fortuna T, Kuehl D/Virginia tech/Carilion School of Medicine, Roanoke, VA

Background: We sought to develop an inexpensive simulation model that could be used for instruction of the emergency medicine model of practice for ophthalmologic complaints. While synthetic phantoms and models using foodstuffs have been described, animal tissue in a lifelike facsimile has not been fully explored.

Educational Objectives: Gain familiarity and psychomotor skills for competently addressing ocular emergencies to include:

1. Perform Slit lamp examination of both normal anatomy and corneal defects
2. Successfully remove foreign bodies and rust rings
3. Execute an ultrasound examination to include appreciation of normal anatomy, foreign bodies, vitreous hemorrhage and retinal detachment

Curricular Design: Using Styrofoam wig holders and animal tissue, we constructed a model for use with ultrasound and slit lamp examination. For this example, eyes from recently harvested specimens of *Odocoileus virginianus* (Virginia white tailed deer) were used. Each

model was less than ten dollars (US) to build. The models can be maintained in a refrigerated environment for at least 3 days. Desiccation due to refrigeration can be repaired with insufflation of the anterior chamber and/or vitreous with crystalloid solution.

Following the simulation exercise a survey was sent to participating learners. 11 of 19 surveys were returned (response rate 58%)

None of the respondents had performed a corneal rust ring removal.

Following the experience, 91% (10/11) of the trainees reported increased comfort with performing the procedure.

Impact/Effectiveness: Ophthalmologic procedures performed in everyday emergency medicine practice are difficult to simulate. This model provides a resource for faculty to safely guide learners through the details of procedures performed on the eye. It affords trainees the rare opportunity to perform these techniques in a safe environment.



6 A Novel Homemade Program to Accurately Record Resident Conference Attendance

*Dodson S, Greenberger S, Khandelwal S, King A/
The Ohio State University Wexner Medical Center,
Columbus, OH*

Background: The Accreditation Council for Graduate Medical Education (ACGME) requires that all residency programs provide didactic conferences for trainees while maintaining an accurate record of resident conference attendance. Resident learners are required to participate in 70% of all scheduled didactics. Attendance data is frequently provided to residents at performance reviews, and the data is reported to the ACGME. Legacy attendance systems typically involve a paper sign-in sheet, which is then manually entered into a spreadsheet. This method has several problems: it requires significant weekly upkeep, lacks easily auditable records should an attendance disagreement occur, a difficulty to determine legitimate versus forged sign-in, and an inability for residents to verify their attendance is recorded accurately.

Educational Objectives: Develop an accurate conference attendance-recording program with the following features:

- Easily auditable records which are immediately transparent
- Quick and easy sign-in with minimal disruption
- Protection against forging conference attendance
- Low requirement for technical knowledge and manual weekly maintenance
- Free and easily replicated with existing technology

Curricular Design: Our innovative conference attendance-recording program replaces manual entry of attendance, is free, and requires no knowledge of coding. The program components are free and require Google Sheets, Google Forms, a QR code generator, and a basic knowledge on scripting or in advanced spreadsheet commands. Learners sign-in to each session by scanning a QR code, and attendance is recorded and calculated in real time. This provides security against multiple sign-ins for a single session, or forging prior check-ins. Residents are able to check their conference attendance at any time.

Impact/Effectiveness: Residents, program leadership, and program coordinators have unanimously provided positive feedback on the new conference attendance program developed by one of our third year residents. The program is accurate, requires minimal oversight, provides immediate attendance calculation, and is transparent. We hope to further disseminate this innovation to other programs in an effort to remedy the “problem” of maintaining accurate conference attendance.

7 A Practical Curriculum for Emergency Medicine Intern Orientation Using Near-Peer Teaching

Sorge R, Sun J, Pour T, Shah K/Icahn School of Medicine at Mount Sinai, New York, NY

Background: Most EM residency programs utilize a traditional learning model for intern orientation that relies on didactics to deliver EM core content. While this knowledge is preparatory for exams, it is presented outside the context of practical ED challenges such as resource bottlenecks or task prioritization and therefore may have limited real-world applicability. We propose a new orientation curriculum that places EM core content within the context of ED workflow to better prepare interns to work clinically.

Educational Objectives: Improve the clinical applicability of EM intern orientation by supplementing EM core content with interactive workshops, practice-based learning and near-peer teaching.

Curricular Design: The 4-week intern orientation curriculum at our PGY1-4 program consisted of 3-hour didactic sessions in which faculty review Tintinalli's Emergency Medicine Manual using PowerPoint slides. In our new curriculum, which was developed through the Harvard-Macy Future Academicians Course giving it face validity, these didactics were shortened to 1 hour and paired with 1-hour interactive workshops led by senior residents. Each workshop consisted of a walk-through of how to approach a chief complaint (Abdominal Pain, Chest Pain, Dizziness, Fever, Agitation, and Blunt Trauma) from arrival to disposition. All workshops were slideless, case-based, and interactive. Using near-peer teaching, senior residents addressed pitfalls in workflow based on their experiences, and reviewed skills related to clinical practice such as giving proper signout, calling consultants, and escalating care. To ensure quality, we created a faculty-approved Course Manual including workflow charts and instructor's guides for senior residents.

Impact/Effectiveness: Pre- and post-orientation surveys were conducted to measure the impact of our intervention. Overall, we found near-peer teaching and the emphasis on ED workflow to be powerful tools that can improve engagement and feedback. Interns received the new curriculum positively, with the majority recommending the new format for next year. Senior residents found the experience to be rewarding for their academic development. We plan to conduct a 6-month follow-up survey to assess the degree to which specific elements of the new curriculum contributed to intern preparedness.

8 A Shock Workshop For 1st Year Medical Students Using Novel Teaching Methods

del Portal D, Wald D /Lewis Katz School of Medicine at Temple University, Philadelphia, PA

Background: With limited clinical context, pre-clinical students may find the concept of "Shock" difficult to understand. Simulation provides instructive clinical context early in the medical school curriculum. Asynchronous instruction allows students to reinforce key principles before more in-depth group discussion and clinical simulation. We developed a workshop that combines asynchronous instruction, group discussion, and clinical simulation to teach 1st year medical students about different shock states.

Educational Objectives: We challenged students to identify the pathophysiology of each shock state and to describe the expected compensatory physiology observed in representative clinical scenarios.

Curricular Design: A week before the workshop the entire MS I class was emailed the workshop objectives and a link to an "Overview of Shock" voice-over Power Point video lecture. A 5-question pre-workshop knowledge assessment was created to gauge students' baseline understanding of the topic. Three simulation cases were developed to illustrate cardiogenic shock (myocardial infarction), distributive shock (sepsis) and hemorrhagic shock (after MVC).

For each case, teaching focused on identifying the primary abnormality and understanding how the shock state affects vital signs and key hemodynamic parameters. Approximately 35 students were assigned to attend each 2-hour workshop, which was offered 6 times over one week to accommodate the entire MS I class. For each workshop, half of the students were brought into the simulation center and divided into 3 groups. In the simulation center each group of students encountered 3 consecutive cases of different shock states. After each brief case, faculty provided focused and consistent debriefing to reinforce predetermined teaching points. The other half of the students attended a classroom discussion on shock led by clinical faculty. For the second hour of the workshop, the groups switched.

Impact/Effectiveness: In 2015 and 2016, all 445 students completed the pre-workshop knowledge assessment. 365 students (82%) completed the post-workshop evaluation (Table 1). All clinical faculty preceptors were rated highly by the students.

The multi-modal session was successful, with many students requesting more sessions of this kind be developed for other topics as well.

Shock: Post-Workshop Evaluation

% of all students
(n=365) who
Agree/Strongly Agree

| | |
|--|------|
| The workshop achieved the learning objectives. | 100 |
| The workshop was a valuable learning experience. | 98.6 |
| Reviewing the pre-workshop voice-over presentation helped to reinforce my understanding of shock. | 96.2 |
| Participating in the simulation component of the workshop helped to reinforce my understanding of shock. | 94.4 |
| The simulation cases were at an appropriate level of difficulty. | 96.7 |

9 Adventures in Didactic Curriculum (Re) Design: Systems Thinking for Core Topics

Grall K, Nelson J/Regions Hospital, Health Partners Institute, St. Paul, MN

Background: The Residency Review Committee for Emergency Medicine requires 5 hours per week of didactic learning. Often lectures are given sporadically without consideration for targeted learners’ needs. Learning can be suboptimal and contextual goals and objectives unclear. Many undergraduate medical institutions have transitioned curriculum into system-based blocks with excellent educational results.

Educational Objectives: We redesigned our didactic curriculum to repeat on an 18-month cycle and organized it into intensive systems-based blocks (Respiratory, Neuro, GI etc.) assigning a “Topic Guru” from our Core Faculty. Our objective was to create a deliberate didactic curriculum that examines a specific system from multiple viewpoints. A secondary goal was ongoing engagement of our Core Faculty into the didactic curriculum.

Curricular Design: We designed an 18-month repeating curriculum based on physiologic systems. Topic Gurus were notified approximately 3 weeks in advance of their upcoming month and responsibilities. Repeating curricular elements included:

- Distributed reading and podcast / blogs/videos
- Core Topic discussion session using active learning / Flipped Classroom
- Core Topic Review Session
- Ask the Expert Q and A Session
- Emerging Issues / Advance Topic Session
- Pharmacology / Quality / Procedure (PQR) Rounds
- Regions RAP (Monthly Review of Podcasts, Blogs,

Videos) or Journal Club

This curriculum re-design was introduced in July 2017 and has been continued for the past 5 months.

Impact/Effectiveness: Bi-monthly meetings held with Topic Gurus to assess barriers to implementation, including difficulty scheduling outside speakers and understanding new recurring curricular elements. These barriers are less intrusive with each passing month. Overall curriculum changes have been extremely well received by both our residents and Topic Gurus based on conference feedback. Future goals are to further examine impact on our learners.

10 After Action Report: Reflective Practice Beyond the Core Curriculum

Erogul M, Schiller J/Maimonides Medical Center, Brooklyn, NY

Background: The sprawling core curriculum of emergency medicine leaves little time in the didactic schedule for reflective practice and attention to the topics outside the umbrella of medical knowledge, patient care and procedural skills. To that end, our ED has instituted “After Action Report,” a yearlong longitudinal thread to encourage residents to think and reflect on their practice. Sample topics for AAR include professional boundaries, working in a medical system with healthcare disparities, addressing practical ethical quandaries in the ER, dealing with inter-professional conflict, intrapersonal awareness in the stressful clinical environment, the hidden curriculum of emergency medicine, etc. The sessions emphasize reflecting on one’s actual practice and the lived experience of being an emergency physician. The goal, broadly defined, is professional development and development of humanistic values. We believe this curriculum also supports resident wellness.

Educational Objectives: At the close of this academic year, our residents are expected to:

- Maintain proper professional boundaries with the patient and within the medical team.
- Recognize and work through common ethical dilemmas that take place in the ED.
- Foster intrapersonal awareness in the stressful clinical environment.
- Develop skills to identify and respond to emotionally driven conflict.
- Acknowledge and resolve contentious behavior between colleagues, departments, and other staff.
- Recognize the reality of healthcare disparities in medicine and formulate a healthy internal narrative about encountering these disparities.
- Effectively analyze and participate in effective

communication interactions with patients with varying cultural backgrounds.

Curricular Design: Approximately once a month, select residents participate in a one hour small group facilitated by a faculty preceptor. The small group activities are mapped in advance with cases, questions and suggested answers for the preceptor. The groups are a mix of residents at all levels of training (EM1, EM2 and EM3). Rotation activities vary, depending on subject, including small group didactic, role-playing, out-of-hospital activities, as well as use of mixed media stimulus. Residents will be expected to participate in all rotation exercises, and may be required to submit written or spoken assignments.

Impact/Effectiveness: Reflective practice can be an effective modality in achieving empathy among practitioners and their patients, which in turn translates to strengthening several ACGME milestones, including: professional values; professional centered communication; and team management. The AAR provides a comfortable forum for resident discussion and possible incorporation of these topics into their practice.

11 An Advanced Perfusion Elective for Emergency Medicine Residents

Butterfield M, Wilson J /University of South Florida/ Tampa General Hospital, Tampa, FL; University of South Florida/ Tampa General Hospital, Tampa, FL

Background: We focus on two exciting developments in the management of acute and chronic cardiopulmonary failure not yet addressed in standard residency training:

1) extracorporeal membrane oxygenation (ECMO) and 2) ventricular assist devices (VADs).

1. A growing number of tertiary medical centers are using ECMO to resuscitate patients with cardiac arrest, shock, or ARDS, with encouraging preliminary results. Emergency physicians (EPs) are becoming involved at every step in the care of these patients, from the decision to initiate ECMO to placing patients “on pump” and ICU management
2. An increasing number of patients with advanced heart failure are receiving implantable VADs. These devices use continuous mechanical pumps to bypass the native heart and increase cardiac output. Understanding the health needs for these patients will become an essential skill set for EPs regardless of practice setting.

Educational Objectives:

1. Recognize the clinical indications, physiology, and complications related to both arterial-venous (AV) and venovenous (VV) ECMO
2. Gain a practical understanding of how VA and VV ECMO circuits work from cannulation to pump management and troubleshooting, weaning, and decannulation

3. Recognize the indications, function, and potential problems related to mechanical support devices in patients with advanced heart failure

Curricular Design:

1. Duration: 2-4 weeks
2. Components:
 - a. Didactic and Practical Instruction with VAD coordinators and perfusionists to learn about device function, malfunction, and troubleshooting.
 - b. Procedural Observation: Residents will observe and possibly assist ECMO cannulation and observe VAD placement in the OR.
 - c. Self-Directed Rounding: Residents will follow post-intervention ICU patients daily
 - d. Attend weekly VAD/transplant review conference
 - e. Self-Study: We developed a structured syllabus with readings/multimedia
 - f. ECMO Call: Residents will be “on call” for after-hours ECMO cannulation during weekdays (M-F)

Impact/Effectiveness: Effectiveness:

1. Feedback: Mid and end of rotation
2. Scholarly Work: Update/revise ED ECMO protocols, curriculum and syllabus

Impact:

1. Clinically and professionally position EPs to make critical management decisions in patients with heart failure or acute cardiopulmonary failure
2. Spur interest and research in these areas
3. Possible collaboration with European ECMO centers

SAMPLE SCHEDULE

Week 1:

| | MON | TUES | WED | THURS | FRI |
|----|---|--|---|--|---|
| AM | -Orient with VAD/ Perfusionists -OR Cases -Rounding | -OR Cases -Rounding | -VAD/ECMO seminar 1 | (No OR Cases) -Rounding | -OR Cases -Rounding |
| PM | -Loose ends -Self study -ECMO call | -Loose ends -Self study -ECMO call | -VAD/ECMO seminar 1 -Loose ends -Self study -ECMO call | -Transplant Conference -Loose ends -Self study -ECMO call | -Loose ends -Check-in -Self study -ECMO call |

Week 2:

| | MON | TUES | WED | THURS | FRI |
|----|--|--|--|--|---|
| AM | -OR Cases -Rounding | -VAD/ECMO seminar 2 | -OR Cases -Rounding | (No OR Cases) -Rounding -Cardiohelp (portable ECMO) training | -OR Cases -Rounding |
| PM | -Loose ends -Self study -ECMO call | -VAD/ECMO seminar 2 -Self study -ECMO call | -Loose ends -Self study -ECMO call | -Transplant Conference -Loose ends -Self study -ECMO call | -Loose ends -Feedback -Self study -ECMO call |

Sample Schedule

Week 3-4:

| | MON | TUES | WED | THURS | FRI |
|----|---|------|-----|-------|-----|
| AM | Ride with mobile ECMO Teams/ Shadow CT ICU in Paris or Dusseldorf* (*under discussion: PMID 2717983) | | | | |
| PM | | | | | |

12 An Emergency Medicine Residency Didactics Revolution: The Use of a Multidisciplinary Team and Branding to Inspire and Support Curricular Change

Huang R, Munzer B, Haas N, Byrne B, Hopson L, , Haas M, Turer R, Odom M, Santen S/University of Michigan, Ann Arbor, MI

Background: The ACGME requires EM residencies to provide a set number of educational hours via didactics with the intention to teach core topics in EM. The use of innovative teaching techniques and active participation can increase information retention and comprehension. Previous literature has shown success in developing a didactics curriculum based upon active learning formats. However, change within an established residency program can be difficult due to the multiple stakeholders within the department.

Educational Objectives: To highlight how a team-based model can create an environment in which drastic curricular reform can be successful.

Curricular Design: Twenty EM residents and 5 faculty were recruited to form a committee to critically evaluate the curriculum, under the brand the “Didactics Revolution.” They identified a desire to increase engagement in the didactics curriculum via more active presentation formats. Additionally, after each didactic in the original curriculum, an “educational autopsy” was held, providing constructive feedback on the style, design, and educational methods of each presentation. The direct input of residents and results from the educational autopsies led the committee to redesign didactics to minimize podium presentations, placing emphasis on 15-minute presentations, panel discussions, and small group sessions. Through effective branding and engagement, residents bought into the design process as a means to effect positive change in how they are taught and learned core EM concepts.

Impact/Effectiveness: Through the use of effective branding and early involvement of both residents and faculty, the “Didactics Revolution” has successfully generated resident and key faculty ownership of resident didactics. Additionally, the use of “educational autopsies” has increased engagement and fostered ongoing open discussions for continued curricular improvement.

13 An Integrative “Flipped Classroom” Model for Emergency Medicine Residency Education

Fox W, Roppolo L, Koyfman A, Green W, Williams D, Velez L/University of Texas Southwestern, Dallas, TX

Background: The “flipped classroom” is a relatively new method of teaching in Emergency Medicine that

requires residents to complete basic learning at home prior to weekly education time. It promotes active learning and participation in the classroom by requiring residents to present to a group, as opposed to simply attending lectures. We present an integrative model of the flipped conference that has been successfully implemented at our 3-year program of 63 residents by assigning roles and ensuring that learning objectives are consistently met for 3 different resident levels. It also fosters increased faculty participation in residency education.

Educational Objectives:

1. Interns will develop a foundation of basic EM core content
2. R2 and R3 level residents will learn more challenging and evidence-based practices for diagnosing and managing EM patients
3. Residents will become more confident in teaching in the small group setting
4. Faculty will participate more in residency conference education and will be more engaged in teaching

Curricular Design:

1. An 18-month curriculum based on the model curriculum for EM with 1 to 2 core topics covered each month
2. A problem-based learning slide set is created containing 3 different cases based on the core topic of the month. Each slide set contains progressively difficult questions relating to the case, with teaching points immediately after each slide to answer the clinical question.
3. Groups of residents from all levels are created for each session:
 - a. Interns: assigned core content reading from a textbook. Questions for each case are initially directed to them
 - b. R2 and R3 residents: assigned review articles and FOAMED resources on each case. One resident in each group is assigned to be the group leader for one case. This resident must TEACH the content on the slides. One additional resident in each group is assigned to bring one evidence-based article, and discuss what is relevant to his or her assigned case.
4. Faculty are assigned to be the facilitator for ONE case for the group discussion, and rotate between the 3 groups every 25 minutes. See Figures 1 and 2.

Impact/Effectiveness: Although this format involves more work for all residents, it has had a positive impact on our resident learning and has increased our faculty involvement and teaching at weekly conferences.

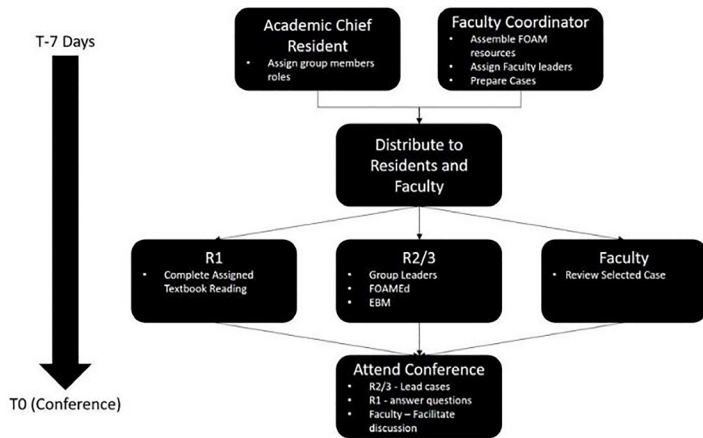


Figure 1. Roles and responsibilities of each participant of “flipped conference” day.

| Assignments | Case 1 | Case 2 | Case 3 |
|-------------|-----------|-----------|-----------|
| Presenter | PGY2 #1 | PGY2 #2 | PGY2 #3 |
| EBM | PGY3 #1 | PGY3 #2 | PGY3 #3 |
| Faculty | Faculty 1 | Faculty 2 | Faculty 3 |

| Time | Group 1 | Group 2 | Group 3 |
|------|---------|---------|---------|
| 0000 | Case 1 | Case 3 | Case 2 |
| 0025 | Case 2 | Case 1 | Case 3 |
| 0050 | Case 3 | Case 2 | Case 1 |

Figure 2. Example of assignment sheet and schedule for “flipped conference” day.

14 Capturing Resident Observed Concerns Regarding Both the Patient Safety and the Health Care System: An Innovative Use of Resident Logs

Kane B, Yenser D, Barr G, Goyke T, Kane K, , Weaver K/Lehigh Valley Health Network, USF Morsani College of Medicine, Bethlehem, PA

Background: The Accreditation Council on Graduate Medical Education (ACGME) places an emphasis on Quality Improvement (QI) and Patient Safety (PS). LEAN theory suggests that front line clinical staff may be best able to make suggestions for improvement to management.

Educational Objectives: We sought to engage every resident in QI and PS by requiring submission of a “Health Systems” log.

Curricular Design: After review and approval by the Program Evaluation Committee (PEC), the residency program required each resident to submit one “Health Systems” log per Emergency Medicine (EM) block. The program is a dually approved PGY 1-4 program training 12 residents per class based

at a suburban integrated health care network. The Emergency Departments and EM program are all Chaired by a unified network Department with a dedicated Vice Chair of Quality. “Health Systems” logs were submitted using New Innovations (NI) software. Residents could choose to either submit an observation of the Health Care System or a formal PS report to Risk Management (RM) and Process Improvement (PI) in an effort to capture both near misses and actual events. PS reports were initially submitted using RL Solutions software, with the resident only logging the submission number in NI for RM purposes. The requirement was implemented in the 2016-17 academic year. Table One demonstrates the information collected.

Impact/Effectiveness: Since August 1, 2016, 104 logs have been submitted, of which 21 were PS. The observations most commonly concerned communication, including shift change, followed by stocking. Other issues observed included fall prevention, use of checklists/protocols, staffing/hallway beds, triage, and cognitive error. Next steps include formalizing feedback on the logs and utilization to direct future, PGY class-based QI projects.

