American Thoracic Society International Conference

EDUCATION

Innovations in Fellowship Education

2016 Highlights Book

ATS 2016
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May 13 - May 18, 2016
San Francisco, California
conference.thoracic.org

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PROGRAM OVERVIEW

The American Thoracic Society greatly values a strong fellowship program as a means of academic and clinical success. In an effort to recognize programs that implement exceptional practices, the ATS Training Committee developed the Innovations in Fellowship Education Award Program. All pulmonary, critical care, sleep, and allergy fellowship programs (adult and pediatric) were invited to submit one abstract showcasing a novel and innovative best practice method. The goal of this program is to honor fellowship programs that demonstrate educational excellence and share these best practices with other programs.

Abstracts were reviewed and ranked by the ATS Training Committee based on the following criteria:

1. **Innovation:** How unique is the educational program? What is new and different?
2. **Implementation / Sustainability:** How was the program implemented and how effective was such implementation? Was this program sustainable over time?
3. **Transferability:** How easily might this educational program be adopted by other programs?
4. **Outcomes:** Are there reported outcomes or plans to measure them?

All abstracts that were received are published within this booklet. The ATS Training Committee would like to thank all the programs that submitted abstracts and applauds them for their innovative and outstanding work!

The ATS Training Committee is pleased to honor the following top programs:

University of Colorado School of Medicine

Abstract Title: High-Fidelity Airway Trainer Teaches Novice Learners Flexible Bronchoscopy Skills

Brown University

Abstract Title: A Novel Electronic Rounding Tool to Assist in ICU Fellow Training in Quality

Baylor College of Medicine

Abstract Title: A Longitudinal Interprofessional Curriculum for Pediatric Critical Care Fellows Using Situated Cognition as a Theoretical Framework

New York University School of Medicine

Abstract Title: The Utility of High-Fidelity Simulation for Training Critical Care Fellows in the Management of Extra-Corporeal Membrane Oxygenation Emergencies

The Ohio State University Wexner Medical Center

Abstract Title: Implementation and Evaluation of an Outpatient Pulmonary Curriculum iBook

University of Washington

Abstract Title: Novel Multidisciplinary Online Bronchoscopy Curriculum

University of Colorado School of Medicine

Aurora, CO

High-Fidelity Airway Trainer Teachers Novice Learners Flexible Bronchoscopy Skills

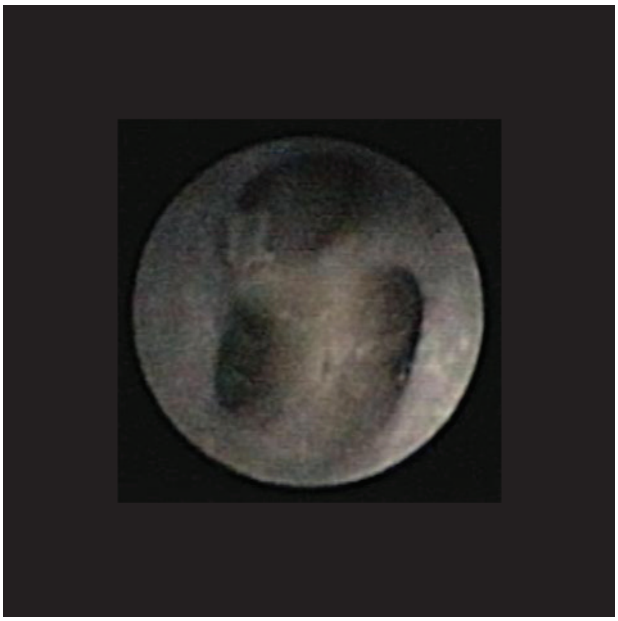
Program Director: Ricky Mohon, MD
Type of Program: Pediatric Pulmonology and Critical Care Medicine
Abstract Authors: Emily M. DeBoer, MD; Ricky Mohon, MD; and Matthew Rustici, MD

BACKGROUND
Pulmonology fellows learn flexible bronchoscopy (FB) primarily through supervised experiences on patients. Teaching via models may decrease complications and procedure time but has not been widely adopted by pediatric pulmonology programs due to cost, time, and applicability to pediatrics.

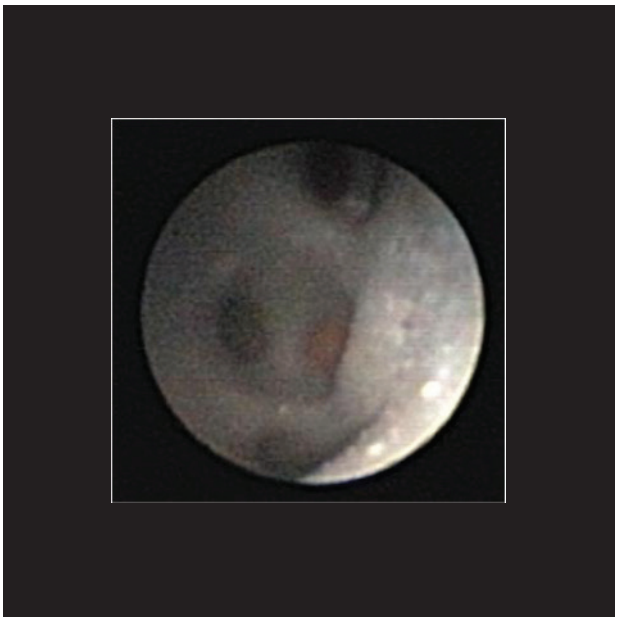
METHODS
A low-cost, high-fidelity pediatric airway model was created using chest CT images and a 3D printer. In our program, first-year fellows learn FB on this model. To evaluate the effectiveness of the model, subjects with minimal FB experience were enrolled in a study and randomized as controls or to receive standardized trainings over one month. All participants received 12 minutes of introduction to the bronchoscope and airway anatomy and performed a pre-test and post-test assessment. Intervention participants performed 4 self-directed 15-minute practice sessions; each followed by interval assessments, and received feedback from a pediatric pulmonologist during one of the sessions. Assessments required participants to manipulate a pediatric bronchoscope to 6 areas of the lungs (5 lobes and lingula) and identify an exchangeable colored marker located in a segmental airway of each lobe. Correct identification of the markers was the primary outcome. Secondary outcomes include time to complete the assessment and confidence measured on a Likert scale. Medians were compared using Wilcoxon exact test.

RESULTS
In this ongoing study, 6 intervention and 4 control participants have been enrolled. No differences were noted between groups in the pretest. The participants who received training significantly improved in accuracy, speed, and confidence, whereas controls did not. At completion, intervention participants identified the colored markers with 100 percent accuracy, but there was variability in the practice required to achieve this goal. Controls identified 0-3 markers ($p = 0.004$). Median time to complete the final assessment was 97 seconds and 600 seconds for intervention and control groups, respectively ($p = 0.008$).

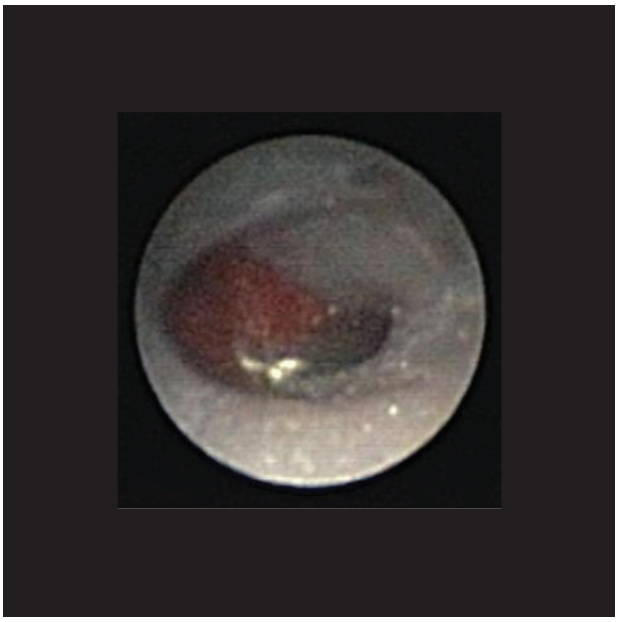
DISCUSSION
This FB model is innovative due to its low cost and high fidelity. We have established that a short amount of self-directed learning improves basic FB skills with minimal faculty time. This is an inexpensive, realistic, and safe method to quickly teach basic pediatric FB skills to novice trainees. We hypothesize that practicing with this model prior to FB on patients could decrease anesthesia time and allow fellows to progress to advanced FB skills sooner in their training. Retention testing of our cohort is underway. Future studies to evaluate the relationship between success on the airway trainer and success in patient-related FB are planned.



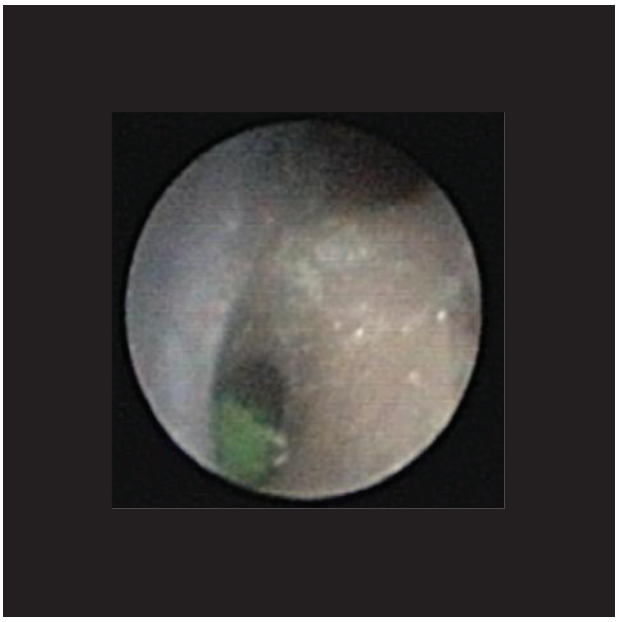
A. Three segments of right upper lobe within the airway model. No markers are visible from this scope position.



B. Orange marker in the left lower lobe.



C. Red exchangeable colored marker in anterior segment of right upper lobe.



D. Green exchangeable colored marker in anterior segment of right upper lobe.

Brown University

Providence, RI

A Novel Electronic Rounding Tool to Assist in ICU Fellow Training in Quality

Program Director: Nicholas Ward, MD
Type of Program: Pulmonary and Critical Care Medicine
Abstract Authors: Gerardo P. Carino, MD; Abdullah Chahin, MD; Sameer Shah, MD; Dawn Menard, MD; Jason Aliotta, MD; and Andrew Levinson, MD

Checklists and daily goal sheets have been widely shown to improve the quality of critical care. A daily paper "Rounding Tool" had been used in the Miriam Hospital and Rhode Island Hospital ICUs. This rounding tool was useful as a reminder to the ICU team to address important issues, including daily weaning, review of the necessity for central lines and Foley catheters, glucose control, and DVT prophylaxis. However, these daily goals sheets proved to be an inefficient way of organizing, interpreting, and utilizing the data that was collected. By the time data was tabulated and organized, many months had passed.

In order to improve ongoing real-time feedback, we developed a wireless tablet-based ICU Quality Data collection tool using Adobe Acrobat XI that we now routinely use on ICU rounds. As part of the electronic system, the ICU fellows are responsible for the eRounding Tool each day and the quality data collected is automatically saved for review and analysis in Microsoft Excel. Weekly, this data is shared with the ICU fellows as feedback regarding the quality of care delivered during their ICU rotation. This program was initiated on March 1, 2015. Our ICU also maintains an ongoing "ICU Quality Dashboard," which is reviewed monthly at the ICU Quality Meetings. The dashboard includes information about the rates of hospital-acquired infections (e.g., nosocomial C. difficile infections, catheter-associated UTIs, catheter-related bloodstream infections), patient falls, ventilator-associated pneumonia, hospital-acquired pressure ulcers, and other quality measures important to the ICU and the institution.

The goal of this project is to compare data collected using our eRounding Tool with monthly ICU quality data. The fellows have access to data regarding their specific performance in the ICU and how it directly affects patient outcomes. We have already seen improvements in important indicators with the eRounding Tool. For example, for the first 2 months of implementation, our rates of Foley utilization in one of our ICUs decreased 30 percent from the previous full year. We feel that this eRounding Tool is an important and potentially powerful innovation developed by our fellowship program. Fellows learn a great deal about quality of care in the ICU and positively affect the care they provide, while meeting current ACGME requirements regarding involvement in quality improvement. Individual programs could easily construct their own eRounding Tool to address important issues unique to their own hospital and training program.

Room #	Select
Admit Date:	
Today's Date	01/07/2016
Attending:	Select

Documentation		**Responses**
Neuro:	Delirium Assessed	Select
	Awakening Trial	Select
	SBT Assessed	Select
Endo:	BS<180	Select
FEN/GI:	Nutrition @ Goal	Select
	Daily BM	Select
Tubes/Lines:	Need for TLC	Select
	Does Pt need a Foley	Select
	If yes, order placed	Select
	If yes, Pt ready for voiding trial	Select
	Does Pt need restraints	Select
Mobility:	Qualifies for PT/OT	Select
	PT/OT ordered	Select
Prophyl	GI Prophylaxis	Select
	DVT Prophylaxis	Select
Housekeeping	Meds reviewed	Select
	Are the orders placed	Select
	Med reconciliation done	Select

Nurse present on Rounds? Select

Baylor College of Medicine

Houston, TX

A Longitudinal Interprofessional Curriculum for Pediatric Critical Care Fellows Using Situated Cognition as a Theoretical Framework

Program Director: M. Hossein Tcharmtchi, MD
Type of Program: Pediatric Pulmonary and Critical Care Medicine
Abstract Authors: Danny Castro, DO; Kevin Roy, MD; Eric Williams, MD, MMM; Julia Lawrence, RRT, MSHP; Melissa Cashin, RN, MSN; Tessy Thomas, DO; Karla Abela, RN, MSN; Satid Thammasitboon, MD, MHPE; and M. Hossein Tcharmtchi, MD

RATIONALE/PURPOSE

Team-based care delivery and redesigning systems are critical to achieving care that is patient-centered, safe, efficient, and more effective. Health care professionals are educated in silos, ill-preparing them for the current realities of everyday practice. After graduation they are thrown into complex systems and expected to function as part of a team, engaging in shared decision-making[1,2]. Interprofessional education has lagged behind changes in clinical practice, resulting in a widening gap between current health professions training and actual needs for health care delivery[1,2]. These issues are especially evident in the intensive care unit (ICU) as teamwork is a vital component to this high-stakes environment. We developed an interprofessional curriculum (IPC) with the purpose of having Pediatric Critical Care (PCC) fellows understand the importance of interprofessional teamwork and how that relates to safe and quality patient care and being able to practice team skills and behaviors.

METHODS

Physician, nursing, respiratory care, and pharmacy leaders supported this interprofessional curriculum and were involved in the development and implementation, which included the critical steps of assessing needs, prioritizing content, developing goals and objectives, and employing adult learning theories[3,4]. The situated cognition theory centers on the position that optimal knowledge acquisition occurs when it is learned within the social, cultural, and physical contexts in which it will be used. More specifically, we created learning communities and incorporated the cognitive apprenticeship model to foster interprofessional learning within the curriculum [5,6] (Figure 1).

EVALUATION

A systematic program evaluation has informed program improvement over the course of 5 years. The focus of initial program evaluation was to assess the practical implications of situated cognition: ensuring a safe environment for delivering feedback, assessing if learners valued the opportunity to engage in discussions with interprofessional peers/educators, and assessing the realism of simulated experiences in order to ensure the authenticity of context. Learners' perceptions to these items for 2 of the 4 learning communities are shown in Tables 1a and 1b. Future phases of evaluation aim to assess learners' participation in all the stages of the cognitive apprenticeship model and to assess team performance using interprofessional competencies[1-3].

CONCLUSIONS

We described the multi-year development of a theory-informed IPC. Within the framework of situation cognition theory, learners perceived the learning communities to be safe, non-threatening, and ideal for receiving feedback. Learner's perceived the simulated experiences to be realistic and also valued the opportunity to engage in interprofessional teamwork and collaboration.

REFERENCES
1. Interprofessional Education Collaborative Expert Panel. (2011). Core competencies for interprofessional collaborative practice: Report of an expert panel. Washington, D.C.: Interprofessional Education Collaborative.
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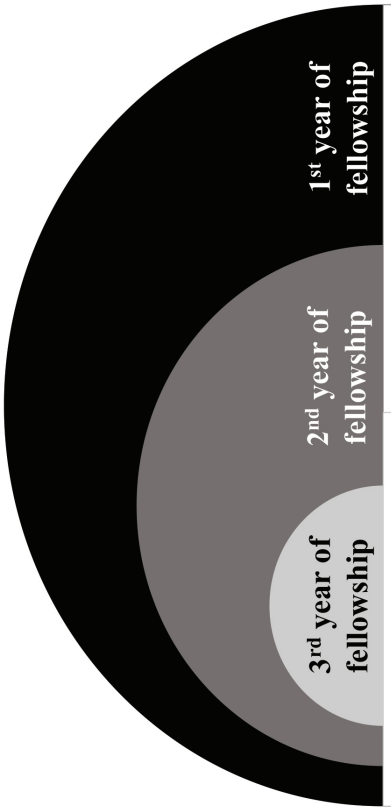

Learning Communities

- **Boot Camp Program**: Introduction to the principles of crisis resource management (CRM) and engages them in interdisciplinary and interprofessional team training, which includes case-based, team-based and simulation-based learning.
- **Quality Improvement Lecture Series**: Introduction to concepts and processes of quality improvement (QI) accompanied with application through participation in a group QI project and multi-disciplinary Morbidity & Mortality Conference.
- **Interprofessional Simulation-based Education**: Fellows practice teamwork training in a simulation center and in *in situ* simulations as members of an interprofessional team and participate in a debrief.
- **Quality and Safety Team**: While on clinical service, fellows participate in daily, weekly and bi-monthly interprofessional discussions, on actual patients, regarding issues in quality of care and patient safety.

