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APCCMPD Award for Medical Education Research

The **APCCMPD Award for Medical Education Research** recognizes pulmonary, critical care, and pulmonary/critical care medicine training program directors, associate program directors, key clinical faculty, and fellows-in-training for their outstanding contributions and commitment to medical education research. The recipient is selected for conducting innovative research focused on undergraduate or graduate medical education in pulmonary, critical care, and pulmonary/critical care medicine.

Congratulations to the 2020 awardee:

Janae K. Heath, MD, MSCE
University of Pennsylvania

The APCCMPD would like to honor the contributions of all 2020 applicants:

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Stony Brook Medical Center

Ilana R. Krumm, MD
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Examining the Relationship Between ACGME Internal Medicine Residency Milestones and Subsequent Pulmonary and Critical Care Fellowship Milestones

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INTRODUCTION

The Accreditation Council for Graduate Medical Education (ACGME) Milestones were widely implemented across medical subspecialties in 2015 to provide a novel criterion-based framework for trainee assessment. (1,2) Although Milestones have been proposed as a potential longitudinal predictive assessment tool (3), the association of subspecialty fellowship ratings with prior residency ratings remains unclear. Specifically, while it is not known if lapses within these milestones during IM training are associated with similar lapses in fellowship training, this data could provide crucial data to further operationalize the Milestones for individualized development. Therefore, our objective was to retrospectively assess the relationship between Internal Medicine (IM) residency milestones and Pulmonary-Critical Care Medicine (PCCM) fellowship milestones.

ABSTRACT PRESENTATION

We performed a retrospective cohort analysis of all PCCM trainees enrolled in an ACGME-accredited PCCM fellowship program in the 2017-18 academic year, who had complete prior IM milestone ratings from 2014-17. All milestones were submitted to the ACGME biannually and were converted to a 5-point scale for analysis. Only the Professionalism and Interpersonal and Communication Skills (ICS) were included based on the shared anchors between IM and PCCM milestones. Using a Generalized Estimating Equations model, we assessed the association of PCCM milestones of 2.5 or less with corresponding IM subcompetencies at each time-point, nested by program. We then assessed the association of PCCM ratings of 2.5 or less with IM milestone ratings of 2 or less at any point in IM residency (as a dichotomized variable). Statistical significance was determined using logistic regression. Overall, 358 unique PCCM fellows were included in the cohort. For both the ICS and Professionalism subcompetencies, fellows with higher IM ratings were less likely to obtain PCCM ratings at or below 2.5 during the first year of fellowship. (Table 1) The subcompetency ICS02 ("communicates effectively in interprofessional teams") was significantly associated with future lapses in fellowship training (ß -0.702, p 0.001). Similar associations were noted in PROF2 ("accepts responsibility and follows through on tasks," ß -0.450, p 0.018) and PROF03 ("responds to each patient's unique characteristics," ß -0.573, p 0.007). A secondary analysis revealed significant associations between low IM milestones ratings (at any point) with low PCCM milestone ratings for the PROF03 (OR 1.61, 95% CI 1.03 - 2.50) and the ICS01 subcompetency ("communicates effectively with patients and caregivers," OR 2.54, 95% CI 1.43 - 4.54). (Table 2)

DISCUSSION

Our study revealed several trends between IM residency ratings and ultimate PCCM fellowship trainees' ratings within the Professionalism and Interpersonal and Communication Skills domains. Specifically, we found an association between IM milestone ratings and achieving milestone ratings in subspecialty training of 2.5 or less (where those achieving higher IM milestone ratings were less likely to be rated low in fellowship training). Additionally, we found IM residents being rated at or below 2 in both the PROF03 subcompetency ("Responds to each patient's unique characteristics and needs"), and the ICS01 subcompetency ("Communicates effectively with patients and caregivers") were more likely to be rated at or below level 2.5 during their first year in the PCCM fellowship.

CONCLUSION

Overall, this study is the first to demonstrate an association between residency and fellowship milestone ratings. This study adds to the current validity evidence of the ACGME Milestones, indicating that professionalism or communication lapses in residency may indicate propensity for such lapses later in training. This highlights a potential use of longitudinal milestones to target educational gaps and develop individualized learning plans in PCCM fellowship education.

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TABLE 2. Association of Fellows Scoring at or Below Level 2.5 during the First Year in PCCM Fellowship and Scoring at or Below Level 2.0 During Internal Medicine Residency.

Subcompetency	β coefficient (SE)	OR (95% CI)	p-value
PROF01	0.40 (0.33)	1.49 (0.79, 2.81)	0.24
PROF02	0.40 (0.27)	1.49 (0.88, 2.53)	0.16
PROF03	0.48 (0.23)	1.61 (1.03, 2.50)	0.04
PROF04	-0.02 (0.32)	0.98 (0.52, 1.84)	0.94
ICS01	0.93 (0.29)	2.54 (1.43, 4.51)	0.004
ICS02	0.40 (0.31)	1.49 (0.82, 2.71)	0.22
ICS03	0.14 (0.30)	1.15 (0.64, 2.09)	0.65

TABLE 1. Logistic Regression Coefficients for IM Milestones Associated with Fellows at or Below Level 2.5 during the First Year in PCCM Fellowship Training.

	Subcompetency Description	Fellows Rated ≤ 2.5 During First Year of Fellowship (%, n)	IM Milestone Ratings (β coefficient, SE)*					
			Dec 2014	June 2015	Dec 2015	June 2016	Dec 2016	June 2017
PROF01	Has professional and respectful interactions with patients, caregivers, and members of the interprofessional team	29.9% (n=107)	-0.26 (0.19)	-0.40 (0.21)	-0.34 (0.20)	-0.39 (0.24)	-0.39 (0.27)	-0.55 (0.30)
PROF02	Accepts responsibility and follows through on tasks	33.5% (n=120)	-0.32 (0.19)	-0.44 (0.20)*	-0.45 (0.19)*	-0.40 (0.20)*	-0.23 (0.19)	-0.41 (0.25)
PROF03	Responds to each patient's unique characteristics and needs	35.5% (n=127)	-0.31 (0.18)	-0.26 (0.23)	-0.57 (0.21)*	-0.22 (0.26)	-0.42 (0.23)	-0.48 (0.27)
PROF04	Exhibits integrity and ethical behavior in professional conduct	31.0% (n=111)	-0.14 (0.20)	-0.35 (0.18)*	-0.31 (0.16)	-0.29 (0.21)	-0.20 (0.21)	-0.18 (0.25)
ICS01	Communicates effectively with patients and caregivers	33.2% (n=119)	-0.34 (0.19)	-0.66 (0.23)**	-0.38 (0.23)	-0.55 (0.26)*	-0.64 (0.26)*	-0.05 (0.33)
ICS02	Communicates effectively in interprofessional teams	32.4% (n=116)	-0.37 (0.19)	-0.57 (0.24)*	-0.70 (0.23)***	-0.38 (0.25)	-0.49 (0.23)**	-0.31 (0.28)
ICS03	Appropriate utilization and completion of health records	34.9% (n=125)	-0.36 (0.17)*	-0.37 (0.22)	-0.57 (0.21)***	-0.49 (0.22)*	-0.55 (0.20)**	-0.41 (0.28)

*Note: *p < 0.05; **p < 0.01; ***p < 0.001.*

Effectiveness of an In-Situ Mirror Simulation Program in Medical Intensive Care Cardiopulmonary Resuscitation Training

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INTRODUCTION

While simulation is a well-regarded and studied technique to train emergency teams and improve patient outcomes, the success of this method is often limited by poor participant "buy-in."(1) Adult learning theory elucidates potential underpinnings for this barrier to buy-in during conventional simulation training: an absence of readiness to learn due to asynchrony between clinical and educational environments, lowered internal motivation when being presented with a fabricated patient case, or a disconnect between learner experience and current learning application. As such, we piloted a mock cardiac arrest simulation program, entitled In- Situ Mirror Sim (ISMS), in the Medical Intensive Care Unit (MICU) of our institution that aims to teach the technical and non- technical skills of cardiac arrest management, while circumventing the above-named barriers.