Table 1. Information with the “Health Systems” Log.

| | | | | |
|--|------------------------|--|--|---|
| All Logs: Date of Log | Resident Name | PGY Year | | |
| PS Logs also Include: | Event Date | RL Solutions Submission Number | | |
| System Observation Logs also Include: | Date of Observation | Describe an instance when the health care system was not optimal for patient safety | Identify possible root causes for this observation | Suggest possible counter measures to prevent a similar observation in the future |

15 Clinical Competency Committee by Wiki

Barringer K /Regions Hospital, HealthPartners IME, St. Paul, MN

Background: The Accreditation Council for Graduate Medical Education (ACGME) mandated mandates residency programs to form a clinical competency committee (CCC) to evaluate residents across the milestone continuum. However, there is not a way delineated onto guidelines define the structure of the CCC or how the information is obtained, reviewed and submitted. Wide and there is a wide variety in CCC structure and function across programsexist. CCCs meet at varying intervals across residency programs. In the majority of programs the primary focus of discussion are the resident progress against the milestones.

The Regions Hospital Emergency EM Residency Program is a 3- year program with a total of 30 residents. The CCC meets

6 times per year with the primary focus of creating resident milestone summaries and providing formal recommendations to the Program Director. This requires the compilation and review of large amounts of data for each resident prior to each meeting. One of our struggles in our program was the dissemination, review and updating of information by multiple individuals prior to meetings to make each CCC meeting as streamlined and efficient as possible.

Educational Objectives: To improve our CCC's method of distributing information to all members of the CCC and allow for real time updating of milestone summaries and recommendations by each member of the CCC.

Curricular Design: We use a commercially available wiki platform (PBworks, www.pbworks.com) to streamline our CCC workflow. Our CCC is made of up 5 faculty who are each assigned 2 residents to review prior to each meeting. The program director coordinator compiles data on each resident summarizing conference attendance, procedure logs and conference attendance as well as end-of-shift cards and 360 evaluations, uploading it all our CCC wiki. Each faculty member reviews and summarizes the data on their assigned residents, then makes milestone recommendations. Other committee members can see and add comments without repeating work done by another member. As a group, the committee agrees upon the milestones assessments for each resident and the CCC Chair submits a formal summary of recommendations to the Program Director.

Impact/Effectiveness: We found that CCC by WIKI wiki significantly streamlined our workflow and provided a solution to some of our committee's struggles regarding the dissemination and compiling of residency data. This allowed us to work with each other remotely in real time and make our live meetings more efficient/productive.

16 Combating Patient Depersonalization: Rebuilding the Patient-Provider Relationship With a Simple Communication Tool

Dorsett M, DiOrio E, Oberle A, Choudhri T, Abdallah A, Jardine L, Sampson C / Washington University in Saint Louis, St. Louis, MO; Indiana University, Indianapolis, IN; George Washington University, Washington, DC; SUNY Downstate Medical Center, Brooklyn, NY; University of Missouri-Columbia, Columbia, MO

Background: Emergency Medicine (EM) physicians work in fast-paced environments, leaving little time spent with patients. Many clinicians now feel disconnected from the very patients that they pledged to heal. This fraying of the patient-provider relationship can lead to depersonalization - the treating of patients as their disease processes rather than as human beings - and contribute to the syndrome of burnout that affects a majority of Emergency Physicians. Depersonalization is significantly associated with increased medical errors, self-reported

suboptimal care and decreased physician satisfaction. Last year, an educational initiative to encourage patient-centered care was developed in which patients presenting to the emergency department at Barnes Jewish Hospital received notecards asking them "What is your biggest worry?". As many patient responses focused on challenges they face outside of their medical conditions, it was thought that such cards may be a useful tool to teach providers communication techniques to improve the patient-provider relationship and "re-humanize" their patients.

Educational Objectives: We sought to illustrate to medical providers how acknowledging a patient's "biggest worry" might re-humanize the patient-provider interaction.

Curricular Design: We expanded the project nationally and for one week patients presenting to the ED of 5 academic hospitals with associated EM Residencies received notecards asking them "What is your biggest worry?". Completed cards were shared with their medical team. Providers were then asked to reflect on whether the cards changed their satisfaction with the patient-provider relationship and share their reflections on the exercise.

Impact/Effectiveness: Approximately 1500 cards were distributed to patients and 285 were collected. While there was variability between hospitals, overall 58% of cards addressed a medical concern and 18% focused on a social challenge or concern outside the hospital. Providers completed a voluntary online survey. Thematic analysis applied to provider reflections by two independent reviewers identified "humanization" of the patient-provider relationship as a predominant theme in 37% (95% CI 22 to 55%; n=30) of free-text reflections. 70% (95% CI 52 to 83%) of providers endorsed increased satisfaction with the patient-provider relationship when the patient had filled out a card.

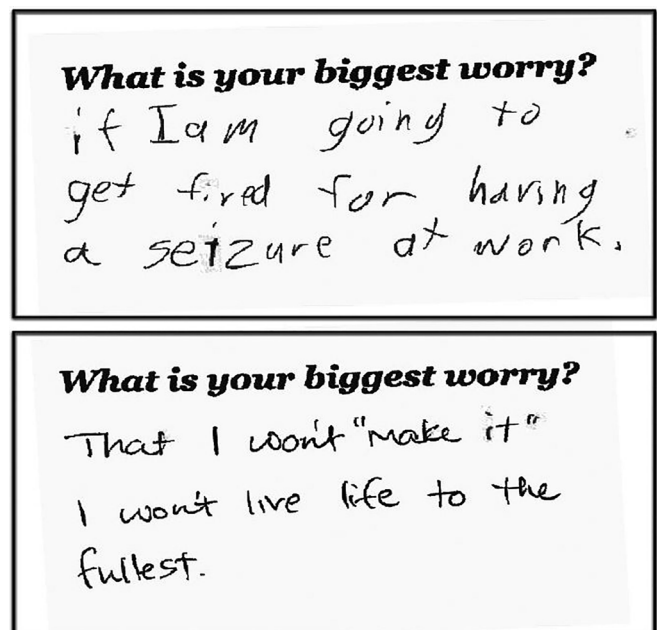


Figure 1. Sample patient responses.

| | |
|--|---|
| <p>"made their CC more personal. my patient was pregnant for the first time and had vaginal bleeding for the fourth time during this pregnancy. she kept apologizing (which didn't really bother me) but her card said she was most scared because it was her first pregnancy it gave her a much more vulnerable and human image, not just another patient with vaginal bleeding that required an uncomfortable exam."</p> | <p>"Reminded me that we are treating patients, not just diseases. The exercise really came as a humanizing reminder that we take care of human beings just like us, and taking a brief moment from worrying about ordering labs, documenting, requirements for billing, etc. and instead trying to understand my patient's concerns makes our job so much more real."</p> |
| <p>"I found this to be extremely helpful. I think it helped me to address the pts specific concern and discuss it with them. It also helped form a meaningful connection. Knowing someone's biggest worry is a big deal. I felt honored to discuss it with them and have a truly honest conversation."</p> | <p>"Made me think harder about treatment options I was considering - cost, ease of getting med and follow-up (transportation). Humbling to realize all the issues my patients are dealing with and how their health fits into or exacerbates those struggles"</p> |
| <p>"Psychiatric patient reflecting on being treated like a "human being". Very humbling and made me much more conscious of how I treat and respect my psychiatric patients"</p> | <p>"It made me think deeper about them as a being - This brings us back to the reasons we chose to work in this environment and reminds us that compassion and human connection are just as important as meds and clinical care"</p> |

Figure 2. Example provider reflections displaying the theme of patient "humanization".

17 Critical Conversations: Using Simulation to Improve Comfort & Skill With Goals of Care Discussion.

Dorsett M, Lawrence C, Oberle A, Galante M, Aubin C /Washington University in Saint Louis, St. Louis, MO; David Grant Medical Center, Fairfield, CA

Background: Despite evidence that most Americans would prefer to die at home, the majority of them die in a health care institution. Goals of care conversations reduce the incidence of unwanted aggressive intervention, but physician discomfort with goals of care conversations leads to avoidance of such conversations. This suggests a need for a formal educational intervention to teach these critical communication skills, especially in the field Emergency Medicine which encompasses the care of both the critically and chronically ill.

Educational Objectives: To increase resident comfort and proficiency with goals of care conversations in an emergent setting.

Curricular Design: The educational intervention began with a didactic component covering both common terminology in end-of-life care, as well as a review of terminology to utilize and avoid during end-of-life conversations. Following this didactic session, learners participated in four different simulation cases that utilized high fidelity mannequins as patients and actors as family members. These cases addressed common goals of care scenarios in the emergency setting, including an advanced lung cancer patient unaware of his prognosis, a pair of conflicted family members with difficulty making decisions for an acutely ill and elderly mother, a hospice patient with progressive dyspnea, and a neurologically-devastated patient to be terminally extubated in the ED. Each case required residents to initiate direct but empathetic goals of care conversations with patient and/or family. Debriefing was performed by the standardized family

member(s) and an independent moderator. Feedback was given on bedside manner, terminology used and effectiveness of overall communication.

Impact/Effectiveness: Using a 5-point Likert scale format, emergency medicine resident physicians were surveyed before and after participation in the end of life simulation session. Post-participation, residents endorsed being significantly more comfortable initiating end of life conversations (3.7 vs. 3.3, p=0.009), contacting palliative care or hospice (3.7 vs. 2.4, p< 0.001), and initiating palliative, comfort or hospice care in the emergency department (3.5 vs. 2.3, p = 0.001).

18 Data-Driven Evaluation of Residents' Clinical Competence: Automating the Model of Clinical Practice of Emergency Medicine

von Reinhart A, Savage D, Sawtelle Vohra S /UCSF-Fresno, Fresno, CA

Background: Accurate, efficient tracking of procedures poses technical challenges that have been the subject of recent research and innovation. Procedural competency is only a portion of the knowledge and experience residents need to obtain through postgraduate training. The Model of Clinical Practice of Emergency Medicine ("EM Model") is a comprehensive list of everything the fully trained EM physician should have mastered. It is scientifically-derived, widely accepted, and details the breadth and depth of our field. First published in 2001 based on empiric data, it is reviewed and updated by panels of experts every 2 years. It serves as the basis for ABEM examinations, and is foundational to curricular planning by ACEP, CORD-EM, and residency programs across the US.

In 2011, Tintinalli et al published one of the only studies attempting to quantify the variation in clinical encounters among trainees in the same program. They found substantial variation among residents in the same cohort, 30% to 60%, with maximal variation corresponding to roughly 1 year of clinical training. There is currently no accepted method for tracking this wide variation, leaving learners and educators to guess at gaps in clinical experience, without data to inform educational plans.

Educational Objectives: To build a tool to automatically track resident clinical encounters by mapping all items of the EM Model to diagnostic and procedural codes already recorded in patient charts.

Curricular Design: We mapped each Model of EM item to 1 or more ICD-10 codes and SNOMED concepts, and each procedure to 1 or more CPT codes. These surrogates are nearly universal searchable constants in the EMR; each item and its matching code(s) can be queried in real time to

measure residents' progress.

Impact/Effectiveness: Accurate, automated tracking of residents' clinical experience provides powerful data that can guide learning plans and patient selection for the individual, and broader curriculum planning for the program.

19 Development of a Multidisciplinary Curriculum for Education of Trauma Teams During Weekly Emergency Medicine Residency Conference

Naik N, Farmer B /New York Presbyterian - Weill Cornell, New York, NY

Background: Coordination and collaboration between trauma surgery, emergency medicine, anesthesia, nursing, and EMS is necessary for care of trauma patients. While many institutions have developed multidisciplinary in-situ team training programs to work on communication and teamwork in the setting of trauma, formal residency didactic education on trauma care has remained isolated to individual department weekly conferences.

Educational Objectives: To develop a multidisciplinary conference curriculum involving trauma surgery, emergency medicine, anesthesia, nursing and EMS to improve knowledge, skills and collaboration in trauma care.

Curricular Design: Educators from trauma surgery, emergency medicine, anesthesia, and nursing developed an interdisciplinary curriculum focusing on abdominal and pelvic trauma. The curriculum sought to incorporate multiple modalities of education to focus on medical knowledge, application of knowledge, procedural skills, teamwork and communication used in trauma resuscitations over a four hour conference during weekly EM didactics. Over 50 learners including EM residents, surgery residents, anesthesia residents, EM physician assistants, EM nurse practitioners, SICU nurses, EM nurses, and EMS personnel participated in the four hour conference. Two thirty minute lectures were used to educate all services on the medical approach to abdominal and pelvic trauma. Three hours were split into rotating small groups involving 1) hands-on skills stations focusing on FAST exam and use of pelvic binders and tourniquets, 2) a high fidelity simulation focusing application of medical knowledge and critical thinking in a case of abdominal trauma resulting in diaphragmatic rupture, and 3) a high fidelity pelvic fracture simulation focusing on teamwork, communication, role definition, and handoffs between services. A wrap-up discussion provided an opportunity for the learners to summarize concepts they learned that would change their practice in the clinical environment. In-situ trauma simulations provide

opportunities to reinforce these concepts.

Impact/Effectiveness: A multidisciplinary educational trauma conference during weekly EM residency conference enables unified and collaborative learning to enable coordinated care of the trauma patient.

20 Development of a Novel Ultrasound Peritonsillar Abscess Model for Simulation Training

Plitt J, Ng V /University of Arizona, Tucson, AZ

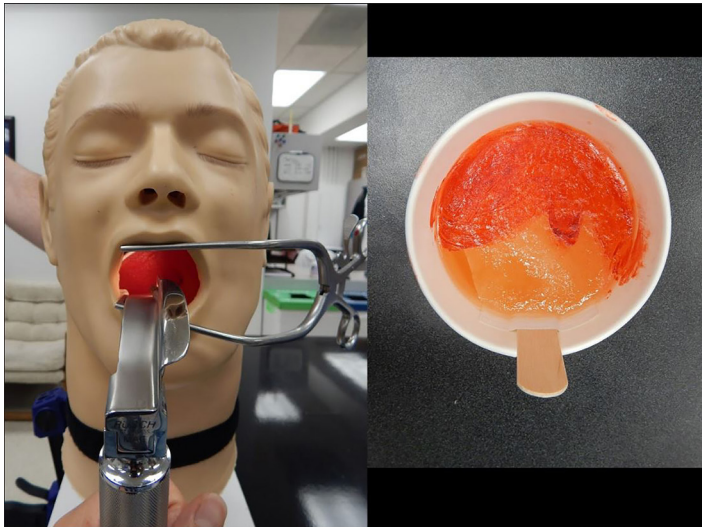
Background: Peritonsillar abscess (PTA) is a common presentation to emergency departments. Often, residents perform their first PTA needle aspiration in the clinical setting, a nerve-racking experience with multiple potential complications. Few PTA task trainers have been described, none of which allow for ultrasound image acquisition, which improves procedural safety. Simulating PTA needle aspirations under ultrasound guidance with a realistic model can build confidence and proficiency prior to performing this procedure on a clinical shift.

Educational Objectives: To create a realistic task trainer that allows emergency medicine residents to acquire ultrasound and needle aspiration skills when draining a PTA.

Curricular Design: The task trainer was built with low-cost, replaceable, and easily cleanable materials. An airway mannequin head, internally stripped aside from the tongue, was placed upright on a mesh wire cylinder attached to a wooden base. Water and barrier lotion were combined to simulate abscess material and injected into a small water balloon. The balloon was glued to the bottom of a paper cup with a tongue depressor taped to the inside, allowing insertion into a slit made at the base of the tongue, thereby maintaining correct abscess orientation. The cup was filled with ballistic gelatin and layered with cotton to obscure the balloon. After setting, a uvula and two tonsils were painted on top. Cups were replaced after each needle aspiration.

Impact/Effectiveness: Residents were surveyed on their comfort performing PTA needle aspirations and on task trainer utility. Eleven of 16 residents have previously drained 1-3 PTAs, with the rest having no prior experience. On a 1-5 visual analog scale, residents rated their comfort with the PTA procedure as 2.07 before and 3.64 after practicing the procedure on the trainer. Similarly, residents felt ultrasound images were representative of real PTAs (mean 3.41, range 1-5). The model was felt to be realistic (mean 3.73, range 1-5) and easy to use (mean 4.08, range 1-5). An ultrasound guided PTA task trainer has not yet been reported. This low-cost model increased resident comfort in performing PTA needle aspiration, provided realistic ultrasound images, and allows for

repeated practice outside of the clinical setting. Improvements to the model have already been made, including the addition of a carotid artery to increase anatomic fidelity.



21 Development of a Palliative Care Curriculum for Yale Emergency Medicine Residents: A Novel Approach

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Background: Emergency physicians frequently care for patients with serious illness, including those near the end of life. The 2013 Choosing Wisely Campaign goals defined by the American College of Emergency Physicians emphasize early use of hospice and palliative care (PC) services in the Emergency Department for patients likely to

benefit. Few emergency medicine (EM) residencies include a PC curriculum; we created an EM-PC curriculum to meet this need.

Educational Objectives: To design and implement a curriculum for EM residents to integrate PC into their clinical practice.

Curricular Design: We identified 6 core PC topics to integrate into our existing EM didactic curriculum using lecture, small groups, and simulation to deliver content in an effective and practical manner. Topics included Trajectories & Prognosis, Stages of Death, Symptom Management, Legal & Ethical Considerations, Goals of Care Conversations, and Conflict Management/Spiritual Consideration. Faculty and residents with a particular interest in PC designed and delivered the content. The chosen topics were delivered in eight 1-hour sessions in the 2015-16 academic year.

Impact/Effectiveness: As part of an IRB approved study, a voluntary survey was distributed to residents participating in the curriculum. Of the 27 residents surveyed, 92.6% reported they will “use the concepts” taught in the curriculum, 92.6% reported “increased comfort level having goals of care conversations” and 88.9% reported they felt “more knowledgeable” managing end-of-life symptoms. When surveyed about the future of the curriculum, 55.6% of residents responded that the curriculum should be kept the same, while 37% felt the curriculum should be expanded. Of those responding that the curriculum should expand, 50% were at the PGY-4 level of training. A small minority, 7.4% reported that the curriculum should have less emphasis in the curriculum.

Our impact study demonstrated that integration of PC concepts into the EM resident curriculum was well received and potentially practice changing. Given the support for expansion of the curriculum we believe it has filled a vital knowledge gap in our curriculum. Our sample curriculum is geared towards adult learners and is easily adaptable to most residency conference schedules.

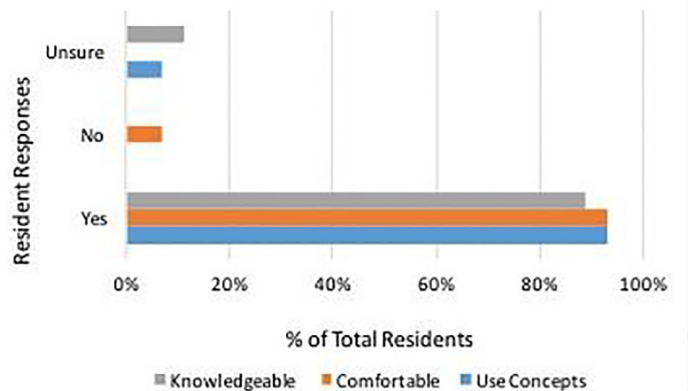


Figure 1. Resident perception of knowledge, comfort level, and usefulness of concepts after curriculum exposure.

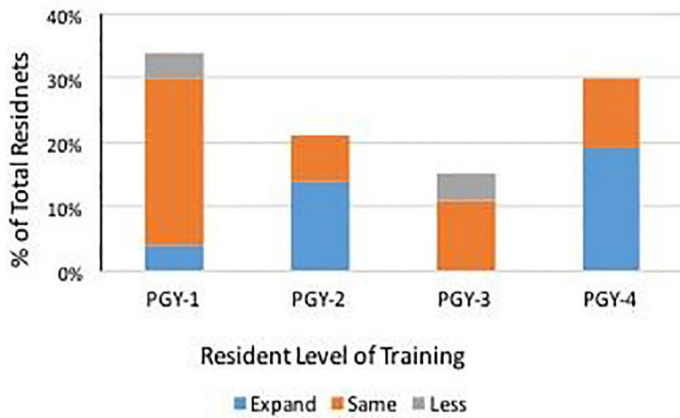


Figure 2. Resident feedback for future direction of the curriculum.

22 Development of a Sustainable Curriculum on Substance Use Disorders (SUD) for Emergency Medicine Residents at Cooper University Hospital

Gruber E, Zapp Z, Pescatore R, Nyce A, Salzman M/ Cooper University Hospital, Camden, NJ

Background: Substance use disorders (SUD) are estimated to afflict nearly 1 in 5 emergency department patients, while the incidence of overdose, particularly opiate-related, continues to rise. Emergency medicine (EM) physicians are on the front line of this epidemic. To the best of our knowledge, through literature searches and discussion with national SUD leaders, our development of a curriculum for EM residents relating to the comprehensive management of SUD in the emergency department is a first. In doing so, we align with the CDC and NIDA goals of reducing exposure to opioids, expanding access to medication-assisted treatment, promoting the use of prescription drug monitoring programs, and expanding the availability of antidote.

Educational Objectives: Our curriculum aims to develop competency among EM residents in each of the following areas as related to SUD: patient care, medical knowledge, practice-based learning and improvement, systems-based practice, and professionalism.

Curricular Design: The curriculum was designed through the help of two medical toxicologists with addiction medicine training, social workers with invaluable insight into community SUD resources, and input from ED program leadership. It will be a requirement for all EM residents to complete the curriculum prior to graduation. At its core, our curriculum consists of formal didactic lectures

during structured EM resident weekly conferences, clinical exposure in multiple settings including the ED, outreach clinic, and inpatient detoxification consultation, and synthesis of all material through personalized care plans for SUD emergency department super-utilizers. Lectures are generated from evidence-based literature relating to a variety of SUD topics; addiction medicine specialists are in attendance for lectures and available to further discussion. Table 1 summarizes the curriculum and didactic topics, while Table 2 summarizes a checklist of clinical exposures and tasks required for residents to successfully complete the SUD curriculum.

Impact/Effectiveness: Emergency medicine residents at Cooper University Hospital must complete our designed SUD curriculum to graduate. While the direct effectiveness of this education will be difficult to measure, we are confident Cooper residents will emerge well-equipped to tackle the challenges of the current SUD epidemic in their future practice. Furthermore, we are excited that this curriculum is continuing to foster and spark resident projects related to SUD (examples include local pharmacy pledge to make naloxone readily available, EMS SUD curriculum development, opiate pledge for Cooper University Hospital ED providers).