Cognitive Apprenticeship

- **Modeling**: Learners gain an in depth understanding of how a concept or task is done through expert demonstration.
- **Coaching**: Learners perform a task and are then provided feedback on their performance by a subject matter expert.
- **Scaffolding**: The act of implementing strategies and methods that serve to enhance learners' educational experience.
- **Articulation**: Learners' are encouraged to articulate what they know about the content or concepts and how they problem solved.
- **Reflection**: Enables learners' to compare their problem solving skills to those of an expert or peer.
- **Exploration**: Learners' are encouraged to solve problems on their own and are offered new strategies they can use to explore problems.

FIGURE 1. *Learning communities* are educational environments where the educator(s) and learners' work collaboratively to achieve learning goals. Learning communities also emphasize distributed expertise. Including interprofessional healthcare providers within learning communities forms a wealth of distributed expertise that provides opportunities to learn from one another. A *cognitive apprenticeship model* allows a learner to learn the necessary skills, but more importantly, the professional identity from an expert who has mastered the social, cultural and physical contexts of the profession. A learner participates in this apprenticeship by engaging in the above teaching methods. As the PCC fellows continually participate in these learning communities, over the course of their fellowship, they move from the periphery of the community, as a beginner, to its center as they become more active and engaged, and hence assume the role of expert.

TABLE 1

A. Learners' rated statements using a Likert scale where 1=Strongly disagree and 5=Strongly agree

Boot Camp Evaluation (2010-2015)	Mean (SD)
Overall, this clinical orientation program was valuable.	4.9 (0.4)
This course was clearly organized.	4.7 (0.5)
The objectives of this course were clearly stated.	4.8 (0.5)
The content of this course and the information presented were relevant to my clinical practice.	4.9 (0.2)
This course improved/will improve my clinical knowledge, skills, and behavior.	4.9 (0.3)
This course provided me the opportunity to develop rapport with interprofessional multi-disciplinary health care providers.	4.8 (0.4)
Overall, how would you rate this workshop?[a]	8.0 (1)

List 2 new things you learned. (Representative sample)

- "I liked working as a team."
- "Team work is essential to be productive."
- "The importance of CRM"
- "Importance of role assignment"
- "Understand everyone's role"
- "Situational awareness"
- "Reiterating importance of mental modeling"
- "Importance of communication"
- "Effective communication in teams"
- "Learned new tips on effective communication in stressful situations"
- "Communication is the biggest component of crisis management and is many times, the place where problems arise."
- "The importance of effective team leadership and closed loop communication"

What was the best thing about the course? (representative sample)

- "I really appreciated practicing as well as the feeling of a safe environment to learn in."
- "Getting to run the codes with other physicians and work as a team"
- "Simulation"
- "The feedback and debriefing after the [simulation] scenario"
- "CRM videos"
- "Stressed importance of communication"

a Learners' rated using a Likert scale where 1-3=Below expectations, 4-6=Met expectations, 7- 9=Exceeded expectations

B. Learners' rated statements using a Likert scale where 1=Strongly disagree and 5=Strongly agree

Simulation Center Evaluations (2011-2015)	Mean (SD)
I feel that the course instructors provided a safe and non-threatening environment for learning	4.9 (0.4)
The simulation center environment is realistic to my clinical environment	4.7 (0.8)
I feel that the course has improved my technical skills.	4.7 (0.7)
I feel that the course has improved my medical knowledge.	4.7 (0.7)
I feel that the course has improved my communication skills.	4.8 (0.4)
I feel that the course has improved my ability to care for my patients.	4.9 (0.4)
I feel that participation in this course will improve patient safety.	4.8 (0.4)
Participating in scenarios using high fidelity simulators will increase your vigilance to safety related issues in actual practice	4.7 (0.7)

What did you like best about the course? (representative sample)

- "Very positive environment, perfect for learning"
- "Nice learning environment, stressful but controlled"
- "Provided a great environment to learn"
- "Relaxed atmosphere; honest feedback"
- "Debriefing [and] the learning environment. I liked everyone's input and the ability to ask questions openly."
- "Safe environment…constructive/helpful feedback"
- "Non-judgmental environment"
- "Safe environment to practice"
- "I could attempt to get comfortable with skills that I am not familiar with in a non-threatening environment."
- "Realistic, safe environment, able to address +/-"
- "Great simulation, realistic scenarios, great feedback from instructors"
- "I like how much this simulation felt real and could happen in our unit."
- "I felt like it was realistic. It helped remind me of things I can use in real practice."
- "Opportunity to practice code simulation w/my peers and entire multidisciplinary team."
- "Great teambuilding exercise"
- "That there are multiple disciplines present and practicing together"
- "Knowledge gained, working closer with my co-workers"
- "Working with new team members"
- "Enjoy doing scenarios with different levels of experience, new nurses vs experienced"

General comments (representative sample):

- "Course is important for multi-disciplinary interactions."
- "This course is very much needed…and will improve outcomes."

New York School of Medicine

New York, NY

The Utility of High-Fidelity Simulation for Training Critical Care Fellows in the Management of Extra-Corporeal Membrane Oxygenation Emergencies

Program Director: Doreen J. Addrizzo-Harris, MD
Type of Program: Pulmonary, Critical Care and Sleep Medicine
Abstract Authors: Bishoy Zakhary, MD; Vikramjit Mukherjee, MD; Lily Kam, MD; Brian Kaufman, MD; Kevin Felner, MD; and Doreen Addrizzo-Harris, MD

PURPOSE

While veno-venous extra corporeal membrane oxygenation (VV-ECMO), a treatment modality for refractory hypoxemia, has grown in utility, the management of patients requiring ECMO support remains technically challenging. NYUSOM recently began offering ECMO to its critically ill patients, but there was no formal training for the critical care fellows. Simulation-based training has emerged as a valuable tool in medical education and may be ideally suited for ECMO training. We evaluated the utility of high-fidelity simulation in teaching critical care fellows management of VV-ECMO emergencies.

METHODS

A Laerdal SimMan 3G was connected to a running VV-ECMO circuit (Fig 1). Participants completed a pre-test written exam followed by individual participation in a scored simulated ECMO emergency (Sim1–Recirculation). Participants then attended three ECMO lectures followed by randomization to simulation (S) and traditional (T) training groups. Both groups participated in three identical ECMO emergencies, either via simulation or via discussion, then completed a 5 point Likert scale survey about the training. Participants returned after 6 weeks for a post-test written exam followed by individual participation in two scored simulated ECMO emergency scenarios – one case (Sim2–Pump Failure) was similar to a scenario encountered during training while the second case (Sim3–Access Insufficiency) was a novel scenario not previously encountered. Statistical analyses were performed via two-tailed paired Wilcoxon and unpaired Mann-Whitney tests.

RESULTS

Twenty-one of 22 fellows at our program participated in the study. Pre-test written exam scores were 43±11 percent vs 33±12 percent, p=0.20 (S vs T). Sim1 scores were 31±14 percent vs 32±15 percent, p=0.18 (S vs T). Post-test written exam scores were improved in the simulation group (55±11 percent, p=0.01) but not in the traditional group (45±12 percent, p=0.07). Performance in Sim2 was similar between groups (76±18 percent vs 70±22 percent, p=0.48) (S vs T) but time to perform a predetermined critical action (pump exchange) was shorter in the simulation group (131±24s vs 202±73s, p=0.004). Performance in Sim3 was higher in the simulation group (48±20 percent vs 30±9 percent, p=0.03) and time to critical action (administer fluid bolus) was shorter in the simulation group (229±129s vs 360±0s, p=0.004) (Figs 2a and 2b). Survey scores were more favorable among the simulation group (37.7 vs 32.0, p=0.006).

CONCLUSIONS

Simulation is effective for teaching ECMO emergency management to critical care fellows with improvement in both written and practical aspects of ECMO management. The benefit appears to transfer to novel ECMO scenarios not encountered during training. Compared to traditional training, surveys show greater satisfaction with simulation-based training.

FIGURE 1

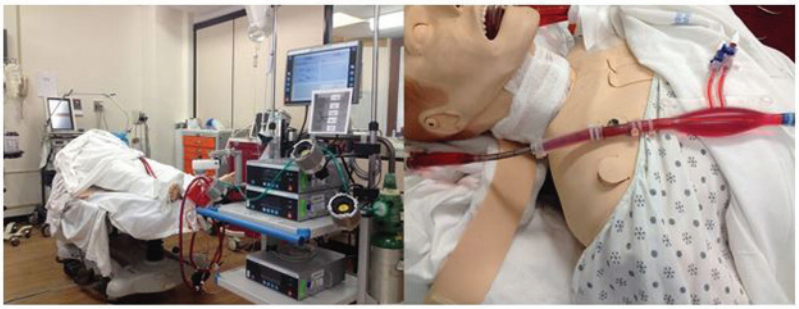

Fig 1: VV-ECMO simulation setup. A Laerdal SimMan 3G was connected to a running VV-ECMO circuit composed of a Rotaflow pump, a Macquet Quadrox-iD oxygenator, and a dual-lumen Macquet Avalon catheter. To maintain flow in the circuit, the catheter tip was placed in a bladder reservoir and sealed.

FIGURE 2

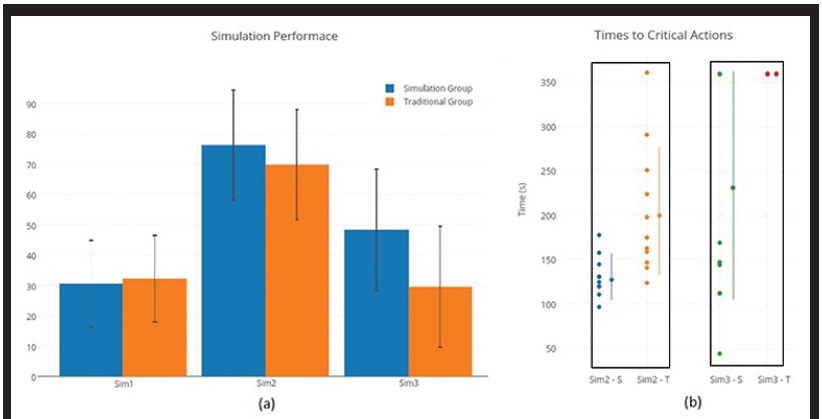

Fig 2. (a) Simulation scores for Sim1, Sim2, and Sim3. Performance was similar between groups for Sim1 (a scenario pre-training) and for Sim2 (a scenario similar to one seen during training) but higher in the simulation group in Sim3 (a novel scenario not encountered during training). (b) Plot of times to critical actions for each individual in the Simulation (S) and Traditional (T) groups with means and standard deviations for each group beside each dataset. During Sim2, the critical action was pump exchange for pump failure. During Sim3, the critical action was to administer a fluid bolus for access insufficiency. Time to critical action was shorter in the simulation group for Sim2 and for Sim3.

The Ohio State University

Columbus, OH

Implementation and Evaluation of an Outpatient Pulmonary Curriculum iBook

Program Director: Jennifer W. McCallister, MD
Type of Program: Pulmonary and Critical Care Medicine
Abstract Authors: Adam G. Manko, MD; Emily Amin, MD; Karen Wood, MD; Jennifer W. McCallister, MD

RATIONALE

Upon completion of training, pulmonary fellows must demonstrate competence in management of a wide range of pulmonary conditions in the ambulatory setting (1). However, fellows within the same institution may have variable educational experiences. These variations are influenced by referral base, patient population, and attending physician teaching styles. Currently, our fellows receive dedicated didactics on ambulatory pulmonary topics as part of our core lecture series. The topics rotate on a two-three year basis. The continuity clinic experience consists of two years of general pulmonary clinic with an additional year of focused training in select sub-specialty clinics. We hypothesize that the addition of a widely available, mobile, iBook curriculum with interactive digital media will improve medical knowledge and fellow comfort in disease management in ambulatory topics in pulmonary medicine (2).

EDUCATIONAL STRATEGY

Senior fellows worked collaboratively with faculty with content expertise to develop 13 interactive chapters (Figure 1) focused on high-yield ambulatory pulmonary topics. Each chapter ends with a medical knowledge assessment. Select expanded chapters (Figure 1) also include a pre-test for comparison to the medical knowledge post-test and pre- and post-questions related to comfort with disease management (Figure 2). Demographic information (Figure 2) about each learner is collected at the time of completion, and aggregated responses recorded via an online data collection sheet.

IMPLEMENTATION

The Outpatient Pulmonary Curriculum iBook will soon be published in the iTunes Store free of charge through The Ohio State University. Additional chapters will be added and the existing content will be updated based on review of initial performance data. The content will be integrated into our existing curriculum and made widely available for any other programs to use. We will require fellows to complete one chapter each month, and monitor the self-assessment scores as a potential trigger for targeted teaching and self-directed learning.

EXPECTED IMPACT AND OUTCOMES

The Outpatient Pulmonary iBook is a low-cost, mobile outpatient pulmonary curriculum that will be easily accessible to all programs. We anticipate that it's interactive and portable content will not only be desirable, but effective. 1. ACGME program requirements for graduate medical education in pulmonary disease and critical care medicine (internal medicine). 2013. 2. Parslow GR.

COMMENTARY

iBooks packaging textbooks for the iPad. Biochemistry and molecular biology education: a bimonthly publication of the International Union of Biochemistry and Molecular Biology 2012;40(2):142-143.

The content is available for download on iBooks. Search for "Outpatient Pulmonary Curriculum."

FIGURE 1: Chapter Topics for the Outpatient Pulmonary Curriculum iBook

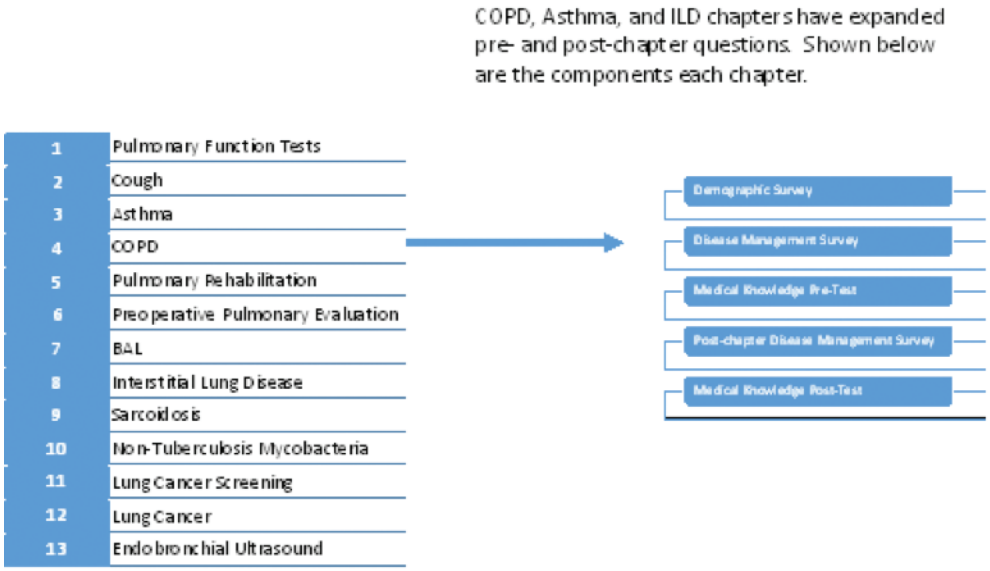

FIGURE 2: Demographic and Disease Management Survey Questions for COPD.

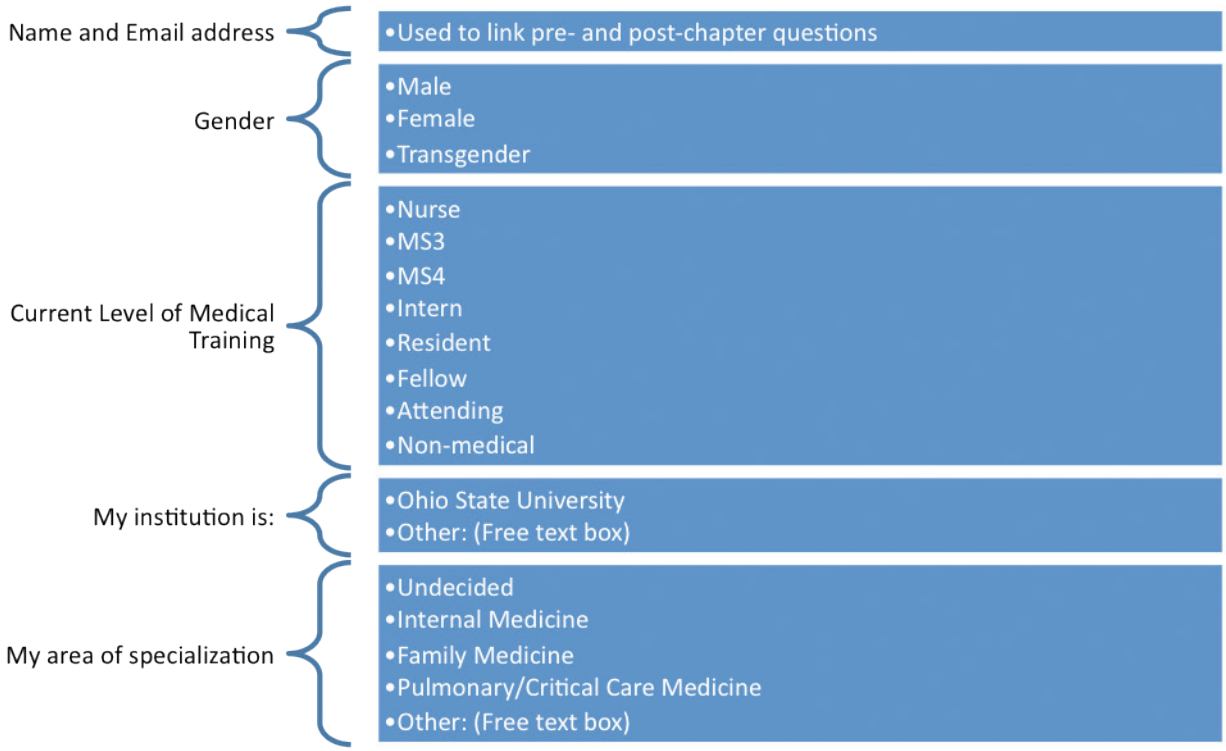

FIGURE 3

Survey Question	Survey Answers				
On average, the number of patients per month I manage with COPD is:	0 or N/A	1-5	5-10	>10	
My current comfort level with managing COPD in the outpatient setting is:	Extremely High	High	Average	Low	Very Low
My current comfort level with managing an acute exacerbation of COPD is:	Extremely High	High	Average	Low	Very Low
My current comfort level discussing smoking cessation with patients is:	Extremely High	High	Average	Low	Very Low
My current comfort level in managing pharmacologic smoking cessation aids is:	Extremely High	High	Average	Low	Very Low
I understand _____ of the criteria for referral to pulmonary rehabilitation for patients with COPD.	All	Majority	Some	None	
I understand _____ of the criteria for lung cancer screening in patients who are current smokers or have a history of smoking.	All	Majority	Some	None	

University of Washington

Seattle, WA

Role of Peer Mentoring for Clinician-Educator Fellows within the Pulmonary and Critical Care Fellowship Training Program

Program Director: Mark Tonelli, MD, MA
Type of Program: Pulmonary and Critical Care Medicine
Abstract Authors: James A. Town, MD; Anna K. Brady, MD; Tyler J. Albert, MD; and Mark R. Tonelli, MD, MA MA

RATIONALE

The original Clinician-Educator Track (CET) within our Pulmonary and Critical Care Medicine (PCCM) Fellowship Program has been described (1); however, examining the evolving experience can optimize outcomes. Current CET fellows adopted peer mentoring (PM) to identify and enhance opportunities for fellows' professional and educational development. Educational Strategy: CET fellows reflected on strategies to improve their training and selected PM to reduce barriers for timely, personalized, and pragmatic advising of each other. All PCCM fellows at UW have formal faculty mentors; however, the CET PM relationship mitigates hierarchy and offers perspective through a shared experience. PM offers a benefit at several levels to both peer mentors and mentees: mentees are advised on selection of faculty mentors, teaching opportunities, and other activities (see Figure 1). Likewise, peer mentors engage in professional development skills that are crucial to the clinician-educator. The PM relationship between CET fellows is informal and multidirectional, although senior fellows (and recent CET graduates) provide longitudinal context and experience.

