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The **Darlene Buczak Abstract Award for Educational Excellence** recognizes Pulmonary and Critical Care Medicine training Program Directors, Associate Program Directors, faculty, and fellows-in-training for their outstanding contributions and commitment to medical education and training. The recipient is selected for success in applying an innovative educational method in his/her training program.

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Sean J. Callahan, M.D.
 University of Virginia

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 Johns Hopkins University School of Medicine

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 Mount Sinai St. Luke's-West Hospitals

Joshua R. Smith, M.D.
 University of Wisconsin School of Medicine and Public Health

2018 AWARDEE

An Innovative Evidence-Based, Fellow-Driven Bundle to Improve Professional Satisfaction and Wellness

Presenter/Author: **Sean J. Callahan, M.D.**
 University of Virginia

Authors: **Cheryl Etelvari, B.A.**
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INTRODUCTION

Rates of burnout and professional dissatisfaction are high amongst physicians, affecting more than 1 in 3, with critical care physicians approaching 50%. Research indicates professional dissatisfaction and burnout negatively affect both patient care and physician personal wellness on a number of fronts, including mental health. Reasons for physician displeasure are numerous and diverse, with unique underlying causes. Based on concerning indicators of physician well-being, our program sought to implement data-proven strategies specific to our fellowship to improve the trainee experience, as described by the ACGME Common Program Requirements focus on well-being.

ABSTRACT PRESENTATION

Methods: We analyzed the yearly anonymous ACGME Fellow Survey results and identified areas for improvement in the domains of Duty Hours, Educational Content, Resources, and Patient Safety. Within each of these domains we identified specific opportunities for quality improvement. Using A3 methodology, we then developed an ideal state and an action plan for interventions. The fellowship program developed interventions through a PubMed query for evidence-based interventions to improve burnout and professional satisfaction, and modified interventions specifically to fit the fellowship program. In the absence of an evidence-based strategy, we implemented interventions developed by the fellows based on the target state defined in the A3. This resulted in a bundle of interventions over the subsequent six months (Figure 1). To assess the efficacy of our multi-faceted intervention, fellows completed a 15-question Likert scale survey pre- and post- (3 months) bundle implementation, with plans to repeat the survey at 6 and 12 months. Fellows also completed Epworth Sleepiness Scales (ESS) pre- and post-implementation of the bundle. The chi-square test was used to analyze categorical data for all questions.

Results: All fellows completed both assessments. An improvement was observed in 13 of the 15 domains queried between pre- and post-implementation surveys, which included improvements in all domains measuring quality of life and sleep. Despite the small dataset (n=9), several domains demonstrated statistically significant improvement, including 1) satisfaction with weekend schedules (p=0.004), 2) increased ability to do non-clinical activities, such as research (p=0.004), and 3) overall quality of life (p=0.018) (Figure 2a). We also observed a statistically significant improvement in abnormal ESS scores (p=0.018), with a reduction in the mean ESS from 12 to 7 (Figure 2b).

DISCUSSION

Implementation of an innovative wellness bundle directed to improve fellow well-being was successful in improving trainee-perceived quality of life, sleep, and time afforded to do projects which complement patient care. These interventions were primarily designed by, or in conjunction with, the primary stakeholders. When applicable, we utilized proven problem-solving approaches such as lean methodology to implement changes. Consistent with the physician burnout literature, we found organizational interventions (such as work reduction and increasing employee influence) to be markedly effective.

CONCLUSION

The innovative wellness bundle implemented by our trainees has portability in the sense that other training programs can identify their areas of improvement and use similar engagement strategies and data monitoring to enact change and measure the response.