Table 1. Curriculum Overview.

| Formal lectures | Clinical Experience | Synthesis of material |
|---|--|---|
| <ul style="list-style-type: none"> Overview of opiate epidemic SUD prevention and the high-risk patient Innovative approaches to SUD in the ED Pharmacology of opioids, naloxone, buprenorphine, methadone, and adulterants Panel with SUD patients and recovery specialists Buprenorphine "X" waiver training course Overdose complications Alternatives to narcotics Treatment of withdrawal in the ED Benzodiazepine and alcohol abuse treatment | <ul style="list-style-type: none"> Outreach clinic for medication-assisted treatment of SUD Inpatient detoxification and addiction consultations Emergency Department | <ul style="list-style-type: none"> Post-curriculum reflection essay Development of care plan for SUD patient with frequent ED utilization Pre/post-curriculum written assessment |

Table 2. Curriculum Checklist.

| | |
|---|--|
| ✓ | Attend 70% of formal SUD lectures during weekly resident conference |
| ✓ | Complete buprenorphine "X" waiver training course |
| ✓ | Create and adhere to patient care plan for one SUD patient with frequent ED utilization |
| ✓ | Complete consult for 2 patients on addiction medicine inpatient service |
| ✓ | Outreach clinic for medication-assisted treatment of SUD; participate in initial intake visit, follow up visit; total of 2 sessions (4 hours each) |
| ✓ | Complete curriculum reflection piece |
| ✓ | Pre and post-curriculum assessment |

23 Difficult Discussions - A Novel Educational Technique to Teach Professionalism and Interpersonal Skills to Fourth Year Medical Students

Holmes J, Bowe C, Zimmerman K, MacVane C, Strout T/Maine Medical Center/Tufts University School of Medicine, Portland, ME

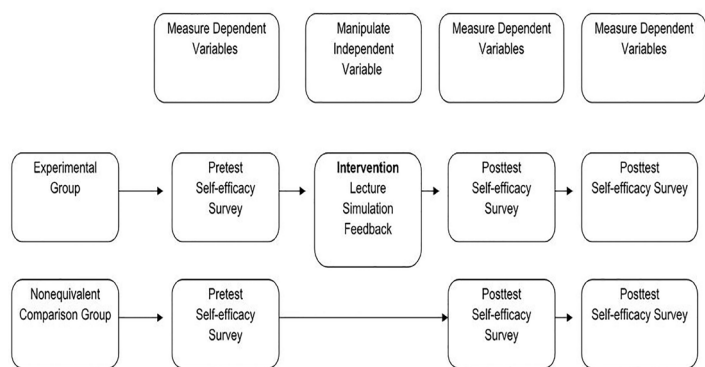
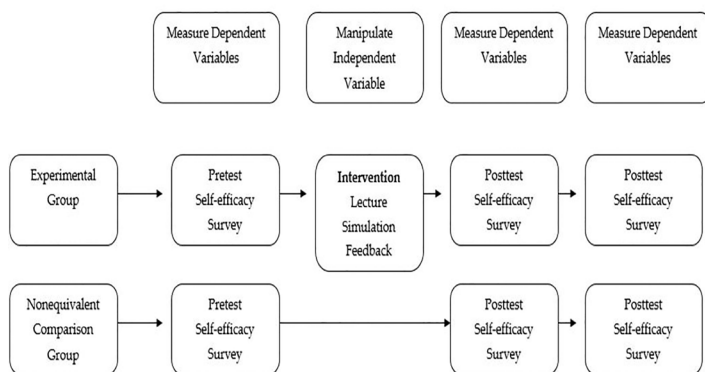
Background: Simulation offers an innovative modality to teach the skills of ethics, humanism and communication as it allows the deliberate practice of learned skills in a safe educational environment. We have implemented a novel educational module that provides fourth year medical students the uncommon opportunity to immediately practice and integrate newly taught knowledge in the management of four difficult patient scenarios: death notification, end-of-life discussion, medical error disclosure, and patients who wish to leave against medical advice.

Educational Objectives: 1) Demonstrate the five-step process of death notification; 2) Describe how to effectively and compassionately discuss a patient's end-of-life preferences; 3) Describe how to broach the subject of a transition from life saving care to comfort care measures; 4) Describe techniques for respectfully withdrawing unwanted life-sustaining interventions; 5) Demonstrate appropriate medical error disclosure; 6) Demonstrate respectful communication skills and components critical to the process of refusal of medical care.

Curricular Design: After completing a self-efficacy evaluation and a pre-intervention test students listen to short lectures and then participate in clinical scenarios. Critical action checklists help guide instructor feedback. Short and long-term outcomes are assessed with posttests administered at one and twelve months post module completion. Participants complete a follow-up survey after their intern year to assess their experience and confidence in utilizing these learned skills during clinical practice. A nonequivalent control group is composed of fourth year students who have not participated in this educational intervention.

Impact/Effectiveness: We anticipate that students participating in the educational module will demonstrate long-term retention of key knowledge, greater self-efficacy and higher posttest scores when compared to the control group.

Experimental Study Design: Longitudinal Pretest and Posttest Design with a Comparison Group



Appendix B. Experimental Study Design: Longitudinal Pretest and Posttest Design with a Comparison Group.

24 Education Faculty Scorecards as a Method of Ensuring Compliance and Accountability Among Educators

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Background: The ACGME has developed specific guidelines that must be accomplished by core education faculty yearly to ensure accreditation. Additionally, each department requires unique demands from its educators in

order to meet both the undergraduate and graduate medical education components of the overall education mission. Given the unique demands of medical educators, education faculty and departmental leaders require a transparent system which promotes accountability in order to ensure all education activities are met.

Educational Objectives:

1. Enable leaders of both undergraduate and graduate medical education to identify saturation and/or gaps in the departmental education mission.
2. Provide a transparent system which promotes accountability within education faculty.

Curricular Design: Quarterly, each core education faculty member receives a faculty scorecard which illustrates their involvement in departmental education requirements. The scorecards provide individual faculty with an assessment of their involvement in departmental education endeavors, while highlighting areas where they are deficient. The forms also allow departmental leaders to re-allocate resources based on participation. Education faculty scorecards include all of the ACGME and departmental requirements of educators. The forms are short enough so as not to be overwhelming, but informative enough to provide an accurate assessment of the faculty. The form itself includes small group facilitation and module creation for flipped classroom conference, end of shift evaluation compliance, professor rounds, UGME departmental involvement, conference attendance, remediation time, and various meeting attendance. The data itself can be found on many different interfaces such as Google sheets or excel spreadsheets.

Impact/Effectiveness: These forms allow both educators and GME and UGME leadership to assess where gaps or saturation in teaching and education opportunities lie. The compiled data has clearly shown where gaps lie within core faculty involvement, and have allowed leadership to make proper changes to core faculty involvement and the programs that they lead, such as weekly conference involvement. The education scorecards have provided a transparent method for ensuring accountability among educators within our department.

25 EKG Fundamentals: An Open Access Flipped Classroom Critical EKG Curriculum

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Background: Rapid and accurate electrocardiogram (EKG) interpretation is critical to the practice of Emergency Medicine (EM). Using a validated tool to evaluate critical EKG interpretation Hartman et al found only 54% of PGY3/4s had a passing score. Despite this need for improved education, many EM residencies lack a formal EKG curriculum. Free Open Access Medical Education (FOAMed) resources are expanding and many studies have demonstrated high learner satisfaction with the incorporation of asynchronous multimedia content, however, the value of guided consumption and coordinated didactic instruction should not be overlooked.

Educational Objectives: We seek to demonstrate the value of a flipped classroom critical EKG curriculum that leverages curated FOAMed content while retaining the advantages of didactic instruction. Additionally, we aim to (1) provide an interpretation framework to help residents develop mastery and rely on when confronted with complex EKGs and (2) ensure open-access to the curriculum for all interested residencies.

Curricular Design: EKG Fundamentals is organized around 5 concise reviews of core EKG principles and 20 challenge EKG cases (Table 1). Topics are based on the 15 critical EKG diagnoses reported by Hartman et al and 5 author selected topics. Cases include a brief history, EKG(s), standard interpretation stem(s), and FOAMed links. Using a flipped classroom approach, learners are assigned EKGs weekly for independent review. Then, during a 10-minute didactic session, faculty or senior resident facilitators guide a review of core concepts and interpretation of the weekly EKG.

Impact/Effectiveness: The curriculum was piloted from July 2015 to June 2016 with the 36 PGY1 residents of Northwestern (NU) and Emory (EU) Universities. In May 2016, these residents were surveyed by collecting anonymous responses to two 5 point Likert scale questions and a free-response section. 20 of 21 (EU) and 10 of 15 (NU) residents completed the survey (83%). Results (Table 2) showed high levels of satisfaction with the curriculum's relevance and impact on clinical performance. The most common feedback focused on concise teaching points and a standardized interpretation strategy leading to a revised curriculum and expanded enrollment (90 PGY1 residents at 7 institutions) this academic year. Satisfaction surveys and an assessment of learner knowledge will be completed in June 2017.

Table 1. Curriculum Overview.

| EKG Fundamentals Curriculum Schedule | | |
|--------------------------------------|-----------------|---|
| Session | Challenge EKG # | EKG Core Content Review |
| 1 | Core 1 | How to Read an EKG (NSR) |
| 2 | Core 2 | Approach to Ischemia |
| 3 | EKG 1 | Anterior STEMI |
| 4 | EKG 2 | Posterior STEMI |
| 5 | EKG 3 | Inferior STEMI, RV STEMI |
| 6 | EKG 4 | LBBB/Pacer (Sgarbossa) |
| 7 | EKG 5 | STEMI Mimics (HyperK, Pericarditis) |
| 8 | EKG 6 | STEMI Mimics (Isolated aVR, Benign Early Repol) |
| 9 | Core 3 | Approach to Syncope |
| 10 | EKG 7 | WPW |
| 11 | EKG 8 | Brugada |
| 12 | EKG 9 | Long QT |
| 13 | EKG 10 | PE/RV Strain/RVH |
| 14 | EKG 11 | LVH/HOCM |
| 15 | Core 4 | Approach to Bradyarrhythmias |
| 16 | EKG 12 | 2nd Degree Type II, 3rd Degree AV Block |
| 17 | Core 5 | Approach to Tachyarrhythmia (Sinus Tach) |
| 18 | EKG 13 | AFib/Flutter with RVR |
| 19 | EKG 14 | SVT |
| 20 | EKG 15 | VT/VF |
| 21 | EKG 16 | RBBB/LBBB |
| 22 | EKG 17 | TCA Overdose |
| 23 | EKG 18 | Digoxin Toxicity |
| 24 | EKG 19 | Pacemaker Malfunction |
| 25 | EKG 20 | Cerebral T Waves |

EKG Fundamentals is available as part of the **Emergency Medicine Foundations** curriculum. Open access to curriculum challenge and answer documents is available on the course website: www.emergencymedicinfoundations.com

Emergency Medicine Milestone Project,” a set of milestones used in evaluating and tracking resident competency. EM interns are expected to have achieved level one milestones before beginning their residency program. Unfortunately, research shows that a significant number of interns struggle to meet these goals. Thus the residency program is tasked with bringing these interns to a level of basic competency prior to direct involvement with patient care. Our study identified each intern’s perceived competence and actual ability to perform the tasks as outlined in the Emergency Medicine Milestone Project, milestone 14, level one, including: perform venipuncture, place peripheral IV line, and perform arterial puncture.

Educational Objectives: We sought to identify incompetent skills and effectively remediate these skills as identified in the EM Milestones Project.

Curricular Design: After completing a self-assessment tool identifying perceived competency, interns completed skill-testing stations, establishing their actual skill levels. Regardless of their perceived or actual competency, interns then viewed a commercially available video training series (Elsevier’s Procedures Consult) and participated in nurse-educator led instructional stations using simulation models. After such instruction, interns then repeated the previous skill-testing stations. As a final step interns completed a post-instruction, self-evaluation tool to assess their perceived competence. Using these tools, we demonstrated that we could effectively assess skill level and instruct to competency over a short period of time. Our data revealed at least one incompetent skill in each of the interns, but after instruction each intern was competent and confident to perform each of the skills tested.

Impact/Effectiveness: We conclude that this method is efficient and effective in assessing procedural skills and quickly bringing EM interns to a minimum level of competency. By using commercially available training videos and bedside nursing instructors, we have identified a standardized and reproducible method of assessment and instruction. We hypothesize that this method could provide a framework for procedural skill assessment and instruction for EM residents or medical students.

Table 2. Pilot Survey Data.

| Survey Item (1- Strongly Disagree, 3- Neutral, 5- Strongly Agree) | Agree or Strongly Agree | Mean |
|--|-------------------------|------|
| Weekly Challenge EKGs were relevant and helpful for learning fundamental knowledge within our specialty. | 28/30 | 4.23 |
| Weekly Challenge EKGs had a positive impact on my clinical performance. | 23/30 | 3.90 |

26 Evaluation of Incoming Emergency Medicine Residents’ Ability to Perform Level One Milestone Tasks as Outlined in “The Emergency Medicine Milestone Project”

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Background: In 2012 the ACGME released “The

27 FOAM Resources in a Flipped Classroom Educational Series

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Background: The ACGME has published guidelines for the implementation of asynchronous learning and the CORD Individualized Interactive Instruction (III) Taskforce has developed best practices to guide medical educators. As noted in the Taskforce report, many III strategies fail to meet requirements for Program Director monitoring, faculty oversight, evaluation, and efficacy assessment.

Educational Objectives: We sought to develop a structured

educational intervention whereby residents could review curated Free Open Access Medical Education (FOAM) resources covering both core content and innovation while meeting III aims of oversight, evaluation, and monitoring.

Curricular Design: An educational series providing III using FOAM resources was created by pairing monthly core content with the Academic Life in Emergency Medicine (ALiEM) Approved Instructional Resources (AIR) series. A subset of resources addressing 1-2 specific topics requiring 1-2 hours of review was selected. During a 50-minute session, residents were divided into teams with representation across academic years to complete an individual, and then group, quiz following Team-based Learning (TBL) methodology. Quiz questions were faculty-developed and from ALiEM materials. During team activities, quiz questions were discussed and each team’s consensus answer was presented to the room. Faculty led a guided discussion based on resident responses; prepared lectures were not required as guided conversation covered planned content. Use of cumulative scoring over the academic year encouraged adequate resident preparation. III sessions are incorporated into the traditional didactic calendar, preventing conflict with clinical and other educational activities.

Impact/Effectiveness: This III series has been well-received by residents and appears to have increased engagement with core content material. Group discussion and TBL quizzes provide opportunities for senior residents to teach junior colleagues during monitored didactic sessions. Although formal evaluation of intervention efficacy has not been conducted, resident qualitative feedback has been positive including the following comments: ‘very engaging,’ ‘I found myself reading beyond the assigned topics,’ and ‘it’s great working collaboratively with the upper level residents.’ Future evaluation of this flipped format’s efficacy is warranted.

28 Healthcare Disparities

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Background: Healthcare Disparities refers to differences between population groups as related to health insurance coverage, access to and use of care, and quality of care. Emergency medicine providers encounter healthcare disparities on a daily basis, therefore it is necessary for Emergency Residents to receive formal education on this topic.

Educational Objectives: As healthcare disparities are difficult to identify, define and approach, we sought to create a multi-faceted didactic curriculum. Overall objectives include increasing the comfort level of our Emergency Medicine Residents’ when faced with healthcare disparities, increasing the Residents’ ability to deal with healthcare disparities when encountered, increasing knowledge of healthcare disparities and

its effects on patient care, and recognizing how we can improve our interactions with certain population groups. We aim to create interventions and enact these interventions to reduce disparities and bias, therefore producing higher quality patient interactions, experiences, and outcomes. Lastly, this lecture series aims to be sustainable and reproducible, such that it can be shared and implemented in other emergency medicine residency programs.

Curricular Design: We developed seven one hour interactive informative sessions. Topics include introduction to healthcare disparities, social determinants of health, the clinical encounter, provider factors contributing to disparities, an expert speaker session, implicit bias and cultural competency, and strategies and interventions for improvement (please see supplemental figure).

Impact/Effectiveness: After each lecture, residents anonymously evaluate the lecture and provide comments. These lectures have been met with incredibly positive feedback from the residents, consistently rated in the top quarter of lectures delivered during weekly education conference. After completion of the curriculum, a focused questionnaire will be completed by the residents to gage the full impact of the curriculum. The questionnaire will focus on increased knowledge and ability to identify healthcare disparities, as well as comfort in dealing with healthcare disparities.

Supplemental Figure.

| |
|---|
| Lecture 1: Introduction to Healthcare Disparities |
| <i>Defining the social determinants of health</i> |
| <i>Defining different terms in healthcare disparities</i> |
| <i>Identifying levels of healthcare disparities</i> |
| <i>Why are disparities important</i> |
| <i>Identifying the healthcare vulnerable groups</i> |
| <i>Examples of disparities</i> |
| Lecture 2: Social Determinants of Health |
| <i>Identifying social determinants of health</i> |
| <i>Economic stability</i> |
| <i>Environment</i> |
| <i>Education</i> |
| <i>Food</i> |
| <i>Community and social context</i> |
| <i>Healthcare System</i> |
| Lecture 3: The Clinical Encounter |
| <i>Patient factors</i> |
| <i>Patient mistrust</i> |
| <i>Patient compliance</i> |
| <i>Patient preference</i> |
| <i>Individual factors</i> |
| <i>What influences the HPI</i> |
| Lecture 4: Provider factors that contribute to disparities |
| <i>Medical education</i> |
| <i>Provider demographics</i> |
| <i>Provider experience</i> |
| <i>Provider comfort</i> |
| Lecture 5: Health group expert speaker |
| Lecture 6: Implicit bias and cultural competency |
| <i>Identifying individual bias</i> |
| <i>Physician Bias</i> |
| <i>Patient Bias</i> |
| <i>How to troubleshoot bias</i> |
| <i>Defining cultural competency</i> |
| Lecture 7: Strategies and Interventions |

29 Identifying Strengths and Weaknesses in 3rd Year Clerkships Through Patient Evaluations and Self-Reflection

Welch K, Kelly L, Ko P /SUNY Upstate Medical University, Syracuse, NY

Background: Implementing multi-source feedback in clinical clerkships provides opportunities for students to engage with patients and practice self-reflection.

Educational Objectives: Evaluate the feasibility of a patient evaluation form and have students identify personal strengths and weaknesses through self-reflection in the Neuroscience and Emergency Medicine clerkships.

Curricular Design: Students were evaluated by a patient with whom they worked while on service. Once the evaluation was completed, students were asked to review the patient's form and complete a corresponding guided self-reflection where they were asked to identify what they did well and what skills they can improve in each clerkship setting. Qualitative analysis was conducted on patient and student evaluations to identify common themes.

Impact/Effectiveness: A total of 117 students participated in both clerkships. Patient evaluation forms were returned by 97% of patients and student reflections were completed by 96% students. Patients wrote comments on 70% of the returned evaluation forms. The top three themes from patient comments were positive personality, professional demeanor, and empathetic manner. The top three student self-identified strengths after the Neuroscience Clerkship were building rapport, providing information, and a tie between listening and history/exam skills. After the Emergency Medicine Clerkship, the top three strengths were history/exam skills, providing information, and building rapport. The top three student self-identified areas for improvement after Neuroscience were history/exam skills, providing next steps and explaining procedures and diagnoses. After Emergency Medicine, areas for improvement were communication, history/exam skills and providing information. Soliciting patient feedback and implementing a student self-reflection in a third year clerkship is helpful to student development. The results of this pilot suggest that third year students are comfortable building rapport with patients, but believe their communication and patient care skills are still developing. Further implementation of multi-source feedback including student self-reflection in clinical clerkships

provides opportunities for students to identify areas of self improvement and learning.

30 Implementation of A 360° Assessment Rubric for Level 5 Milestone Anchors for Procedures

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Background: The Accreditation Council for Graduate Medical Education's Emergency Medicine Milestones includes three Milestones for procedures wherein the Level 5 Anchor is to teach. They are: 9 (General Approach to Procedures), 10 (Airway Management), and 14 (Vascular Access).

Educational Objectives: To implement a rubric for both junior resident learners and faculty supervisors to assess senior residents on procedural Level 5 Milestone Anchors.

Curricular Design: The residency is a PGY 1-4 dually approved program based in a suburban health care network. Orientation includes both a previously published airway training course and a network based central lines course. With the advent of the Milestones, senior (PGY 3 and 4) residents served as instructors for both courses where previously only faculty taught. In order to document teaching competence, a rubric was introduced to assess the abilities of the senior resident instructors. The rubric, for both interns and faculty, included a previously validated metric of EM clinical teaching, the ER Scale, as well as a 1-5 Likert Scale questions including the Milestone 9 Level 5 anchor verbatim. Table One demonstrates the rubric, omitting the demographics section.

Impact/Effectiveness: The rubric was successfully utilized at the courses above for the incoming interns in 2016. PGY 3 and 4 residents were assessed by junior learners positively as teachers in the ER Scale section (Question 4). Question 5a is the Level 5 Anchor for Milestone 9, and the juniors assessed the seniors positively on this and the other Likert questions as well. Likewise faculty observers assessed the senior residents positively for their teaching and recommended them as Level 5 competent for Milestones 9, 10, and 14, as appropriate, to the Clinical Competency Committee. Plans are to expand use of the rubric to programmatic Lumbar Puncture, Chest Tube and Ultrasound courses provided during orientation.

Table 1. Assessment Rubric without Demographics.

4. Please complete the following by circling:

| | Unacceptable | Below Average | Average | Above Average | Outstanding |
|--------------|--------------|---------------|---------|---------------|-------------|
| Didactic | 1 | 2 | 3 | 4 | 5 |
| Clinical | 1 | 2 | 3 | 4 | 5 |
| Approachable | 1 | 2 | 3 | 4 | 5 |
| Helpful | 1 | 2 | 3 | 4 | 5 |

5. Please complete the following by circling:

| | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|-------------------|----------|---------|-------|----------------|
| The resident corrected mistakes | 1 | 2 | 3 | 4 | 5 |
| The resident had appropriate medical knowledge of the procedure | 1 | 2 | 3 | 4 | 5 |
| The resident had appropriate procedural skills for this course | 1 | 2 | 3 | 4 | 5 |

31 Implementation of a Didactic Curriculum for Residents Training in a Dual Residency

Schechter J/SUNY Downstate Medical Center - Kings County Hospital, Brooklyn, NY

Background: It is difficult to integrate didactics into dual training programs that comprehensively address both aspects of the disciplines. Often, trainees will either attend or participate predominantly in educational activities of one specialty over the other. While there are topics that overlap, the subtleties and approach do differ.

In the SUNY Downstate dual emergency medicine-internal medicine residency we developed an integrated training conference to address this important aspect of dual disciplinary training.

Educational Objectives: Our goal was to create a curriculum specifically aimed at dual training residents.

Curricular Design: Using qualitative data obtained from key trainee and faculty informants we developed a curriculum that aimed to enhance dual training among residents. Among the multi-factorial programming development of a case conference program was found to be the most successful educational modality.

This conference is an interactive experience in which a patient that had presented to our institution is discussed in a systematic fashion. The case is presented by the senior resident that cared for the patient from emergency department presentation through inpatient course and final disposition.

The interactive group composed of trainees and educational faculty will then discuss the emergency medicine approach to this patient including differentials, workup, and care. The second part of the conference will then discuss the in-patient management and work up of this patient. This will often lead to out-patient care and follow up. The conference concludes with an overall summary of the topic with didactic and clinical application learning points.

Impact/Effectiveness: The feedback from residents has been uniformly positive and trainees have specifically cited the combination of the dual specialty focus in a single environment. As the emergency room is often the starting point of many patient interactions, this can be easily implemented into any dual training curriculum and may represent a novel and efficacious methodology for application in other training programs.

32 Improving Conference Evaluations via an Electronic Survey Platform

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Background: Conference evaluations are most effective if timely and specific. Traditional paper forms are limited by the resources required to distribute, collect and process the data, which delays results. Specific constructive feedback is also often missing. Computer-assisted surveys allow for follow-up questions based on initial responses, improving specificity while limiting duration.

Educational Objectives: The objective was to create an easily accessible electronic survey instrument that would collect feedback on weekly didactics. A successful tool would yield a response rate of 50%, elicit specific areas for improvement and make that data reportable to presenters within a week.