ABSTRACT PRESENTATION

Methods: Individual patients who are already admitted to the medical intensive care unit are chosen to be 'mirrored' in a simulated cardiac arrest scenario. The patient is 'mirrored' by a mannequin with life-like features, including vital signs controlled by a portable simulator device. The simulation takes place in an empty patient room adjacent to that of the mirrored patient, in which the patient's environment and medical equipment are replicated. The simulation begins with the nurse assigned to the chosen patient prompting the respective MICU team of resident and fellow physicians to evaluate the mirrored patient due to an acute change in clinical status. A pre-conceived decompensating scenario ensues, representative of a plausible scenario with respect to the patient's actual condition. During the course of this educational intervention, two forms of assessment took place: a Direct Observation Tool (DOT), which evaluated technical and non-technical skills based on level of mastery (Figure 1), and a Simulation Assessment Performance Tool (SAPT), which assessed adherence to key aspects of life support protocols, including basics; airway and breathing; circulation and rhythm; and competency and behavior. All assessments were conducted throughout the simulation by a critical care educator with over 5-years of experience in simulation medicine who observed but did not participate in the simulation. The simulation was concluded with a standard debrief session.

Results: Seven postgraduate year-3 MICU residents have participated in this study thus far. Total SAPT scores ranged from 42% to 91%. Residents scored highest in the Circulation & Rhythm category (median 93%) and lowest in the Competency & Behavior category (median 60%). DOT results reveal that five residents (71%) performed all technical skills at Level 4 or higher, while only three residents (43%) performed all non-technical skills at Level 4 or higher. Among all learners collated, 86% of technical skills were performed at Level 4 or higher, while 68% of all non-technical skills were performed at Level 4 or higher.

DISCUSSION

We suggest that in ISMS sessions, buy-in is enhanced as our novel learning paradigm has brought the educational and clinical arenas together, has engaged the internal motivation to care for one's own patient, and has allowed the trainee to access their own experiences with the mirrored patient in order to be successful. We will continue to expand this training program and to evaluate attitudes toward this form of training by resident survey. We postulate that we will see an improvement in all aspects of performance scores and DOT evaluation as the training program continues over time. We plan to verify the effectiveness of this novel training program and later expand this model for use in other areas of critical care training.

CONCLUSION

Our pilot study confirms the feasibility of a novel simulation program, ISMS, designed to circumvent several barriers to learning in conventional simulation-based medical education.

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FIGURE 1. Assessment parameters for Direct Observation Tool (DOT).

Assessment parameter	Skill category
Identifies cardiac arrhythmia and implements appropriate algorithm for ACLS	Technical
Initiates discussion about underlying etiology of cardiac arrest (H's and T's)	Technical
Maintains awareness of the situation in the moment, and responds to meet situational needs	Non-Technical
Effectively communicates and engages all members of the health care team in the code situation	Non-Technical
Maintains appropriate professional relationships with patients, families and staff	Non-Technical
Understands the roles of a variety of health care providers, including but not limited to nursing, respiratory therapy, critical care consultants, pharmacy and social work in a code situation	Non-Technical
Reflects on the code event, debriefs regarding code performance, and identifies areas for improvement	Non-Technical

Key: Learners were evaluated at each assessment on a scale of 1-5, where 1= cannot perform even with direct supervision; 2= Can perform with direct supervision; 3= Can perform with indirect supervision; 4= Can perform independently; 5= Can act as "master" instructor or supervisor

Fluoroscopy with Bronchoscopy: A Just-in-Time Training Video to Fill an Education Gap

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INTRODUCTION

Fluoroscopy is commonly used when performing transbronchial biopsies during bronchoscopy. Fluoroscopy can increase the diagnostic yield for biopsy of masses and make the procedure technically easier for bronchoscopists. However, pulmonologists, like cardiologists who also use fluoroscopy frequently (Jacob, et al., 2004), typically receive very little fluoroscopy-specific training. As a result, trainees' learning is often dependent upon the knowledge of their supervisors rather than a standardized curriculum. To address this, we developed a video module designed to be introductory material for the novice bronchoscopist and 'Just-in-Time' training for those with more experience.

ABSTRACT PRESENTATION

The material for the video module and knowledge assessment was drafted using the available literature, with input from a pulmonologist with experience teaching bronchoscopy and an interventional radiologist. The video material, consisting of diagrams, clinical examples, and audio narration, was revised by a wider group of pulmonologists. Cognitive interviewing was then used to revise the knowledge assessment questions. The video was hosted on an open access website and shared with other pulmonary fellowship programs, with a request that learners complete the accompanying pre- and post-test assessment. The educational objectives are that, by the end of the video module, learners will be able to: 1) Identify the three major components of the C-arm, 2) Position patients to minimize radiation exposure, 3) Describe the protective equipment worn by staff to minimize radiation exposure, 4) Demonstrate correct positioning of the dosimeter, 5) List fluoroscopy settings that will minimize radiation, and 6) Determine when to turn off the fluoroscopic X-ray beam when taking a transbronchial biopsy.

DISCUSSION

We had participants from Pulmonary/Critical Care fellowship programs at seven different institutions. Participants included first-year fellows in their first months of fellowship, second- and third-year fellows, and faculty. Fifteen participants completed the test prior to watching the module with a mean score of 46.1% (42.6% for first-year fellows, 45.8% for senior fellows and 50% for faculty). Eleven participants completed the test after watching the module with a mean score of 96.4% (93.3% for first-year fellows, 95.8% for senior fellows and 100% for faculty).

CONCLUSION

Initial data shows that this video module successfully improved understanding of safety for use of fluoroscopy with bronchoscopy. Notably, the mean pre-test score for faculty was 50%, demonstrating the need for education focused on the use of fluoroscopy across all levels of clinical experience. In the future, we plan to further evaluate the faculty knowledge gap regarding fluoroscopy use and aim to increase the number of participants – particularly faculty. Additional bronchoscopy education modules are in production, including "Management of Pneumothorax" and "Overview of Common Adverse Effects of Bronchoscopy". Following production of these modules, we plan to survey pulmonary fellows to explore if additional aspects of bronchoscopy may benefit from 'Just-in Time' training material.

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FIGURE 1. Pre- and Post-Test Scores
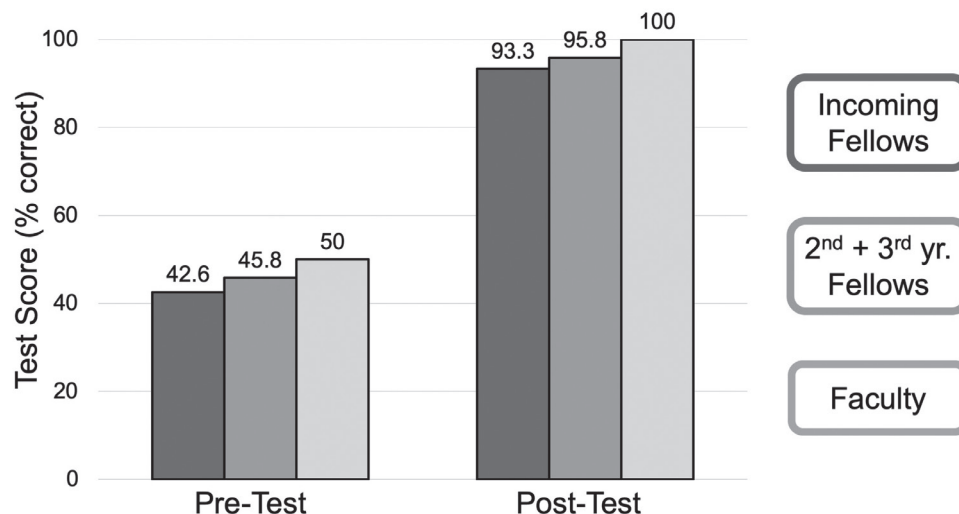
A Longitudinal Evaluation of an On-Demand, Asynchronously Delivered Multidisciplinary Critical Care Curriculum: A 6-Year Follow-up of the Maryland.CCProject.com