PEER MENTORING IN THE CONCEPTUAL FRAMEWORK

The framework (Figure 1) depicts some of the PM activities of CET fellows progressing along the domains of clinician-educators: Clinical, Educational and Professional Development (2). PM itself is a component of both professional and educational development and gives fellows a stake in the pathway's success. Challenges and Solutions: Compared to traditional physician-scientist pathways, no model exists for CETs and traditional mentoring may be less available for clinician-educators (3). Reflection and leadership by current and former CET fellows can advance the program's outcomes. Adding the role of PM to the framework for CETs can help nascent CET programs identify mechanisms of support and growth to optimize fellow development.

EXPECTED IMPACT AND OUTCOMES

We report this active PM relationship as a powerful feature of the CET that can promote positive outcomes, build on successes, and serve as a model for other programs. Identifiable outcomes associated with PM include fellow co-authorship of peer-reviewed scholarship with recent CET graduates, strategies to maximize success in professional development programs, identification and recommendation of teaching opportunities, and shepherding junior fellows into roles within national organizations. In the future, peer mentors could be evaluated and provided with feedback with an internal tool currently used for faculty mentors and program-level data on academic progress (e.g., publications, committees, evaluations) could be assessed for correlation with mentoring relationships.

CONCLUSIONS

New CET programs should encourage PM as a useful developmental activity for their fellows.

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1. Adamson R, Goodman RB, Kritek P, Luks AM, Tonelli MR, Benditt J. Training the teachers. The clinician-educator track of the university of washington pulmonary and critical care medicine fellowship program. Ann Am Thorac Soc. 2015;12(4):480-485.
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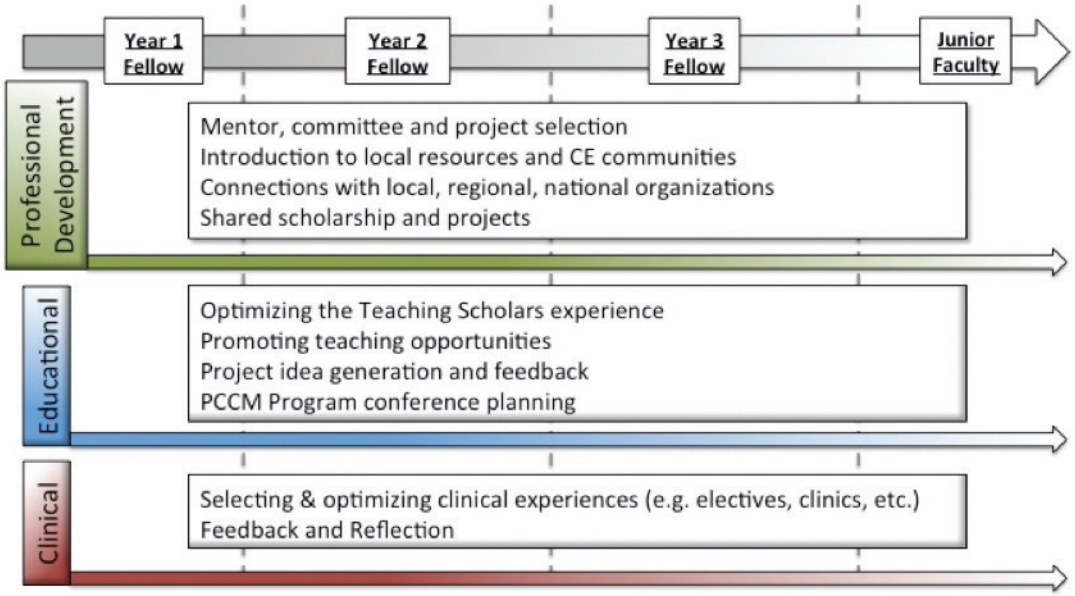
3. Lord JA, Mourtzanos E, McLaren K, Murray SB, Kimmel RJ, Cowley DS. A peer mentoring group for junior clinician educators: four years' experience. Acad Med. 2012;87(3):378-383.

FIGURE 1



Peer mentoring activities across the domains of development for fellows in the Clinician-Educator Track (CET). PM spans all years of fellows in the program and partially extends to the junior faculty role in the case of the few CET-graduates. Teaching Scholars (TS) is the University of Washington's professional development program for clinician-educators. The TS curriculum topics depend on the interests of the yearly cohort and involve a longitudinal project, both of which can be enhanced with pre-planning. The 2nd and 3rd year CET fellows also plan the weekly PCCM educational conference, including topic and speaker selection.

Baylor College of Medicine

Houston, TX

An Alternative Curriculum for Basic Physiology Education Using Meaningful Engaged Learning

Program Director: M. Hossein Tcharmtchi, MD
Type of Program: Pediatric Critical Care Medicine
Abstract Authors: Fong Lam, MD; Dalia Bashir, MD; Nirica Borges, MD; and Satid Thammasitboon,MD

RATIONALE/PURPOSE

Pediatric Critical Care Medicine (PCCM) fellows are adept in applying basic physiology to understand and manage complex, critically ill patients. It is challenging to teach detailed basic science concepts to fellows who generally seek practical knowledge that can be immediately applicable to their professional needs or used to improve skills, facilitate their work, and enhance their confidence. Our fellows viewed the conventional faculty-moderated book study group for basic physiology series as a threatening atmosphere with competing priorities of learning (i.e., basic/foundational vs. clinical/practical), which also used an outdated instructional method. To respond to learners' need for change, we formed a taskforce to develop an alternative curriculum aimed at increasing learners' satisfaction and enhancing their acquisition of basic physiology concepts.

METHODS

Needs assessment, including surveys and focus group discussion, identified learners' needs (i.e., content and format) as well as prescribed needs as deemed by faculty and the content outline of the American Board of Pediatrics, PCCM section. Based on the findings, we created a curriculum to foster meaningful engaged learning among PCCM fellows. More specifically, the curriculum integrated learner-driven hands-on activities, collaborative learning, case-based discussion with connections to real world and prior knowledge, and safe environment with positive learner/faculty rapport. We employed a flipped-classroom modality, in which individual learners used case-based study guides with learning objectives and key questions to plan a learning session 1-2 weeks in advance. During each session, differing levels of learners worked in small groups to create a community of inquiry. Explicit learning objectives provided senior fellows a structure to lead group discussion. Finally, the entire group of learners shared their lessons learned, and the faculty added clinical correlates. We used questionnaires to evaluate learners' satisfaction and knowledge acquisition at the end of each session. Data were evaluated using student's paired t-test.

RESULTS

Satisfaction scores after the first 5 sessions were as follows (5-point Likert scale, 5=best; mean ± SEM): providing a safe learning environment 4.4 ± 0.3, fostering a community of learning 4.5 ± 0.2, relevance to clinical practice 4.6 ± 0.2, and matches preferred learning style 4.6 ± 0.2. Self-reported level of understanding of 25 separate concepts rose overall from 3.4 ± 0.0 to 4.5 ± 0.0 ($p<0.05$). Discussion: We created a new curriculum to foster meaningful engaged learning among fellows to address key barriers to basic physiology education. Our preliminary outcomes indicated that fellows attained knowledge content and reported high satisfaction in learning.

DISCUSSION

We created a new curriculum to foster meaningful engaged learning among fellows to address key barriers to basic physiology education. Our preliminary outcomes indicated that fellows attained knowledge content and reported high satisfaction in learning.

Brown University, Alpert Medical School

Providence, RI

A Novel International Exchange Program for Critical Care Medicine Fellows

Program Director: Gerardo Carino, MD, PhD
Type of Program: Critical Care Medicine
Abstract Authors: Taro Minami, MD; Reimer Riessen, MD, PhD; Andrew Levinson, MD, MPH; Gerardo Carino, MD, PhD

Our program is a 2 year critical care medicine fellowship. Fellows rotate through the Miriam and Rhode Island Hospitals and receive extensive training in the care of medical, surgical and cardiac critical care patients. Fellows are encouraged to develop an attitude of scholarship and the intellectual curiosity to remain in the forefront of the discipline throughout his or her professional lifetime.

Since 2012, a novel international exchange program has been integrated into the curriculum for Brown University Critical Care Medicine Fellows. The program, the Winter School in Critical Care, is a collaborative endeavor between the Warren Alpert School of Medicine, Brown University and the University of Tübingen, Germany. As part of the 2 week long exchange program, a total of 16 fourth year medical students (from Brown, Tubingen and other international schools) have attended each year for the last 4 years. Each year, Critical Care faculty from both institutions and a critical care medicine fellow from Brown teach the course. The course is held in English and emphasizes fundamental concepts in critical care such as resuscitation and mechanical ventilation. In addition to the interactive seminar, the course includes teaching rounds in medical and surgical ICUs at the University of Tübingen and practical hands-on training workshops in various invasive techniques, emergency ultrasound, mechanical ventilation and endoscopy. One of the highlights of the course is a two-day high-fidelity full-scale critical care simulation training including an introduction in crisis resource management (CRM) utilizing video debriefing. Fellows from Brown University are involved in all teaching sessions, which are often given together with German colleagues. They are also responsible for several case-based learning sessions which have been highly received by the German students. In addition to teaching rounds, fellows also take part in regular rounds and case discussions in the Medical ICU. Through this and many other interactions they get an insight in the structure, organization and delivery of critical care at a German university hospital. Major differences between the German and US systems, especially in end of life care, transplant medicine and resource allocation are a key focus of discussion. Fellows and faculty members take part in several social events and gathering organized by the University of Tübingen and by the German students, thereby getting an impression of other aspects of life in Germany. Travel and housing expenses for Brown faculty members are covered by a German international exchange program. The Winter School in Critical Care is a unique international program for Brown critical care medicine fellows that gives them an intense teaching experience and broadens their knowledge of critical care medicine beyond the US. It is an excellent example of a valuable educational program which can be developed between distant universities to improve overall teaching at both sites.

Cincinnati Children's Hospital Medical Center

Cincinnati, OH

Improving Pediatric Pulmonary Training Curricula, SITE Scores, and Board Success

Program Director: Barbara A. Chini, MD
Type of Program: Pulmonary and Critical Care Medicine
Abstract Authors: Gregory Burg, MD; Gary McPhail, MD; Sandra Bales; and Barbara A. Chini, MD

Fellowship training programs in pediatric pulmonology are based around a foundation of clinical experience, research opportunities, and educational programming that ensures fellows receive a comprehensive education in anticipation of independently providing care to children with lung diseases and breathing disorders. The American Board of Pediatrics (ABP) subspecialty certifying exam in pulmonology has long been the benchmark for assessing providers' competence in pediatric pulmonary medicine. During training, fellows take the ABP-sponsored Subspecialty In-Training Examination (SITE), which is based on content specifications that provide a global assessment of one's current knowledge in a subspecialty. In this study, we reviewed our SITE scores and board success rates over the past 12 years and found that higher SITE scores correlated with a greater likelihood of passing the pediatric pulmonary certifying exam on the first attempt (N=23 trainees). We had two outliers: one with average SITE scores of 65 percent who failed on first attempt, and one with average SITE scores of 49 percent who passed on first attempt. (Please see Tables 1 and 2 for further details on correlation between SITE scores and board success.)

Following an 8-year period with board success rate < 80 percent for first-time test takers, our pediatric pulmonary fellowship training program made the following changes in an effort to improve fellow education and board success rates: 1) instituted an annual physiology lecture series led by fellows, and 2) separated our consult service from our primary service. Since then, our board success rate has been 100 percent (N=10). Reviewing our SITE score data revealed that before instituting our curriculum changes, fellows improved their SITE score an average 3.5 percent over the course of their training (N=11). Following the curriculum changes, fellows SITE scores improved by an average of 7.6 percent throughout training (N=13). There was a trend to a statistically significant difference between these groups (p-value 0.06) for both change in SITE scores and change in board success rate for first-time test takers, when comparing pre- and post-curriculum changes. Following implementation of these curriculum changes, namely a separate consult service and an annual core physiology series, our pediatric pulmonology board pass rate increased from 77 percent to 100 percent. Improvement in SITE scores correlates with improved board success rate. We plan to continue to use SITE scores during training to assess fellow's competence in pediatric pulmonary medicine.

Table 1. SITE Score Correlation to First Attempt Board Success

Average SITE	Trainees	Board Success Rate
>40	N = 23	87.0%
>45	N = 22	90.9%
>50	N = 20	95.0%
>55	N = 19	94.7%
>60	N = 19	94.7%
>65	N = 17	94.1%
>70	N = 8	100%

Table 2. Board Exam Data and Average SITE Scores

Certifying Exam	Trainees (N = 23 total)	SITE (avg)	SITE (avg) Minus Outliers
First time pass:	N = 20	69.2	70.6
First time fail:	N = 3	61.3	46.0

Cleveland Clinic

Cleveland, OH

Using Learning Theory to Develop a Course on Hemodynamic Management of the Critically Ill Patient

Program Director: Eduardo Mireles-Cabodevila, MD, and Rendell Ashton, MD
Type of Program: Pulmonary and Critical Care Medicine
Abstract Authors: Neal Chaisson, MD; Aanchal Kapoor, MD; Rendell Ashton, MD; Abhijit Duggal, MD; Ajit Moghekar, MD; Deborah Rathz, MD; Robert Chatburn, MD; Sudhir Krishnan, MD; Carlos Alviar-Restrepo, MD; and Eduardo Mireles-Cabodevila, MD

BACKGROUND

A recent study showed that U.S. trainees have low confidence in managing cardiac critical illness and performing cardiac procedures specific to the ICU. Training programs rely primarily on reading and didactic lectures to teach these skills. We created a simulation-based curriculum for hemodynamic assessment. Our curriculum moves beyond the traditional emphasis on cognitive learning to include psychomotor and affective areas of adult learning theory. We describe the methods for other centers to develop such a course.

METHODS

The course was developed by a multidisciplinary group formed by physicians (critical care, emergency medicine, pulmonary, and cardiology), nurses, educators and fellows. We used literature review, Critical Care ACGME milestones, and our practice needs to define the objectives, curriculum, skill stations, simulations, and evaluations. The course is centered on a basic equation to highlight the physiology, provide structure to patient assessment, apply technology, and define management (fig 1). The objectives were developed to cover the cognitive, psychomotor, and affective domains, and followed the structure for Bloom's taxonomy (fig. 2).

RESULTS

The curriculum includes a 1) didactic pre-course, 2) simulation day, and 3) evaluation. Didactic pre-course requires self-study online modules covering hemodynamic physiology, monitoring, and assessment and including didactics and online resources/simulators. (Given 4 weeks prior to the simulation.) Simulation day is a full-day event consisting of a summary lecture, hands-on skills stations, and case-based simulations. The summary lecture presents the goals and objectives and highlights key principles of hemodynamic assessment. The skills stations focus on hemodynamic monitoring technology and provide facilitated hands-on training. Case-based simulations focus on recognition, assessment, and management of hemodynamics. Debriefing occurs after each simulation to consolidate knowledge and skills.

EVALUATIONS

Cognitive assessments use randomized questionnaires on hemodynamic assessment and management. Assessments are given prior to the pre-course, after the simulation, and after a two-week period. Psychomotor assessments are performed with checklists and self-assessment at the last simulation of the day and two-weeks later using a modified scenario. Affective assessments are done with a questionnaire on attitudes and confidence in management of hemodynamics.

SUSTAINABILITY

The course can be adapted for institutions that do not have access to high-fidelity simulation capabilities. The course is embedded in the yearly schedule with protected time for fellows and teaching staff.

CONCLUSIONS

We present the structure to develop a course to train critical care fellows on hemodynamic physiology, assessment, and management. We use adult learning theory to cover all domains of learning.