Curricular Design: Features correlated with lecture effectiveness are its structure, relevance, lecturer expertise and delivery. Using a web-based survey platform, an instrument with embedded logic was created; a matrix table asked learners to rate scope, delivery and teaching strategies on a 4-point likert-type scale. For any score less than 4, the survey displayed a linked “choose all that apply” question to identify specific sub-categories that needed improvement. The survey concluded with a free text comment box.

Initial feedback revealed learners preferred to respond within a single survey link, instead of re-entering the link for each presentation. The survey structure was modified to allow multiple evaluations per link activation.¹²²¹

Impact/Effectiveness: Average response rate was 47%. Real-time observation of survey completion led to

increased response rates when faculty provided feedback on survey completion. The selection list for improvement and the addition of forced validation increased the frequency of specific feedback. The frequency of completed evaluations and feedback elements for 4 months are shown in Table 1. Average time to evaluate each presentation was 38 seconds. Since implementation, presenters have consistently received timely feedback via reports generated from the software platform.

Table 1.

| Total Surveys | No. with score < 4 per feature (%) | Element (# with detail) | Element Detail | No. of responses | % of category responses |
|---------------|------------------------------------|-------------------------------|-------------------------------------|------------------|-------------------------|
| 1084 | 276 (25.4) | Scope (154) | Cover More | 89 | 57.8 |
| | | | Cover Less | 65 | 42.2 |
| | 298 (27.5) | Content Delivery (296) | Clarity of Learning Objectives | 35 | 11.8 |
| | | | Organization | 21 | 7.1 |
| | | | Time Management | 52 | 17.6 |
| | | | Keeping Audience Engaged | 109 | 36.8 |
| | | | Meeting Learning Objectives | 10 | 3.4 |
| | | | Delivery - other | 69 | 23.3 |
| | 307 (28.3) | Methods (247) | Use of AV | 71 | 28.7 |
| | | | Handouts/ Supplemental Material | 47 | 19.0 |
| | | | Format of Session | 59 | 23.9 |
| | | | Methods - other | 70 | 28.3 |
| | | | Total resolving free text comments: | | 215 |

33 Improving Resident Remediation by Building Bridges: Better Recognition and Insight to Define Goals in Education

Huang R, Munzer B, Byrne B, Peterson W, Arribas M, Wolff M, Santen S/University of Michigan, Ann Arbor, MI

Background: Resident remediation is a challenging but necessary process to show commitment to learner success. The remediation process can be both resource-intensive and difficult to implement. There are many strategies to assist with remediation across the core competencies that can be effective with motivated learners. Some residents, however, do not recognize their deficiencies, while others lack insight into how to solve the problem they are faced with.

Educational Objectives: To create a conceptual framework to assist residency programs in the remediation

of residents that have no recognized the need for improvement in their areas of perceived deficiencies.

Curricular Design: We propose the use of BRIDGES (Better Recognition and Insight to Define Goals in Education). This format has three goals: helping the resident develop Better Recognition of their deficiency, improving Insight into the nature of the problem, and Defining concrete Goals to improve their remediation success. This process relies heavily on implementation intentions, a strategy from cognitive psychology that has been shown to close the intention-action gap and increase goal attainment. In a meeting with a faculty member focused on remediation plans, a resident is presented with his/her individual areas for concern and asked to consider strategies to improve. They are instructed to create plans, with faculty oversight, in an “if-then” model that simulate the future situation and the desired response.

Impact/Effectiveness: The purpose of building BRIDGES for remediation is to connect the stated problem with a concrete, actionable plan that will improve the resident’s chance for success.

34 Intern Passport - Orienting New Travelers to the Emergency Department

Masneri D, Wright J, Lefebvre C/Wake Forest University, Winston-Salem, NC

Background: First year emergency medicine (EM) residents often report challenges with achieving timely orientation to emergency department (ED) personnel and resources. A more structured orientation was deemed necessary based on our program semiannual evaluations of first year EM residents. Limited number of rotations in the ED during the first year, large number of specialists and personnel in the ED, and fast pace and limited free time while working in the ED are listed as barriers that contribute to the difficulty with orientation.

Educational Objectives: The objective of this curriculum was to implement a structured orientation for incoming interns that effectively defined and distinguished various personnel and assets within the ED.

Curricular Design: The “Intern Passport” (IP) curriculum was designed to facilitate definition of department specialists, assets, and resources. The method of training was an on-the-job orientation that required interns to obtain “stamps” (signatures) on their passport from eight “countries” (specialists) within the ED. Interns obtained stamps after spending 30 minute orientation visits with each country during the first month of internship. The eight countries were Administration, Nursing, ED Radiology, ED Orthopedics, ED Psychiatry, Respiratory Therapy, Clinical Observation Unit, and ED Pharmacy.

Topics covered during the visit were introductions, tasks and capabilities, expectations, and pearls and pitfalls. Successful curriculum implementation required orientation material preparation by specialists and motivated participation by both the interns and the specialists. The curriculum effectiveness was assessed by participant completion of an optional anonymous retrospective survey.

Impact/Effectiveness: The IP was effective in defining and distinguishing ED personnel and assets. A total of 14 out of 15 interns completed the IP curriculum. Eleven interns completed the survey. 91% agreed that the IP (1) helped establish relationships early in training, (2) provided a greater understanding and appreciation for ED staff members, (3) was engaging and relevant to orientation, and (4) should be continued for future intern classes. 100% surveyed disagreed that the IP was a negative experience. Other EM residencies may improve the intern orientation process by incorporating this curriculum into their EM residency program.

35 Introduction of a Wilderness Medicine Curriculum to an Urban Emergency Medicine Residency

Einstein N, Meyers J, Williamson K, Lovell E / Advocate Christ Medical Center, Chicago, IL

Background: Wilderness medicine, the practice of medicine with limited resources in austere environments, is extremely applicable to the emergency physician given its association with pre-hospital, international, and disaster care. Teaching wilderness medicine concepts in a practical fashion can be challenging in an urban emergency medicine residency. In response, the authors created a “Wilderness Medicine Day” in 2016 to be incorporated yearly into our residency’s weekly education conference.

Educational Objectives: We sought to enhance our program’s didactic curriculum by providing exposure to an often-underemphasized subspecialty area of emergency medicine. The conference day had a secondary benefit of allowing dedicated time for resident bonding outside the hospital.

Curricular Design: The conference day was held at an off-site park, in order to remove participants from the urban environment. Curriculum development was resident driven. Residents created a small group didactic experience that included discussions of limited resource splinting, extrication techniques, first aid kits, and a tourniquet station. The didactic course was followed by three simulation cases: traumatic pneumothorax from fall, distal extremity amputation from animal attack, and open fracture with traumatic brain injury from biking accident.

The day concluded with a fire building session followed by a resident cookout.

Impact/Effectiveness: Exposure to Wilderness Medicine topics is an important element of emergency medicine residency. With the creation of a morning conference session devoted to this topic, urban emergency residencies can diversify their conference curriculum, enhance resident knowledge, and include simulation for cases unlikely to be encountered in an urban ED. The curriculum received incredibly positive feedback from residents and faculty and will now be part our 18 month repeating conference series.

36 Ionizing Radiation Knowledge Educational Module

Gobin L, Lall M, Theriot D, Herr K, Henn M/Emory University, Atlanta, GA

Background: Use of advanced imaging in the Emergency Department (ED) increased by 140% from 2001 to 2008 [Pitts SR 2012, Annals of Emerg Med]. Despite the increase in ED ionizing radiation (IR) exposure from imaging there are knowledge gaps among ED providers regarding the presence and effects of such exposure [Ditkofsky N 2016, J Amer Col of Radiol].

Educational Objectives: Evaluate if a four-part educational initiative resulting from a collaboration between emergency medicine (EM) and radiology can remedy knowledge gaps regarding ionizing radiation exposure and radiation effects from ED imaging.

Curricular Design: EM residency educational curriculums may contain insufficient information about the amount and risks of imaging related IR exposure. In conjunction with emergency radiology, we developed educational objectives including: 1) improve knowledge of the effects of IR resulting from medical imaging and 2) increase comfort level in counseling patients about risks of individual imaging tests. A four-part educational initiative consisted of: portable pocket card, detailed educational document, recorded electronic video lecture, and an in-person lecture. Various educational materials were chosen to suit different learning styles and increase information dissemination. A survey prior to and following the educational intervention was deployed to assess effectiveness.

Impact/Effectiveness: Prior to the intervention, 69 EM members took the survey, consisting of 46.4% (n=32) residents, 39.1% (n=27) attendings, and 14.5% mid-levels (n=10); the post-test survey had fewer respondents (n=39) with a similar distribution. The educational intervention demonstrated positive effects across all categories, with improving mean comfort level (Fig. 1) and decreasing standard deviations. EM residents were most likely to use the educational materials (58% usage), while

attending physicians (6.7%) and midlevel providers (20%) were less likely to use such materials. 1st and 2nd year residents were more likely to use educational materials than 3rd year residents. This multi-pronged educational initiative shows success in early EM resident education, however, separate efforts are needed to capture attendings and mid-level providers, some of whom also show knowledge gaps [Ditkofsky N 2016, J Amer Col of Radiol].

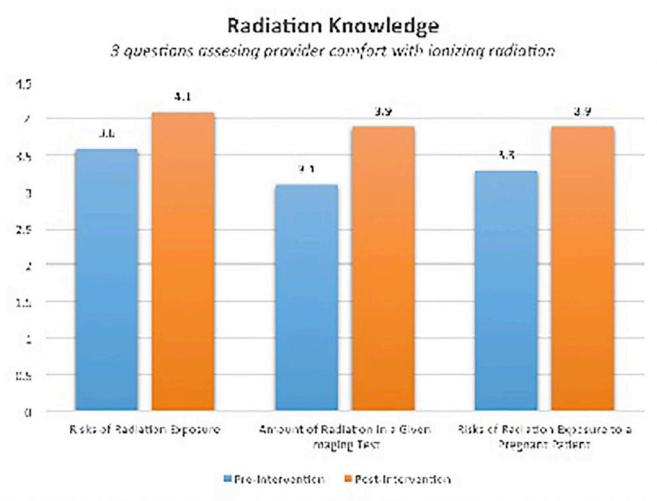


Figure 1—Responses were recorded using a Likert scale where 1 is extremely uncomfortable and 5 is extremely comfortable. Mean values are presented prior to and following the educational intervention. Mean comfort levels rose (reflecting increased provider comfort), and standard deviations declined across all questions.

Figure 1.

Radiation: What Patients Want to Know

- Ionizing Radiation exists everywhere
- Sun and soil provide constant background exposure
- Living or flying at high altitudes increases exposure

Goal: Balance the risk of exposure against harm of missed diagnosis

Medical Sources: X-rays, CTs, MR procedures & Nuc Med studies
 Medical imaging causes ~20% of all radiation exposure
 Practical Comparisons:
 OOR = Airplane ride from NYC to LAX 3 times
 Risk: Health effects with large doses, in small doses effects are estimates
 Younger patients = longer lives = higher risks (age adjustments)
 Risk of death from OOR = 1.4 million
 Risk of cancer from CT AP = 1:2000
 Even lower risk of imaging other body parts as CAPs most sensitive to radiation.

Fetal Exposure: Abdomen/Pelvis imaging is highest risk, avoided when imaging other areas
 Proven risk associated w/ 5-10 CT APs
 Baseline leukemia risk is 1:1500
 Leukemia risk with 1:2500 with 5-10 CT APs
 No documented link b/w CT and fetal brain damage

Figure 2. Front of Pocket Card.

37 It is a Reality: Oculus Assists in Seeing Virtually Everything During Interview Sessions

Crawford S, Monks S, Wells R/Texas Tech University Health Sciences Center El Paso, El Paso, TX

Background: Recruiting, interviewing and training resident physicians is a resource intensive endeavor.

Selecting individuals with the skills and temperament to fit within a specialty or even a specific training program is one of the most deliberated topics for residency training programs. Standardized Letters of Evaluation (SLOEs) aid in the interview selection process but discovering the true character of a candidate during an interview can be challenging. Some programs have used standardized interview systems in an attempt to compare individuals in a systematic manner. These systems, although many would argue are effective, are poorly received by the interviewee who we hope to recruit. The American Association of Medical Colleges (AAMC) has even begun to look at a standardized video interview system to help programs evaluate candidates. We used a virtual reality headset as part of a standardized interview to evaluate the candidates' temperament, problems solving abilities, and communication skills. The purpose of the study was to examine the resident interview candidate's satisfaction with our program's interview process.

Educational Objectives: This innovation was implemented to provide a novel tool for evaluating interview candidates in a systematic and standardized format. A secondary goal was to demonstrate the innovative and progressive nature of the program that would be discussed among other interview candidates resulting in and improved image and marketing for the program. The interview session was constructed to demonstrate some characteristics deemed by our program to be most important in prospective candidates including: adaptability, the ability to communicate clearly and succinctly, teamwork, being calm under stress, and problem solving skills.

Curricular Design: All interview candidates for the Texas Tech El Paso Emergency Medicine residency program in the 2015-2016 interview cycle participated in a standardized interview session. The session was conducted in pairs or threes depending on an odd or even number on interviewees. Each group would watch a training video describing the use of the Oculus virtual reality headset and a virtual bomb defusing puzzle-based game. Each team was then given five minutes to review the game manual and plan their approach to the presenting puzzles. Following this video and planning period, each team member would take a turn solving the logic puzzles within the VR headset, relying on the assistance of their team members. Following the activity each interviewee was asked questions about their experience. This structured interaction was then used to formulate a ranking that was incorporated as part of the overall applicant scoring within our program. Candidates were surveyed during the period between the rank list submission and match day about their experiences with our program and the VR interview session.

Impact/Effectiveness: Faculty members in the department now look to this session for insight or

confirmation about a candidate's temperament, problem solving skills and team-work abilities. Of the 102 candidates who conducted an in-person interview on our campus, 64 completed the voluntary and IRB approved survey. Candidates reported an overall positive impression with this interview activity; 98% stated that it positively affected their ranking of our program and agreed that it gave insight into their communication skills and personality. In addition, 81% told people about their experience with our program. This interview system has been continued and enhanced by improved technology and continues to be a highlight of the day for prospective residency candidates.

38 Junior Faculty Exchange Promotes Regional Presence for EM Faculty

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Background: Most emergency medicine (EM) residency programs exist within easy traveling distance from at least one other residency program. In order to achieve academic promotion, faculty members of a junior rank must demonstrate regional or national "presence," often measured by speaking engagements and other activities beyond their own institution.

Educational Objectives: We sought to create a "junior faculty exchange" that would provide opportunities for junior faculty to speak at the educational conferences of other residency programs in order to 1) receive focused and objective feedback on their presentations and to 2) create connections that would demonstrate a regional presence.

Curricular Design: Five residency programs that were all within 3 hours driving distance of one another created a junior faculty exchange. Each agreed to host one junior faculty (defined as holding the academic rank of associate professor, assistant professor or instructor) in a given academic year from each of the other programs for a 30 minute educational session, after which they would be given focused feedback by senior faculty. A common, written evaluation tool was created for this purpose. A shared, cloud-based spreadsheet was created with a list of interested faculty and topics on which they could present, and invitations were issued by each program.

Impact/Effectiveness: 20 junior faculty exchange lectures were given at the 5 residency programs by at

least 15 different junior faculty members in the first year of the program. Faculty participants have expressed the perception of value in receiving feedback on lecture style as well as in the exchange of information and ideas between different residency programs. It is likely that these presentations will be of benefit to participants who subsequently apply for academic advancement.

39 Learning Moment - An Innovative Experiential Learning Platform

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Background: Experiential learning via clinical practice and self-reflection is a critical component of the development of competency for trainees. Time and patient volume pressure are a constant threat to bedside teaching in the emergency department (ED). Millennial learners favor asynchronous and online formats to enhance their education.

Educational Objectives: Learning Moment (LM), a novel educational platform, seeks to provide an additional resource in medical education by leveraging the strengths of experiential learning in an easy-to-use online format. LM provides a framework for learners to log and share their recently learned clinical "pearls" while allowing the mapping of where learning is actually occurring in the ED.

Curricular Design: LM provides learners with an online "note-taking" platform to log learning experiences, or "pearls", along with learning location and source of learning while working in the ED. In doing so, learners are able to synthesize what they have learned into meaningful thoughts, thus enhancing understanding, retention, and application through self-reflection. Such "pearls" are published within LM's searchable and shareable repository of educational content available to the entire learning community using social media concepts. Users can "tag" colleagues present during learning experiences and view learning "pearls" happening within their learning community. During ED rotation orientations all medical student are introduced to the LM. Emergency medicine (EM) residents received similar training. Students are encourage to log at least one "pearl" per shift. Location data was used to generate "education heat maps" of where learning occurs.

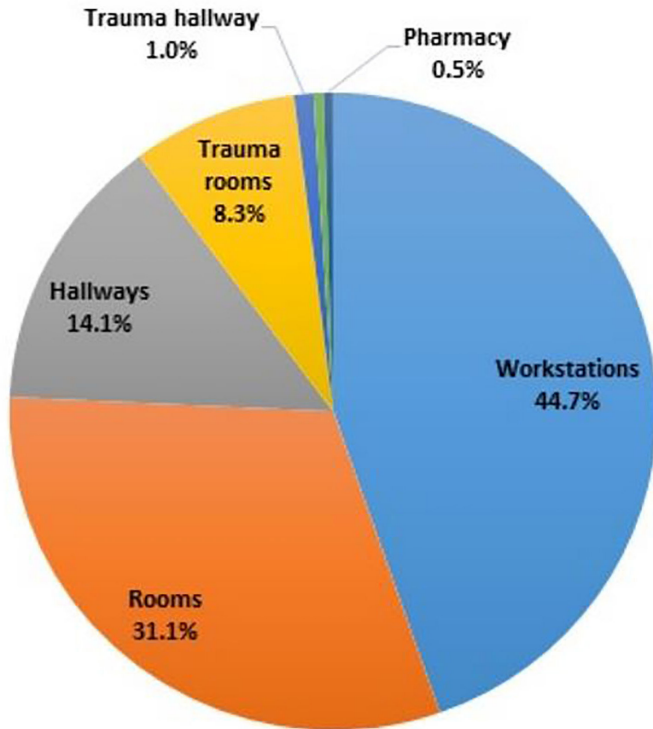
Impact/Effectiveness: EM residents and medical students logged a total of 228 "pearls", 95% of which were from medical students, from 08/22/16 to 10/31/16. For those who reported a source of learning, the most common sources were attendings 69/208 (34%) and senior residents 54/208 (26.6%). The most frequent locations of learning occurred at workstations 92/206 (44.7%) and in patient rooms 64/206 (31.1%). Although successfully piloted in

the ED, LM is scalable to other clinical departments and institutions across the nation as we seek to design the optimal learning ecosystem and maximize experiential learning for future physician trainees.

40 Low Fidelity Simulation Workshop to Teach Principles of Mass Casualty Management in the ED with Emphasis on Quality Improvement

Spillane L, Cushman J, Sensenbach B, Lu M, Pasternack J, Stephanos K, Bodkin R /University of Rochester, Rochester, NY

Location of Learning Moment



Background: In a mass casualty incident, emergency physicians must respond to a rapid influx of patients. Identifying challenges and lessons learned through simulation can be used to guide performance improvement (PI) and Emergency Department (ED) mass casualty planning.

Educational Objectives: To identify and apply through a PI activity key principles of disaster management including patient identification/tracking, triage, team structure, communication, resource allocation, clinical care, and security.

Curricular Design: We created a low fidelity mass casualty exercise, shrinking the ED in size - but imposing four conditions: hospital at capacity, ED beds full with patients waiting, multiple entrances, and distinct treatment areas. The exercise occurred in an educational suite divided into critical care, urgent care, triage and waiting areas. Faculty controlled the influx of patients and available resources. Learners included EM residents, medical students, and pharmacists and were assigned as clinicians, support staff, or patients.

Learners were given a mass casualty scenario and asked to manage the event. The scenario lasted 40 minutes with 10 minutes allowed to organize their teams before casualties arrived. Following the scenario, learners completed a structured written reflection, engaged in small group discussions, and attended a faculty led debriefing. Roles were reassigned and the scenario was repeated.

Debriefing content and written reflections were thematically analyzed and included: need for geographically assigned teams with clear communication; need to coordinate resources across areas; inability to use electronic records for triage/tracking; importance of securing entrances and using a central triage point; and strategic management of low acuity patients. Repeating the scenario improved event management in some areas at the expense of others which emphasized the need for fluidity in resource allocation.

Impact/Effectiveness: Participants were able to engage in a PI experience while learning principles of disaster management (Milestones SBP1, SBP2, PBL1, ICS2). This low fidelity workshop is easily reproducible and can be adapted to conditions in a variety of settings allowing lessons learned to influence departmental disaster planning.

Table 2. Pilot Survey Data.

| Survey Item (1- Strongly Disagree, 3- Neutral, 5- Strongly Agree) | Agree or Strongly Agree | Mean |
|--|-------------------------|------|
| Overall I am highly satisfied with the EM Foundations course. | 28/30 | 4.17 |
| I believe EM Foundations was beneficial to my development as an EM practitioner. | 28/30 | 4.33 |
| I believe EM Foundations course content was appropriate for my level of learning. | 30/30 | 4.57 |
| I prefer small group oral boards style cases over traditional lecture or powerpoint review of equivalent course content. | 24/30 | 4.17 |
| Practice oral boards cases were relevant and helpful for learning fundamental knowledge within our specialty. | 29/30 | 4.53 |
| Case teaching points were relevant and helpful for learning fundamental knowledge within our specialty. | 29/30 | 4.60 |
| Foundations meetings were engaging and enjoyable. | 28/30 | 4.47 |
| Practice oral boards cases had a positive impact on my clinical performance. | 25/30 | 4.13 |
| Case Teaching Points had a positive impact on my clinical performance. | 27/30 | 4.10 |

41 Mental Practice as an Adjunct to Improving Pediatric Resuscitation Skills

Marks L, Spillane L /University of Rochester Medical Center, Rochester, NY

Background: The number of pediatric resuscitations that trainees experience is limited, and simulation is used to augment Emergency Medicine resident experience with managing critically ill pediatric patients. Mental practice (MP), the rehearsal of cognitive or technical skills without physical performance of that skill, has been used as an adjunct to improve procedural and crisis resource management skills. However, this technique has received mixed reviews.

Educational Objectives: To explore the concept of MP as a tool to train residents to better manage pediatric patients with respiratory failure.

Curricular Design: MP was incorporated into one of our regularly scheduled interdisciplinary simulation workshops. Participants were divided into teams completing a 40 minute MP session followed by a 40 minute simulation. During the MP session, the faculty coach described the technique of MP. Residents were assigned to roles, and then given a brief EMS report - child with altered mental status and impending respiratory failure. Residents were instructed to use online resources, the faculty preceptor, and their colleagues in visualizing a step by step plan to fulfill their roles. For example, the airway person detailed specifics such as: proper bag-valve mask technique, rate of ventilation, troubleshooting poor chest rise, rapid sequence intubation technique, and other airway issues that might arise. The team leader was asked to focus on team coordination, situational awareness, and communication among team members.

Teams then completed a pediatric simulation of the same case followed by a group debrief.