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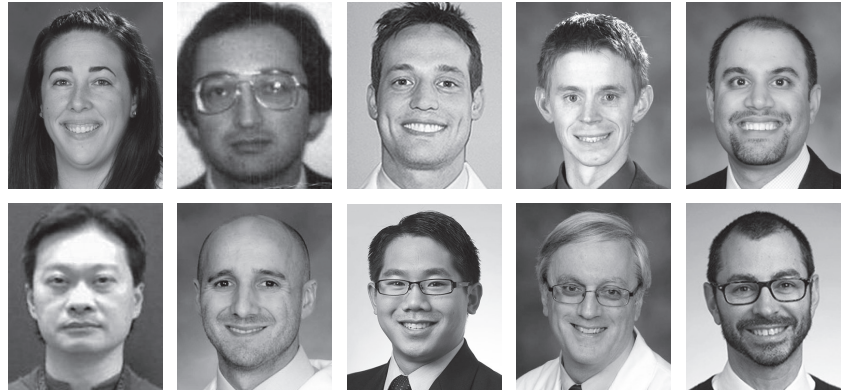
INTRODUCTION

In July of 2013, the University of Maryland launched MarylandCCProject. This is a free-access educational website designed to deliver asynchronous high-quality multidisciplinary critical care education targeted primarily at critical care trainees. The curriculum is regularly updated to account for changes in practice guidelines, featuring evolving and novel topics in critical care (eg, vaping-induced lung injury). The lectures, presented in real-time at the University of Maryland, are recorded and made available free-of-charge on the Maryland.CCProject website or as a podcast on iTunes or Android. In this way, this state-of-the-art multidisciplinary curriculum can be accessed throughout the globe to anyone with an internet connection or a smartphone. Six years after the initial project launch, we surveyed 80 current trainees and graduates from the University of Maryland Multi-Departmental Critical Care training program to assess the ongoing benefits of this educational platform.

ABSTRACT PRESENTATION

Seventy current trainees and graduates of the University of Maryland Critical Care Fellowship were surveyed with an 100% (n=70) response rate. The demographics of the participants are included in Table 1. Of those that responded, 77% (54) use the website as a source of medical education. This subset of 54 persons who use the MarylandCCProject for medical education purposes were further surveyed regarding their scope of use and clinical application. 63% (n=34) access the website at least monthly and 60% (n=32) spend >30 minutes on the website at each visit. Most users (66%, n=35) access the lecture MP3s directly through the website (Maryland.CCProject.com) with the remainder accessing the podcasts via iTunes. All users of the MarylandCCProject "agree" or "strongly agree" that the website has improved their medical knowledge, is a useful education resource, provides topics that are pertinent to daily practice, and provides an overall positive educational experience. Regarding clinical application, 85% (n=45) of users agree that the MarylandCCProject has expanded their skill set and 90% (n=48) agree that the education provided by this website has impacted patient care.

DISCUSSION

The MarylandCCProject is free repository for critical care education delivered by vetted experts and is readily accessible in any environment via smartphone or computer. Previously published data by our group described survey results of fellows shortly after the inception of the MarylandCCProject(1). These data confirmed that access to an online medical educational platform was instrumental in improving the trainees' medical and procedural knowledge and changed the way trainees practice medicine. Our current survey data not only assesses the ongoing value of this educational platform six years after its inauguration but analyzes the long-term use patterns and perceived value of the MarylandCCProject in both current trainees and program graduates. Based on our current data, the MarylandCCProject remains a valuable and highly utilized educational resource, impacting patient care both during and after critical care fellowship training. The paradigm of medical education is shifting. Multiple top tier journals (eg, New England Journal of Medicine, American Journal of Respiratory and Critical Care Medicine, JAMA) are currently using podcasts to deliver educational content. This shift is driven by learners who are demanding knowledge from experts in an instantaneous manner, unencumbered by historical obstacles such as geography or a regional/institutional lack of such expertise. The Maryland.CCProject reflects this paradigm shift. The continuous use of the website for six years by our current and former trainees is a proof-of-concept that an expansive critical care curriculum can be delivered asynchronously, is highly utilized, and impacts medical practice.

CONCLUSION

The Maryland.CCProject is a proof-of-concept that a high-quality critical care education can be delivered asynchronously online and via podcasts. Access to this convenient, up-to-date, and vetted fund of knowledge continues to guide medical practice for current trainees and program graduates.

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TABLE 1. Demographics of survey responders

	Percent (n=70)
Age Group	
30-34	40 (28)
35-39	40 (28)
40-44	15.7 (11)
45-49	2.85 (2)
50-54	1.43 (1)
Gender	
Male	71.43 (50)
Female	27.14 (19)
Non-binary	1.43 (1)
Location OF MD	
United States	81.43 (57)
Caribbean	1.43 (1)
Other	17.14 (12)
Geographic Area of Practice	
Northeast	32.86 (23)
Mid-Atlantic	38.57 (27)
Southeast	7.14 (5)
Midwest	5.71 (4)
South	5.71 (4)
West	4.29 (3)
Northwest	1.43 (1)
International	2.86 (2)
Other	1.43 (1)
Residency	
Internal medicine	41.43 (29)
Surgery	22.86 (16)
Emergency medicine	18.57 (13)
Other	17.14 (12)
Type of Hospital Practice	
University academic	64.29 (45)
Community academic	25.71 (18)
Community non-academic	10 (7)
Year of Fellowship Graduation	
2013	4.29 (3)
2014	7.14 (5)
2015	12.86 (9)
2016	5.71 (4)
2017	14.29 (10)
2018	18.57 (13)
2019	10 (17)
2020 or later	24.29 (17)

APCCMPD Award for Novel Medical Education Implementation

The **APCCMPD Award for Novel Medical Education Implementation** recognizes pulmonary, critical care, and pulmonary/critical care medicine training program directors, associate program directors, faculty, and fellows-in-training for their outstanding contributions and commitment to fellowship medical education and training. The recipient is selected for development of novel and innovative curricular development in his/her training program.

Congratulations to the 2020 awardee:

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The APCCMPD would like to honor the contributions of all 2020 applicants:

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Navin Durairajan, MD
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Rorak E. Hooten, MD
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A Novel, Longitudinal Curriculum for Communication, Professionalism and Ethics

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Caitlin Clancy, MD
Horace M. DeLisser, MD
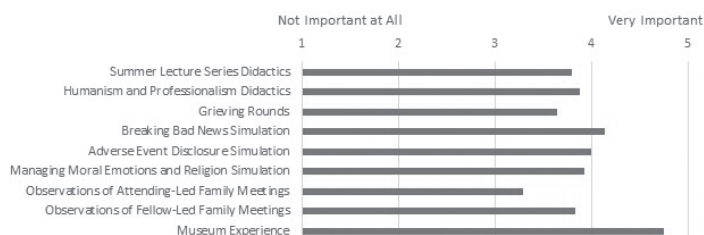**Maryl Kreider, MD**
University of Pennsylvania

INTRODUCTION

The ACGME subcompetencies for Pulmonary and Critical Care Medicine (PCCM) fellowship require training in communication, professionalism and ethics. However, the best methods for developing these competencies in fellowship learners are unknown. To address this knowledge gap, we designed, implemented and evaluated a comprehensive, longitudinal curriculum for communication, professionalism and ethics in PCCM fellowship, including didactics, simulation training, medical humanities experiences, and workplace assessment and observation.

ABSTRACT PRESENTATION

The curriculum was designed as a longitudinal experience including a variety of educational settings, and was organized and administered by two faculty members with training in biomedical ethics and palliative care. Didactics include sessions on ICU communication and cultural competency as part of the fellowship's Summer Lecture Series, and continue with a monthly Humanism and Professionalism conference series, covering topics such as medical ethics, conflict resolution, rationing and organ allocation, informed consent, medically assisted death and dying, and professionalism. Fellows participate in three simulation experiences spaced throughout the first year of training, focusing on delivering bad news, disclosure of adverse events, and managing moral emotions (eg, anger, indignation, guilt) and religious or spiritual beliefs in family meetings. Trained standardized patients are engaged for all simulations, and sessions are followed by a debrief and feedback session. One simulation is recorded and reviewed by the fellow as a narrative reflection activity. All fellows are provided with a book and a journal to encourage narrative reflection. Additionally, first-year fellows participate in two "grieving rounds" sessions to process emotional responses to caring for dying and critically ill patients, and participate in a narrative medicine experience at the local art museum to enhance their observational skills. During the first six months, first year fellows are must observe and reflect on three family meetings led by ICU attendings. In the second six months, fellows are required to have three family meetings observed by their ICU attending. We conducted a voluntary, confidential paper survey of fellows who had participated in at least one year of the curriculum to assess comfort and perceived competence in ICU communication skills, and perceptions of the importance of individual curricular elements to their professional development in the areas of communication, ethics, and professionalism. Survey questions were developed and pilot tested with a group of fellows and faculty educators. Summary statistics were performed to describe the responses.