FIGURE 1: Equation of Mean Arterial Pressure (MAP) as driving principle for the course

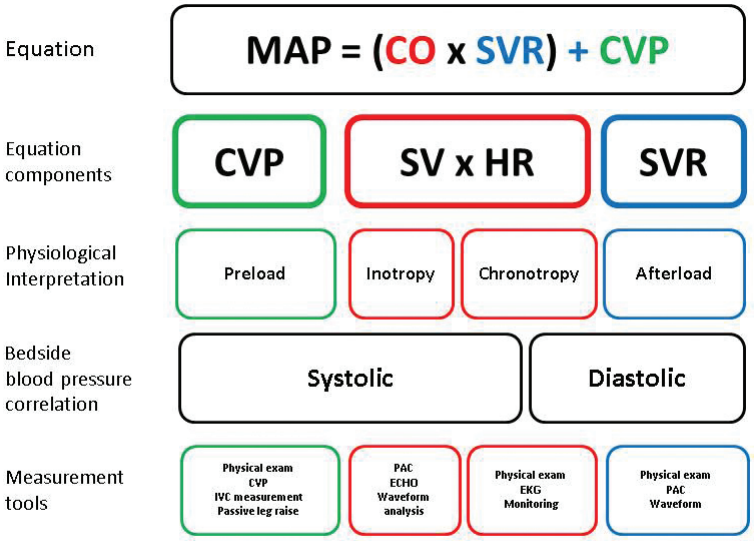


Figure 1. Equation of Mean Arterial Pressure (MAP) as driving principle for the course

FIGURE 2: Example of ICU Hemodynamics Skills Training Learning Objectives

Figure 2. Example of ICU Hemodynamics Skills Training Learning Objectives

Henry Ford Hospital

Detroit, Michigan

Behavioral-based Interviewing to Improve Candidate Selection for a Pulmonary and Critical Care Medicine Fellowship Program

Program Director: Geneva Tatem, MD
Type of Program: Pulmonary and Critical Care Medicine
Abstract Authors: Geneva Tatem, MD; Maria Kokas, PhD; Cathy L. Smith, MA, LPC; and Bruno DiGiovine, MD

BACKGROUND

Traditional interviews for residency and fellowship training programs are an important component in the selection process but can be of variable value due to a non-standardized approach. We redesigned the candidate interview process for our large pulmonary and critical care medicine fellowship program using a behavioral-based interview (BBI) structure. The primary goal of the BBI approach was to standardize the assessment of candidates within non-cognitive domains in order to select those with the best fit for our institution's fellowship program.

METHODS

Eight faculty members attended two BBI workshops. The first workshop identified our program's "best fit" criteria using the framework of the Accreditation Council for Graduate Medical Education's six core competencies and additional behaviors that fit within our program's priorities of professionalism, leadership, communication skills, teamwork, and empathy. BBI questions were selected from a national database and refined based on the attributes deemed most important by our faculty. In the second workshop, faculty practiced the BBI format in mock interviews with graduating fellows. The BBI process was further refined based on feedback and the faculty conducted the BBI structured interviews with fellowship candidates for the 2014 recruitment season.

RESULTS

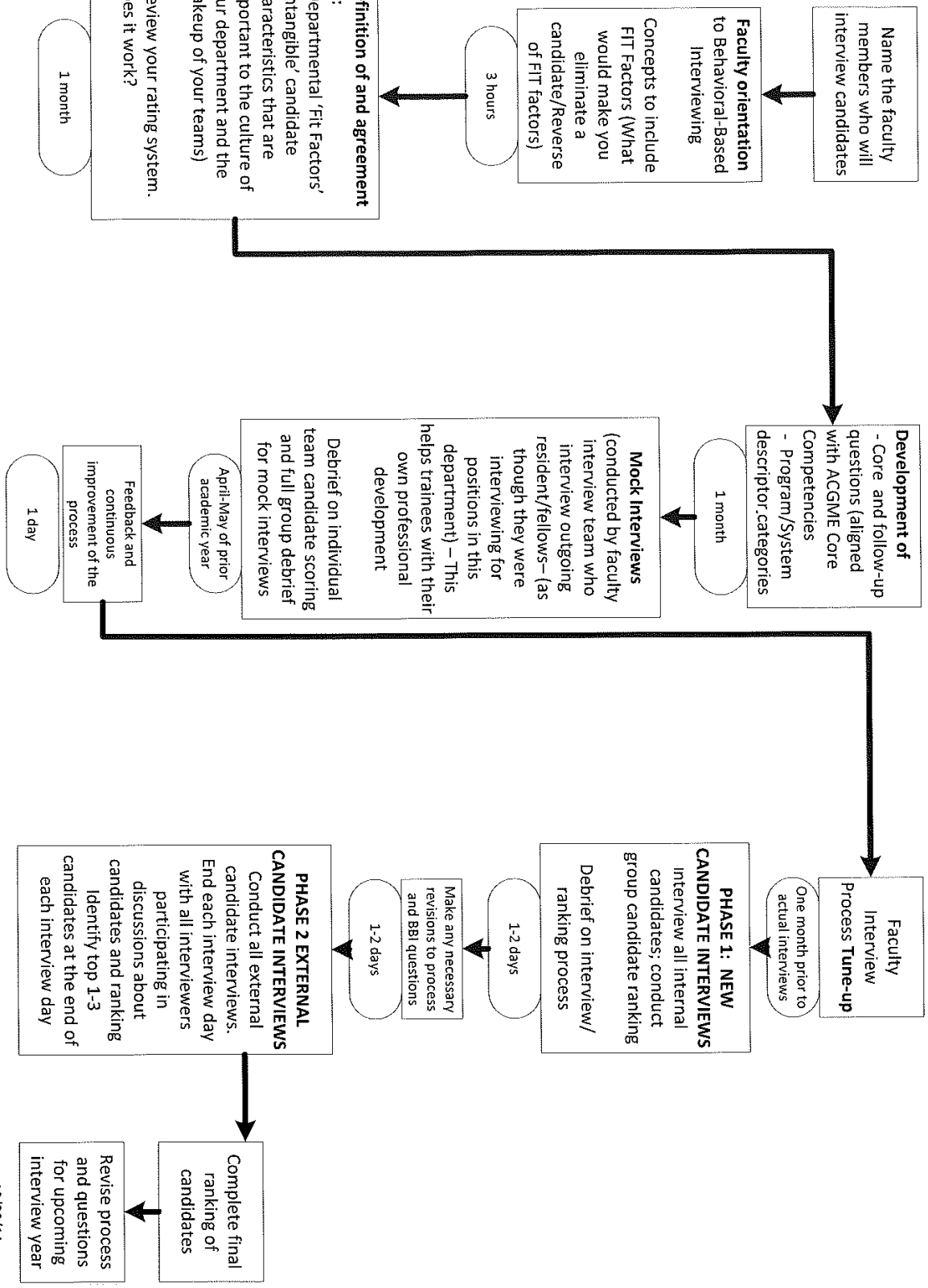
Our program matched all 7 candidates by the 10th rank in 2014 whereas the previous 5 years required on average a 15th rank to fill all positions.

CONCLUSIONS

The one-year pilot of the BBI structure suggests an association with improved match results for our fellowship program. We were able to develop a standardized interview process based on the traits we deemed indicative of a successful fellow within our program using a framework of the ACGME core competencies. Training interviewers in this process using standardized questions, multiple interviewers, and behavioral interview rating scales improved our ability to assess fit with our program. Continued implementation of this program will allow us obtain data on correlates with trainee performance within our fellowship program.

Behavioral-Based Interviewing for Residency/Fellowship Programs (Question-Guide Development, Faculty Training and Candidate Interviews)

(October 2014 – Based on Pulmonary Critical Care Pilot Program)



10/20/14

Indiana University

Bloomington, IN

The Effect of Paging Reminders on Fellowship Conference Attendance: A Multi-Program Randomized Crossover Study

Program Director: Gabriel Bosslet, MD, MA
Type of Program: Pulmonary and Critical Care Medicine
Abstract Authors: Joshua Smith, MD; Lorenzo Zaffiri, MD; Julie Clary, MD, MBA; Tyler Davis, MD; and Gabriel T. Bosslet, MD, MA

INTRODUCTION

Didactic lectures have long served as a foundation of medical education. A common practice at many institutions is to send text pages to learners as a reminder prior to the start of conference. The goal of our study was to determine if routine text paging prior to regularly scheduled conferences improves attendance among fellows in three separate internal medicine fellowship programs.

METHODS

A prospective, randomized crossover study included three separate fellowship programs: pulmonary and critical care, cardiovascular disease, and hematology-oncology. The study was performed between October 2014 and March 2015. All fellows were included and randomized to 1of 2 groups (with subsequent cross over to the opposite group): Pages or No Pages. Paging reminders that included conference title, location, and time, were sent 30 minutes prior to every conference for those in the intervention arm. Attendance was collected through a standard attendance log using self-registration.

RESULTS

A total of 46 fellows (100 percent participation) and 156 conferences were included for analysis, with 75 during the first 3 months and 81 during the second 3 months. There were no differences in individual overall attendance between randomized groups for the entire study period (43.5vs. 46.6 percent, respectively, p=0.54). Paging reminders had no effect on overall individual attendance (43.7 vs. 45.6 percent, p=0.50). In addition, there were no significant differences identified for individuals within each fellowship and within year of training. At the completion of the study, a survey was provided to all study participants with an overall response rate of 59 percent (27 out of 46 fellows). The majority of fellows found paging reminders to be helpful prior to conference (70.4 percent), although almost 60 percent of participants felt that paging had no effect on their overall attendance. Forty percent of fellows reported being annoyed by reminder pages. The most common reason for absence from conference was clinical responsibilities, followed by conference time and location.

CONCLUSIONS

In this randomized crossover study, paging reminders prior to a regularly scheduled conference had no effect on overall attendance. Alternative measures may need to be investigated to improve attendance, in particular, reducing barriers to attending conference. Future studies could assess the effect of paging on a variety of rotation types.

**Disclaimer: This abstract has been submitted for publication to the Journal of Graduate Medical Education but has not been accepted at time of submission to the ATS.*

Johns Hopkins Hospital

Baltimore, MD

Innovation in Interprofessional Education: A Quality Improvement Project in a Pulmonary Care Unit

Program Director: Henry Fessler, MD
Type of Program: Pulmonary and Critical Care Medicine
Abstract Authors: T. Sidharthan, MD; P. Galiatsatos, MD; A. Lambert, MD; H. Fessler, MD; and V. Sidhaye, MD

Competence in quality improvement is vital to medical practice and emphasized in graduate medical education and by fellowship accreditation and specialty credentialing boards. Interprofessional practice with care shared by physicians and mid-level providers (MLPs), physician assistants and advanced care nurses, is an increasingly prevalent staffing model. However, the management of specialized patients by MLPs, their training, and their role in a medical team lacks clear definition in many clinical settings. We describe a fellow-implemented quality improvement project designed to 1) train pulmonary and critical care (PCCM) fellows in quality improvement, 2) provide education for MLPs in the conditions prevalent in our medical unit, and 3) improve the ability of MLPs to function more independently and improve their patient care. The Progressive Care Unit (PCU) at Johns Hopkins Bayview Medical Center is a 14-bed pulmonary and intermediate critical care unit managed by an attending pulmonologist, a PCCM fellow, and 2 MLPs. The MLPs provide day-to-day management, with fellows and the attending acting in supervisory roles.

We devised a longitudinal quality improvement project to expose fellows to concepts in quality improvement through participation in a program-wide Plan-Do-Study-Act cycle. Fellows, attendings, and MLPs were independently surveyed to assess limitations in MLPs competency in key areas of pulmonary disease management and perform needs-assessment analysis for improvement. Likert-scale surveys addressed attitudes toward MLP medical knowledge, continuity of MLP staffing on the unit, and satisfaction with overall team-based management and provider roles. Median scores and frequencies were calculated to compare groups and assess competencies. Qualitative data was coded and frequency lists were generated to assess interventions. The 2015-2016 fellow class developed a longitudinal intervention that a) implemented an educational curriculum for MLPs aimed at perceived knowledge gaps, b) aimed to improve continuity among MLPs in the PCU, and c) and assessed satisfaction among MLPs by engaging key members of the mid-level team. Surveys will be administered at the end of the intervention and Chi-squared tests will be applied to compare groups before and after intervention. Data supports fellow-lead quality improvement interventions among fellows, attending physicians, and MLPs alike.

Mayo Clinic

Rochester, MN

Innovative Intervention to Improve Pulmonary and Critical Medicine Fellows' Research Training

Program Director: Kannan Ramar, MD
Type of Program: Pulmonary and Critical Care Medicine
Abstract Authors: Kannan Ramar, MD; Robert Vassallo, MD; Darlene R. Nelson, MD; and Jay H. Ryu, MD

RATIONALE

The Mayo Clinic Pulmonary and Critical Care Medicine (PCCM) Fellowship program consists of 24 months of clinical rotations and 12 months of dedicated research time, which usually occurs during the second year of the fellowship program. Fellows' satisfaction with their research training and their research productivity were below expectations. The lack of awareness of ongoing research opportunities, time to reflect on long-term academic career goals, and prioritization of research interests during their busy first-year clinical fellowship rotations were identified as key causes of lack of satisfaction and reduced productivity, based on a survey of current and prior fellows. Lack of time for advanced planning led to a delay in initiating research projects during the research year.

METHODS

The education leadership within the PCCM division allocated a month of research in the month of January during the first year of fellowship and developed a structured process with the following goals:

- Explicitly state the goals/objectives of the January research month;
- Provide time to survey online research courses from the Mayo Clinic's Center for Clinical and Translational Science Activities (CCaTS);
- Provide a venue for research mentors and research coordinators to interact and present ongoing work to fellows;
- Facilitate encounters with principal investigators and their laboratories/programs;
- Reflect on, plan, develop, and present a research plan to the education committee for approval by the end of the month;
- Obtain the necessary approvals from relevant institutional boards (IRB and IACUC) before the start of the research year.

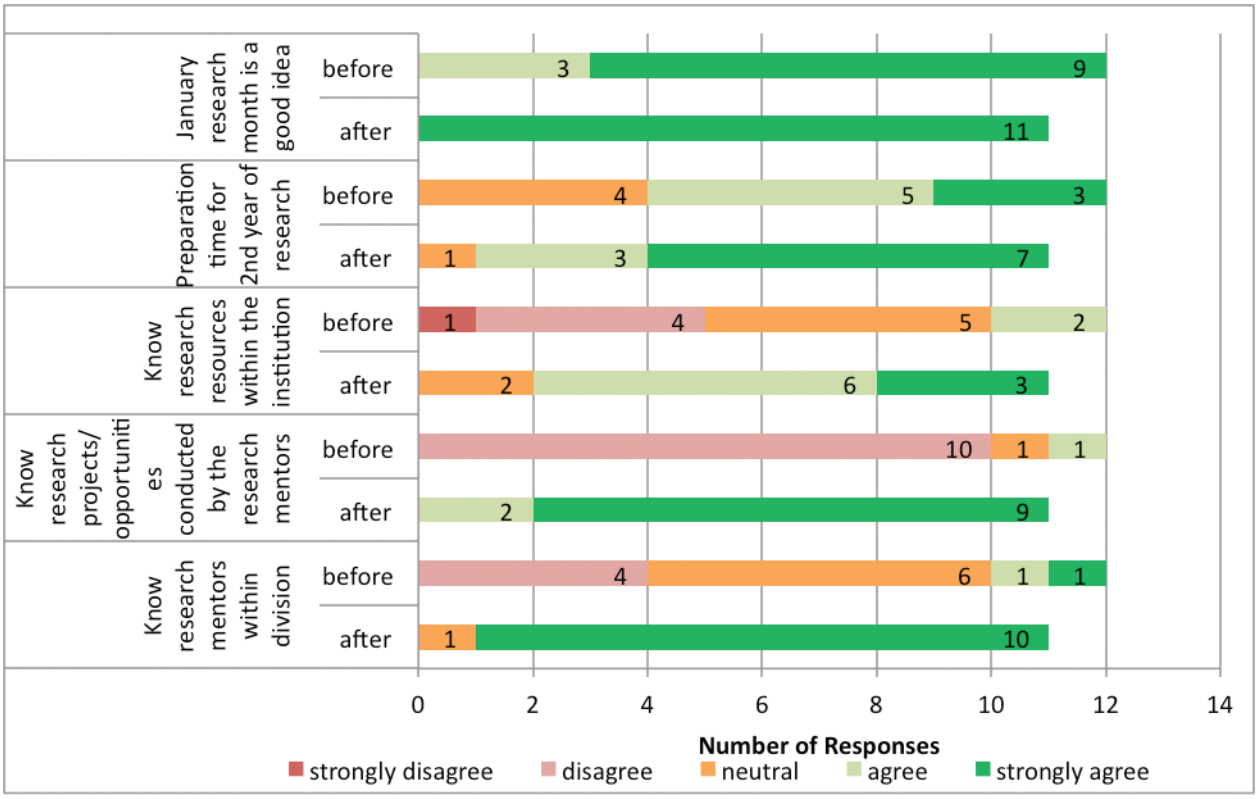
RESULTS

Twelve fellows participated with 11 fellows completing the post-intervention survey. Following the intervention, 9 out of the 11 fellows were very satisfied and the remaining 2 were somewhat satisfied with the January research month (Likert scale from 1 to 5, with 5 being very satisfied). Knowing the research mentors, the research opportunities and projects conducted by research mentors, and the research resources within the institution significantly improved post-intervention (Figure). The number of manuscripts published by fellows at the end of their second year of research (for those who had the January research month) was 20, compared with 5 for fellows who did not have the intervention ($p < 0.005$). However, the latter was not controlled for other confounding variables.

CONCLUSIONS

Based on the positive results from this pilot project, the education committee has recommended continuation of a January month of research for the first-year fellows.