Impact/Effectiveness: Compared to a prior simulation of a child with respiratory failure, there was no apparent improvement in demonstrated skills. Team members, concentrating on individual roles appeared to communicate less and have difficulty coordinating tasks. Team performance may have improved with use of specific check lists during the MP session and more robust team leadership training. MP itself may be a complex skill that takes practice. It is imperative that we find ways to better educate our residents to manage less common but critically important patient presentations.

42 Milestones in Simulation: Mapping Critical Actions in Simulation to the Milestones in Emergency Medicine

Elliott N, Nguyen M, Goyke T, Johnson S, Weaver K/ Lehigh Valley Health Network, Bethlehem, PA

Background: The Accreditation Council for Graduate Medical Education (ACGME) mandates that all accredited residency programs assess the development of their resident physicians along a framework provided by the Milestone Project. Individual residency programs task their clinical competency committees (CCCs) to monitor and record trainees' progress along these predefined milestones. Suggested sources for this information involve many aspects of the residency program and should include simulation performance. Resident performance in simulation can be applied to the milestone levels.

Educational Objectives: We sought to create an assessment tool that directly ties resident actions in simulation to specific milestone levels.

Curricular Design: At the beginning of case development, our faculty considers how a proposed simulation case can measure performance along select milestones. Our cases run for approximately 15 minutes allowing us to observe actions related to 4-6 milestones. Critical actions that should be performed during the case are then used as anchors for milestone levels. These anchors are then written into a pre-generated template. As a result, we create an assessment form paired to the proposed simulation case (see images). At our institution, we upload the form into New Innovations, an online residency management suite. Case writing proceeds routinely with the scenario appropriately triggering the critical actions (milestone anchors). Each time we run the simulation case, we select one resident to lead the resuscitation team. We assign one faculty member to observe that resident during the case and to complete the assessment form in real-time. The forms are archived and later reviewed by members of our CCC.

Impact/Effectiveness: We expose individual residents to approximately 36 cases paired with these assessment forms over a four-year residency. Our CCC examines the results of these assessments and incorporates that data into our residents' semi-annual reviews. As per the intent of the Milestone Project, our CCC considers milestone performance in simulation to be one of many data points that contribute to the overall assessment of each resident. By incorporating this tool in simulation and in CCC meetings, we can use the framework of the Milestone Project to more precisely provide meaningful assessment of our residents.

Simulation Case Evaluation Form
Ethylene Glycol Overdose

Simulation Case Evaluation Form
Ethylene Glycol Overdose

Performance of Focused History and Physical Exam (PC2)

Abstracts current findings in a patient with multiple chronic medical problems and, when appropriate, compares with a prior medical record and identifies significant differences between the current presentation and past presentations.

- Level 1 Performs and communicates a reliable, comprehensive history and physical exam
Action: Obtains PMH and SH
- Level 2 Performs and communicates a focused history and physical exam which effectively addresses the chief complaint and urgent patient issues
Action: Palpates and visualizes the entire patient (manikin) front and back
- Level 3 Prioritizes essential components of a history given a limited or dynamic circumstance
Prioritizes essential components of a physical examination given a limited or dynamic circumstance
Action: Asks for all three components of the GCS
- Level 4 Synthesizes essential data necessary for the correct management of patients using all potential sources of data
Action: Recognizes the need for intubation AND Identifies intoxication as the likely cause of the patient's condition.

Diagnostic Studies (PC3)

Applies the results of diagnostic testing based on the probability of disease and the likelihood of test results altering management.

- Level 1 Determines the necessity of diagnostic studies
Action: Orders CMP
- Level 2 Orders appropriate diagnostic studies
Performs appropriate bedside diagnostic studies and procedures
Action: Orders bedside blood glucose and EKG
- Level 3 Prioritizes essential testing
Interprets results of a diagnostic study, recognizing limitations and risks, seeking interpretive assistance when appropriate
Reviews risks, benefits, contraindications, and alternatives to a diagnostic study or procedure
Action: Orders Serum Osmolality, ASA, Tylenol, AND Ethanol level
- Level 4 Uses diagnostic testing based on the pre-test probability of disease and the likelihood of test results altering management
Practices cost effective ordering of diagnostic studies
Understands the implications of false positives and negatives for post-test probability
Action: Orders toxic alcohol levels AND begins specific treatment for toxic alcohol ingestion before levels are available

Diagnosis (PC4)

Based on all of the available data, narrows and prioritizes the list of weighted differential diagnoses to determine appropriate management.

- Level 1 Constructs a list of potential diagnoses based on chief complaint and initial assessment
Action: Includes structural, metabolic, and toxic causes on the differential diagnosis of altered mental status
- Level 2 Constructs a list of potential diagnoses, based on the greatest likelihood of occurrence
Constructs a list of potential diagnoses with the greatest potential for morbidity or mortality
Action: Constructs the differential diagnosis of an anion gap acidosis
- Level 3 Uses all available medical information to develop a list of ranked differential diagnoses including those with the greatest potential for morbidity or mortality
Correctly identifies "sick versus not sick" patients
Revises a differential diagnosis in response to changes in a patient's course over time
Action: Constructs a differential diagnosis of an osmolality gap
- Level 4 Synthesizes all of the available data and narrows and prioritizes the list of weighted differential diagnoses to determine appropriate management
Action: Provides a specific treatment (i.e. Fomepizole, dialysis) for toxic alcohol ingestion based on the POC lab

Pharmacotherapy (PC5)

Selects and prescribes, appropriate pharmaceutical agents based upon relevant considerations such as mechanism of action, intended effect, financial considerations, possible adverse effects, patient preferences, allergies, potential drug-food and drug-drug interactions, institutional policies, and clinical guidelines; and effectively combines agents and monitors and intervenes in the advent of adverse effects in the ED.

- Level 1 Knows the different classifications of pharmacologic agents and their mechanism of action.
Consistently asks patients for drug allergies
Action: Obtains allergy history
- Level 2 Applies medical knowledge for selection of appropriate agent for therapeutic intervention
Considers potential adverse effects of pharmacotherapy
Action: Gives Bicarbonate
- Level 3 Considers array of drug therapy for treatment. Selects appropriate agent based on mechanism of action, intended effect, and anticipates potential adverse side effects
Considers and recognizes potential drug to drug interactions
Action: Gives Fomepizole
- Level 4 Selects the appropriate agent based on mechanism of action, intended effect, possible adverse effects, patient preferences, allergies, potential drug-food and drug-drug interactions, financial considerations, institutional policies, and clinical guidelines, including patient's age, weight, and other modifying factors
Action: Provides adjunctive treatment with cofactors (i.e. thiamine) to decrease amounts of toxic metabolites AND gives Fomepizole based on POC lab

Disposition (PC7)

Establishes and implements a comprehensive disposition plan that uses appropriate consultation resources; patient education regarding diagnosis; treatment plan; medications; and time and location specific disposition instructions.

- Level 1 Describes basic resources available for care of the emergency department patient
Action: Has patient admitted
- Level 2 Formulates a specific follow-up plan for common ED complaints with appropriate resource utilization
Action: Asks for post-intubation CXR, post-treatment ABG
- Level 3 Formulates and provides patient education regarding diagnosis, treatment plan, medication review and PCP/consultant appointments for complicated patients
Involves appropriate resources (e.g., PCP, consultants, social work, PT/OT, financial aid, care coordinators) in a timely manner
Makes correct decision regarding admission or discharge of patients
Correctly assigns admitted patients to an appropriate level of care (ICU/Telemetry/Floor/ Observation Unit)
Action: Consults toxicology
- Level 4 Formulates sufficient admission plans or discharge instructions including future diagnostic/therapeutic interventions for ED patients
Engages patient or surrogate to effectively implement a discharge plan
Action: Arranges emergent dialysis

43 Military Emergency Medicine (EM) Residency Guide: Demystifying the Military Match and Application Process

Katirji L, Desai S, Hillman E, Lufty-Clayton L, Schmitz G /University of Kentucky, Lexington, KY; University of Missouri-Kansas City, Kansas City, MO; Baystate Medical Center, Springfield, MA; University of Texas San Antonio, San Antonio, TX

Background: The military match process for Emergency Medicine can be confusing and challenging to navigate. One can easily get lost in the maze of military jargon and service specific information. The military match impacts 1) students who join the Health Professional Scholarship Program (HPSP) or Health Services Collegiate Program (HSCP for Navy only), 2) students who attended a military service academy for undergraduate training and attend a private medical school and 3) students who attend the Uniformed Services University of the Health Sciences (USUHS). The purpose of this document is to serve as an overview of the military match process for both students and their advisors.

Educational Objectives:

1. To create a set of standard guidelines which are agreed upon and endorsed by CORD and EMRA for medical students and advisors involved in applying to the Emergency Medicine military match.
2. To identify and highlight common pitfalls that may prevent qualified military applicants from matching to a military or civilian EM spot.

Curricular Design: Five members of the CORD EM Student Advisement Taskforce met over a period of 10 months in person and over conference call. After discussion with multiple faculty members involved in military Graduate Medical Education, common areas of confusion and pitfalls were identified and a four page document of guidelines was drafted.

Impact/Effectiveness: A standard set of general guidelines for the military was created and was approved by CORD and EMRA to be widely distributed to undergraduate medical education programs and online. These will hopefully help to clarify many common questions and areas of confusion that military applicants and advisors have.

Military Emergency Medicine (EM) Residency Guide: Demystifying the Military Match and Application Process

Linda Katirji MD, Sameer Desai MD, Emily Hillman MD, Lucienne Lufty-Clayton MD, Gillian Schmitz MD

THE MILITARY BOUND MEDICAL STUDENT

The military match process for Emergency Medicine (EM) can be confusing and challenging to navigate. One can easily get lost in the maze of military jargon and service specific information. The military match impacts 1) students who join the Health Professional Scholarship Program (HPSP) or Health Services Collegiate Program (HSCP for Navy only), 2) students who attended a military service academy for undergraduate training and attend a private medical school and 3) students who attend the Uniformed Services University of the Health Sciences (USUHS). The purpose of this document is to serve as an overview of the military match process for both students and their advisors.

GENERAL OVERVIEW OF THE MILITARY SYSTEM

MSI and MSII years should be used to focus on doing well in classes, Step I and Step II. Basic officer training for HPSP students will be completed between first and second year.

The military application timeline is **much EARLIER** than civilian so it is important to be aware of the timeline early in medical school. Many students start in January of their third year setting up rotations at the military sites. The deadline for the initial application is usually in the second week of September and all final supporting documents are required no later than October 15. All applications are submitted through The Directorate of Medical Education Website known as "MODS" <http://www.mods.army.mil/MedicalEducation/>

Interviews are completed by November. It is the job of the Joint Service GME Selection board to rank and "match" everyone. They meet in late November / early December. The military match day is in December.

If you have a military obligation, you must apply to the military GME *and* the civilian match (ERAS). When you do this, there can be three different outcomes:

- a) A military residency is obtained
- b) A civilian residency is obtained, with military deferment (generally only in the Air Force)
- c) A military transitional internship is obtained

If you are selected for a military residency, you will serve as an active-duty physician. Time in residency does not count towards any service commitment.

THE MILITARY SELECTION PROCESS

Every military student **MUST** go through the formal military selection process. All medical students with a military obligation will be selected for training by their military service's Program Directors (PDs), even if the student wants to go deferred to a civilian residency.

WARNING: It doesn't matter what your medical school or civilian residency programs tell you. You could be the most competitive applicant and they could even unofficially offer you a spot to train. **HOWEVER**, if you do not speak with the PDs of the military residencies you will not be selected to train in Emergency Medicine anywhere. This includes all civilian deferments if they are offered by your branch of services. Every year, this step is missed by a few very good students who are disappointed when they do not get their choice of residency.

CIVILIAN DEFERRED SLOTS

Each year the services look at their manpower needs and then set the number of EM physicians that need to be trained. This usually remains fairly constant in the Army and the Navy, but the Air Force has been known to swing widely over the years. For example, in the Air Force, there are 20 military slots with some civilian deferred slots available. These civilian deferment slots can swing from zero to over 20 in a single year. Every year a few very good students get civilian slots by letting the PDs know their intentions up front. (Honesty is key, do not try and play the game of telling everyone that they are your number one selection. It will be found out very quickly.) In general, there are rarely civilian deferments for Emergency Medicine in the Army and Navy.

SCHEDULING INTERVIEWS

Since some military applicants will obtain military deferment and train in a civilian residency, it is important that those students also apply through the civilian match and schedule an adequate number of interviews. All residencies are aware of this issue, and understand that you will be withdrawn off their list if you match in the military.

In a perfect world, you could do civilian interviews all after military match is completed, however it could be very difficult to schedule enough interviews in that short of a time. One option is to arrange for lighter month in January and backload your civilian interviews for that time period. If you do train in a civilian residency, you will fulfill your military obligation after residency.

The interview at a military residency does not have to be face to face -- phone or Skype® are acceptable alternatives in many cases. The interview also does not mean that you must place the military residencies first on your preference ranking.

WHERE ARE THE MILITARY RESIDENCY PROGRAMS LOCATED?

- Army
 - Augusta University Medical Center (GA)
 - Fort Hood – Darnall (TX)
 - Fort Lewis – Madigan (WA)
 - Fort Sam Houston – SAMMC (TX)
- Navy
 - Navy Medical Center Portsmouth (VA)
 - Balboa (San Diego)
- Air Force
 - Fort Sam Houston – SAMMC (TX)
 - Nellis Air Force base (Civilian led) (NV)
 - Travis Air Force base (Civilian led) (CA)
 - Wright Patterson Air Force base (Civilian led) (OH)

THE POINT SYSTEM

The military uses a structured point system to rank all applicants, but the process is different for each branch of the service. When the Joint Service GME Selection board meets, each applicant is evaluated and given a point score based on success in medical school (class rank and USMLE / COMLEX scores), suitability (based on clerkships, interviews, LORs), research (more points for peer reviewed and multiple publications), and prior military service. Every military applicant will be put in an order based on their points. Based on the needs of each service, which may change drastically every year, a cut off line is set.

SUCCESS IN THE MILITARY MATCH

The Emergency Medicine military match is becoming more competitive. Success in the military match is largely based on the same things as the civilian match: course and clerkship performance, class rank, standardized testing scores, letters of recommendation, and contributing to research and extracurricular activities. Although the point system is in place, there are subjective components such as interviews and "suitability".

Much like the civilian match, if there is a particular place you hope to do your residency, you should try and schedule a 4th year clerkship there. All HPSP students should perform a rotation at a military hospital. This gives the staff a chance to get to know the potential applicants. Knowledge and interest in the military and the customs and courtesies associated with it can go a long way. Letters of recommendation and support from military physicians may carry more "weight" than civilian.

WHAT IF I DON'T MATCH?

Unfortunately due the way the match is set up, this can be a reality for some people. However, if you do not match into a military OR civilian spot, there are still options.

- a) Switch into a military residency in another field, if available
- b) Do a one year civilian or military internship (transitional PGY-1 year)

Afterwards, you may do one of the following:

- a) Reapply to for residency (with the opportunity to obtain more points)
- b) Serve as a General Medical Officer (GMO): GMOs (Flight Surgeons and Undersea Medical Officers) provide care to active-duty personnel and gain military-specific medical training. Time as a GMO fulfills active-duty service obligation and may make your application more competitive when you reapply to the residency of your choice.

BOTTOM LINE

The military match is a difficult system to navigate and many aspects of it can change from year to year and is different for each branch of the military, it is very important to find a mentor in your own who is knowledgeable about the process to help guide you. The following is a list of a few key points:

1. Focus on success during medical school following the same principles outlined in the CORD Student Advising Task Force (SATF) **EM Applicant's Frequently Asked Questions and EM Applying Guide**.
2. Start preparing early: find a mentor who is knowledgeable about the military match process to guide you. Consider reaching out to the military training programs to learn about timelines specific to their program. (Students may also sign up for a military resident mentor through EMRA. Mentorship application and information is available at <https://www.emra.org/students/mentorship>)
3. Strongly consider an EM rotation at a military hospital in addition to a civilian program.
4. It is imperative that you go through the military match and interview at the programs even if your goal is to match at a non-military program. If you do not interview with the military you will not be eligible for the civilian match.
5. Plan for civilian interviews and, when possible, schedule them for late December or January of your 4th year.

For more detailed information on military EM please [click here](#) for an expanded FAQ document created by the Government Services Chapter of the American College of Emergency Physicians (GSACEP).

44 NEXUS Introduction to Emergency Medicine Course: Resident-Taught Multi-Modality Medical Student Elective

Ben M, Trevor P /Icahn School of Medicine at Mount Sinai, New York, NY

Background: Emergency Medicine has become an increasingly popular specialty choice among US medical students. Although students may enter with a clear interest in emergency medicine, few medical schools incorporate early exposure the specialty.

Educational Objectives: We sought to establish an extracurricular medical student classroom elective covering basic concepts of emergency medicine taught by emergency medicine residents. By using residents as primary teachers, we intended to conduct the course without strain on departmental faculty resources, foster improvement in resident teaching abilities, and cultivate mentorship relations between residents and medical students.

Curricular Design: The course consisted of weekly 90 minute didactic sessions covering eight cardinal clinical presentations in emergency medicine. A different senior emergency medicine resident taught each session. The sessions were divided between tabletop interactive case discussions and brief hands-on procedural teaching covering maneuvers that a medical student might reasonably be expected to perform during medical school (i.e. operating a BVM, attaching a cardiac monitor). Additionally, residents were encouraged to teach the same topic in subsequent semesters, providing an opportunity to continually develop their presentation in response to learner feedback.

Impact/Effectiveness: Each session over two semesters was rated in three categories, each on a scale of 1 through 5, 1) educational value of session, 2) educator's teaching ability, and 3) educator as a role model. Our first semester's sessions received an average rating of 4.1, 4.2, and 4.3 respectively in the above categories, and our second semester received an average of 4.3, 4.5, and 4.5 respectively. A large number of constructive comments were also collected to guide subsequent sessions and improve upon future semesters. The course was received with overwhelming enthusiasm and we were unable to meet the demand of medical students wanting to attend sessions and residents wanting to teach sessions. With minimal

strain to the emergency medicine department or curricular adjustments of the school, we were able to establish an early presence of emergency medicine to medical students while simultaneously improving resident teaching skills.

45 Novel Cost-Effective Model to Simulate Corneal Foreign Body Removal

Lu M /University of Rochester Medical Center - Strong Memorial Hospital, Rochester, NY

Background: Corneal injury from foreign bodies (FB) is a common complaint in the emergency department (ED), but deeply embedded corneal FB are much less common and more challenging to remove. Individual resident experience with corneal FB removal is highly variable. Through simulation, ED residents can practice skills to which they may have limited clinical exposure.

Educational Objectives: To teach ED residents several techniques for removing embedded corneal FB using a novel eyeball model to mimic the feel and consistency of the human cornea.

Curricular Design: Model eyeballs (Fig. 1) were crafted with gelatin dessert (Jell-O® Jigglers recipe) poured into watercolor trays to make the rounded shape of the cornea and into baby bottle caps to represent the rest of the eye. Prior to cooling, shavings from a metal finger splint were placed into each well. The hardened “corneas” with FB were removed from the molds and easily adhered to the “globe” in the bottle caps.

Thirty ED residents participated in a 1-hour hands-on workshop. After a brief presentation on various methods for corneal FB removal (e.g. using a needle tip on a syringe or with an electric burr), residents paired up to practice these techniques with the eyeball models (Fig. 2). Faculty instructors provided direct observation and feedback. Residents were given a 3-question anonymous survey at the conclusion, soliciting prior experience with corneal FB removal, how realistic the eyeball models felt, and how helpful the session was to their training.

Impact/Effectiveness: Prior to this workshop, only one third of residents had removed more than 2 deeply embedded corneal FB. This hands-on approach with the gelatin model allowed all participants to practice until they felt more comfortable. The majority of residents found the simulated experience very realistic, and all participants

found it either very helpful or outstanding to their training.

This novel, cost-effective eyeball model is easily duplicable, portable, and can be easily utilized in large group training sessions. Each model also accommodates multiple corneal FB, giving the learner multiple opportunities to practice various techniques.

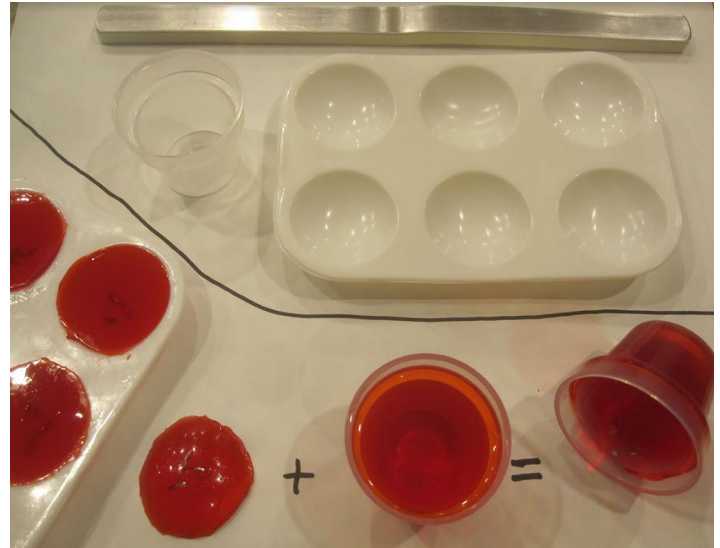


Figure 1.

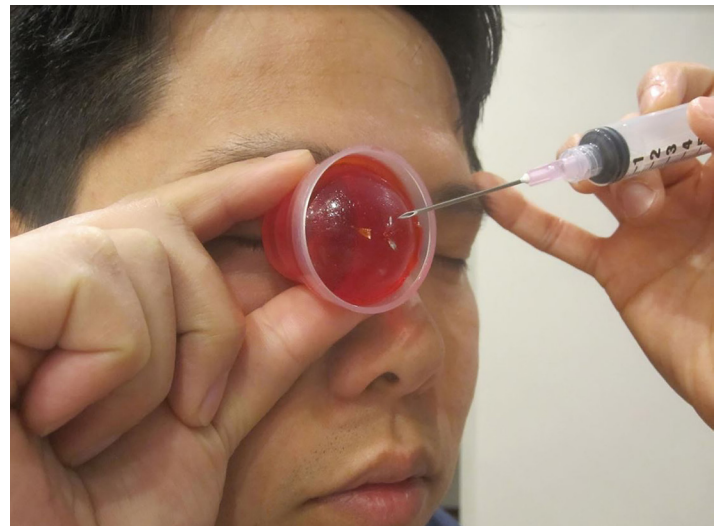


Figure 2.

46 Resident as Expert: A Novel Approach to Teaching and Practicing Quality Improvement

del Portal D, DeAngelis M, Schreyer K, Repanshek Z / Lewis Katz School of Medicine at Temple University, Philadelphia, PA

Background: Physicians are increasingly expected to participate in quality improvement. At teaching hospitals, residents constitute a valuable “brain trust.” As front-line providers, they identify operational inefficiency. As learners, they review the latest literature to inform clinical practice. Naming the resident learner as the department’s “expert” in a clinical area provides a means to harvest this “brain trust” to improve patients’ experience and outcomes. However, many residents have limited, if any, experience in conducting quality improvement.

Educational Objectives: To create a framework for residents to learn and practice quality improvement while developing an area of expertise within the broad scope of emergency medicine (EM) practice.