DISCUSSION

All fellows completed the survey (n=19 with 8 second-years, 6 third-years, and 5 fourth-years). All participants agreed or strongly agreed that they feel well prepared to engage and communicate with patients and families in the ICU and are comfortable conducting a family meeting to discuss goals of care and end-of-life. Fellow self-assessments of ICU communication skill competency are listed in Table 1. Fellows rated the importance of each curricular element, shown in Figure 1, the museum experience had the highest mean importance rating, while observations of attending-led family meetings had the lowest mean rating. While most fellows felt that the curriculum included the right amount of didactic sessions and simulation experience, 31% wanted more medical humanities experiences, and 53% wanted more workplace-based observation and assessment.

CONCLUSION

We found that a longitudinal, multifaceted curriculum for communication, ethics, and professionalism was acceptable to the fellows at our institution. Overall, our fellows endorsed feeling prepared and comfortable with ICU communication and goals of care discussions, and rated themselves as competent in family meeting skills. Next steps include revision of our current curriculum to increase workplace-based observation and assessment. The framework of our curriculum could be easily transported to other large, well-resourced fellowships, and modified versions could also be considered in lower-resourced environments.

REFERENCES

N/A

FIGURE 1. Importance of Curricular Elements

TABLE 1. Self-Rated Competency in Family Meeting Skills

	Mean Ability Rating* (SD)
Conduct a family meeting to discuss goals of care and/or end-of-life	4.65 (0.49)
Establish the conditions for a productive family meeting	4.65 (9.49)
Use active listening skills during a family meeting	4.76 (0.44)
Present medical facts during a family meeting	4.59 (0.51)
Communicate prognosis during a family meeting	4.18 (0.53)
Make unambiguous recommendations for patient care during a family meeting	4.18 (0.53)
Manage conflict during a family meeting	4.09 (0.66)
Respond to emotion during a family meeting	4.47 (0.62)

*1-5 scale where 1= "I am not able to perform", 2= "I am able to perform with close supervision", 3= "I am able to perform with minimal supervision", 4= "I am able to perform independently", 5= "I am able to teach others to perform this skill"

Does Teamwork Make the Dream Work? The Impact of Confidence and Competence on the Collective Intelligence of Learners Enrolled in a Course on Mechanical Ventilation

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INTRODUCTION

Many ICUs utilize a team-based approach to patient care. The rationale for this derives from the theory of collective intelligence, which suggests that individuals in a group behave synergistically, enabling group performance to exceed the average performances of individual members. However, overly confident (under-competent) learners may undermine group synergy, lowering collective intelligence.

ABSTRACT PRESENTATION

First-year Critical Care and Pulmonary/Critical Care fellows from several academic medical centers were enrolled in a mechanical ventilation course in 2018-2019. The first half of the course was held in the summer, while the second occurred in the winter. Fellows were randomly assigned to groups of 5-7 learners, with whom they completed exercises and simulations. Prior to and following the course, each learner completed an examination on identifying several ventilator dyssynchronies. Fellows then completed the same exam with their group. Following the collective exam, learners were asked to identify their group's most confident member. Synergy was noted if the group performance exceeded that of the most competent learner. Pearson's correlation coefficients were used to describe the relationships between the performance of the group and the group's most competent or confident learner.

DISCUSSION

Twenty-eight and 21 fellows were included in the individual post-test analyses from summer and winter, respectively. In both summer and winter, learners were divided into six groups. Synergy was noted in 1/6 (17%) and 3/6 (50%) groups among summer and winter learners, respectively. Though scores of the most competent learners increased with teaching, group scores tended to decrease relative to the most competent learner's score in both the summer (ß = -0.51, p = 0.30) and winter (ß = -0.61, p = 0.20). Among the summer learners, the group score was within 10 points of the most confident learner's score in 3/5 (60%) groups; among the winter learners, the group score was within 10 points of the most confident learner's score in 5/6 (83%) groups.

CONCLUSION

Only 33% of groups demonstrated synergy, challenging the utility of collective intelligence in mechanical ventilation management. Competent learners did not appear to bolster the group's performance, as the test performance of these learners typically exceeded that of their groups. Overly confident (potentially less competent) learners may limit group performance as the most confident members appear to have more impact on the group than their competent peers. This data suggests that the most competent learners should be identified early and encouraged to share their knowledge.

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FIGURE 1. Impact of the Most Competent and Confident Learner on Group Test Performance
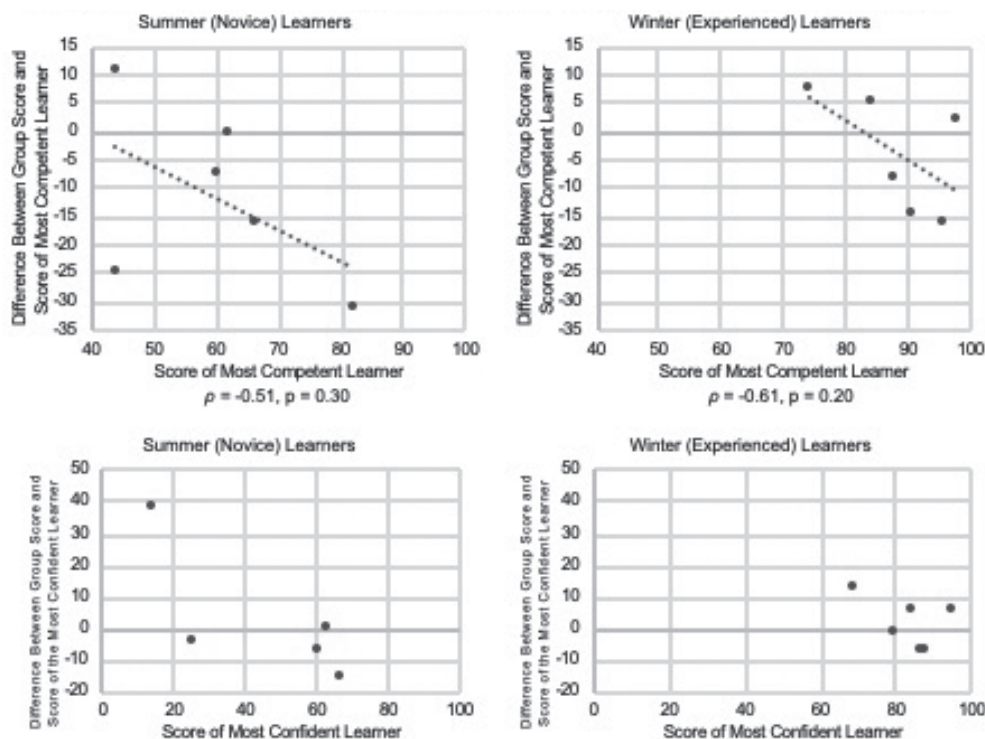
Development and Implementation of a Novel Learner-Driven Precepting Model for Pulmonary Fellowship

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INTRODUCTION

Ambulatory education is currently underemphasized in Pulmonary and Critical Care Medicine (PCCM) fellowship training, leaving fellows feeling underprepared for independent practice(1). Existing clinic precepting models(2,3), originally developed for students and residents, do not account for advanced competency achievement and developmental goals of fellowship-level trainees. We aimed to improve the outpatient precepting process for PCCM fellows at the University of Pennsylvania by performing a multifaceted local needs assessment and developing a novel precepting model based on our findings. We then implemented, pilot-tested, and evaluated the new model for acceptability, usability and impact on learner-centered outcomes.