Figure 1: Survey results



Monroe Carrell Jr. Children's Hospital at Vanderbilt

Nashville, TN

Design and Implementation of a Curriculum to Teach Communication Skills to Pediatric Critical Care Fellows

Program Director: Geoffrey Fleming, MD
Type of Program: Pediatric Critical Care Medicine
Abstract Authors: Erin R. Powell, MD, and Jessica Turnbull, MD, MA

Good communication is an essential skill for all physicians. Poor communication was cited as one of the top root causes of all sentinel events by the Joint Commission from 2004-2014. Fellows in pediatric subspecialties are required by the ACGME Core Competencies and the Pediatric Milestones Project to achieve competency in communication skills. While most fellowship programs focus on traditional skills such as medical knowledge and procedural skills, little training exists on teaching communication. There is a growing body of literature that demonstrates curricula can improve communication skills. Many of these studies evaluate trainee confidence and perception of a particular curriculum. However, few studies have been performed to determine if implementation of such a curriculum improves trainee performance or family satisfaction. Additionally, few studies have been performed to evaluate communication curricula in pediatrics. The aim of this project is to design and implement a curriculum to improve communication skills among pediatric critical care fellows. By improving communication skills, we hope to improve fellow confidence and family satisfaction.

This is a prospective study involving the pediatric critical care medicine (intervention group) and neonatal intensive care fellows (control group) from 2015-2016 at MCJCHV. The intervention group will participate in a new longitudinal curriculum designed to teach communication skills in the care of critically ill pediatric patients. The curriculum is divided into 6 didactic sessions and 3 practice simulation sessions with standardized family members in which fellows can practice using the skills in a safe environment. The curriculum covers topics such as basic communication skills, emotionally challenging conversations, communicating across cultures, end-of-life conversations, leading family/team meetings, and negotiating professional disagreements. After each session, fellows are asked to practice and reflect on the skills taught in subsequent clinical encounters. Please see supporting documents that include an annotated presentation and a simulation session as examples of the curriculum. For objective analysis of change in communication skills, all participants will complete pre- and post-curriculum standardized family member simulations and be evaluated using a communication performance evaluation checklist. Additionally, pre- and post-curriculum surveys assessing participant confidence in communication skills will be used for comparative analysis of subjective improvement in both the intervention and control groups. Caregivers of patients in the pediatric critical care unit will also be surveyed via a standardized communication evaluation tool before and after implementation of the curriculum regarding their satisfaction with communication with the fellow caring for their child during hospitalization.

Basic Communication Skills for Advanced Clinicians

MCJCHV PCCM Communication Curriculum

Erin R. Powell, M.D.
Jessica Turnbull, M.D., M.A.

It may be helpful to review the following references prior to this session:

1) Makoul G. Essential elements of communication in medical encounters: the Kalamazoo consensus statement. Acad Med. 2001; 76(40): 390-393.
2) The Calgary-Cambridge Guide as published in Kurtz SM, Silverman JD, Draper J (1998) Teaching and Learning Communication Skills in Medicine. Radcliffe Medical Press (Oxford). and
Silverman JD, Kurtz SM, Draper J (1998) Skills for Communicating with Patients. Radcliffe Medical Press (Oxford).
3) Back A, Arnold R, Tulsky J. Chapter 2: Getting a good start. Mastering communication with seriously ill patients: balancing honesty with empathy and hope. New York: Cambridge University Press, 2009.

Authors: Erin R. Powell and Jessica Turnbull
Project: Design and implementation of a curriculum to teach communication skills to pediatric critical care fellows
Institution: Monroe Carell Jr. Children's Hospital at Vanderbilt

Communication Curriculum Practice Session #1

Objectives:

- Practice using the Calgary-Cambridge guide as a framework for effective communication with patients and their families specifically focusing on the following skills:
  - Negotiating agendas
  - Assessing prior level of knowledge and incorporating perspective of illness
  - Maximizing and checking for understanding
- Practice advanced skills for effective communication during emotionally challenging conversations, specifically
  - Delivering serious news
  - Disclosure of an unintended medical event
  - De-escalation of an angry caregiver

Scenarios:

- De-escalation of an angry caregiver
- Disclosure of an unintended medical event
- Responding to emotion after notifying a caregiver of a child's critical illness
- Fellow's choice improvisation

Nationwide Children's Hospital

Columbus, OH

Physiology "Flipped Classroom"

Program Director: Beth Allen, MD
Type of Program: Pediatric Pulmonary
Abstract Authors: Lisa M. Sarzynski, MD, and Beth Allen, MD

BACKGROUND

Pulmonary physiology is an essential component of pulmonary fellowship education; however, finding ways to keep fellows engaged (and to retain covered concepts) is challenging. We've previously utilized a variety of approaches to try to improve our fellows' mastery of the topic. These have included didactic lectures by faculty, by the fellows themselves, or by viewing lecture videos of the master physiologist, John B. West, himself. With the exception of occasional use of short post-lecture quizzes, these approaches required minimal audience participation. An independent study approach was then trialed, which required reading assigned chapters and answering related questions online. Often, deadlines for online quiz completion were missed, indicating poor engagement in this activity as well. In training physiology scores remained suboptimal. Given these relative failures, we elected to trial a "flipped classroom" approach.

METHODS

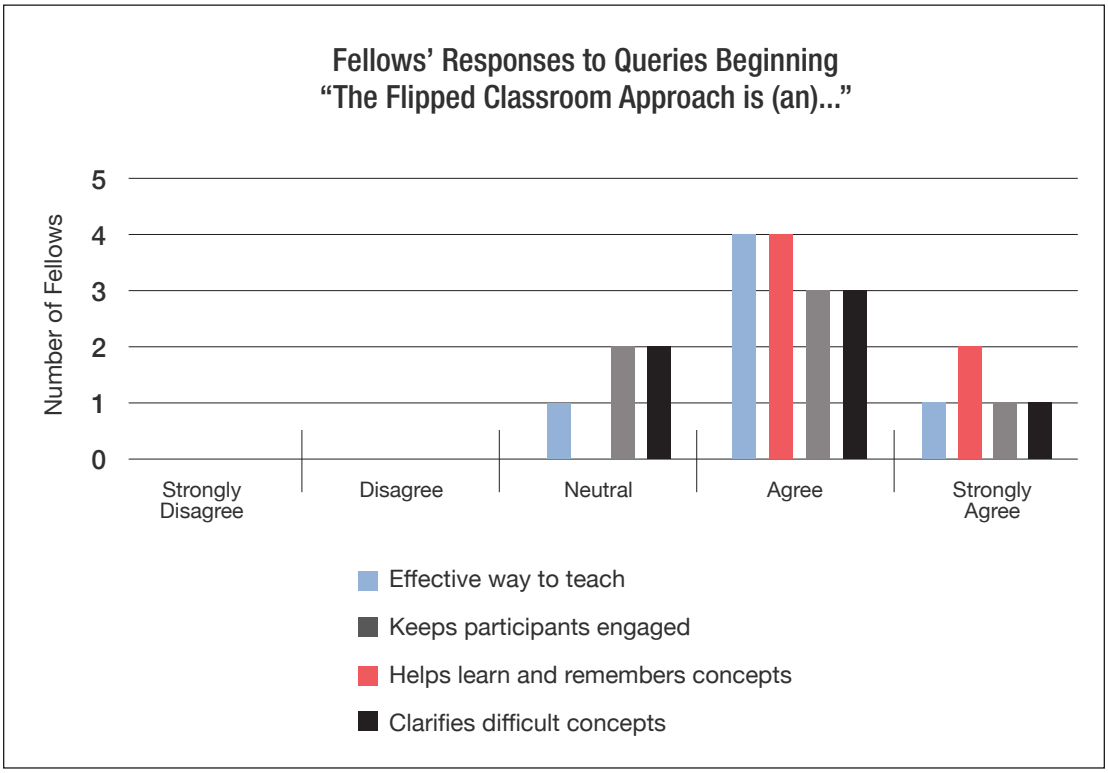
Our physiology flipped classroom occurs at monthly intervals during the academic year. Prior to each session, fellows are required to independently study the assigned physiology chapter. Each session begins with a closed-book test taken independently by everyone in attendance. Test questions are derived from a variety of resources, including the chapter review questions in Respiratory Physiology: The Essentials by John B. West, pulmonary prep questions, and questions created by the program director. One pre-assigned fellow must then provide explanations for the correct answers and review key teaching points. This format promotes an interactive environment that engages every fellow and attending present in the session. After initially trialing this method, we surveyed the fellows for their opinions regarding the new format.

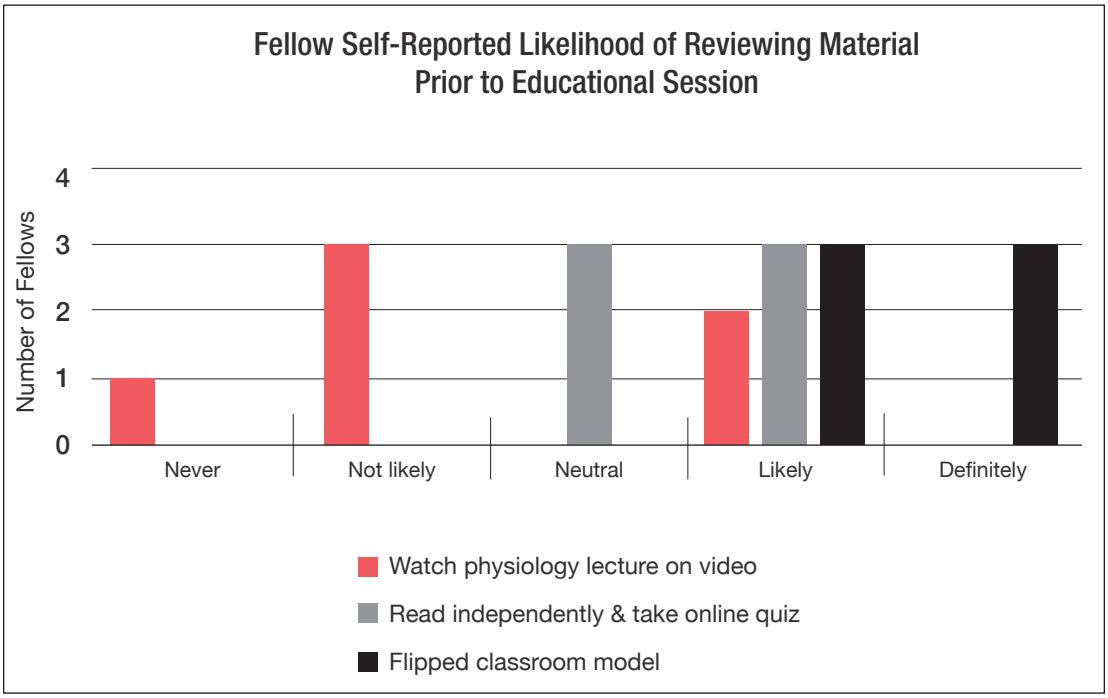
RESULTS

A recent survey indicates fellows are more likely to review physiology in advance with the flipped classroom model than with any previously trialed methods. The majority indicated that this method is an effective teaching model that kept them engaged. We plan to compare previous years' scores of the physiology section on the In-Training Exam to future scores. This will allow us to objectively see if our new approach impacts academic outcomes.

CONCLUSIONS

Pulmonary physiology involves many complex concepts that are essential for every pulmonary fellow to master. Our flipped classroom model has improved fellow participation and encouraged tudying of material (as opposed to passive absorption), which we hope will lead to improved understanding of these concepts.


Fellows' Responses to Queries Beginning
"The Flipped Classroom Approach is (an)..."
Number of Fellows
5
4
3
2
1
0
Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree
Effective way to teach
Keeps participants engaged
Helps learn and remembers concepts
Clarifies difficult concepts


Fellow Self-Reported Likelihood of Reviewing Material
Prior to Educational Session
Number of Fellows
4
3
2
1
0
Never
Not likely
Neutral
Likely
Definitely
Watch physiology lecture on video
Read independently & take online quiz
Flipped classroom model

Oregon Health and Sciences University

Portland, OR

Using Fidelity Simulation to Integrate Fellow and Nursing Education to Improve Team-Based Learning and Performance in the ICU

Program Director: Jeffrey A. Gold, MD
Type of Program: Pulmonary and Critical Care Medicine
Abstract Authors: Jeffrey A. Gold, MD; Raiza Dottin, MD; and Stephanie N. Nonas, MD

RATIONALE

Interprofessional communication is critical to effective team-based care and one of the core competencies for pulmonary/critical care. Deliberate practice and assessment in this domain is difficult in the clinical environment due to the inability to control the medical content, environmental disruptions, personnel, and timing. Simulation affords this opportunity. We currently use high-fidelity in situ simulation to train our interprofessional code teams, with training and assessment in process measures, teamwork, and communication. We expanded this to management of complex ICU patients.

METHODS

We created a dedicated interprofessional high-fidelity simulation exercised focused on team-based management of complex ICU patients. To facilitate participation of ICU nurses, we integrated this activity with the ICU nurses' annual educational intensive, which focused on sepsis/ARDS. The simulation was a 2.5-hour continuous, staged scenario involving 1 fellow and 2 ICU nurses working together. The scenario progressed through 3 stages: initial sepsis management (sepsis bundle), recognition and placement of central access, and recognition and management of severe ARDS (ARDSnet, paralytics, and proning). All simulations were conducted with a HAL 3201, which allows for full ventilator integration and adjustment of lung compliance. In addition, a fully functional simulation instance of our hospitals' EHR was used for data extraction, order entry, and real time reporting of all lab tests. Teams were assessed on adherence to established process measures, situational awareness, and team-based learning. Debriefing for the entire team was conducted with both nursing and physician facilitators, focusing on achievement of predefined learning objectives and team-based communication.

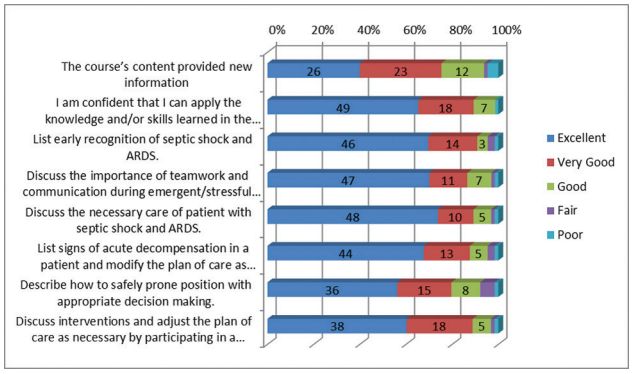
RESULTS

Ten fellows and 60 RNs participated in 10 sessions. The overall course evaluation received an average score of 4.5/5 and 80 percent felt the course helped them achieve their learning objectives. When specific questions were asked to review whether attendees felt that learned the basic concepts, >90 percent felt that the simulation-based session was good, very good, or excellent. A full breakdown in specific knowledge based areas can be found in Figure 1.

CONCLUSIONS

By leveraging hospital training needs, we were able to create a fully interprofessional, high-fidelity simulation that allows for deliberate practice of complex ICU tasks and assessment of Interprofessional communication between the fellows and the ICU nursing team. Studies are ongoing to determine the impact this has on clinical performance, and we now plan to use the infrastructure to allow for expansion of team-based practice in other ICU and pulmonary based scenarios.

Figure 1



Saint Louis University School of Medicine

Saint Louis, MI

Introduction to Sleep Medicine on Blackboard

Program Director: Ravi P. Nayak, MD.
Type of Program: Pulmonary and Critical Care Medicine
Abstract Authors: Joseph Roland D. Espiritu, MD, MSPH, and Ravi P. Nayak, MD.

COURSE DESCRIPTION

This an introductory course designed on Blackboard for pulmonary and critical care medicine fellows rotating through the SLUCare Sleep Disorders Center, focusing on the principles and practice of sleep medicine.

LEARNING OBJECTIVES

1. The fellow will be able to explain the neurophysiological mechanisms underlying sleep and wakefulness.
2. The fellow will be able to discuss the adverse health consequences of poor sleep quality and quantity.
3. The fellow will be able to list the diagnostic criteria for common sleep-related breathing disorders.
4. The fellow will be able to propose further diagnostic work-up for common sleep-related breathing disorders.
5. The fellow will be able to discuss therapeutic options for common sleep-related breathing disorders.

COURSE MATERIALS

All suggested readings (articles, book or manual chapter excerpts, etc.) will be uploaded under the Introduction to Sleep Medicine Course site on Blackboard.

TYPES OF COURSEWORK AND ASSIGNMENT S

1. 1. A pre-test to determine the fellow's baseline knowledge about the principles and practice of sleep medicine.
2. Validated sleep questionnaires to familiarize the fellows with the tools used in evaluating patient with sleep disorders:
   A. A self-completed Epworth Sleepiness and Fatigue Severity Scales
   B. A self-completed sleep diary
   C. A self-completed Morningness and Eveningness questionnaire
   D. A self-completed Insomnia Severity Scale
   E. A self-completed Beck's Depression and Anxiety Inventory
   F. A self-completed Restless Legs Syndrome Rating Scale
3. A formal case presentation, in which the fellow will present his/her clinical findings, assessment, and diagnostic and therapeutic management plans on a specific interesting patient.
4. Sleep Medicine Seminars, a series of interactive didactic sessions to discuss the basic principles of sleep neurophysiology and epidemiology, as well as pathophysiology, diagnosis, and management of common sleep-related breathing disorders.
5. A post-test to determine the increment in knowledge gained during the course.

INNOVATIONS

1. All suggested reading materials (practice parameters, review articles, etc.) will be accessible via Blackboard.
2. Weekly announcements via e-mail will be sent to the fellows to remind them of the topic and suggested reading for each week's Sleep Medicine Seminar.
3. Sleep Medicine Seminars will be recorded on Tegrity to allow fellows to review the lecture as needed.
4. Pre-test and post-test will be administered via Blackboard for rapid scoring of test results
5. Anonymous composite feedback from the fellows about the course content and instructors will collected by the fellowship coordinator.