Curricular Design: Each of 36 EM residents in a PGY1-3 program selects a clinical area on which to focus. With a faculty advisor, the resident critically appraises the latest published literature and assesses current institutional practice. The expert identifies a need and develops a quality improvement project.

A steering committee reviews the progress of each project annually to identify barriers, opportunities, and methods of dissemination. These may include educational sessions (lectures, workshops, simulation) or updating existing protocols/guidelines.

The expert becomes the department’s “point person” for the topic area, leading discussions on rounds and presenting at resident conference. Faculty advisors support the resident experts by directing them to high quality sources of information, helping to select metrics, and sharing publication/presentation opportunities.

Impact/Effectiveness: In the pilot year (2015-2016) only PGY1-2 residents (n=24) participated, so as to develop longitudinal projects. At the end of the year, nearly 90% reported they learned about their topic. The majority felt such a program would help them professionally and help their department/institution.

We identified opportunities for clarifying expectations, as well as improving support from advisors and from the steering committee. We added flexibility with regard to topic selection and types of projects. In fewer than 18 months, the program has generated 16 new or updated clinical protocols or guidelines, and resident involvement in quality improvement has increased dramatically.

| | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | Total |
|---|-------------------|------------|-------------|--------------|----------------|-------|
| I have learned about my assigned content area by participating in the Content Expert Program (CEP). | 0.00% 0 | 4.17% 1 | 8.33% 2 | 58.33% 14 | 29.17% 7 | 24 |
| I believe the Content Expert Program will help me professionally. | 4.17% 1 | 0.00% 0 | 25.00% 6 | 41.67% 10 | 29.17% 7 | 24 |
| I believe the Content Expert Program will help my department/institution. | 0.00% 0 | 0.00% 0 | 20.83% 5 | 54.17% 13 | 25.00% 6 | 24 |

47 Role of Teaching Resident in Emergency Medicine Residency Program

Mauldin J, Mueller P /Orlando Health, Orlando, FL

Background: Medical student rotations in Emergency Medicine (EM) can be difficult for students to obtain autonomy and proficiency due to high volumes and acuity. The creation of a dedicated teaching rotation is a novel concept that enables students to have constant supervision and guidance by a senior resident while honing vital skills like obtaining H&P’s, formulating differential diagnoses and treatment plans, and performing a wide array of procedures rarely afforded in a busy Emergency Department (ED). This rotation allows the senior resident to become a teaching supervisor and ultimately introduces them to the role as a clinical educator.

Educational Objectives: Expose students to patient assessment, procedures, and emergency management of patients entering a metropolitan ED and Trauma Center under the supervision of a senior resident. Allow residents the opportunity to demonstrate level 4-5 milestone achievement in sub-competencies such as General Approach to Procedures, Airway Management, Practice-based Performance Improvement, Systems Based Practice, Wound Management and Vascular Access.

Curricular Design: Structured educational rotation with 4th year medical students working directly with 3rd year EM residents at high-volume Level 1 Trauma Adult and Pediatric ED’s. Students were scheduled fifteen 8 hour shifts during their rotation, five of which were in the pediatric ED where there was no dedicated teaching resident. Students were involved in their patients’ care throughout their ED stay from door to disposition, including all associated procedures. They were also involved in interesting educational cases that were in the ED during their shift (trauma alerts, medical codes, etc.). Students and residents completed surveys via free text response and online ranking (1-9) respectively at the end of the rotation.

Impact/Effectiveness: At the end of their rotation, each student was asked to complete a free response survey including the best/worst aspects of their rotation. From 08/12-10/16, a total of the 214 students submitted surveys. Of these students, 140/306 (46%) of responses found the teaching resident as the best aspect of the rotation. 51/241 (21%) responses listed “Nothing/ Not Applicable” as the

worst aspect. During the same time period, residents found the quality of the rotation to be “Excellent” based on an average of 7.83/9. Refer to tables for specific breakdown.

| Retrospective Review of Rotating Student Post-Rotation Survey 8/2012-10/2016 | | | | |
|--|---------------------------------|-----------------------------|--------------------------------------|-----------------------------|
| | Top 10 Best Aspects | Number of responses (N=306) | Top 10 Worst Aspects | Number of responses (N=241) |
| 1 | Teaching Resident | 140 (46%) | Nothing/ Not Applicable | 51 (21%) |
| 2 | Faculty/ Staff/ Residents | 43 (14%) | No Teaching Resident at Pediatric ED | 47 (19.5%) |
| 3 | Procedures | 38 (12%) | Too Many Students on a Shift | 29 (12%) |
| 4 | SIM/ US/ Procedure Labs | 17 (5.6%) | Pediatric ED Shifts | 25 (10.4%) |
| 5 | Patient Variety/ Pathology | 15 (4.9%) | Limited Night/ Weekend Shifts | 15 (6.2%) |
| 6 | Conference/ Journal Club | 14 (4.6%) | Conferences | 12 (5%) |
| 7 | Autonomy/ Ownership of Patients | 13 (4.2%) | Not Enough Patients | 11 (4.6%) |
| 8 | Pediatric ED | 11 (3.6%) | Schedule/ Shift Turnaround | 8 (3.3%) |
| 9 | Trauma Exposure | 4 (1.3%) | Limited Attending Interaction | 8 (3.3%) |
| 10 | Learning Environment | 2 (0.65%) | Presenting to Multiple Attendings | 5 (2.1%) |

| Resident Responses to “Evaluate Quality of Clinical Experience” for Teaching Rotation | | | |
|---|---------------------|-----------------------|------------------------|
| | Number of Responses | Period of Evaluations | Average Response (1-9) |
| | 7 | 7/1/12-6/30/13 | 8.43 |
| | 14 | 7/1/13-6/30/14 | 7.93 |
| | 12 | 7/1/14-6/30/15 | 7.27 |
| | 13 | 7/1/15-6/26/16 | 7.77 |
| | 6 | 6/27/16-7/2/17 | 8.33 |
| Total | 52 | - | 7.85 |

to assess a single EPA using simulated patients. This is time and resource intensive.

Small-Group Shift (SGS) consists of 4-6 students and one faculty facilitator. Each patient interaction is directly observed by the facilitator. Then follows a discussion of differential diagnosis, plan and identification as sick or not-sick. The student then enters orders and a note including a pertinent literature reference. Meanwhile the next student’s patient interaction is observed. The cycle continues until all students have seen a patient. Each student presents his case to the group. At the end, each student is observed transitioning care to the next provider.

Evaluation categories for EPA 1-10 are “Entrustable”, “Pre-entrustable”, or “Remediation”.

Several limitations were encountered. Students are idle until they see their first patient. Space is needed within the ED to allow group discussion. Assessing transition of care is not always possible if the patient has been discharged.

Impact/Effectiveness: 48% of students (n=27) felt SGS exceeded expectations and 48% felt it met expectations. 74% of students felt the facilitator’s teaching skills exceeded expectations.

Positive themes from student feedback included a sense of autonomy, real-time feedback on plans and learning from peers during case discussions. Downtime was noted as a negative.

The SGS is the first method described allowing one faculty member to assess multiple students simultaneously on most EPA using real patients. The SGS offers a time- and cost-effective method of evaluating a large number of students.

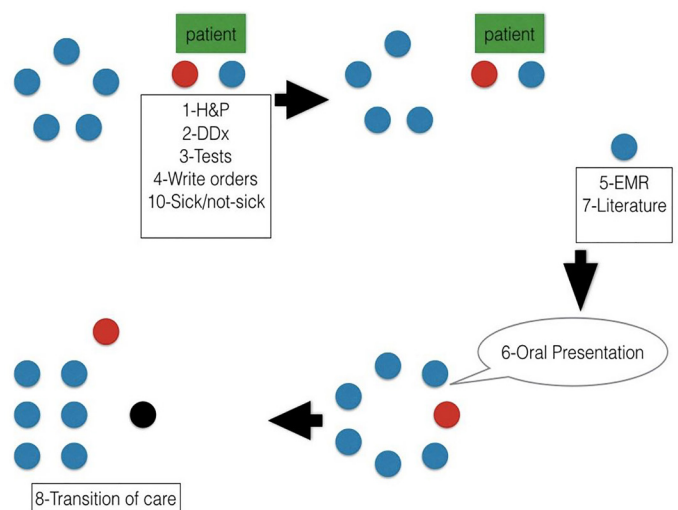
48 Small-Group Shift for Assessment of Entrustable Professional Activities in an EM Clerkship

Kiemeney M, Matthews S, Dudas R, Mainville D, Wickes J, Smith D, Young T, Phan T, Daniel-Underwood L /Loma Linda University School of Medicine, Loma Linda, CA

Background: Entrustable professional activities (EPA) have gained acceptance in UME to assess readiness to transition from medical student to intern. The best method for evaluating students within the EPA context has not been identified. Many of the EPA can be routinely evaluated in a single ED shift.

Educational Objectives: The goal is to evaluate fourth year medical student’s proficiency in EPA 1-10 during an ED shift.

Curricular Design: Many methods have been described



Loma Linda University Emergency Medicine
Small-Group Shift Assessment Tool

Student: _____ Evaluator: _____
Date: _____ Chief Complaint: _____

| Expected Level: | Entrustable "Intern" | Pre-Entrustable/Pro- gressing "MS4" | Critical Error/Requires Remediation "MS3" |
|--------------------------------|-------------------------|---|---|
| Focused H&P | | | |
| Prioritized DDX | | | |
| Recommend/Interpret Tests | | | |
| Write orders and rx | | | |
| EMR Documentation | | | |
| Oral communication | | | |
| Use of literature | | | |
| Sign-out/Transition of care | | | |
| Interprofessional teamwork | | | |
| Sick/not-sick | | | |

Comments:

49 Staggering Transitions of Care to Provide Supervised Signouts

Choudhri T, Roche C /The George Washington University, Washington DC

Background: The CLER Pathways of Excellence clearly defines certain basic principles of care transitions which include resident education and engagement in the process, in addition to faculty engagement and assessment of the hand-off process. In a review of our own sign-out processes, we ascertained that our program is not incorporating all of these ideologies and by instituting some rudimentary changes, we could immensely impact care transition education and subsequently provide superior patient care.

Educational Objectives: To create a clinical environment in an otherwise busy Emergency Department conducive to protected and supervised care transitions while allowing for patient care and flow to continue in an unobstructed and safe fashion.

Curricular Design: Shift times were staggered throughout the day to allow for attending-supervised care transitions and protected time for directed education. Our resident services that previously all transitioned independently at 7AM and every 8 hours thereafter, now transition at 6AM, 7AM and 8AM and continue that

staggering for the remainder of the day. For the 30 minutes before and after sign-out, the residents are also protected from new patients to allow for time to give and receive sign-out without additional clinical pressures that often portend to errors and substandard care. At each resident sign-out time, an attending is present to both supervise and provide real-time training on transitions of care. Attendings also have the opportunity to evaluate the residents on their ability to transition care, provide teaching points and give feedback. Furthermore, to aid in an interprofessional approach to care transitions, hand-off times are announced to the department allowing for nursing involvement.

Impact/Effectiveness: By creating a system where residents were supervised in their care transitions and concurrently not overwhelmed by increasing clinical demands, we found that the safety and care of our patients improved significantly by ensuring smooth transitions and minimizing miscommunication. Qualitative resident feedback showed that having an attending present at sign-out times provided valuable education. Feedback from our faculty exposed that supervising resident sign-outs gave them a unique perspective on our residents' ability to provide an effective sign-out, and new teaching goals directed toward this quality initiative. This can easily be implemented in any ED. With the simple action of reorganizing schedules to allow for attending presence at sign-outs, residents can be observed and taught appropriate behaviors that should take place during this time and adapt such practices from the start of their training. This will work to enhance both the clinical working environment and patient care

50 Storytelling: A Novel Wellness Initiative for Emergency Medicine Residents

Paetow G, Schiller J, Chung A, Hart D/ Hennepin County Medical Center, Minneapolis, MN; Maimonides Medical Center, Brooklyn, NY; Mount Sinai Emergency Medicine, New York, NY

Background: Storytelling (ST) can help physicians reflect on their practice, cultivate a sense of empathy, and develop a support network of trusted colleagues. Additionally, sharing experiences through ST or narratives can decrease emotional exhaustion, an important component of burnout. Despite these benefits of ST for resident wellness, Emergency Medicine (EM) residents rarely get an opportunity to share their experiences with others in structured residency supported settings.

Educational Objectives: We sought to create a forum for EM residents to share stories about the human side of medicine, in order to promote empathy, reflection, and develop a greater sense of community.

Curricular Design: We planned an off-campus, 2 hour "open microphone" night for residents and faculty to share their experiences at two separate EM residency programs.

Participants could prepare stories ahead of time, although this was not mandatory for attendance, and all participants were encouraged to tell a story. Large and small group formats were both utilized, based on venue and hosting institution. Themes ranged from emotionally devastating patient encounters to hilarious pearls and pitfalls of a long career in EM. When small groups were utilized, session facilitators were also tasked with weaving in discussions of how to deal with feelings of emotional exhaustion, depersonalization, compassion fatigue, medical errors, second victim syndrome, and other stressors.

Impact/Effectiveness: The post-event surveys revealed that 97% of responders (n=33) felt the event was worthwhile and they would be “extremely likely” (n=21) or “very likely” (n=11) to attend future sessions. They felt the optimal frequency of these events would be every 3-6 months. Themes from open-ended resident feedback included 1) the positive nature of the open, honest, safe, and supportive environment for discussion, 2) the camaraderie and relationships developed between residents and faculty, and 3) that the discussion can help individuals process the complex emotions associated with difficult situations. Given the overwhelming success of this ST program and the minimal budget and logistics required, this wellness initiative could easily be replicated at other programs to promote reflective practice, empathy, and a sense of community.

51 The Flipped Classroom in Medical Student Education: Does “Priming” Work?

Rose E, Jhun P, Baluzy M, Wagner J, Hauck A, Huang J, Kearl YL, Behar S, Claudius I /Los Angeles County + USC Medical Center, Los Angeles, CA

Background: Annually, approximately 160 fourth year medical students rotate in the general emergency medicine rotation at Los Angeles County + University of Southern California medical center. Weekly case-based interactive teaching sessions are facilitated by the faculty on pediatric fever and shortness of breath (SOB).

Educational Objectives: This educational innovation sought to evaluate if in-class learning could be enhanced by “priming” the students with educational online videos prior to the in-class session.

Curricular Design: Twenty minutes of video on the topics of pediatric fever or SOB (bronchiolitis and laryngotracheobronchitis) were recorded by pediatric emergency medicine faculty. Students rotating in 2015 -2016 were randomly assigned to either the fever or shortness of breath (SOB) group. All participating students took a pre-test prior to viewing the online lectures. Those in the fever group then received lecture links to two fever videos and those in the SOB group received links to two videos on

SOB topics to view. They then attended an in-class didactic session on both fever and SOB, followed by an immediate post-test. A delayed post-test was administered at the end of the rotation. To equalize the amount of material distributed, students were given a transcript of the video lectures not assigned at the in-class session. For analysis, test scores were placed into concordant groups (test results on fever questions in the group assigned the fever video and test results on SOB questions in the group assigned the SOB video) and discordant groups (crossover between video assigned and topic tested). Each subject contributed one set of concordant results and one set of discordant results. Descriptive statistics were performed with the Mann-Whitney U test.

Impact/Effectiveness: During nine months of data collection, 126 students were on rotation. Sixty-eight percent of students volunteered to participate in the study (n=86). In the analysis of concordant scores, the pre-test averaged 56.7% correct, the immediate post-test averaged 77.95% correct, and the delayed post-test was 67.18%. In the discordant groups, the pretest averaged 51.89%, the immediate posttest was 66.5% and the delayed by 69.78%. In the concordant groups, the immediate post-test scores improved by 21.3 percent, compared with only 14.8% in the discordant groups. (p = 0.565).

Conclusions: Priming the students for the educational experience enhances immediate learning but may not result in retained knowledge on the respective topic.

52 The Quadruple Threat Emergency Medicine Clerkship Curriculum

Pelletier-Bui A /Cooper Medical School of Rowan University, Camden, NJ

Background: The unique quadruple threat EM clerkship curriculum developed at Cooper Medical School of Rowan University uses a combination of asynchronous and synchronous learning to meet the important educational need of covering core EM concepts in multiple different learning formats. Many EM clerkships promote the use of FOAMed and SIM as adjuncts to their curriculums. However, we are unaware of any EM curriculums that have used home-grown interactive online lectures as a primary method of didactics in combination with weekly team-based SIM cases, oral board cases, and procedure labs to reinforce the same material.

Educational Objectives: By utilizing four different education modalities through both asynchronous and synchronous learning, we hope to reach each different type of learner and provide a fun yet educational way to solidify the core topics in EM.

Curricular Design: Powerpoint® lectures from previous years were revamped into an interactive 30-40 min

online format using Articulate Software®. Students review 3-4 online lectures each week (total of 10 lectures) on their own time for the first 3 weeks of their rotation. Lectures are grouped into themes as much as possible for each week (for example, Altered Mental Status, Headache, Toxicology & Trauma). At the end of each week, students are quizzed on the material and participate in a lab consisting of a team-based SIM session, an oral board case, and a procedure lab covering the same material from the online lectures. An end of rotation test assesses mastery of information.

Impact/Effectiveness: All students rotating in our emergency department (n=73) from July 2015 to October 2016 rated their preference for the new curriculum compared to a traditional curriculum from 1 (strongly preferring traditional) to 9 (strongly preferring new). Average ratings were 8.0, 8.4, 8.1, and 8.3 for interactive lectures, SIM cases, oral board cases, and procedure labs respectively. The mean end of rotation test scores for students engaged in our new curriculum are comparable to the mean test scores from past years during which the same home-grown exam, but a more traditional curriculum, was used. Our new quadruple threat EM clerkship curriculum seems to be an equally effective, yet preferable method to teaching the core concepts in EM compared to a traditional curriculum.

53 Using a Case-Based Blog to Supplement Emergency Medicine Education: One Residency's Experience

Love J, Mamtani M, Conlon L, DeRoos F, Zeidan A / Perelman School of Medicine at the University of Pennsylvania, Department of Emergency Medicine, Philadelphia, PA

Background: Emergency medicine (EM) resident education has embraced social media and web-based resources as critical teaching tools. While these resources provide a wealth of EM information, we hypothesized that more institution-specific, case-based online learning would enhance our EM resident education. Because our residents care for patients at both a highly-specialized quaternary-care hospital and community EDs, we selected topics beyond the typical scope of EM for additional instruction. In order to increase learner engagement, a case-based residency blog was developed.

Educational Objectives: 1) To provide continuous case-based education to EM residents, and 2) to promote resident engagement through online, case-based learning.

Curricular Design: The University of Pennsylvania's EM residency website (PennEM.com) had a pre-existing blog feature through WordPress, a free web-based site. Blog case entries were password protected and accessible only to emergency medicine residents. Cases were submitted by

residents and selected by the blog editor. Cases included diagnosis and treatment questions for residents to answer. Cases were posted at least monthly and tagged by category. Posts were announced via email, and residents were rewarded for correct answers with points redeemable for a small gift card.

Impact/Effectiveness: Since beginning the case-based blog initiative on March 8, 2016, the PennEM.com blog page was viewed 622 times. 15 cases were posted over 9 months on ultrasound, toxicology, critical care and clinical EM. The average number of emailed answers was 3.9 (range: 1-8). The average number of views on the case's first post date was 20 (range: 4-40 views). The top three most-viewed posts were two clinical cases (40 views, 35 views) and an ultrasound case (32 views). The top three most-answered posts were a toxicology case (8 responses) and two clinical cases (6 responses each). The data suggests that while residents may not participate in case competition, they view blog cases to supplement their EM education. Additionally, the trend towards increasing resident email participation supports increased resident engagement.

54 Utility of Alumni and Resident Survey in Curriculum Evaluation: Resident Perception and Alumni Perspective

Won C, Yang L, Jiang L, Fortenko A, Waight G, , Sayan O /New York Presbyterian Hospital, New York, NY

Background: In preparation for the Annual Program Evaluation, the Program Evaluation Committee (PEC) conducts an annual alumni survey, asking graduates about the residency's curriculum and how well it prepared them for their careers as Emergency Medicine attending physicians. These results, in conjunction with resident feedback, are used to enhance the clinical rotations and didactic components of our residency to maximize the residency experience.

Educational Objectives: We created a survey for our alumni and residents to obtain information about their current perception of their residency training and preparedness for clinical practice. Our goals included:

1. identifying potential deficiencies in clinical practices,
2. comparing current resident perception with that of alumni, and
3. establishing longitudinal feedback to ensure that our curricular interventions had an impact on our graduates skills.

Curricular Design: Utilizing Google Forms, we surveyed our residency alumni and current residents by email. We inquired about our residency training in the areas of Burn, Critical Care, Education, Neurology,

Obstetrics/Gynecology, Ophthalmology, Orthopedics, Otorhinolaryngology (ENT), Pediatrics, Psychiatry, Toxicology, Trauma, Urgent Care/Fast Track, and Research.

Impact/Effectiveness: Based on the feedback from our alumni and current residents, the PEC has made adjustments to our curriculum including the elimination of our inpatient medicine rotation, the inclusion of ENT and Orthopedic morning report didactic sessions, and evidence-based medicine lectures. We will continue this work longitudinally to ensure that our curricular changes make a difference in our graduates' assessment of their preparedness. We will continue to dynamically adapt our curriculum based on current resident and alumni feedback in an attempt to meet their needs in their future Emergency Medicine careers.

55 We are Being Interviewed too: Faculty Development on How to Find and Attract The Best Resident for Your Program

Choudhri T, Roche C /The George Washington University, Washington DC

Background: With the field of Emergency Medicine growing increasingly more competitive and the numbers of applicants on the rise, our recruitment efforts need to be tailored specifically toward those students who we feel will be a good 'fit' for our programs. As we attempt to find that ideal candidate, the candidates themselves are looking for the program that passes the 'gut' check. Whereas interviews have traditionally been viewed as where applicants need to impress, changing the rhetoric to understand that the applicants are interviewing us as well is important to recruiting those best suited for our individualized programs. We found that the style and approach our faculty had toward interviewing varied greatly among the various members of our department, thus sending differing messages among applicants. Educating faculty and designing a structured and polished interview process for your faculty to follow is integral in creating a marketable interview day.

Educational Objectives: 1. Conduct a survey of the faculty and the residents to determine the key tenants and mission of our program that makes our program unique 2. Design an interview day that highlights those ideals of our individual program 3. Conduct a formal faculty development session to educate the faculty on the residency program and the interview process 4. Conduct repeat informal faculty development sessions throughout the interview season to ensure quality and standardization of the interview process.

Curricular Design: Months prior to the start of interview season, residency leadership conducted a survey of faculty and residents to determine what our department held as the important ideals and tenants of our program; namely, what makes our program unique. Utilizing that information,

residency leadership designed an interview day that highlighted those key components and created documents to assist faculty in the interview process. Understanding that not all members of the faculty are abreast of the day-to-day operations and details of the program, a series of information sheets and FAQs were created in order to assist faculty with their interviews. A formal faculty development session was held to educate the faculty and give tips on how to interview, what types of applicants to look for, and how to answer questions. Finally, throughout the interview season informal education was given through both written and verbal modalities to keep all faculty up-to-date and sharp with their interview skills.