ABSTRACT PRESENTATION

We performed a mixed-methods needs assessment, including surveys, focus groups and direct observations, to explore perceptions of ambulatory training, define current precepting practices, and identify areas for improvement. A baseline survey and focus group with fellows identified a mismatch between current precepting practices and fellows' needs for graduated autonomy, development of assessment and management skills, and self-directed learning. Only half of respondents (53%, n=9) agreed that they were satisfied with their current precepting experience. In a separate focus group, faculty expressed openness to changing precepting practice to improve fellow education. Fourteen direct observations showed that mean precepting time was 10.1 minutes (SD 5.6 minutes, range 2-24 minutes), with less than half (47%) of the total precepting time spent discussing assessment and plan. Based on our needs assessment, we developed and implemented a novel, learner-driven precepting model, STEP-UP, to prioritize clinical reasoning skills and enable fellows to identify learning objectives (Table 1). For novice fellows, or complex patient cases, precepting structure reverted back to the traditional detailed presentation, although learners were still asked to identify educational objectives. Implementation strategies to encourage uptake of the new model included a one-hour interactive training session for fellows, training videos for faculty, and in-person support in clinic. Seventy percent (n=14) fellows responded to a three-month post-intervention survey assessing overall perceptions of outpatient training and precepting experiences. Baseline and post-implementation results are reported in Table 2. At six months (response rate 65%, n=20), fellows reported variable uptake of the STEP-UP model, with 46% (n=6) using the model in fewer than 25% of precepting encounters. The majority of fellows (69%, n=9) reported spending less than half of the precepting time discussing assessment and plan, compared to 65% in the initial survey. However, 50% (n=10) of fellows indicated that they were reliably setting educational goals. Barriers to use of the STEP-UP model were similar at 3- and 6-months post-intervention, with fellows citing lack of familiarity, difficulty remembering, and increased cognitive load requirements with the new model.

DISCUSSION

Using a mixed-methods approach, we created a novel learner-driven precepting model to improve ambulatory training for PCCM trainees. While we did demonstrate improvements in overall satisfaction, perceived educational value of precepting, and increased opportunities for graduated autonomy, we faced implementation barriers that limited uptake of the STEP-UP model. One strength of our study was the mixed-methods approach to intervention development. By precisely defining our current process and context, we were able to identify a high-yield target for improvement. Limitations include generalizability, as our model was developed based on a local needs assessment. Consideration of local institutional culture and needs should drive adaptation of STEP-UP and inform implementation strategies.

CONCLUSION

A robust assessment of ambulatory education at a single PCCM fellowship program identified a need to align precepting processes with the unique goals of advanced trainees. We developed a learner-driven precepting model focused on development of clinical reasoning skills and self-directed educational objectives. Additional study is warranted to refine, adapt, and test the model in different settings.

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TABLE 1. STEP-UP Model for Ambulatory Precepting of PCCM Fellows

S	Set the Stage — Align Expectations with Faculty	Fellow will identify which precepting model to use in the current encounter (STEP-UP versus a traditional model).	"This case is very straight-forward, I would like to proceed with the STEP-UP" vs. "This is a complicated new patient and a diagnostic dilemma, and therefore it would be helpful to do a traditional full presentation."
T	Tell the Story, Starting with the Diagnosis (in less than 60 seconds)	Fellow will briefly summarize key history, physical, and data on the patient in less than one minute, starting with their assessment.	"This is a patient with stable COPD. Briefly, he is a 60-year-old heavy smoker, who developed dyspnea several years ago. He was diagnosed with COPD based on obstruction on PFTs, and flattened hemidiaphragms on CXR. He can walk several blocks before getting winded, and has one exacerbation per year managed as an outpatient. He is only on SABA therapy currently."
E	Educational Goals	Fellow will identify one-two potential learning goals for the encounter, which may include medical knowledge or direct observation of skills.	"I want to learn more about the evidence base of current smoking cessation resources, but also would love to get feedback on my smoking cessation communication with this patient."
P	Preliminary Plan	Fellow will propose a preliminary plan, prior to input from the faculty member.	"My plan for the patient is to focus on smoking cessation- I will to start him on nicotine patches and gum. Otherwise, I would continue his current inhalers regimen. He is already up-to-date with lung cancer screening and vaccinations, and we already reviewed inhaler technique."
U	Uncertainties and Learning Objectives	Preceptor will clarify any uncertainties with the presentation, and address the learning objectives set by the fellow.	"Let's talk about some options to help patients succeed with smoking cessation. What options are you familiar with?"
P	Plan Recap	Fellow and preceptor will confirm plan prior to conclusion of the encounter.	"Ok, so in addition to his current inhalers, we will recommend Varenicline to assist with smoking cessation."

TABLE 2. Baseline and Three-Month Follow Up Perceptions of Outpatient Training and Precepting

Survey Question	Agreed/Strongly Agreed (n, %*)	
	Baseline	Follow Up
Confident in outpatient skill set	17 (94%)	6 (43%)**
Satisfied with current precepting experience	12 (71%)	12 (86%)
Precepting improved patient care	11 (65%)	13 (93%)
Discussion with preceptor improves knowledge	10 (59%)	13 (93%)
Experienced progression of autonomy throughout training	12 (71%)	14 (100%)

*The eligible number of fellows increased from 18 to 20, and response rate decreased from 94% to 70% at three-month follow-up.
** The baseline study respondents included a higher proportion of second- and third-year fellows (78% vs 50%).

Improving Endobronchial Ultrasound (EBUS) Competency in Pulmonary Fellows with a Novel Hands-on Simulation-based Curriculum

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INTRODUCTION

Simulation techniques have been increasingly used to train physicians and trainees on specific procedure skills to lower the risk of patient complications while improving their learning skills. We hypothesized that the implementation of a novel hands-on simulation-based curriculum for Endobronchial ultrasound (EBUS) will improve medical knowledge, technical skill and satisfaction of Pulmonary and Critical Care (PCCM) fellows. Previously, EBUS Skills and Tasks Assessment Tool (EBUS-STAT) has been validated as a tool to assess operator competency in knowledge and technical skills to perform EBUS, however this tool has not been used as a training curriculum for PCCM fellows.

ABSTRACT PRESENTATION

The study targeted second- and third-year PCCM fellows (n=6) in an urban academic center. Simbionix BRONCH Express™ simulator was used in this curriculum, to assess competency and to train fellows. Competency pre- and post-curriculum was assessed using a modified version of EBUS-STAT and Multiple-Choice Questions (MCQs) after confirming their internal validity. Subjective confidence scores of fellows in EBUS skills were also assessed using a previously validated assessment tool, EBUS Subjective Assessment Tool (EBUS-SAT). After baseline testing, all six trainees were included in the EBUS curriculum including hands-on learning on the simulator, educational lectures, and small group-interactive case-based learning modules. The fellows' baseline and 2-month post-EBUS curriculum performances were compared.

DISCUSSION

The mean modified EBUS-STAT scores of the six PCCM fellows improved from baseline score (maximum score is 105) of 43.5±8.2 (41.4%, range 30-46) to 61.0±10.2 (58.1%, range 48-58) at 2-month post-curriculum (p=0.005). This improvement was mainly contributed by the improvement in the bronchoscopic technical skills part (maximum score is 80) of the assessment tool [29±7.7(36.2%) to 47±10.9(58.7%), p=0.004]. The mean EBUS-SAT confidence scores (maximum score is 50) of the six PCCM fellows improved from 23.8±7.8 at baseline to 34±6.1 at 2-month retention testing (p=0.005).

CONCLUSION

A hands-on simulation-based EBUS curriculum may improve PCCM fellows' technical skills and confidence in performing EBUS. It allows direct observation of trainees in a controlled environment without compromising patient safety. Assessment of retention for EBUS procedure knowledge and competencies in a larger sample and longitudinal monitoring is needed.