EVALUATION OF THE COURSE

1. Pre- and post-test performance comparison.

Proposed Schedule of Coursework

Session	Time	Topic	Suggested Reading
1	7:30-8:30 am 8:00-10:00 am 10:00-11:00 am 11:00-11:30 am Homework:	PSG Reading Session Orientation Post-PSG Clinic Orientation Class Activity: Epworth Sleepiness Scale Fatigue Severity Scale Sleep Diary (self)	Course Syllabus
2	7:30-8:30 am 8:00-10:00 am 10:00-11:00 am 11:00-11:30 am Homework:	PSG Reading Session Post-PSG Clinic Polysomnography Class Activity: Sleep Diary (self) Results Morningness-Eveningness Questionnaire (self)	Vaughn BV et al. The technical review of polysomnography. *CHEST* 2008; 134:1310–1319.
3	7:30-8:30 am 8:00-10:00 am 10:00-11:00 am 11:00-11:30 am Homework:	PSG Reading Session Post-PSG Clinic Obstructive Sleep Apnea Syndrome Class Activity: Morningness-Eveningness Questionnaire (self) Results STOP-BANG (volunteer)	Epstein LJ et al. Clinical guideline for the evaluation, management, and long-term care of obstructive sleep apnea in adults. *J Clin Sleep Med* 2009; 5:263- 276.
4	7:30-8:30 am 8:00-10:00 am 10:00-11:00 am 11:00-11:30 am Homework:	PSG Reading Session Post-PSG Clinic Central Sleep Apnea Syndromes Class Activity: STOP-BANG (volunteer) Results SLUCare SDC Sleep Questionnaire (volunteer)	Aurora RN et al. The treatment of central sleep apnea syndromes in adults: Practice parameters with an evidence-based literature review and meta-analyses. *SLEEP* 2012; 35:17-40.
5	7:30-8:30 am 8:00-10:00 am 10:00-11:00 am 11:00-11:30 am Homework:	PSG Reading Session Post-PSG Clinic Sleep-related Hypoventilation and Hypoxemia Disorders SLUCare SDC Sleep Questionnaire (volunteer) Findings Case Presentation Preparation	Casey K et al. Sleep-related hypoventilation/hypoxemic syndromes. *CHEST* 2007; 131:1936 –1948.
6	7:30-8:30 am 8:00-10:00 am 10:00-11:00 am	PSG Reading Session Post-PSG Clinic Case Presentation/s Post-Test	

Stanford University Medical Center

Stanford, CA

Monthly High-Fidelity Simulation in Medical Emergencies Improves Survival

Program Director: Ann Weinacker, MD
Type of Program: Critical Care Medicine
Abstract Authors: Paul K. Mohabir, MD, and Daniel Skully, MD

INTRODUCTION

Medical emergencies, or "code blues," occur frequently in the hospital and are associated with a high degree of mortality. These situations are often highly chaotic, leading to poor flow of information between team members that might ultimately contribute to the outcome. Additionally, these situations can be highly stressful and do not occur often enough for team members to perform at an optimal level.

GOAL

We postulated that monthly high-fidelity simulation sessions that include all members of the code team, could help to improve communication between team members and ultimately result in code blues being run more efficiently with improved survival.

METHODS

We performed monthly high-fidelity code blue simulations at our simulation lab from October 2011 to present day. Sessions includes 2 critical care fellows, 2 crisis nurses, 2 nurses from non-intensive care units, 2 pharmacists, 2 respiratory therapists, and 2-4 medical students. Participants meet in a classroom prior to the simulation to review CPR technique and familiarization with the simulation mannequin. A clinical vignette is initiated with the bedside nurse and all participants clinically manage the cardiac arrest as would be in a real-like situation according to the recent Acute Cardiac Life Saving (ACLS) guidelines. After the simulation, participants return to the classroom to review filmed footage and debrief ACLS algorithms, etiologies of cardiac arrest, and teaching points that are specific to the underlying cause of decompensation in the simulation.

RESULTS

Multivariate logistic regression models revealed that simulation training had a statistically significant improved survival to hospital discharge compared to pre-simulation course survival, OR 1.75 (95% CI=1.68, 1.90).

CONCLUSIONS

High-fidelity code blue simulations allow code team members from several disciplines to practice delivery of emergent care in situations without patient risk. Code team members gain experience in communication during chaotic situations, providing high-quality CPR, and improved survival to hospital discharge.

The First Affiliated Hospital of Xi'an Jiaotong University

China

The Suggestions from International Medical Students Helped to Improve the Teaching Methods of Respiratory Medicine

Program Director: Shi Zhihong, MD
Type of Program: Pulmonary Medicine
Abstract Authors: Liu Ting, MD

More international students are coming to China to study medicine. As one of the most famous colleges for international medicine training in China, Xi'an Jiaotong University has more than 20 years' experience teaching international medical students. To improve the teaching quality of respiratory medicine, we gave an anonymous questionnaires to international medical student graduates of Xi'an Jiaotong University. The total number of valid return was 107, and the valid usable return rate was 97.3 percent. Most of the students (96.3 percent) aimed to be a doctor after graduation, while 98.1 percent of students considered that the course of respiratory medicine is helpful. About 75.7 percent of the students thought respiratory medicine practice is more helpful than learning by themselves. From this study, we found that we needed to improve the quality of teaching in many aspects, respondents gave us many useful suggestions, and changes have been implemented that we believe will enhance student learning in respiratory medicine.

University of California, Davis School of Medicine

Sacramento, CA

Impact of Group-Based Mini-Mentoring on Productivity and Satisfaction Among Fellows in Training

Program Director: Brian Morrissey, MD
Type of Program: Pulmonary and Critical Care Medicine
Abstract Authors: Brian Morrissey, MD; Elizabeth Garman, MD; Nicholas Kenyon, MD; Richart Harper, MD; and Nicholas Stollenwerk, MD

Pulmonary/critical care fellows participate in creative activities (basic, clinical, translation, and quality improvement projects) as a required portion of training and for career development. Fellows have a wide range of motivations and skills outside of the clinical skills and knowledge acquired during internal medicine residency. Success in creative activity, (as measured by satisfaction, productivity as evidenced by papers and abstracts, and subject enrollment) is variable. Assessments of fellow success in creative activity by faculty revealed several frustrations: lack of fellow commitment, low productivity, and inadequate time and research skills. Fellows, on end-of-year reviews and group surveys, reported unmet needs from mentors (availability), timely feedback, project specific skills (IRB review, statistics, subject enrollment). Individual fellows and primary mentors are not uniformly aware of the array of support available (e.g., faculty expertise, statistics support, clinical research support, lab infrastructure/core facilities, and other secondary mentors). We trialed a biweekly meeting for fellows led by senior faculty for casual mentoring, critical questioning, and progress assessment. The hypothesis was that improved mentoring would improve creative success.

GROUP-BASED, MINI-MENTORING

The sessions are led by key faulty of the fellowship program. Elements employed include senior/mid-career faculty with broad experience (clinic research, quality improvement, and lab research), fellows, progress log-book tracking project, mentor, accomplishments, short-term goals, barriers, and needs. Three faculty members share the responsibility of leading the sessions with other faculty visiting irregularly. The sessions last typically less than one hour. During the session, fellows briefly presents their project with updates. A log-book is kept recording the short-term goals, achievements, needs, barriers, and suggestions. Notes from prior sessions provide a reference point for discussions. Three to 6 fellows participate during non-hospital based activities from our 12-fellow programs.

OUTCOMES

A 6-month assessment revealed the value of these sessions. Fellows shared a mixed message exemplified by, “It’s a pain in the butt, but let’s keep doing it.” After a year, the value and characteristics of the sessions were assessed. Participating faculty contributions included directed questioning to guide toward hypothesis clarification; pre-project statistics and feasibility, particularly subject number; contacts for clinical research support (IRB, etc.); and laboratory technique/core services. Primary research mentors reported positive outcomes: an increased perception of engagement by fellows in projects and productivity. Peer-to-peer mentoring during sessions provided details on finding resources (e.g., statistician choice) and encouragement. Measure of productivity: abstracts increased from 4 to 12 over prior year.

University of Cincinnati

Cincinnati, OH

Quality Improvement by Meeting Milestones: Implementation of an Evaluation System to Address Aspects of the Next Accreditation System in PCCM Fellowship Program

Program Director: Peter H. Lenz, MD
Type of Program: Pulmonary and Critical Care Medicine
Abstract Authors: Adam G. Cole, MD, and Peter H. Lenz MD

RATIONALE

The Accreditation Council for Graduate Medical Education (ACGME) has identified core competencies for the development of capable physicians that training programs must address. The Next Accreditation System (NAS) for internal medicine residencies and subspecialty fellowships requires trainees meet key milestones as they progress through training, and 24 subspecialty milestones have been identified by the ACGME and American Board of Internal Medicine (ABIM). Achievement of competency in these milestones necessitates assessment of the progression of a trainee to a clinician ready for unsupervised practice. In order to assess progression to competency, some form of evaluation must be coupled with each milestone. Our Program Evaluation Committee (PEC) reviewed our fellowship curriculum and evaluation system to identify any milestones that were underutilized. We identified 5 such milestones in 3 competency domains: medical knowledge (MK3 – scholarship), practice-based learning and improvement (PBLI1 – monitors practice with a goal for improvement, PBLI2 – learns and improves via performance audit and PBLI3 – learns and improves via feedback), and systems based practice (SBP2 – recognizes system error and advocates for system improvement).

METHODS

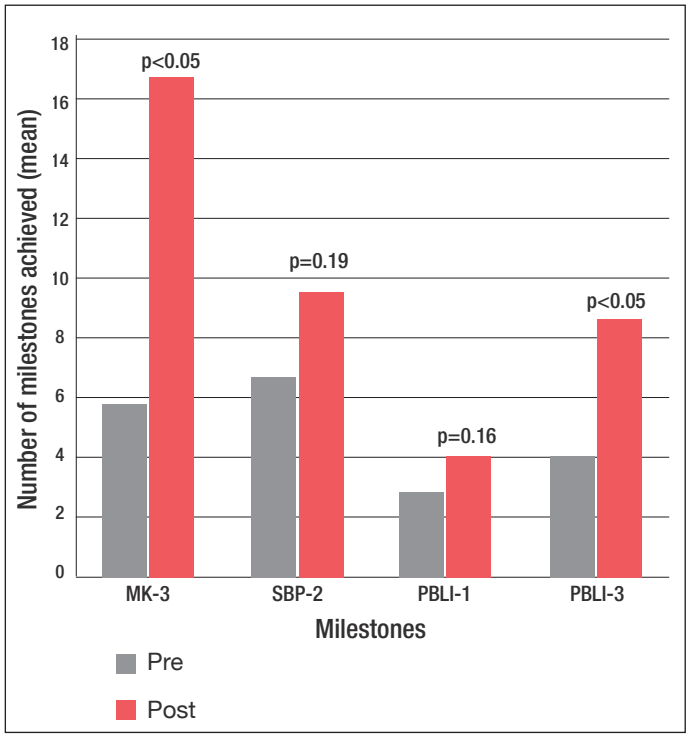
We designed evaluation forms for fellows' scholarly presentations that were directly linked to the milestones described above. Each evaluation was based on observable practice activities (OPAs) and utilized the entrustable professional activities model described in the NAS milestone project. Evaluations were completed immediately after each presentation by faculty and fellows, collected by an administrative assistant and entered in our graduate medical education (GME) electronic management system (MedHub). We then compared the number of milestones assessed for fellows before and after the implementation of our evaluation.

RESULTS

The mean number of milestones assessed for each fellow increased after the implementation of our new evaluation system. Total for MK-3 increased from 47 to 135 (mean per fellow 5.88 to 16.88, p=0.028), SBP-2 increased from 54 to 77 (mean per fellow 6.75 to 9.63, p=0.19), PBLI-1 increased from 22 to 33 (mean per fellow 2.75 to 4.13, p=0.16), and PBLI-3 increased from 32 to 70 (mean per fellow 4.0 to 8.75, p=0.0071).

CONCLUSIONS

The implementation of an evaluation form linked to milestones increased the number of documented milestones achieved by our fellows. For two milestones (MK-3 and PBLI-3), this increase was statistically significant. By linking the milestones with OPAs, our evaluation emphasized directly observed behaviors to limit ambiguity and measured the degree to which entrustment was achieved.



UNIVERSITY OF Cincinnati

PULMONARY AND CRITICAL CARE CONFERENCES

Fellow Conference OPA Evaluation – M&M Conference

Speaker: _____ Topic: _____ Date: _____

Evaluator: *(Circle One)* FACULTY FELLOW

	Level 1	Level 2	Level 3	Level 4	Level 5	
	Critical deficiencies present	Entry level	Appropriate for advanced trainee	Attending level	Expert in field/ aspirational	N/A
1. Reviews & summarizes key aspects of important medical literature on topic (MK3)						
2. Shows that the topic is relevant to clinical practice (MK3)						
3. Can incorporate feedback from peers into thoughtful discussion (PBLI 3&4)						
4. Stays within the time limit and allows time for questions from audience (MK3 & ICS-2)						
5. Organizes and disseminates medical knowledge well in talk/ gives outline (MK3)						
6. Applies principles of good slide design (clear graphics- e.g."assertion-plus-evidence" format w/declarative statement at top of slide with graphic & citation below) (MK3)						
7. Engages the audience using contemporary interactive techniques such as audience response, reflective pauses, or peer instruction/discussion (MK3)						
8. Suggests options for the development of quality improvement projects (PBLI2)						
9. Shows how a sub-optimal clinical outcome can lead to improvement in patient care (PBLI1)						
10. Proposes options for improvement in patient care systems (SBP2)						
Additional Comments & Overall Assessment:						

University of Louisville

Louisville, KY

A Case-Based, Fellow-Led Approach to Resident Pulmonary Education

Program Director: Nemr Eid, MD
Type of Program: Pediatric Pulmonology
Abstract Authors: Scott Bickel, MD; Nemr Eid, MD; Adrian O'Hagan, MD; and Ronald Morton MD

BACKGROUND

Goals of the ACGME milestones for fellowship training include improving the mastery of a core knowledge base and participating in the education of health professionals, including residents and medical students. One method to accomplish both goals is by having the fellow teach core material to residents and medical students. At our institution, the pediatric pulmonary fellow developed a curriculum utilizing the core content outline for residents taking the general pediatrics certifying exam, with the goal of providing a general overview of pediatric pulmonary topics essential for a resident in training.

METHODS

Residents and medical students assigned to wards teams taking care of primary pulmonary patients were expected to attend weekly pulmonology teaching rounds. Other wards were encouraged to attend if it did not interfere with other duties. A 12-week rotation of topics considered essential knowledge for a general pediatric resident was developed by the pediatric fellow (Table 1), with general guidance and direction provided by the fellowship director and other pulmonary faculty. Each session was taught by the fellow with a pulmonology attending present. Each session generally included a case description and a didactic description of the topic with active participation by the residents and students. If a resident was rotating on the pediatric pulmonary service for the month, he or she was given the opportunity to develop and present the case description. At the end of the first year of the program, a survey was distributed to all residents to assess their participation in pulmonary rounds and the degree to which they felt it was beneficial to their clinical knowledge.

RESULTS

Thirty-six pediatric residents who had participated in teaching rounds responded. Fifty-seven percent of respondents stated they attended 75 percent or more of the sessions offered while they were on wards while 81 percent attended at least half. All respondents agreed or strongly agreed that the rounds were "a good use of my time" and "provided me with clinically useful information." Seventy-four percent reported better insight into the role of pediatric pulmonologists as a result of the sessions. Qualitative feedback provided by respondents underscored the resident's positive feelings towards the interactive, relaxed, case-based format of the program.

CONCLUSION

A program developed and led by our pediatric pulmonary fellow to enhance residents learning of general pediatric pulmonary topics provided a valuable addition to our GME-approved residency program and helped our fellow progress in multiple ACGME milestones.

PEDIATRIC CORE CONTENT OUTLINE	TOPIC
1 Section XIII, Objective A7	Tachypnea
2 Section XIII, Objective A6	Evaluation of wheezing
3 Section VIII, Objective C	Approach to difficult to control asthma
4 Section XIII, Objectives A1 and B4	Approach to Stridor/Airway malcia
5 Section XIII, Objective A3	Evaluation of cough
6 Section XIII, Objective A8	Hemoptysis
7 Section XIII, Objective C4	Aspiration
8 Section XIII, Objective C5	Bronchiectasis
9 Section XIII, Objective G	Primary ciliary dyskinesia
10 Section XIII, Objective C	Bronchiolitis
11 Section XV, Objective C3	Respiratory Disorders in Sickle Cell Disease
12 Section XIII, Objective L1	Pulmonary function testing

University of Maryland Medical Center

Baltimore, MD

Training Fellows to Triage Effectively

Program Director: Nirav G. Shah, MD
Type of Program: Pulmonary and Critical Care Medicine
Abstract Authors: Van K. Holden, MD; Avelino C. Verceles, MD, MS; Nirav G. Shah; Michael T. McCurdy, MD; and Kathryn S. Robinett, MD

RATIONALE

Although triaging for ICU admission is a component of many critical care fellowship programs, there have been no studies evaluating the effectiveness of ICU triage education on fellows. Pulmonary/critical care and critical care fellows triage admissions to the MICU at the University of Maryland, a large tertiary care center with a 29-bed closed MICU. Our hypothesis is that a structured triaging orientation program will improve fellows' comfort level with MICU triaging.

METHODS

Thirteen entering pulmonary/critical care and critical care fellows attended an hour-long triaging orientation program. The training session included (1) key points of the SCCM Consensus Statement on the Triage of Critically Ill Patients, (2) information on Emergency Medical Treatment & Labor Act (EMTALA), (3) reasons for interhospital transfer, (4) benefits and risks of interhospital transfer, and (5) outcomes of ICU admission delay and refusal. These components were based on a review of the available literature. The second element of the training session addressed institution specific resources, (1) the interhospital transfer process including transport, (2) triaging flow sheet based on bed availability and patient location, and (3) a modified patient transfer accept instrument. The fellows completed a 9-question survey assessing their understanding of these components prior to, and immediately after the training session. Responses were based on a 5-point Likert scale.

RESULTS

Twelve fellows participated in the surveys. Pre- and post-intervention survey responses were compared. Six fellows had prior ICU triaging experience, ranging from 2 to 24 months. The remaining six fellows had no prior ICU triaging experience. After the training session, fellows with prior experience demonstrated a statistically significant increased understanding of EMTALA, tertiary care services that the hospital provided, risks and benefits of interhospital transfer, and how the interhospital transfer process works compared to those without prior experience. This improved understanding persisted when the fellows' responses were compared based on post-graduate training year 4 vs. 5 and above. Although there was no difference in comfort level with MICU triaging, fellows without prior triaging experience wanted additional training after the intervention. All fellows demonstrated increased knowledge on EMTALA.