Impact/Effectiveness: After this new interview process was implemented, faculty were polled to ascertain the effectiveness of this process. Qualitatively, faculty were satisfied with the additional development sessions and felt more prepared for their interviews. Residency leadership also noted a distinct change in the faculty's ability to critically assess an applicant. Each of our programs are unique in their own right, and tailoring a day to highlight those individualized aims helps us attract residents who will be the most successful in our programs. Understanding that the interview day is just as important for the department as it is for the applicant, guides us to identify those residents who are the best fit for our program, and in turn which programs are the best fit for them.

Best of the Best Oral Presentations

1 Inter-Rater Reliability of Select Emergency Medicine Milestones in Simulation

Wittels K, Abboud M, Chang Y, Sheng A, Takayesu J/ Brigham and Women's Hospital/Massachusetts General Hospital, Boston, MA

Background: In 2012, the ACGME established the Milestones in emergency medicine (EM) training to provide competency-based benchmarks for residency training. Small observational studies have shown variable correlation between faculty assessment and resident self-assessment.

Objectives: Using a simulation clinical scenario, we sought to determine (1) the correlation between resident self-assessment and faculty assessment of clinical competency using selected Milestones; and (2) the inter-rater reliability between EM faculty using both Milestone scoring and a critical actions checklist.

Methods: This is an observational study in which second-year EM residents at an urban academic medical center were assessed with two simulation cases focusing on management of cardiogenic shock and sepsis. Twenty-three residents completed both cases; they were assessed by two EM faculty in eight select Milestones (scored 1-5, increments of 0.5) and with a checklist of critical actions to

perform (scored 0 or 1). Intra-class correlation coefficients (ICC) were used to compare Milestone scoring between faculty and to assess correlation between resident self-assessment and faculty scoring. Faculty checklist inter-observer agreement was assessed using kappa statistics. Correlation between Milestone achievement and checklist performance were assessed using Spearman and Pearson correlation coefficients.

Results: The ICCs for inter-rater agreement between faculty for Milestone level were 0.12 and 0.15 for the cardiogenic shock and sepsis cases, respectively. The ICC comparing resident self-assessment with the average of faculty Milestone level scoring for each case was 0.00. The inter-rater agreement on checklist items for the cardiogenic shock and sepsis cases had kappa coefficients of 0.83 and 0.78, respectively. Pearson and Spearman correlation coefficients comparing Milestone scoring and checklist items in the cardiogenic shock case were 0.27 and 0.29; in the sepsis case, 0.085 and -0.021.

Conclusions: When compared to critical action checklists, use of Milestones lacks consistency between faculty raters for simulation-based competency assessment. Resident self-assessment shows no correlation with faculty assessments.

2 Proceedings from the CDEM Consensus Conference on Clinical Assessment of Medical Students in the ED: Introducing the NCAT-EM

Hiller K, Franzen D, Jung J, Lawson L /University of Arizona, Tucson, AZ; University of Washington, Seattle, WA; Johns Hopkins University, Baltimore, MD; East Carolina University, Greenville, NC,

Background: Clinical assessment of medical students in the Emergency Department (ED) is a highly variable process with unique challenges. Currently, clerkship directors use institution-specific tools with unproven validity and reliability. Standardization of assessment practices and development of a common tool would benefit EM educators, students and patients.

Educational Objectives: The objective of the consensus conference was to derive guidelines and a common tool for clinical assessment of students in the ED.

Curricular Design: The conference was held in the CDEM track of the 2016 Council of Residency Directors in Emergency Medicine (CORD) Academic Assembly in Nashville, TN. All stakeholders in the clinical assessment process were invited. A total of 140 participants registered; approximately 60 participated in the first day and 70 in the second day of the conference. Themes underlying assessment, domains to include, and the structure of a national tool were discussed and voted

on. These were (1) criterion- vs norm-referenced assessment, (2) learners at different levels, (3) translation of clinical assessment data into other products, (4) implementation and use of a national form, and (5) ensuring post-implementation reliability and validity. The second day of the conference determined consensus on domains of assessment to include on a national assessment form. For all questions not reaching consensus, a modified Delphi process was initiated after the conference to reconcile differences. The first day of the consensus conference was dedicated to developing consensus on high stakes themes. The second day of the conference and subsequent Delphi determined consensus on domains of assessment to include on a national assessment form. Once the domains were finalized, Delphi participants were invited to participate in three conference calls during which wording for the tool was finalized. (Figures 1 and 2).

Impact/Effectiveness: This consensus conference was the first of its kind for CDEM, or any clinical educator group of which we are aware. By standardizing assessment, educators can move toward more valid and reliable practices that facilitate high quality feedback and permit accurate assessment across multiple institutions. Future plans include pilot testing and further refinement of the new tool, research regarding its feasibility, reliability across users and institutions, and validity.

Clerkship Directors in Emergency Medicine National Clinical Assessment Tool

| Student Name: | | Date: | | |
|---|---|--|---|---|
| Assessor Name: | | Shift/Unit: | | |
| | Pre-Entrustable | Mostly Entrustable | Fully Entrustable/ Milestone 1 | Outstanding/ Milestone 2 |
| Focused history and physical exam skills | Extraneous or insufficient information. May miss key physical findings or examine incorrectly. | Generally adequate information. Exam mostly adequate and correct. May not differentiate important from extraneous detail. | Appropriate information for clinical context. Exam complete and appropriately tailored. May include excess detail, but thorough and accurate. | Exceptional focused H&P, exams all relevant information. Addresses chief complaint and urgent issues. Differentiates important from extraneous detail. |
| <input type="checkbox"/> Unable to assess | | | | |
| Ability to generate a prioritized differential diagnosis | Limited ability to filter, prioritize, and connect information to generate a basic differential based on clinical data and medical knowledge. | Generally able to filter and connect information to generate a basic differential based on clinical data and medical knowledge. Beginning to incorporate data and prioritize. | Reliably synthesizes data into a complete differential. Incorporates data. Prioritizes differential by likelihood. | Demonstrates exceptional differential diagnosis and data interpretation. Uses all available information to develop a prioritized differential focusing on life/threats. |
| <input type="checkbox"/> Unable to assess | | | | |
| Ability to formulate plan (diagnostic, therapeutic, disposition) | Difficulty applying knowledge to formulate plans, or does not offer plan. | Usually able to apply knowledge to formulate plans, though plans may be incomplete/incorrect in some details. | Reliably able to apply knowledge to formulate plans that are complete, appropriate, and tailored to patient needs/wishes. | Exceptional ability to apply knowledge to formulate outstanding patient-centered plans. |
| <input type="checkbox"/> Unable to assess | | | | |
| Observation, monitoring and follow-up | May not re-evaluate patients or follow up results in a timely fashion. | Usually re-evaluates patients and follows up results, though may need prompting. Beginning to integrate new data into ongoing plan. | Reliably re-evaluates patients and follows up results in a timely manner without prompting. Integrates basic data into ongoing plan, though may need help. Completes tasks despite distraction. | Exceptional re-evaluation and follow up skills. Proactive. Integrates complex results into ongoing plan. Able to handle multiple patients simultaneously. |
| <input type="checkbox"/> Unable to assess | | | | |
| Emergency recognition and management | May not recognize or respond to abnormal vital signs or patient deterioration. Delays or fails to seek help. Unable to recommend stabilization interventions. | Recognizes and responds to most abnormal vital signs and trends, but may miss subtle changes. Promptly seeks help. Recommends and/or initiates some basic stabilization interventions. | Reliably recognizes and responds to all vital sign abnormalities and trends. Promptly seeks help. Recommends and/or initiates all basic and some advanced stabilization interventions. | Exceptionally attentive to vital sign abnormalities and patient deterioration. Promptly seeks help. Recommends and/or initiates basic and advanced interventions appropriately. |
| <input type="checkbox"/> Unable to assess | | | | |

| | Pre-Entrustable | Mostly Entrustable | Fully Entrustable/ Milestone 1 | Outstanding/ Milestone 2 |
|---|---|---|---|---|
| Patient- and team-centered communication □ Unable to assess | Communication with patients and/or team is unidirectional or not tailored to circumstances. May not read or respond to others' emotions well. May not always attend to patient comfort or preferences. May not always integrate well into team, may not recognize value of team contributors. | Communication with patients and/or team is bidirectional and usually tailored to circumstances. Generally reads and responds to others' emotions well. Usually attentive to patient comfort and preferences. Usually integrates well into team, may not fully understand team roles or contributions. | Communication with patients and/or team is bidirectional and reliably tailored to circumstances. Skillful in reading and responding to others' emotions. Reliably sensitive to patient perspective and preferences. Integrates well into team and recognizes value of team members. | Demonstrates exceptional communication skills with patients and/or team. Effectively reads and regulates complex emotional situations and conflicts. Always sensitive to patient perspective. Highly regarded by patients and team. |

| Professionalism: Specific Attribute/Behavior | Concerns? | | Please describe specific behaviors observed |
|--|-----------|----|---|
| | Yes | No | |
| Compassion, sensitivity, or respect towards patients | | | |
| Respect or collegiality towards team members | | | |
| Receptivity to constructive feedback | | | |
| Honesty or ethical conduct | | | |
| Dependability, accountability, or responsibility | | | |
| Initiative, diligence, or work ethic | | | |
| Punctuality, attendance, or preparation for duty | | | |
| Appropriate dress or grooming | | | |
| Other (please describe) | | | |

Global assessment: compared to other students with a similar level of experience, this student's performance today was:

| | | | |
|-----------|------------|---------|-----------------------|
| Lower 1/3 | Middle 1/3 | Top 1/3 | Exceptional (top 10%) |
|-----------|------------|---------|-----------------------|

Please comment on this student's performance today:

3 ROAR: Resident Ovation and Appreciation Rewards, on the Path to Wellness in Emergency Medicine

Rainey J, Klyce V, Neugarten C, Chien J, Williams S, Fukumoto K, Mahadevan S/Stanford/Kaiser Emergency Medicine Residency Program, Stanford, CA; El Camino Hospital, Mountain View, CA

Background: Residency is challenging: physically, emotionally, and mentally. Numerous studies cite burnout rates amongst residents as high as 76%. Research also demonstrates that physicians who are primed to feel emotionally positive are more effective, ultimately providing higher-quality patient care. With this goal in mind, development of a wellness curriculum for residents could potentially mitigate burnout during training, promote practices that build personal and professional resiliency, and lead to a long and fulfilling career.

Educational Objectives: Drawing on research recognizing the benefits of expressing gratitude, we have developed the Resident Ovation and Appreciation Rewards, or "ROAR," pilot program. We devised a system of routine resident recognition by peers, attendings and other ED staff for the, "small but meaningful" things we do every day that often go unrecognized. Our goal was to support the development of a culture of gratitude within our department in our efforts to improve wellness.

Curricular Design: Prior to implementing the ROAR

program, we administered an anonymous 5-point survey to our PGY 1-3 EM residents to obtain baseline data on their sense of wellness. We then re-surveyed these same residents at 6-months and 1 year to evaluate the impact of ROAR.

We placed blank ROAR forms throughout our department and also created a web-based version of the form. Completed forms were collated, tabulated and presented to the individual residents each month. For each ROAR written or received, residents earned credits for domestic services, such as meal delivery and home cleaning.

Impact/Effectiveness: The departmental response to ROAR has been tremendous, as approximately 370 ROARs have been written in the first year of the program. Our preliminary survey results, based on two classes of residents, reveal a 9.7% improvement in self-reported overall wellness scores from pre-ROAR to 1-year post-intervention. Surveyed residents also noted an 8.3% increase in the positive effect of ROARs compared to their initial expectations. Based on the preliminary results, we plan to continue this program as well as explore other similar well-being initiatives.

Curricular Innovations Oral Presentations

1 Cricothyrotomy: An Inexpensive Training Model

Malik E, Deutchman M /University of Colorado School of Medicine, Anschutz Medical Campus, Aurora, CO

Background: Cricothyrotomy is a rarely used procedure that requires operator competence in critical situations. Trainees are rarely exposed to this procedure in the clinical setting, which necessitates simulated practice to prevent a potentially negative impact on patient care. Tightening residency budgets often make the use of expensive, commercially-available models cost-prohibitive. Here, we present a re-usable, inexpensive task trainer to address this gap in medical training.

Educational Objectives:

- To present an inexpensive task trainer for the education and practice of cricothyrotomy
- To compare the effectiveness of teaching with this constructed model against sheep trachea

Curricular Design: Ten task trainers were constructed from a Styrofoam head, ribbed garden hose with a cut hole for the cricothyroid space, electrical tape as the cricothyroid membrane, zip-ties to signify the laryngeal prominence and cricoid cartilage, and foam sheets with Tegaderm to represent the subcutaneous layers (Fig. 1). Twenty second-year medical students were given a 10 minute lecture on the standard, surgical cricothyrotomy and then randomly divided into two groups for practice on either the constructed model or the sheep trachea. After 10-15 minutes of practice, students were given a pristine airway of the same model type and evaluated on their ability to correctly perform a cricothyrotomy using a procedural checklist.

Impact/Effectiveness: There was no significant difference in trainee scores on the procedural checklist using the constructed model (mean 18.5; SD 1.6) compared to the animal model (mean 18.0; SD 2.9) ($p = 0.64$) (Fig. 2). Students completed the procedure faster on the constructed model (mean 84.1 s; SD 17.8 s) than on the sheep trachea (mean 117.5 s; SD 54.3 s) ($p = 0.038$). These results suggest that learning the procedural steps of cricothyrotomy on our model is equivalent to learning on animal tissue. Students' ability to complete the steps more quickly on the constructed model may be due the lack of subcutaneous tissue to dissect, simplifying the anatomy. Our model allows trainees to perform many iterations of a cricothyrotomy without the expense or difficulties in procurement and storage with animal or commercially available models. Overall, this model addresses the need for increased access to cheap, hands-on practice of cricothyrotomy for medical trainees.



| Procedural Step | Constructed Model | Sheep Trachea | p value |
|---|-------------------|-------------------|-------------|
| 1. Correctly identifies cricothyroid membrane | 2.0 (0.0) | 1.9 (0.3) | 1.00 |
| 2. Vertical, midline incision, 3-5 cm, stabilized larynx | 2.0 (0.0) | 2.0 (0.0) | 1.00 |
| 3. Bluntly dissects to expose cricothyroid membrane | 1.8 (0.6) | 1.8 (0.6) | 1.00 |
| 4. Horizontal, 1-2 cm incision in membrane | 1.9 (0.3) | 1.9 (0.3) | 1.00 |
| 5. Index finger of non-dominant hand guards opening | 1.6 (0.8) | 1.6 (0.7) | 0.58 |
| 6. Spreads membrane vertically with clamp | 1.9 (0.3) | 1.6 (0.8) | 0.47 |
| 7. Rotates clamp 90 degrees | 1.8 (0.6) | 1.5 (0.8) | 0.58 |
| 8. Inserts and twists endotracheal tube into place | 2.0 (0.0) | 1.9 (0.3) | 1.00 |
| 9. Blows up cuff with 10 mL syringe | 1.8 (0.6) | 2.0 (0.0) | 1.00 |
| 10. Verbalizes connecting to ventilator, checks CO ₂ | 1.7 (0.7) | 1.8 (0.6) | 1.00 |
| Total scores | 18.5 (1.6) | 18.0 (2.9) | 0.64 |

Figure 2. Comparison of the trainee performance on the constructed model vs sheep trachea on the procedural checklist. The p value was determined using Fisher's exact test. Data are expressed as mean (SD).

2 Incorporating an Interesting Case Discussion Board into an Emergency Medicine Clerkship

Wald D, Fane K, Barrett J/Lewis Katz School of Medicine, Philadelphia, PA

Background: With shift work scheduling and students being assigned to geographically separate training sites, student - student collegial interaction is limited. Asynchronous discussion boards may help to address this and allow for more comparable educational experiences across clinical training sites.

Educational Objectives: Our goal was to incorporate an asynchronous "Interesting Case" discussion board into a 4th year EM clerkship for students rotating at geographically separate training sites.

Curricular Design: Using Blackboard Learning Management System, a student initiated "Interesting Case" discussion board was developed. Guidelines including expectations for participation were reviewed during the clerkship orientation. The discussion board allows students working different shifts and assigned to separate training sites to interact by creating case threads and replying to posts about cases encountered during their EM clerkship. A post clerkship evaluation was administered.

Impact/Effectiveness: From May - September 2016, 83 students at 8 clinical training sites participated in the "Interesting Case" discussion board. Students initiated 126 separate threads, 501 total posts. The mean # of threads per rotation was 25 (range 19-29), mean posts per rotation was 100 (range 65 - 159). 131 posts included references or hyperlinks, 49 PDF's, 44 radiographic images, 16 photographs and 15 EKG's. More than one third (37.3%) of threads had 5 or more posts. 63 students (75.9%, n=83) completed post clerkship evaluations. Most students (82.5%) favorably viewed our discussion board. Only 8 students (12.7%) report previously participating in a discussion board for medical education purposes. The majority, 55.6% reviewed the discussion board every few days, 22.2% reviewed it weekly. 63.5% of students spent 1-3 hours each week on the discussion board. 77.8 % of students report learning something from participation in the discussion board that they were able to directly apply to patient care during their rotation. 79.4% of students report reviewing articles or linking to websites that were posted. In the first 5 months of use, the discussion board was well received, improved collegial interactions and generated many interesting conversations.

3 Student Creation of Social-Media Based Teaching Tools as a Required Component of a Fourth Year Emergency Medicine Subinternship Curriculum

St. George J, Rafie C, Simon G, Tedeschi C /Weill Cornell Medical College, New York, NY; New York Presbyterian Hospital, New York, NY; New York; Columbia University Medical Center, New York, NY

Background: It has become increasingly important for educators to address student interaction with medical education-focused social media, and to enable students to critically appraise and contribute in this domain. Faced with students with varied learning styles and a finite amount of classroom time, we replaced a required sub-internship oral presentation with the “EM Design Challenge” in which students create an online learning tool for their peers.

Educational Objectives: The exercise aims to introduce students to the creation of appealing, informative and accurate online teaching tools. An additional goal is to reinforce learning on a topic of the student’s choosing.

Curricular Design: Sub-interns are first exposed to a didactic presentation and hands-on workshop introducing them to online, social media-based medical education. They then create an online teaching tool at the MS4 level, for inclusion on the course’s private Google Plus social network site. Posts ideally include links, videos, photos, and the capacity for commentary and feedback. Students are encouraged to utilize formats best suited to their topic: video, slide decks, infographics, podcasts, etc. Platforms include (but are not limited to) YouTube, Haiku Deck, Vine, Piktochart, and Instagram. The posts are archived on the social media site, and available to past, present and future course participants. Formative feedback is provided via online comments from peers, senior residents, and faculty. Summative feedback and a scored evaluation are obtained via an online evaluation process which assesses EM relevance, accuracy, creativity and engagement, use of references and links, and potential to serve as an innovative educational tool.

Impact/Effectiveness: Contemporary medical students learn in the online space. Our format enables them to create content for their peers, fostering a deeper learning of both EM core content and the educational process. To date, nearly 100 students have submitted Design Challenge posts, all of which are accessible to the course community. Preliminary feedback indicates that students prefer the assignment to a traditional presentation, and have found the approach unique and educational, cultivating skills which will be essential to them as they become resident-educators.

4 The Patient Experience Shift: Enhancing Medical Student Attitudes Toward Patient-Centered Care

Prince L, Calleo V, Welch K, Wojcik S /SUNY Upstate Medical University, Syracuse, NY

Background: Literature indicates that patient-centered attitudes and behaviors declines throughout medical school and residency. Patient-centered care has been linked to improved patient outcomes and patient satisfaction.

Educational Objectives: Improve student attitudes toward patient-centered care. Observation of practitioner/patient communication. Identify Emergency Medicine (EM) barriers that detract from patient-centered care.

Curricular Design: A four hour patient experience shift was developed by EM clinical and research faculty, residents and medical students as part of the existing one month Adult Acting Internship elective in EM. The module was approved by the Associate Dean for Undergraduate Medical Education prior to implementation. Students were orientated, completed the pre Patient-Practitioner Orientation Scale (PPOS), were advised to not provide patient care during the four hours but to experience the emergency visit as the patient and completed an ICARE observation form. Patients were given an orientation letter and gave verbal permission to allow the student to observe their care. Patients were selected by residents or clinical faculty with priority for patients with chief complaints of chest pain, abdominal pain, neurological, syncope or headache roomed shortly prior to assigning a student. Students completed a reflective essay, the post PPOS and were debriefed at completion of the elective. Implementation difficulties included ongoing education of staff on execution of new module, the time commitment for student orientation and debriefing monthly, and that a four hour experience may not be enough to impact students PPOS scores.

Impact/Effectiveness: 28 students participated. Median post PPOS score were statistical more patient-centered overall (74.5 pre vs. 72.5 post) as well as for the caring subscale (34 pre vs. 32.5 post) but not for the sharing subscale (40.5 pre vs. 40.0 post). There were no statistical differences in the PPOS or its subscales between students by gender. During debriefing, students recommended continuing the module and expressed that the experience was valuable in showing them the perspective of the patient during care and impacted how they would personally communicate with patients.

Educational Soundbites Oral Presentations

1 Development of an Educational Track to Supplement Emergency Medicine Resident Curriculum

Craddick M, Krzyzaniak S /University of Illinois College of Medicine at Peoria- OSF St. Francis Medical Center, Peoria, IL

Background: Emergency medicine (EM) residents are often tasked with educating students during EM clerkships. Although the ACGME expects residents to develop skills and habits to participate in the education of students and other residents, many programs lack a formal residents-as-teachers curriculum. Similarly, academic topics are often underrepresented in standard residency education. Developing a co-curricular education track (ET) to supplement resident education would be valuable to residents, especially those interested in pursuing academic careers.

Educational Objectives:

1. Enhance bedside teaching skills of EM residents
2. Introduce theoretical background of effective feedback, curriculum design and evaluation
3. Recognize current trends and controversies in medical education
4. Characterize career opportunities in academic medicine
5. Support research endeavors in medical education

Curricular Design: Utilizing the constructivist approach and communities of practice theory, we designed a curriculum that included faculty-led discussion, peer interaction, and learner-centered selective activities. Quarterly meetings were held to discuss a variety of topics in medical education. Each meeting had an educational theme that was explored using case studies and peer-reviewed journal articles to link discussion to the existing literature.

Successful completion of the ET required participants to earn 40 credits by participating in selected activities, engagement with EM-related social media and attending ET meetings. Flexibility within the requirements allowed a resident to select activities that most relate to their specific interest within academic medicine (Figure 1). Credits could be earned over a three-year period. The ET is open to all interested residents, regardless of their intent on completing the requirements by graduation.

Impact/Effectiveness: In the inaugural year 6/36 residents participated. After the first 6 months of the program, each resident had an average of 18 credits. Participants will complete a survey after completion of each year to identify successes and opportunities for improvement for future direction. This will serve to evaluate if objectives are being met, as well as tailor the ET to cover gaps regarding academic topics in the resident curriculum.

| | Education/Teaching | Social Media | Meetings |
|-----------|--|--|------------------------------------|
| Mandatory | MS Lecture (2) MS Simulation (4) | Education blog x 2 (4) Twitter post x 8 (4) | ET meeting x 2 (2) |
| Elective | MS lecture (2) MS simulation (4) MS orientation (4) Skills lab (4) Procedure day (4) 4-hour EBM teaching shift (6) Ultrasound shift/lecture (4) RAT panel (1) | Education blog (2) Twitter post (0.5) | ET meeting (2) EMIG meeting (2) |

Figure 1. Educational Activities. 40 credits required over three-year period.