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Simulation-Based Curriculum for Ultrasound Training and Shock Management in a Pulmonary & Critical Care Medicine (PCCM) Fellowship Training Program: Effectiveness and Retention

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INTRODUCTION

Bedside critical care ultrasound (US) plays a major role in the early detection and management of shock in the intensive care unit (ICU); however, it is an emerging skill such that incoming trainees into a Pulmonary and Critical Care (PCCM) fellowship have vastly differing competencies and prior experiences. We created a standardized curriculum for orientation boot camp that aims to improve knowledge and skills in shock management using US simulation and bedside assessment.

ABSTRACT PRESENTATION

All participants were PCCM fellows during their first year of training. The US and shock curriculum included a baseline knowledge test consisting of internally validated 15 multiple-choice questions, a high-fidelity simulation manikin [SimMan 3G®], a 29-item checklist to assess clinical competence in shock diagnosis and management, a Simbionix U/S Mentor ultrasound simulator, a 15-item checklist for the US use competency, and a post-simulation knowledge test. The training team consisted of Clinical Educator (CE) PCCM fellows and two teaching faculty attendings. Each learner underwent the following chronological steps: 1) Baseline knowledge test. 2) A two-part baseline simulation session with a standardized case scenario utilizing a high-fidelity manikin to assess adherence to best practices in medical decision-making and communication in shock management and using an US simulator to assess motor skills and knowledge of visualized anatomy. The learner's performance was measured via a standardized competency checklist. All simulations were conducted over 30-minute sessions followed by structured 10-minute debriefings. 3) A 60-minute didactic lecture. 4) Bedside US/shock teaching rounds in an ICU. 5) Post-course simulation sessions conducted one to two weeks later. The primary outcome was the comparison of learners' competency pre- and post-course. In addition, retention assessments were completed both in the simulation center and at the bedside. This study was granted exemption from IRB. Results are expressed as mean ±SD or median (25-75%) as appropriate.

DISCUSSION

A total of 16 first-year fellows completed the US and shock curriculum (eight fellows in 2018 and eight in 2019). The median (25-75%) post-course shock simulation competencies increased significantly from a baseline of 12 (10.3-14.8) which is 41.4%) to 23 (21.3-24.0) which is 79.3% (p<0.001). The mean (SD) post-course competency on US simulator (maximum score is 15) increased significantly from 8.9 ±3.6 (59%) to 13.4 ±1.3 (89.3%), p<0.001. Retention assessment of US competencies at bedside showed a mean competency score (maximum score is 13) of 12.3±0.7(92.3%) at a 2-week post-test in the 2019 fellows compared to baseline 6.8±3.6 (52.3%) (p=0.003).

CONCLUSION

Our study results suggest that a standardized curriculum using simulation is an effective teaching method and can improve new learners' competencies in ultrasound and shock management during orientation boot camp with excellent retention at the bedside. Future studies are needed to assess the impact on clinical outcomes.

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N/A

Simulation to Improve Critical Care Fellows' Confidence in Intubation

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INTRODUCTION

Airway management is a core competency for Pulmonary and Critical Care Medicine (PCCM) fellows as prescribed by the ACGME. Intubations in the ICU are known to be more difficult and have more complications; commonly hypotension and hypoxia.(1,2) Simulation has been shown to improve first pass success rate and to decrease adverse events while intubating in the ICU. (3) We hypothesized by implementing a simulation course fellows' confidence and experience in airway management would improve.

ABSTRACT PRESENTATION

A ten-session simulation course was created modeling a course previously described in the literature. The course focuses on airway evaluation, pharmacology, and decision-making strategies early, and progresses to teaching advanced techniques like fiberoptic intubation or emergent cricothyrotomy. The course also incorporates principles of crew resource management, leadership, and effective communication in order to improve outcomes. Pre-course surveys evaluating confidence in increasingly difficult airway situations were obtained prior to initiation of the course were compared with the same survey post-course. Billing codes were used to estimate the number of intubations performed by the fellows in the ICU prior to the initiation of the course. An airway survey was also used to capture clinical outcomes including first pass success and complication rates.

DISCUSSION

From 2016 through 2018, the average number of intubations billed for by CCM faculty was 34 per year. The number of intubations performed since implementing the program is projected to increase to 116 intubations per year. Confidence surveys showed an increase in confidence on all scenarios (P Value Range 0.01-0.03) and by all methods (direct laryngoscopy P=0.01, video laryngoscopy P= 0.03, cricothyrotomy P=0.02) except bronchoscopic and placement of LMA. Clinically, first pass success rate was 73% on 70 intubations. Complications included esophageal intubation (N= 4/70, 5.7%), Severe Hypoxemia (Sat< 70 N= 9/70, 12.8%), Hypotension (N = 8/70 11.4%), Cardiac Arrest (N= 1/70, 1.4%)

CONCLUSION

By implementing an airway simulation course, we were able to increase the number of intubations performed by PCCM fellows in the ICU by more than three-fold. We were also able to increase the confidence of our fellows while achieving similar first pass success rates previously described in the literature.

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Fellow as Educator: Educational Skills Development During Pulmonary and Critical Care Fellowship Training Through Deliberate Practice and Coaching

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INTRODUCTION

Effective teaching is an important skill for a career in academic medicine. Educational skills curricula for fellows are often only provided as an elective, and as a result, many trainees miss the opportunity to cultivate these competencies. Within our program, fellows historically have received variable instruction and directive feedback about their skills as an educator. We developed a longitudinal curriculum using the theoretical framework of deliberate practice to provide a foundation for educating the adult learner. This curriculum incorporates self-reflective feedback and coaching to complement existing educational opportunities promoting teaching skills development.

ABSTRACT PRESENTATION

Commonly identified educational skills were extracted from a review of the literature and used to develop the framework for the fellows as educators curriculum. The curriculum was implemented in July 2019. Fellows participated in experiential workshops focusing on skills relative to their educational level of training including: leading clinical problem-solving cases, teaching through consultation, procedural teaching skills, leading bedside rounds, delivering a research talk and small group teaching. These workshops preceded paired teaching opportunities within the fellowship allowing application of learned skill. Teaching opportunities (Figure 1) were paired with direct observation with feedback through self-reflection and direct observation by faculty. Curricular impact was assessed via survey.

DISCUSSION

Eighty-five percent (17/20) of fellows responded to the survey. The majority of respondents, 94% (16/17) agreed or strongly agreed that developing effective teaching skills is important for their career. Since completing the seminars, the majority of fellows applied their learned skills in: bedside procedure teaching 88% (15/17), bedside rounding 76% (13/17), and giving a chalk talk 82% (14/17). Comparing the fellowship cohorts, 100% of (7/7) of first year fellow respondents reported receiving directly observed feedback presentations and coaching on their large group compared to baseline (pre-intervention rate) reported by upper level fellow respondents of 50% (5/10).

CONCLUSION

Effective educational skills are a desired competency for a career in academic medicine and should be taught to all fellowship trainees. A curriculum aimed at developing these skills comprising experiential workshops and teaching experiences paired with direct observation and feedback can be integrated into Pulmonary and Critical Care training programs. Future work will assess the programmatic impact on fellow teaching skills through objective measure of learner evaluations.

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FIGURE 1.

Novel Research and Career Development Curriculum for Pulmonary and Critical Care Medicine Fellows

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INTRODUCTION

During the second year of fellowship at our institution, fellows have dedicated research time to work with their mentors on individual research initiatives. The research year comes at a time of pivotal career development, as fellows work toward identifying an academic niche, search for jobs, and decide on a career path. Traditionally, the year has been focused on exposure to a single path of research with no formal research or career development curriculum. Importantly, fellows have had limited opportunities to learn from each other's research experience, relying on the experience and guidance of their individual mentor. In order to rectify these issues, we designed a research and career development curriculum to standardize the research experience for all fellows in our program and increase the breadth of exposure to career development opportunities.