CONCLUSION

Our study highlights the finding that fellows with prior ICU triaging experience, or advanced level of post-graduate training, have greater understanding of various components involved in triage decision-making with a structured training session. This suggests that continued training on triaging would be beneficial as part of a critical care fellowship curriculum, regardless of prior experience.

		Prior ICU Triaging Experience (n=6)			No Prior ICU Triaging Experience (n=6)		
		Pre-Intervention[a] (A)	Post-Intervention[a] (B)	P (A vs B)[b]	Pre-Intervention[a] (C)	Post-Intervention[a] (D)	P (C vs D)[b]
1	For transfers from outside hospitals, I would prioritize patients in terms of maximizing the benefits that ICU care can provide.	4.0 ± 1.1	4.5 ± 0.6	0.20	4.3 ± 0.5	4.8 ± 0.4	0.08
2	For transfers from outside hospitals, I would prioritize patients in terms of a first come, first served basis.	2.3 ± 0.5	2.3 ± 1.2	1.00	2.5 ± 1.2	2.5 ± 1.4	1.00
3	I understand how EMTALA pertains to me as the MICU triaging	2.8 ± 1.0	4.3 ± 0.5	**0.02**	2.5 ± 0.8	4.7 ± 0.5	**0.00**
4	I am aware of the tertiary care services that our hospital provides.	2.8 ± 1.3	4.7 ± 0.5	**0.03**	4.2 ± 0.4	4.7 ± 0.5	0.08
5	I understand the risks and benefits of interhospital transfer.	3.7 ± 0.5	4.5 ± 0.6	**0.00**	3.7 ± 0.5	4.5 ± 0.6	0.09
6	I understand how our transfer center Maryland ExpressCare works.	2.5 ± 1.4	4.3 ± 0.5	**0.03**	3.3 ± 1.0	4.3 ± 0.5	0.11
7	I know what questions to ask to gather pertinent information from referring physicians for patient transfer.	3.5 ± 0.8	4.3 ± 0.8	0.09	4.0 ± 0.6	4.5 ± 0.6	0.30
8	I need more training on MICU triaging.	3.8 ± 0.8	3.3 ± 0.8	0.30	4.3 ± 0.8	3.5 ± 1.2	**0.04**
9	Rate your comfort level with MICU triaging:	3.5 ± 0.6	3.8 ± 0.4	0.18	3.0 ± 0.9	3.8 ± 0.4	0.14

[a]Likert score of 1 (strongly disagree), 2 (disagree), 3 (neither agree or disagree), 4 (agree), 5 (strongly agree).
[b]*P* value obtained comparing mean quality scores using Student *t* test.

University of Maryland Medical Center

Baltimore, MD

Introduction of a Novel Physiology Discussion Series in a Post-Graduate Critical Care Curriculum

Program Director: Michael T. McCurdy, MD
Type of Program: Critical Care Medicine
Abstract Authors: Radhika M. Shah, MD; Van K. Holden, MD; Rabin K. Shrestha, MD; Avelino C. Verceles, MD, MS; Kathryn S. Robinett, MD; Nirav G. Shah, MD; and Michael T. McCurdy, MD

RATIONALE

Physiology is an integral component of every medical school preclinical curriculum. However, post-graduate critical care training, which demands the daily bedside application of basic physiology principles learned many years earlier, does not typically include intensive formal physiology didactics. Clinically oriented physiology education enhances medical students' critical thinking abilities, increases their medical knowledge, and improves their satisfaction with didactics (1-2). Continuing physiology education in the post-graduate setting, especially in critical care training, may improve patient care and increase understanding of complex disease processes. To date, no studies have assessed the effects of a formal post-graduate physiology curriculum. We hypothesize that a post-graduate physiology curriculum is effective in increasing trainee comfort level with understanding, teaching, and applying basic physiology principles encountered in critical care medicine when compared with trainees who did not participate in this curriculum.

METHODS

A physiology discussion series was created for the critical care curriculum consisting of monthly, hour-long sessions facilitated by a clinical faculty member within the University of Maryland School of Medicine. A fellow creates a structured presentation with faculty mentorship to review specific physiology principles and their clinical application. Twenty-nine critical care and pulmonary/critical care fellows were invited to complete a pre-intervention educational needs assessment based on a survey of comfort level in understanding, teaching, and applying basic physiology principles. This survey will be re-administered 5 and 10 months into the curriculum. Responses from fellows who attended the curriculum will be compared with fellows who did not attend. Survey responses of the two groups will be compared using statistical analysis.

RESULTS

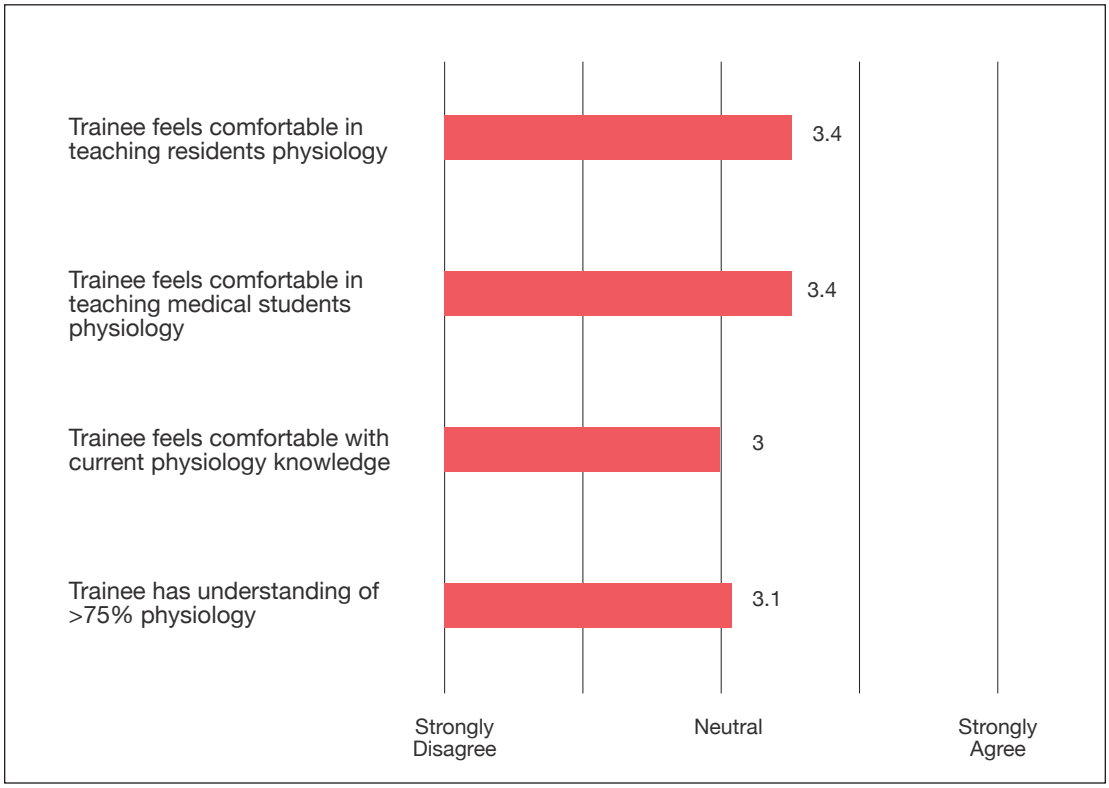
Pre-curriculum survey responses from twenty fellows show an average Likert score of 3.0 and 3.4, respectively, for trainee comfort level of understanding and teaching physiology principles, indicating an educational need in our curriculum (Figure 1). After implementing a problem-based physiology discussion curriculum, we anticipate significant increases in Likert score surrounding comfort level in understanding, teaching, and applying physiology principles among trainees participating in the intervention arm compared to baseline values and also compared to trainees who did not participate.

CONCLUSIONS

Post-graduate medical education rarely includes a physiology curriculum, yet an understanding of basic physiology is essential in managing patients in the intensive care setting. Initial data show lack of trainee comfort with understanding, teaching, and applying key physiologic concepts. This study will demonstrate the effect of our innovative, post-graduate physiology discussion curriculum on trainee comfort level.

REFERENCES
1. Abraham RR, Upadhya S, Torke S, et al. Clinically oriented physiology teaching: strategy for developing critical-thinking skills in undergraduate medical students. Adv Physiol Educ. 2004;28:102-104.
2. Walters MR. Problem-based learning within endocrine physiology lectures. Adv Physiol Educ. 2001;25:225-227.

Figure 1. Trainee Comfort Levels with Physiology before Implementation of Curriculum



University of Maryland Medical Center

Baltimore, MD

Effective Learning in High Cognitive Load Critical Care Simulation

Program Director: Nirav G. Shah, MD
Type of Program: Pulmonary and Critical Care Medicine
Abstract Authors: Radhika M. Shah,MD; Avelino C. Verceles, MD; Kathryn S. Robinett, MD; Michael T. McCurdy, MD; and Nirav G. Shah, MD

RATIONALE

Simulation has consistently proven to be an effective teaching technique that has yet to be uniformly incorporated in pulmonary and critical care programs. Simulating critically ill patients requires the development of high-fidelity simulations (HFS), which may need the use of high cognitive load. This is in direct contrast to cognitive load learning theory in medical simulation, which suggests that simulation should aim to decrease cognitive load by limiting the number of learning objectives and distracting tasks (1). We hypothesize that a new approach to critical care simulation that allows for higher cognitive load can increase fidelity and will continue to improve knowledge and performance in managing rare clinical scenarios. This would provide evidence that HFS with high cognitive load should be included in pulmonary and critical care curriculums nationwide.

METHODS

We conducted a prospective, cohort study with 20 critical care fellows who participated in a HFS of massive hemoptysis. Fifty percent of fellows who participated had never managed a patient with massive hemoptysis. The simulation was developed with diverse learning objectives, including CT scan interpretation, airway management, bronchoscopy, consultant communication, and endobronchial blocker placement. It also intentionally included secondary tasks to increase fidelity and cognitive load, such as answering consultant calls and setting up the bronchoscopy cart. A questionnaire consisting of a Likert scale surrounding comfort level and knowledge on management of massive hemoptysis was administered before and after the simulation, with the baseline questionnaire serving as a control. All fellows will participate in the same simulation again in 8 months and performance data will be tracked prospectively.

RESULTS

There was a significant increase in comfort level in managing massive hemoptysis after the HFS despite intentionally high cognitive load. There was also a significant increase in scores surrounding knowledge on management of massive hemoptysis, from an average score of 77.5 percent to 96.2 percent on the post-simulation questionnaire ($p = 0.001$).

CONCLUSIONS

This novel approach, which incorporates a critical care HFS with an intentionally high cognitive load, resulted in a significant increase in comfort and knowledge surrounding management of massive hemoptysis. We expect that knowledge, comfort, and performance measures will be retained on subsequent simulations in 8 months. Our preliminary data piloting critical care HFS with high cognitive load demonstrate that such methods are an effective learning tool, which increases fellows' experience with rare clinical scenarios and should be incorporated in all fellowship programs.

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University of Massachusetts

Worcester, MA

Bridging the Gap: Recognizing the Need for a Structured Curriculum in Advanced Airway Management for Critical Care Fellows

Program Director: Scott Kopec, MD
Type of Program: Pulmonary and Critical Care
Abstract Authors: Rahul N. Sood, MD; Paolo J. Oliveria, MD; Sukary Touray, MD; and Jared Mickleson, MD

RATIONALE

Pulmonary and critical care physicians are often involved in managing critically ill patients with marginal cardio-pulmonary reserve, who require urgent endotracheal intubation (ETI) in the medical intensive care units (ICU). This is often a high risk/ high stakes situation. Advanced airway management competency is a required core skill for pulmonary/ critical care medicine (PCCM) fellows. To effectively evaluate and accomplish this educational goal, it is important to understand fellow attitudes and learning needs in this domain. We will use our programs' baseline data to help implement a structured airway management curriculum. Currently, at UMass Memorial Medical Center the vast majority of intubations in the ICU are performed by anesthesia residents. A survey of our PCCM fellows conducted last year showed that 88 percent of PCCM fellows had performed fewer than 10 ETIs across all levels of training. This represents a clear deficiency in our curriculum.

METHODS

An anonymous 5-question online survey was emailed to all 9 UMass PCCM fellows to assess their learning needs, attitudes, and comfort level surrounding advanced ICU airway management using a 5-point Likert scale.

EVALUATION

A completed survey was returned by 8 out of 9 fellows. Of the respondents, 7 out of 8 felt uncomfortable managing urgent ICU airway-related issues and believed they would benefit from formal training. The survey also, importantly, revealed that our fellows would not feel comfortable managing the airway in critically ill patients after graduating should they seek employment at hospitals where they are relied upon as the primary airway managers. Based on this gap in fellowship education, we plan to implement a multi-domain competency-based curriculum and assessment process to assist fellows in acquiring the confidence, cognitive aptitude, and technical expertise in critical care airway scenarios as part of the curriculum over the next 3 years.

CONCLUSIONS

The majority of PCCM fellows at our institution who recently responded to an anonymous online survey reported that they felt uncomfortable performing urgent ETI in the ICU, would benefit from formal training, and desired to achieve competence in advanced airway management. We aim to implement a novel airway management curriculum consisting of didactics, case-based scenario learning, and hands-on training with senior anesthesia staff to maximize fellows' comfort level with intensive care intubations that when tracked longitudinally after graduation will translate into the rectification of our current curricular training deficit.

Figure 1: ICU physicians should be competent in airway management

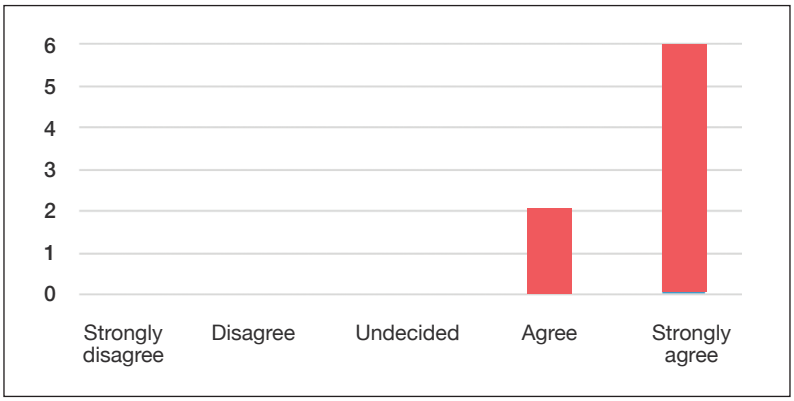


Figure 2: Given the proper training and equipment, how frequently would you perform endotracheal intubations in the ICU?

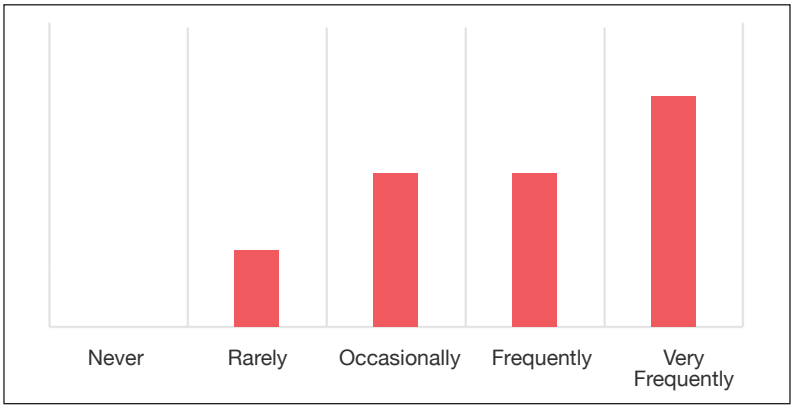
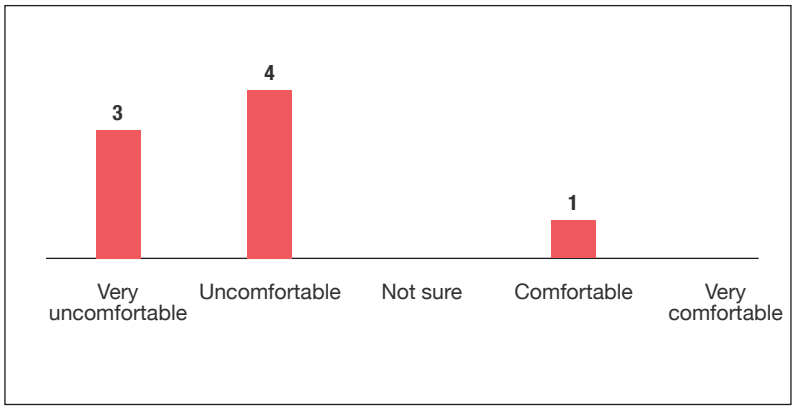


Figure 3: How comfortable are you performing endotracheal intubations in the ICU?



University of Minnesota

Minneapolis, MN

Quality Assurance and Improvement in Ultrasound Education

Program Director: Melissa King-Biggs MD
Type of Program: Pulmonary and Critical Care Medicine
Abstract Authors: Andrew Keenan, Petr Bachan and Melissa King-Biggs MD

BACKGROUND

As use of ultrasound (US) in critical care medicine (CCM) has expanded, there has been increased integration of US training into CCM programs. The Society of Critical Care Medicine (SCCM) and the American College of Chest Physicians (ACCP) provide guidelines regarding critical care ultrasound (CCUS) training, including recommendations for quality assurance and quality improvement (QA/QI) processes. Implementation of these processes can be complex given technical requirements, variable faculty level of ultrasound training, and the use of multiple training sites.