MS, medical student; ET, education track; EBM, evidence-based medicine; (n), number of credits provided; RAT, residents as teachers; EMIG, emergency medicine interest group.

2 Pharmacist Observation of Residents' Management During Resuscitations: A Novel Direct Observation Assessment of Resident Milestones

Barringer K/Regions Hospital/HealthPartners IME, St. Paul, MN

Background: In 2013, the Accreditation Council for Graduate Medical Education (ACGME) implemented the Next Accreditation System, which introduced subcompetencies and the milestones. Emergency Medicine (EM) Residency programs must evaluate each resident's progression by obtaining data for 227 milestones falling under 23 subcompetency areas. By the end of residency, each resident is expected to reach proficiency for each of these sub competencies. Obtaining accurate and reliable milestone data for each resident can be challenging for residency programs. There are many different methods programs use. Direct observation is typically listed as a suggested evaluation method for the majority of the milestones. However, it can be challenging to obtain direct observational data given the total number of milestones needed to be evaluated for each resident during the course of their residency.

Educational Objectives: Our objective was to increase direct observation of 2 specific milestones (PC5 and PC11) by enlisting our clinical pharmacy staff to directly observe residents during their management of critically ill patients in the Emergency Department and improve the quantity and quality of data and feedback related to these specific milestones.

Curricular Design: Regions Hospital is a Level 1 Trauma Center with pharmacists present in the Emergency Department 24 hour per day. They directly observe and assist with the care of most of the critically ill patients in the Emergency Department, including trauma activations, resuscitations, stroke codes, sepsis codes, and cath lab

activations. We implemented a novel approach by enlisting our pharmacists to directly observe the residents and provide a milestone assessment for 2 of the milestones directly related to pharmacology (PC5 and PC11). With the help of our ED pharmacy staff, we created an observation tool based on those 2 specific milestones. During the codes and resuscitations, the pharmacist would observe and evaluate the resident specifically for that competency and fill out a brief checklist created directly from the milestones. They would also add specific observations and feedback if applicable.

Impact/Effectiveness: We are still in the beginning phases of assessing effectiveness of this innovation. However, During the first 4 weeks of this implementation, we have received approximately 15 pharmacist evaluations. There are very specific observations and feedback documented, including some specific areas where residents are not meeting milestones expected for their level of training. We believe that this intervention will improve the quantity and quality of feedback for the milestones evaluating pharmacology knowledge and application.

Resident: _____
 Faculty: _____
 Date: _____

PC5 Checklist for ED Pharmacist
 Selects and prescribes, appropriate pharmaceutical agents based upon relevant considerations such as mechanism of action, intended effect, financial considerations, possible adverse effects, patient preferences, allergies, potential drug-food and drug-drug interactions, institutional policies, and clinical guidelines; and effectively combines agents and monitors and intervenes in the advent of adverse effects in the ED.

| | |
|---|---|
| The provider applied their medical knowledge for the selection of an appropriate agent | <input type="checkbox"/> Consistently <input type="checkbox"/> Inconsistently <input type="checkbox"/> Not at all <input type="checkbox"/> N/A |
| The provider discussed or anticipated potential adverse effects of pharmacotherapy | <input type="checkbox"/> Consistently <input type="checkbox"/> Inconsistently <input type="checkbox"/> Not at all <input type="checkbox"/> N/A |
| The team leader/provider selected the appropriate medication based not only on basic medical knowledge but ALSO on mechanism of action and intended effect | <input type="checkbox"/> Consistently <input type="checkbox"/> Inconsistently <input type="checkbox"/> Not at all <input type="checkbox"/> N/A |
| The provider discussed or recognized potential drug – drug interactions | <input type="checkbox"/> Consistently <input type="checkbox"/> Inconsistently <input type="checkbox"/> Not at all <input type="checkbox"/> N/A |
| The provider selected the appropriate agent not only based on mechanism of action but ALSO based on patient preferences, allergies, potential interactions, financial considerations or patient demographics (patient age, weight, other modifying factors) | <input type="checkbox"/> Consistently <input type="checkbox"/> Inconsistently <input type="checkbox"/> Not at all <input type="checkbox"/> N/A |
| The provider followed institutional policies or guidelines as applicable | <input type="checkbox"/> Consistently <input type="checkbox"/> Inconsistently <input type="checkbox"/> Not at all <input type="checkbox"/> N/A |

3 Preparing Emergency Medicine Residents to Disclose Medical Error Using Standardized Patients

Rudinsky S, Spalding C /Naval Medical Center San Diego, San Diego, CA

Background: Emergency Medicine (EM) is a unique clinical learning environment. The ACGME Clinical Learning Environment Review Pathways to Excellence calls for “hands-on training” of disclosure of medical error (DME) during residency. Training and practicing key elements of DME using standardized patients may enhance preparedness among EM residents in performing this crucial skill in a clinical setting.

Educational Objectives: The goal of this training is to improve resident preparedness in DME in the clinical setting. Upon course completion, the resident will be able to: define a medical error, discuss ethical and professional standards of DME, recognize common barriers to DME, describe key elements in effective DME to patients and families, and apply key elements during a standardized patient (SP) encounter.

Curricular Design: A 4-hour course, including didactic and experiential learning methods, was created collaboratively by core EM faculty, regional subject matter expert in conflict resolution, and simulation nurse educator. Educational media included: lecture (30 minutes); video exemplars of DME communication with discussion (15 minutes); small group case study discussion (15 minutes); and SP encounters (five formative sessions and an evaluated case: 3 hours). A survey seeking changes in preparedness in DME was administered pre-and post-training. A critical action checklist was administered to assess individual performance of key elements of DME during the evaluated SP case.

Impact/Effectiveness: Of 15 PGY 1&2 EM residents, 66% reported prior DME training; of which only 13% reported the use of simulation. After the course, residents reported increased preparedness in performing several key elements in DME [Table 1] and demonstrated the ability to apply these key elements during a SP encounter [Table 2]. Residents valued the training, rating the didactic, SP sessions, and overall educational experience very high (mean scores 4.2, 4.5, and 4.4 respectively; Likert scale, 1= not at all useful, 5= very useful). Experiential learning using SP is effective in improving resident knowledge of and preparedness in performing medical error disclosure. This educational module can be adapted to other clinical learning environments through creation of specialty-specific scenarios.

Table 1. Self-efficacy in Error Disclosure Among 15 Emergency Medicine Residents.

| "How prepared do you feel to perform each variable during the disclosure of a medical error?" | Score* mean (SD) | | Residents Improved n (%) | P value |
|---|------------------|-----------|--------------------------|-----------|
| | Pre | Post | | |
| Know what to include | 2.5 (0.6) | 4.4 (0.7) | 15/15 (100) | p < 0.001 |
| Introduce the topic with a patient | 2.9 (1) | 4.3 (0.5) | 13/15 (87) | p < 0.001 |
| Deal with a patient's emotional response | 3.1 (1) | 3.9 (0.6) | 10/15 (67) | p = 0.005 |
| Express Empathy | 3.9 (0.6) | 4.2 (0.6) | 8/15 (53) | p = 0.05 |
| Respond to a patient's questions | 3.1 (0.7) | 3.9 (0.6) | 10/15 (67) | p = 0.003 |
| Address patient concerns about consequences of error | 2.5 (0.9) | 3.9 (0.7) | 11/14 (79) | p < 0.001 |
| Deal with legal questions | 1.7 (0.7) | 2.7 (0.9) | 10/15 (67) | p < 0.001 |
| Recognize your own emotions | 3.6 (0.9) | 4.1 (0.8) | 7/14 (50) | p = 0.006 |
| Keep your emotions in check | 3.5 (0.8) | 4.2 (0.7) | 9/15 (60) | p < 0.001 |

*Score ranges from 1 (lowest; not at all prepared) to 5 (highest; very well prepared), expressed in mean (SD), p value using paired t-test. Survey adapted from Bonnera R et al. / Grad Med Educ. Sep 2009;3(1):114

Table 2. Critical Action Checklist for Key Elements in Medical Error Disclosure.

| Critical Action | Score | | Score mean (SD) |
|---|---|---|-----------------|
| | 1 = very poor | 5 = excellent | |
| Conducts explicit disclosure of error to patient | Does not explicitly explain that an error took place and the patient had suffered as a result | Describes the nature and source of the error and consequences of the error to the patient and/or family members | 3.6 (0.6) |
| Responds forthrightly to patients questions about the event | Avoids direct responses to a family members question | Responds truthfully to the patient and/or family member's questions | 4.0 (0.4) |
| Apologizes upfront and early in conversation | Does not apologize upfront | Apologizes to the patient and family member at the beginning of the disclosure conversation | 4.4 (0.5) |
| Exhibits general communication skill with the patient | Remains aloof and distant to family member's emotional distress | Displays verbal and nonverbal empathy and support of the patient and family member | 3.9 (0.5) |
| Conducts blame-free disclosure, acknowledges personal role | Blames a team member in front of the family member | Avoids blaming of other team members, resists patient and/or family members attempts to affix blame | 4.1 (0.6) |
| Offers plans to prevent future errors | Does not address specific plans for preventing future errors | Explains to patient and/or family member what will be done to prevent such errors from occurring in the future | 3.8 (0.7) |
| Plans follow up with patient | Does not offer to follow up with the family member | Offers to follow up with the patient and family member for other potential questions they may have | 3.9 (0.6) |

Adapted from Biberston K et al. Error Communication: Discover barriers, share best practices and lead change with simulation. IMSH 2016.

Lightning Oral Presentations

1 Does a Positive Delta from Step 1 to Step 2 Correlate with Board Passage?

Dulani T, Guo U, Visconti A, Cabezon M, Jara-Almonte G, Gaeta T/New York Methodist Hospital, Brooklyn, NY

Background: USMLE Step 1 has been reported to have correlation with successfully passing the boards. A low passing or below average Step 1 score is often a deterrent to residency directors. However, we also see residency applicants that have performed below average on their USMLE Step 1 but have shown significant improvement in their USMLE Step 2 scores. There are recent studies that suggest that Step 2 may be a better predictor than Step 1. Our study aims to evaluate if a positive delta, that is if the improvement from USMLE Step 1 scores to Step 2 scores, independently correlates to successful passage of the boards in Emergency Medicine (EM) on first attempt.

Objectives: To evaluate if step 1 scores, step 2 scores or a significant improvement (the delta) from Step 1 to Step 2 scores independently correlates with successful passage of the boards.

Methods: We performed a retrospective cohort study utilizing data from residents graduating between 1999 and 2015 at a three-year Emergency Medicine training program at an urban, community, university affiliated hospital. USMLE Step 1, Step 2 CK scores of graduates, and first-attempt ABEM qualifying exam passage were compiled and blinded for confidentiality. Percentile of USMLE scores was extrapolated from the national average and standard deviation for each exam year. The change in percentile between Step 1 and Step 2 was calculated and is termed the delta.

Residents who did not complete the residency, who did not take both USMLE Step 1 and 2, who had a history of failing USMLE Step 1 on first attempt and graduates with partial information on file were excluded. Correlation between each variable and the relative risk (95% CI) for success are reported (alpha <0.05).

Results: From 1999 to 2015, there were 122 graduates from the Emergency Medicine residency program. 30 were excluded because they met exclusion criterion.

A positive delta from Step 1 to Step 2 was found to be statistically significant when the value was 30 points or higher, 1.16 (1.07-1.26). Step 2 was found to be an independent predictor of passing the ABEM qualifying exam, 1.18 (1.02-1.31).

Conclusions: There was a positive trend in success rate with increasing delta. Step 2 was found to be an independent predictor of success for board passage. Our future studies will include a multi-center analysis with other emergency medicine residencies to further evaluate the significance of delta.

2 Does Video Playback Speed Affect Comprehension for Students Listening to Podcasts for Novel Curriculum Delivery?

Song K, Chakraborty A, Dugan A, Adkins B, Dawson M, Doty C /University of Kentucky College of Medicine, Lexington, KY; Stanford University Department of Radiology, Palo Alto, CA

Background: Medical education is a rapidly evolving field that has been utilizing new technology to enhance the learning of medical students. One new teaching modality is the video recorded lectures or podcasts. Recorded lectures not only allow the flexibility to pause and rewind, but also allows students to watch lectures at faster speeds. In a setting such as medical school where knowledge of minutiae and comprehension of concepts is paramount for success, the ability to watch lectures at faster speeds could be extremely beneficial. Though previous studies have shown subjective improvement in learning, no quantitative studies measuring information retention has yet been published.

Objectives: The purpose of this study is to determine if watching podcasts at 1.5x speed is more effective, equivalent to, or less effective to 1.0x speed for retention of new material by statistical comparison of the mean and median test scores.

Design: prospective, single-center, IRB approved, experimental study.

Setting: University of Kentucky College of Medicine.

54 medical students were randomized into two groups. Each group watched two separate videos at 1.5x and 1.0x speeds and took the respective assessments immediately after watching each video. The two videos shown were ultrasound artifacts and transducers. Neither topic is covered in the medical school curriculum. Group A watched artifacts video first at 1.5x speed then transducers at 1.0x speed; Group B watched transducers video first at 1.5x speed then artifacts at 1.0x speed. Mean and median test scores at different speeds were compared using the t-test.

Results: On artifacts test, there was a significant

difference ($p=0.0188$) in performance with 1.5x speed group (mean- 61.4; SD- 19.3) performing worse than the control group at 1.0x speed (mean-72.7; SD- 14.6). On transducers assessment, 1.5x speed group (mean- 66.9; SD- 17.6) again performed worse than the control group at 1.0x speed (mean- 73.8; SD-15.6), but the difference was not significant ($p=0.1365$).

Conclusions: Contrary to the previous studies showing subjective improvement in performance with sped up lectures compared to live lectures, our data shows worse test performance pertaining to new material at 1.5x speed compared to normal speed.

Table 1. Artifacts Quiz results- t-test- was used to compare the mean of 1.5x versus 1.0x speed. Group A viewed Artifacts at 1.5x speed and Group B viewed Artifacts at normal speed.

| Artifacts podcast | Overall | 1.0x Speed (Group B) | 1.5x Speed (Group A) | P-value |
|-------------------------|-------------------|----------------------|----------------------|---------|
| No. of Participants | 54 | 26 | 28 | N/A |
| Artifacts Scores | | | | |
| Mean (SD) | 66.9 (18.0) | 72.7 (14.6) | 61.4 (19.3) | 0.0188 |
| Median (Quartiles) | 65.0 (56.3, 80.0) | 75.0 (65.0, 80.0) | 60.0 (50.0, 75.0) | |

Table 2. Transducers Quiz results- t-test- was used to compare the mean of 1.5x versus 1.0x speed. Group A viewed Transducers at normal speed and Group B viewed Transducers at 1.5x speed.

| Transducers podcast | Overall | 1.0x Speed (Group A) | 1.5x Speed (Group B) | P-value |
|--------------------------|-------------------|----------------------|----------------------|---------|
| No. of Participants | 54 | 28 | 26 | N/A |
| Transducer Scores | | | | |
| Mean (SD) | 70.5 (16.8) | 73.8 (15.6) | 66.9 (17.6) | 0.1365 |
| Median (Quartiles) | 69.6 (56.5, 87.0) | 73.9 (64.1, 88.0) | 69.6 (52.2, 81.5) | |

3 Training Residents to C.A.R.E. Using Videotaped Unannounced Standardized Patient Encounters

Chung A, Saloum D, Retino C, Brazg J, Weiner C, Pushkar I, Drapkin J, Likourezos A, Marshall J/Mount Sinai Emergency Medicine, New York, NY; Maimonides Medical Center, Brooklyn, NY

Background: Physician empathy increases patient satisfaction, improves outcomes, and is integral to effective patient communication. We developed an innovative educational method using videotaped unannounced standardized patient (USP) encounters during real clinical shifts to train and assess our residents' empathic communication skills. In contrast to other assessment types, USP encounters do not suffer from low fidelity or the Hawthorne effect. Video provides valuable feedback on verbal and nonverbal behaviors.

Objectives: We hypothesized that the addition of video would improve our residents’ empathy skills more than a post-encounter assessment form alone.

Methods: First-year EM residents (n=16) participated in the study during one academic year. All residents completed two videotaped USP encounters during the first four months. After each encounter, the USP completed a CARE form, a validated empathy measure. All 16 interns were then individually debriefed. This included a self-assessment, review of the CARE forms, and goal-setting. The intervention group (n=8) also reviewed the videotapes of their USP encounters, while the control group (n=8) did not. All residents then completed two more encounters during the last four months of the year. USPs again filled out the CARE form after each encounter. At the end of the study, we invited all residents to review their videos. The CARE form has 10 questions with response options from 1 to 5 (1=poor, 2=fair, 3=good, 4=very good, 5=excellent). Student’s T-test was used to compare mean scores between the groups. A p value <0.05 denoted statistical significance between groups.

Results: CARE baseline scores were similar for the first two USP encounters (p>0.05 on all CARE items). After the debrief intervention, the intervention group had statistically significantly higher scores compared to the control group for the following questions: “How good was the doctor at explaining things clearly?” (4.5 vs. 3.13, p=0.012); “How good was the doctor at helping you to take control?” (4.13 vs. 2.38, p=0.038); “How good was the doctor at making a plan of action with you?” (4.13 vs. 2.38, p=0.038).

Conclusions: Video review of USP encounters during real clinical shifts had a significant impact on resident empathy. In the future, we envision this novel method to be particularly useful for interpersonal and communication skills remediation.

4 Use of Multidisciplinary Simulation to Improve Communication Skills, Interpersonal Relationships, and Job Satisfaction in Emergency Medicine Residents

Austin R, dela Cruz J, Kegg J, Jaeger C, Patel C, Helmerichs A, Helmerichs M, Norman Z/Southern Illinois University School of Medicine, Springfield, IL; Memorial Health System, Springfield, IL

Background: Traditional simulation (TS) in residency training places the learner in a controlled environment and uses scripted confederates to assess for critical actions. Multidisciplinary simulation (MDS) which includes physicians, nurses, and ancillary staff as active participants has been shown to improve inter-professional communication. The use of MDS in which nurses and ancillary staff are active participants with resident learners has not been previously evaluated in its ability to effect

resident communication and interpersonal skills.

Objectives: The objective of the project was to evaluate resident perception of TS versus MDS in its ability to improve resident communication and interpersonal skills. We hypothesized that MDS would improve resident communication and interpersonal skills more than TS.

Methods: Ten Emergency Medicine PGY2-3 residents participated in a simulation curriculum involving TS ran by physician faculty and MDS including nurses and ancillary staff from their clinical workplaces. Cases were built upon high acuity scenarios. Residents were surveyed using a 5-point Likert scale on the effectiveness of each modality after 6 months of participation during which 4 multidisciplinary simulations and 4 traditional simulations were completed. Results were analyzed by an independent measures t-test.

Results: Residents felt MDS was more effective at improving communication (p=0.003), interpersonal relationships (p=0.007), and understanding the roles of nurses and technicians in critical situations (p <0.001) compared to TS. 10/10 (100%) respondents indicated that MDS improved workplace environment. Residents did not report a difference between MDS and TS in the effectiveness of improving confidence in caring for similar patients (p=0.29) which may be a result of high baseline confidence (Table 1).

Conclusions: Residents felt MDS enhanced communication skills, interpersonal relationships, and understanding of the roles of all team members better than TS. All respondents felt that participating in MDS improved their clinical workplace environment. MDS may also play a role in improving job satisfaction in the Emergency Department. The authors advocate a role for MDS in residency for assessing and training communication and interpersonal skills.

| Question | Mean Likert Score | P-Value |
|--|-------------------|-------------------|
| How effective do you feel traditional simulation is at improving your communication skills during acute situations? | 3.1 | |
| How effective do you feel multidisciplinary simulation is at improving your communication skills during acute situations? | 4.3 | TS vs. MDS 0.003 |
| How effective do you feel traditional simulation is at improving your interpersonal relationships? | 3.1 | |
| How effective do you feel multidisciplinary simulation is at improving your interpersonal relationships? | 4.1 | TS vs. MDS 0.007 |
| How effective do you feel traditional simulation is at improving your communication skills during critical situations? | 2.3 | |
| How effective do you feel multidisciplinary simulation is at improving your communication skills during critical situations? | 4.3 | TS vs. MDS <0.001 |
| Likert Scale: 5-Very Effective, 4-Effective, 3-Somewhat Effective, 2-Not Very Effective, 1-Not at All Effective | | |
| Does participating in multidisciplinary simulation improve your workplace environment? | 10/10 Yes | |
| Rate your confidence in caring for similar patients in acute situations after traditional simulation | 4.1 | |
| Rate your confidence in caring for similar patients in acute situations after multidisciplinary simulation | 4.3 | TS vs. MDS 0.29 |
| Likert Scale: 5-Very Confident, 4-Confident, 3-Somewhat Confident, 2-Not Very Confident, 1-Not at All Confident | | |

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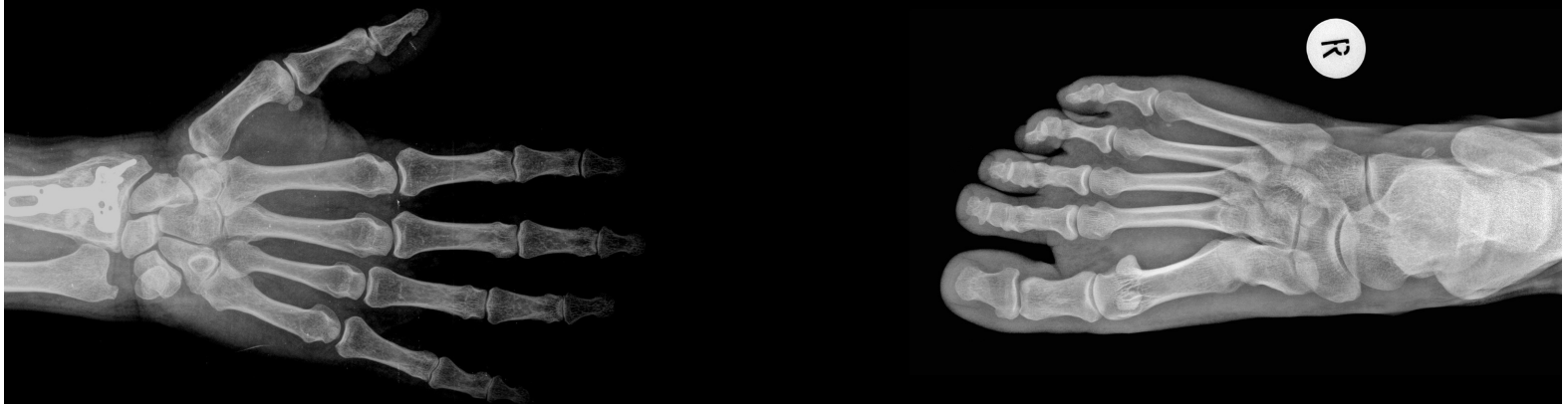
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