ABSTRACT PRESENTATION

We surveyed second- and third-year fellows to determine areas of research and career development that needed improvement within our fellowship program. The survey response rate was 94.4% (17 of 18). Most fellows (76.5%) envisioned themselves working at an academic medical center upon completion of fellowship training. We found that only 41.2% of fellows were "satisfied" with our current research curriculum, and no fellows were "very satisfied". Likewise, only 47.1% of fellows reported being "somewhat satisfied" with our career development programs. Most respondents were "somewhat comfortable" or "uncomfortable" when asked about various research topics, including the ability to write "fundable" grant applications, navigate resources available to conduct successful research, and deliver effective presentations. After collecting this information, we designed our enhanced research and career development curriculum with several principle goals: 1) Introduce monthly, semi-structured group sessions focused on core fundamental topics in biomedical research. These are led by content experts. Topics include manuscript writing, grantsmanship, effective peer review, clinical study design (prospective and retrospective), basic science/ translational study design, and academic promotion. In addition to these sessions, we also host a panel dinner on curricula vitae development, job searching, and contract negotiation. 2) Provide a venue for fellows to learn from each other's research experience through open discussion during the monthly group sessions.

3) Augment mentorship and career development of fellows by faculty in research pathways by setting up "mentorship committees" for each fellow to help oversee their professional development, provide career counseling, and facilitate job placement. These committees will consist of the fellow's primary research mentor, secondary mentor (if applicable), an assistant program director or program director, and one to two other faculty members (as selected by the fellow). The committee will meet twice per year to review and update all elements of a specially-designed "mentoring plan." Following the initial implementation of this program, we re-surveyed fellows with a response rate of 70.6% (12 of 17). All fellows indicated that they were either satisfied (41.7%) or very satisfied (58.3%) with the new research/ career development curriculum, and the majority of fellows were either satisfied or very satisfied with the program's focus on career development (58.3%). In addition to periodic surveys (including a modified version of the "Mentorship Profile Questionnaire" developed by Berk et al.), we will use academic productivity (eg, quality and quantity of peer reviewed publications, academic rank, leadership positions within national societies, and grant awards) as well as job placement as outcome measures.

DISCUSSION

Career development and research training are key components of fellowship training and academic growth. Unfortunately, these are often overlooked and not part of the standardized fellowship curriculum.

CONCLUSION

We developed a novel research and career development curriculum that improved satisfaction among fellows. Future outcome measures, such as academic productivity and job placement, will further delineate the value of this novel curriculum.

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APCCMPD Award for Innovative Fellowship Program Administration

The **APCCMPD Award for Innovative Fellowship Program Administration** recognizes outstanding contributions to fellowship program administration through the development of novel best practices in pulmonary, critical care, or pulmonary/critical care medicine fellowship programs.

Congratulations to the 2020 awardee:

Kelli Alderman
*Program Coordinator*
University of Washington

The APCCMPD would like to honor the contributions of all 2020 applicants:

Cheryl Etelvari, C-TAGME
Program Coordinator
University of Virginia

The Hackathon as a Way to Innovate in Fellowship Education

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Rosemary Adamson, MBBS
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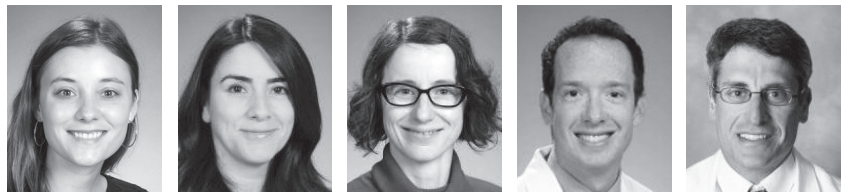
INTRODUCTION

In 2017, the Accreditation Council for Graduate Medical Education (ACGME) incorporated quality improvement and patient safety (QI/PS) and wellness into the Common Program Requirements (CPRs).

1. The updated requirements address a growing need to provide quality care at lower costs and improve population health, as well as the urgency to reduce levels of physician burnout.

2. In considering these regulatory requirements and reviewing our ACGME self-study and fellow exit surveys, we recognized that QI/PS and wellness were weaknesses in our program. In the Spring of 2019, we held a program retreat to find creative solutions to these components of our fellowship program.
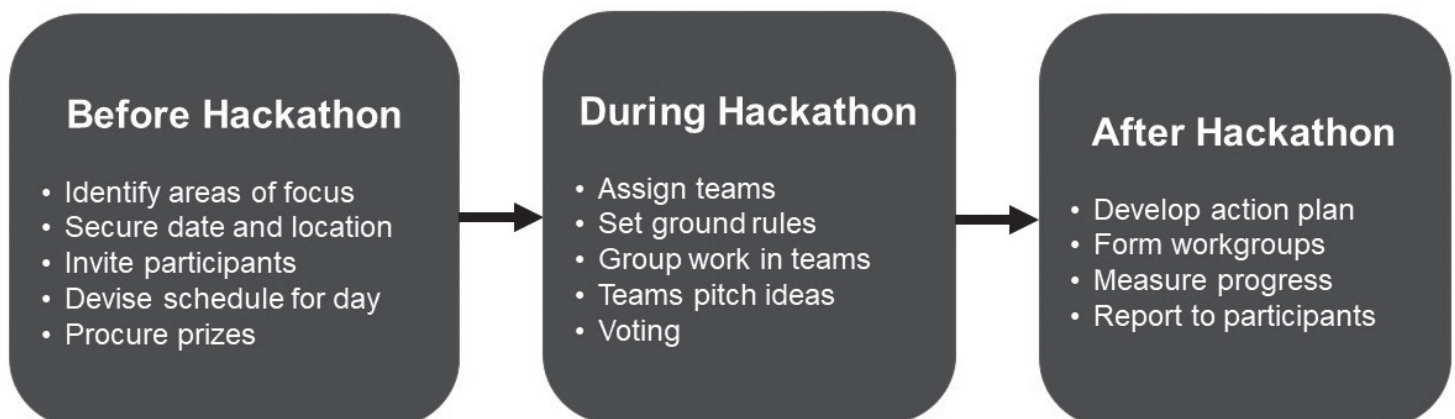
DISCUSSION

To encourage innovation, we structured a half-day retreat as a "hack-a-thon." Borrowed from the design world, a hackathon is an event where individuals are placed on teams to come up with a "hack," or innovative solution to a problem. This format was successfully used by others at our institution to address complex educational problems. Figure 1 includes a process map for a hackathon, including steps to consider before, during, and after the event. Fellows, faculty, and staff were randomly assigned to one of five interdisciplinary teams. After an initial review of ongoing fellowship initiatives and a team-building exercise, participants were given a fifteen-minute overview of QI/PS and our institutional goals to engage trainees in these initiatives. The perfect hack was defined as one that is innovative, integrates into existing workflow, measurable, and cost neutral. The teams were then given thirty minutes to brainstorm a hack to address program gaps and generate ideas related to advancing QI/PS initiatives. For the next thirty

minutes, each team was given five minutes to pitch their hack to the group and participants voted on the ideas they liked the most. Next, participants received a brief overview of wellness initiatives in medicine, including Pulmonary and Critical Care programs nationally, and the hacking process was repeated. Themes for QI/PS included the need to improve QI literacy, with education around terminology and methodology, as well as opportunities for trainees to engage in QI projects with faculty mentorship. Common themes for the wellness initiatives included community-building and greater schedule autonomy and flexibility. Following the retreat, faculty and fellows were invited to participate in two workgroups charged with implementing actionable and measurable initiatives based on the hacks from the program retreat. Each workgroup is comprised of 11 individuals representing program leadership, core faculty, and fellows. The QI/PS workgroup has determined curricular needs, identified opportunities for QI/PS participation at each of our hospital sites, and created a pilot for fellows to lead QI/PS efforts at one of our sites. The wellness workgroup plans to survey faculty and fellows, incorporate more flexibility into scheduling, and to promote a culture of load-sharing. We plan to measure progress on these initiatives with the annual ACGME survey, fellow exit surveys, and review at our annual program evaluation.

CONCLUSION

The increasing complexity of fellowship training programs requires innovative solutions. We implemented a hackathon to bring together faculty and fellows to improve QI/PS education and wellness within our fellowship program. Through this initiative, we built community, engaged diverse participants, and encouraged creativity. Ideas generated by the hackathon are now being implemented and we have delineated ways to measure progress. Programs can consider the hackathon as an engaging way to approach program improvement.

FIGURE 1.