METHODS

Our Pulmonary and Critical Care program is expanding our US curriculum into a longitudinal model that utilizes didactics, hands-on training, case reviews, and exam documentation. As part of a needs assessment, we found that a strong QA/QI component for assessing image acquisition and interpretation would provide accountability and better document fellow skill level. Challenges we faced in developing this process included multiple training sites, and a high ratio of fellows to trained faculty. In our process, after a fellow performs an ultrasound examination, a de-identified exam is saved to a portable drive. Using non-traceable identifiers, the exam is logged into our education management suite (New Innovations, Inc.), and the video loops are uploaded to our academic center's secure file sharing site (Google Drive). Experienced critical care faculty will review each US exam. The reviewing faculty can assess exam acquisition as well as interpretation, and provide direct feedback to the performing fellow. Requirements for the number and type of exams have been developed from society recommendations, and fellows will graduate with a log of these reviewed exams.

EVALUATION

As part of our curriculum we will review US exam numbers, and adequacy of acquisition and interpretation based on fellow level. We have performed baseline assessments of US background knowledge, interpretation, and perceived skill level. These will be followed up by summative assessments at the end of the academic year, in addition to fellow evaluations of the new curriculum.

CONCLUSION

This QA/QI process provides accountability and documentation for our trainees as they transition out of fellowship. By utilizing resources commonly available to fellowship programs it limits the costs associated with dedicated US review and storage products, and works across multiple health systems. Additionally, by allowing remote exam review it leverages the skills of US trained faculty to provide more effective feedback. Our QA/QI process may serve as a model for other fellowship programs that are expanding their US curricula.

University of Toronto

Toronto, ON

Implementation, Design and Evaluation of a Program of Formative Assessment for a Canadian Adult Critical Care Training Program

Program Director: Andrew Steel, MD
Type of Program: Adult Critical Care Medicine Residency and International Fellowships
Abstract Authors: Dominique Piquette, MD, PhD; Christie Lee, MD; David Hall, MD, PhD; and Andrew Steel, MD

The Royal College of Physicians and Surgeons of Canada (RCPSC) recently started the progressive implementation of competency-based training across Canadian specialty postgraduate programs. As such, Canada is joining other countries (e.g., the UK and Netherlands) in a worldwide movement towards competency-based medical education. According to this approach, trainees must demonstrate specific competencies by the end of their training, documented during frequent work-based assessments completed by multiple assessors and for a range of clinical activities. Individual trainees build a portfolio including formative and summative assessments used by programs for pass/fail decisions. Accountability and learning are two frequently claimed benefits of competency-based training, but have yet to be confirmed by empirical evidence. Many questions remain regarding the best way to design and implement a program of assessment as part of competency-based training. Known challenges include a lack of popularity among trainees and assessors and a lack of reliability of many individual assessment tools used to measure trainee performance. Other areas of uncertainty include the effects of assessors' cognition and expertise, as well of the role of different response formats, on the quality of individual assessments, the best strategy to combine multiple assessments using different formats, and the quality of feedback provided to trainees.

The Adult Critical Care Medicine Residency and International Fellowships at the University of Toronto has undertaken the design, implementation, and evaluation of a program of formative assessment in anticipation of the transition to competency-based training required by the RCPSC. A core group of local educators have determined goals and priorities for our assessment program. We chose an activity-based framework of assessment, using critical care entrustable professional activities as a unit of evaluation. Following published guidelines, we created an assessment map and selected assessment tools based on the best available evidence, our program goals, and local contexts. These tools will be progressively implemented in five teaching hospitals where trainees rotate, and contribute to trainee learning portfolio. Individual data will be combined every 3 months to provide supported feedback to the trainees. We will evaluate the program using a 2x2 approach as previously published. Expected and emerging processes and outcomes will be measured to answer pre-determined evaluation questions related, for example, to supporting validity evidence, trainee and faculty engagement and perceptions, and unintended consequences on learning. Data collection and analysis will occur iteratively and combine quantitative and qualitative data. The results will inform program changes locally, and more broadly, the implementation of competency-based training in critical care.

CRITICAL CARE MEDICINE DATA COLLECTION METHODS AND TOOL

DRAFT FOR DISCUSSION Version 1: October 21, 2015

Evaluation Question(s)	Information	Sample and process	Data Sources - Tools
How was the assessment process constructed to provide an accurate picture of the students' abilities?	How do other programs accurately assess students' abilities? What is needed to provide an accurate picture? How was their assessment processes developed? What is the literature saying? What are assessment experts saying?	Scoping review of existing literature Visiting scholar – Cees Van Der Vleuten. Syntheses of information from scoping review and Cees brought to the Core Team for discussion.	Scoping review Consultation from experts
Do students feel engaged and supported throughout the assessment process? Does the assessment process enable well performing students to feel competent and confident in their abilities?	To what extent do students feel that the assessment impacted their learning? What does support look like? Do they feel competent at the end of their rotation? Do they feel confident at the end of their rotation? Do they feel that they are/were engaged in the assessment process? What was the value of the assessment process for them?	Done across all sites. Focus group conducted with student reps from all sites quarterly (Oct., Jan., May and June). Questions of engagement, support, confidence, and assessment impact embedded into the evaluation survey completed at the end of their rotation. (both closed and open ended questions) Embedding a question in the Power System to ask the students if the assessment tools were used.	End of Rotation Evaluation Survey. Power survey (if possible) Focus group with a purposeful sample of students.
How has this assessment process impacted the attitude and practice of faculty?	Are faculty using the process correctly? Do they know how to use the process? Do they find the tools useful, valuable? Is the process (and the tools) constructed in such a way as to support student learning (from a faculty perspective)?	Random audit of tool use brought to quarterly core team meetings for discussion. Student feedback from the Power system obtained quarterly. Number of hits and downloads of online faculty development offerings on how to use the tools captured quarterly. Faculty engaged in the pilot attend a feedback session on their experience with the tools. Faculty feedback brought to the core team for discussion.	Audit Power system Online faculty development system Focus group with pilot faculty (could be combined with audit efforts)
What lessons have been learned along the way, and how have they been applied to the design and/or implementation process? What unplanned or unintended consequences occurred as a result of the development and/ or implementation of the CCM assessment process?	What has been learned about student assessment process design and/or implementation? How has this learning been applied? What is happening in the system as a result of the work? What contributed or led to those things? What needs to be done now based on the learnings?	Reflective exercise to be completed at the end of each team Meeting	1. Reflection Template to be used at team Meetings.
What unplanned or unintended What unplanned or unintended consequences occurred as a result of the development and/ or implementation of the CCM assessment process? (One year post launch)	What has been the most significant change as a result of this work? What contributed or led to those things? What needs to be done now based on the learnings?	Most Significant Change method (Davies & Dart, 2001	See the MSC method for further details.

Wayne State University- Detroit Medical Center

Detroit, MI

Central Venous Catheterization Simulation Mastery Program in Pulmonary/Critical Care Fellowship Training

Program Director: James Rowley, MD
Type of Program: Pulmonary and Critical Care Medicine
Abstract Authors: Abdulghani Sankari, MD; Sarah Lee, MD; and James Rowley, MD

BACKGROUND

Central venous catheter (CVC) placement is one of the most common procedures used for critical care management. In academic medical centers, CVC are mainly placed by trainees, making CVC training highly important for pulmonary and critical care fellows to reduce errors and complications [1]. In order to improve CVC placement education for our trainees, we started training all fellows on CVC placement using Northwestern University's simulation-based mastery learning program [2]. The curriculum goal was to increase placement effectiveness and reduce error rates. In addition, the program included metrics to measure improvement in skills and adherence to standard practice over time using simulation techniques with ultrasound.

METHODS

Two faculty trainers were responsible for training all staff and trainees at Wayne State University/ and Detroit Medical Center (WSU/DMC) PCCM fellowship program. Each trainee underwent baseline CVC placement (both internal jugular and subclavian) knowledge assessment then watched 8 video modules on anatomic landmarks and Ultrasound techniques. The trainees were administered a 20-question written evaluation followed by a deliberate training in one-on-one sessions using a high fidelity simulation manikin and standardized clinical scenarios. For the final practical test, each trainee independently performed CVC placement, which was assessed using a checklist of 28 items (table 2). The test was followed by a debrief session on performance in the CVC placement. Outcome: The performance was considered successful (pass) if score >80% or ≤5 from 28 points were missed on the checklist.

RESULTS

Since March 1, 2015, all 16 fellows have completed the program (Table 1). Of these, 12 passed the CVC training practical test and 4 failed. Despite the simulation training, significant number of trainees did not follow standard sterility techniques at baseline (62.5 percent), missed timeout procedure (50 percent), or incorrectly positioned patients (43.8 percent) on the final test. The passing rate and sterility techniques increased at 6 month re-do training of CVC simulation (Figure 1).

CONCLUSIONS

Simulation-based learning for CVC placement can be used in training fellows at different stages of their training to probe strength and weaknesses. Years of fellowship training do not affect overall scores of performance of CVC placement or passing rate. The CVC placement and sterility using simulation mastery program improve at six months compared to baseline, hence follow up training is important to achieve and maintain high level of performance.

Acknowledgment: The authors thank the simulation center at Detroit VA Medical Center for supporting this training.

REFERENCES
1. Barsuk, Jeffrey H., et al. "Use of simulation-based education to reduce catheter-related bloodstream infections." Archives of internal medicine 169.15 (2009): 1420-1423.
2. Barsuk, Jeffrey H., et al. "Simulation-based mastery learning reduces complications during central venous catheter insertion in a medical intensive care unit*." Critical care medicine 37.10 (2009): 2697-2701.

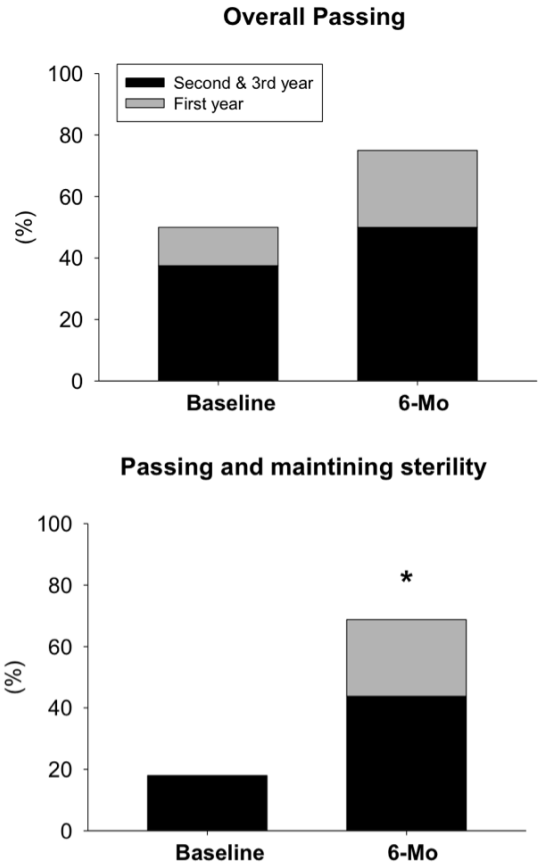
Table 1:

	Baseline characteristics
N	16
Age (yrs)	33.1±2.4
Gender (M/F)	15/1
Year of training (1/2/3)	6/6/4
Confidence in performing CVC (0-100%)	90.0±15.5
No. prior CVC	68.2±40.5

Table 2: Summary data of items missed by PCCM fellows during US guided central line simulation (N=16) at baseline and 6 month. Adopted with modification from Barsuk, J, et al. Journal of Hospital Medicine 2009. *P<0.05 vs. Baseline Wilcoxon Signed Rank Test Abbreviations: US, ultrasound; CXR, chest x-ray.

No	Test Item	Baseline	6 Months
1	Consent n (%)	0 (0)	0 (0)
2	Timeout n (%)	8 (50.0)	8 (50.0)
3	Wash hands n (%)	5 (31.3.0)	4 (25.0)
4	Trendelenburg position n (%)	7 (43.8)	7 (43.8)
5	Adequate Chlorhexidine use n (%)	7 (43.8)	1 (6.3)*
6	Don sterile n (%)	1 (6.3)	2 (12.5)
7	Adequate drape n (%)	3 (18.8)	1 (6.3)
8	US probe set up n (%)	0 (0)	0 (0)
9	Pre-flush catheter n (%)	0 (0)	0 (0)
10	Clamp/cap port n (%)	7 (43.8)	3 (18.8)
11	Open distal port n (%)	1 (6.3)	1 (6.3)
12	US vein localized n (%)	1 (6.3)	0 (0)
13	Skin wheal n (%)	1 (6.3)	1 (6.3)
14	Deeper anesthesia n (%)	0 (0)	2 (12.5)
15	Cannulate vein n (%)	1 (6.3)	3 (18.8)
16	Remove syringe n (%)	0 (0)	0 (0)
17	Advance guidewire n (%)	3 (18.8)	6 (37.5)
18	knick skin n (%)	0 (0)	0 (0)
19	Dilator use n (%)	3 (18.8)	0 (0)
20	Advance catheter n (%)	0 (0)	1 (6.3)
21	Never let go guidewire n (%)	2 (12.5)	0 (0)
22	Remove wire n (%)	0 (0)	0 (0)
23	Catheter position n (%)	2 (12.5)	2 (12.5)
24	Connector use n (%)	4 (25.0)	3 (18.8)
25	Proper dressing n (%)	1 (6.3)	1 (6.3)
26	CXR confirmation n (%)	0 (0)	0 (0)
27	Communicate w/Nurse n (%)	1 (6.3)	0 (0)
28	Sterility n (%)	10 (62.5)	2 (12.5)*

Figure 1: Passing rate and sterility techniques increased at 6 month re-do training of CVC simulation. N=16 *<0.05 vs. baseline RM-ANOVA.



Winthrop University Hospital

Mineola, NY

"Flip or Flop" – Active Learning in a Pulmonary and Critical Care Fellowship Noon Conference

Program Director: John Ilowite, MD
Type of Program: Pulmonary and Critical Care Medicine
Abstract Authors: Girish B. Nair, MD; John Ilowite, MD; Jack R. Scott, EdD, MPH

PURPOSE

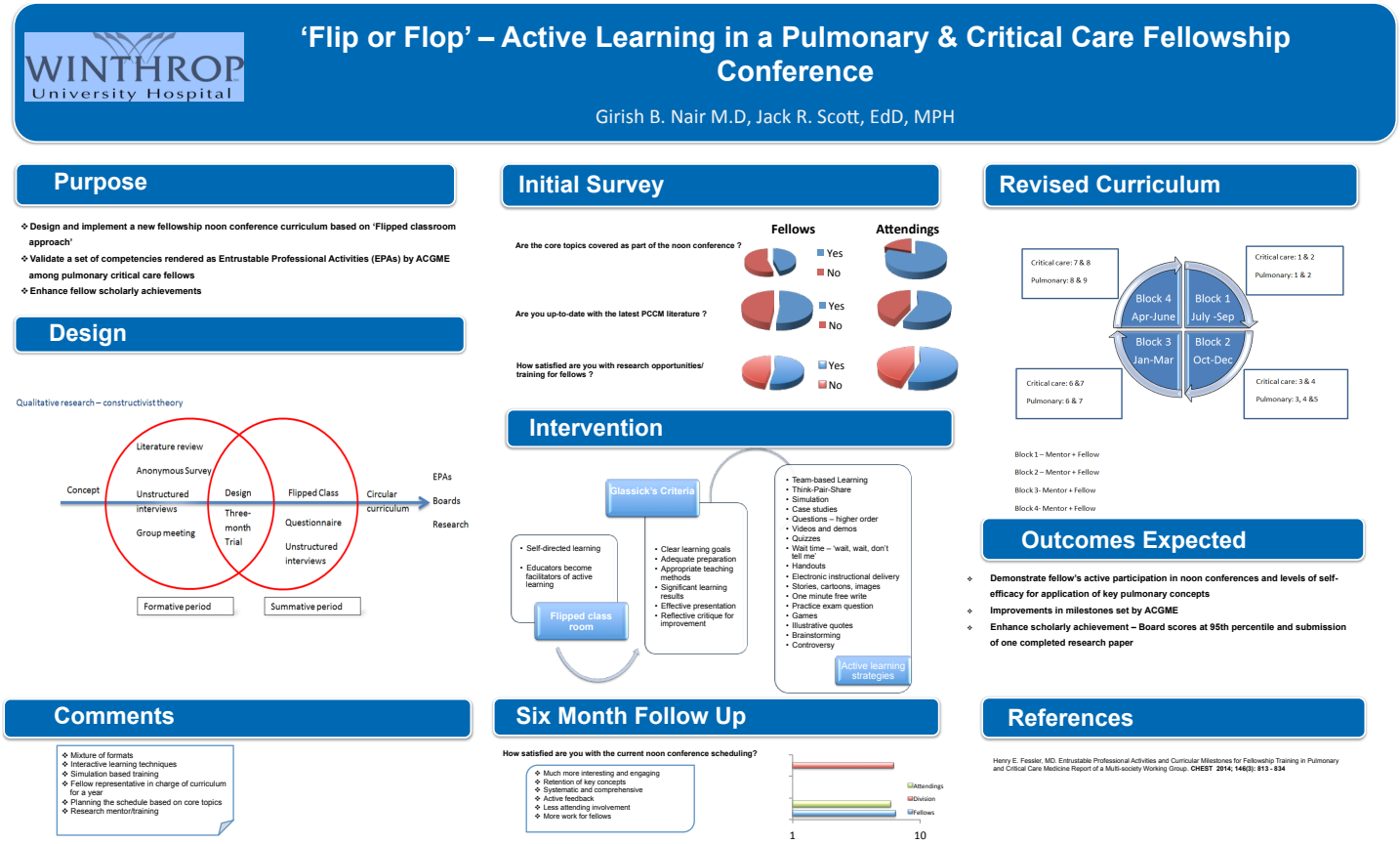
1. Design and implement a new fellowship noon conference curriculum based on "flipped classroom" approach
2. Validate a set of competencies rendered as Entrustable Professional Activities (EPAs) by ACGME among pulmonary/critical care fellows
3. Enhance fellow scholarly achievements

METHODS

Qualitative research – constructivist theory (please see attached poster)

EXPECTED OUTCOMES

1. Demonstrate fellow's active participation in noon conferences and levels of self-efficacy for application of key pulmonary concepts
2. Improvements in milestones set by ACGME



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