Before Hackathon
- Identify areas of focus
- Secure date and location
- Invite participants
- Devise schedule for day
- Procure prizes

During Hackathon
- Assign teams
- Set ground rules
- Group work in teams
- Teams pitch ideas
- Voting

After Hackathon
- Develop action plan
- Form workgroups
- Measure progress
- Report to participants

Using the A3 to Improve Completion Rate of Fellow Evaluations in New Innovations

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INTRODUCTION

The A3 worksheet is a Process Improvement approach that holistically incorporates strategy, work processes, people, and technology to improve effectiveness, efficiency, and service delivery. Outcomes include the development of new processes or steps, improvement of existing processes, or elimination of processes or steps that no longer add value. Process Improvement aims to breakdown the functional silos so that the processes deliver the most value at the least cost. An A3 template has been attached for review.

DISCUSSION

Performance evaluations are the cornerstone in the development of fellows' skills and abilities as they progress through their training experience. Without an adequate sampling of (well) completed evaluations, it is difficult to identify areas of opportunities for improvement/concern or to initiate remediation plans should deficiencies be discovered. The current rate of completion and timeliness to completion for our program is far less than optimal and an area that has been identified as important to improve for the benefit of both the program as well as the fellows' educational experiences. We hypothesized that use of the A3 mechanism to revise our fellow evaluations would lead to improvements in the overall completion rate (percentage) and timeliness of evaluations. The goal was to make the evaluations more concise and easier to complete based on feedback and engagement from our multi-disciplinary team. Expected outcomes were 1) fellows would receive more and better feedback to enable them to make any necessary changes in their practice habits and 2) the Clinical Competency Committee would likewise receive more and better feedback to aid in the semi-annual evaluation process as well as identify signs of potentially at-risk fellows. Two of our fellows participated in the rewrite process and qualified the experience as part of their Quality Improvement requirements. The program evaluation was rewritten by our Program Director. Use of the new evaluations began in July 2018.

CONCLUSION

We have seen a modest improvement in the percentage of evaluations completed (43% of all evaluations in December 2019 compared to 36% in September 2018). More importantly, the quality of feedback and relationship to the competency goals has improved significantly which has led to improved processes with our clinical competency committee. The Clinical Competency Committee has noted that the written comments provided by the evaluators has improved providing them better insight into the actual performance of our fellows. We anticipate ongoing improvements in the completion rate of evaluations throughout the academic year and will query fellows and members of the faculty for ongoing improvements for the coming year.

FIGURE 1. A3 Scientific Method Problem Solving Tool Worksheet

Outstanding Educator Award

APCCMPD members work diligently to foster excellence in education through the training and mentoring of the next generation of educators in pulmonary, critical care, and/or pulmonary/critical care medicine. The annual **Outstanding Educator Award** recognizes clinicians who are exemplary clinician-educators. The recipient is chosen by his/her peers for demonstrating excellence in the development of future physicians by making significant, innovative, and/or cumulatively outstanding contributions to education in pulmonary and/or critical care medicine.

Congratulations to the 2020 awardee:

Mark R. Tonelli, MD
Professor
University of Washington

Mark R. Tonelli, MD completed his fellowship training at the University of Washington and never left. Going on to direct the UW fellowship for nearly 20 years, he has overseen the training of more than 100 PCCM fellows and fostered an integrated critical care training mission that includes anesthesiology critical care and internal medicine critical care-only fellows. His scholarly pursuits lie within the philosophy of medicine, particularly medical epistemology and case-based clinical reasoning.

Mid-Career Educator Award

The **Mid-Career Educator Award** honors mid-career individuals who are actively engaged in enhancing the practice and profession of pulmonary, critical care, and/or pulmonary/critical care medicine through education. The medical educator selected for this award is actively making significant and innovative contributions to education in pulmonary and/or critical care medicine.

The APCCMPD honors the contributions of all 2020 nominees:

Michael T. McCurdy, MD
Clinical Associate Professor
University of Maryland

Congratulations to the 2020 awardee:

Darlene R. Nelson, MD
Assistant Professor of Medicine
Mayo Clinic College of Medicine and Science

Darlene R. Nelson, MD is an assistant professor of medicine at Mayo Clinic and the program director of the pulmonary and critical care medicine, pulmonary disease and critical care medicine fellowship programs at the Mayo Clinic in Rochester Minnesota. She is a committed clinical educator and has been the course director for the pulmonary block at the Mayo Clinic Alix School of Medicine for the last five years, as well as the course director for the Annual Midwest Introductory Bronchoscopy and Pleural Procedures Course held each year in Rochester. She is board certified in interventional pulmonary and her educational interests include procedural education and assessments.

Emerging Educator Award

The **Emerging Educator Award** honors one up-and-coming clinician-educator. The recipient is selected for his/her work in delivering and promoting medical education in pulmonary, critical care, and/or pulmonary/critical care medicine through various means at the local and regional levels.

The APCCMPD honors the contributions of all 2020 nominees:

Stacey Kassutto, MD
Assistant Professor of Clinical Medicine
University of Pennsylvania

Edward F. Kilb, III, MD
Assistant Professor
Medical University of South Carolina

Brooks T. Kuhn, MD
Assistant Professor of Clinical Medicine
UC Davis Medical Center

Morgan I. Soffler, MD
Instructor in Medicine
Beth Israel Deaconess Medical Center

James M. Walter, MD
Assistant Professor
Northwestern University Feinberg
School of Medicine

Congratulations to the 2020 awardee:

Lekshmi Santhosh, MD, MAEd
Assistant Professor of Pulmonary/Critical Care Medicine and Hospital Medicine
University of California, San Francisco

Lekshmi Santhosh, MD, MAEd went to college at Yale University, majoring in psychology/behavioral neuroscience, and then attended Harvard Medical School. She completed her internship, residency, chief residency, and Pulmonary/Critical Care fellowship at the University of California-San Francisco, where she now is an Assistant Professor of Clinical Medicine jointly appointed in the Division of Pulmonary/Critical Care Medicine and Hospital Medicine. Dr. Santhosh serves as the Associate Program Director for the Pulmonary and Critical Care Medicine Fellowship. She recently obtained her Master's in Health Professions Education from UC-Berkeley to obtain more expertise in qualitative research. She is heavily involved in education at the medical school, resident, fellow, and faculty level as well as with the education of interprofessional team members. Her primary interests in medical educational research are related to ICU transitions of care, women in leadership development, clinical reasoning, and subspecialty education career choice, and she has authored several publications about these topics. In addition to her local medical education scholarship and leadership, she is very active within the American Thoracic Society Section on Medical Education as well as the California Thoracic Society.

APCCMPD Scholarship in Medical Education Research Award

The **APCCMPD Scholarship in Medical Education Research Award** is a monetary grant awarded to fellows-in-training, junior faculty within 5-years of program completion, associate program directors, and/or program directors, to fund research projects that further the field of pulmonary and critical care graduate medical education research.

The APCCMPD honors the contributions of all 2020 nominees:

Sahar Ahmad, MD
Stony Brook University Hospital
Blended Learning: A Novel Paradigm for Ultrasound Education in Pulmonary and Critical Care Medicine Fellowship

Kathryn Melamed, MD
University of California, Los Angeles
A Prospective Trial of an In-House Overnight Fellow Rotation: Impact on Perceptions of Patient Safety, Trainee Well-being, and Education

Rebecca Sternschein, MD
Brigham and Women's Hospital
Tools for Teachers: Developing an Educational Toolkit for Clinical Teachers of Pulmonary and Critical Care Medicine Fellows

Congratulations to the 2020 awardee:

Camille R. Petri, MD
Beth Israel Deaconess Medical Center
Understanding the Educational Roles of Interprofessional Providers in the ICU

Camille R. Petri, MD is a Clinical and Research Fellow in Pulmonary and Critical Care Medicine at the Massachusetts General Hospital and Beth Israel Deaconess Medical Center. Her primary research interest is in enhancing teamwork and collaboration in the intensive care unit. This year, her research investigates the impact that multidisciplinary team members have on trainee education in the intensive care unit. Other educational interests include procedural teaching, simulation and bedside echocardiography. She is also a member of the Clinician Educator Track for Fellows at BIDMC, and a representative on the Fellows' Workgroup of the Association of Pulmonary and Critical Care Program Directors.