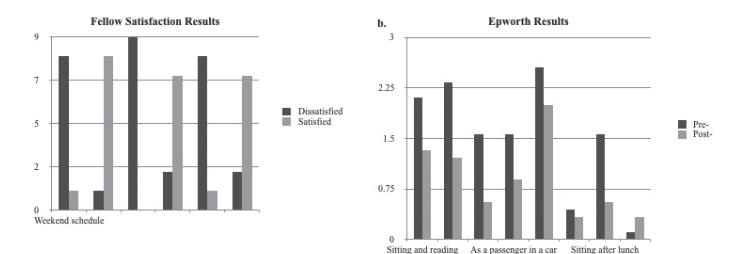
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TABLE 1. ACGME Areas for Focusing on Trainee Well-Being

ACGME Well-Being Focus	UVA Fellowship Correlate	Implementation
Enhancement of what it means to be a physician	Lack of curriculum-specific procedural time or teaching Excessive phone-time spent admitting patients to the MICU	Procedures rotation assigned to 1 st year fellows and as an elective thereafter* Joint fellow/resident paging system, equating to less time spent triaging and affording more medicine resident autonomy*
Attention to scheduling and work intensity	Fellows obtain scope and assemble and disassemble each bronchoscopy cart Duty hour concerns while in the MICU	Shared RT fellow system, resulting in minimal fellow processing of bronchoscopes* Call system re-structure, resulting in nearly 100% duty hour compliance*
Evaluating workplace safety	Perceived lack of influence in the improvement of patient care	Institution of monthly MICU Quality Improvement conferences, led by fellows, at which interventions are designed
Policies/programs that encourage trainee well-being; attention to trainee burnout and depression	High levels of trainee burnout and dissatisfaction Lack of curriculum detailing post-fellowship opportunities and finances	Monthly wellness seminars for the pain/CC division, inviting outside faculty and experts in the area of wellness Monthly lectures focused on career development topics, including contract negotiations, interviewing skills, and manuscript-writing tips

FIGURE 1. Pre- and Post-Bundle Results



A Comprehensive Curriculum in Personal Finance for Fellows

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INTRODUCTION

Fellows bear substantial financial stress. They carry an average of nearly \$200,000 of medical school debt, face impending career decisions with large financial implications, and are often starting families or purchasing their first home. However, they typically receive little instruction in personal finance through their residency or fellowship training programs, and what they receive is often delivered by financial planners who are marketing services or products. This can delay or impair important financial decisions, with long-term harm.

ABSTRACT PRESENTATION

Methods: To meet this need, we collaborated with a faculty member in our business school with expertise in personal finance education (YDB). Over four weeks, he delivered an 8-hour, in-person interactive course for fellows in PCCM, that had previously been piloted with another training program and revised with participant and the co-authors' input. To share the cost of the course, which was paid by the participating programs, Cardiovascular Disease and Infectious Disease fellows were also invited. The curriculum topics are shown in Table 1. As a needs assessment, fellows who expressed interest in attending were asked to provide their demographics, household income, assets and debt. Following the course, attendees completed course evaluations and a survey asking what financial decisions they had made based upon it.

Results: The course was offered to 58 fellows in the three fellowships. Twenty-five expressed an intent to attend the course. Eighteen of those completed the pre-course survey. Two-thirds were female and two-thirds married, with a mean age of 32.7 years. All married fellows had working spouses. Eight respondents had 1-3 children. All but one owned or leased a car and half owned a home. Household debt ranged from \$40,000 to >\$200,000. Twelve fellows completed the post-course survey after attending an average of 70% of the sessions. All respondents strongly agreed or agreed that they learned from the course, that the material should be taught in GME programs, and that they would recommend the course to others. Eleven of the 12 respondents reported making a total of 21 concrete financial decisions as a result of the course, related to retirement planning and investment, insurance coverage, employment contracts and debt management.

DISCUSSION

Previous studies, although few, have found that medical residents have high debt/income ratios, minuscule retirement savings, and lack household budgets (1-2). However, financial literacy training during residency or fellowship is scant (3). When provided, it is often by advisors with products or services to sell, which may bias their presentations. Our curriculum was unique in its depth and its leadership by a business school faculty member without potential biases or conflicts of interest. Despite busy schedules, more than a third of the invited fellows attended this eight-hour class. They perceived it as valuable, and it prompted tangible financial decisions. This model may be generalizable among programs at institutions with business schools or other local, unbiased experts. We believe that greater attention to fellows' financial literacy will contribute to a heightened sense of control over their future and greater short- and long-term well-being. As these learning needs are shared by all trainees, we are currently exploring expanding this course to all GME trainees at our institution.

CONCLUSION

Fellows value and utilize instruction in personal finance. This training, by an unbiased and therefore trustworthy instructor, may enhance long-term financial security and well-being.

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TABLE 1. Financial literacy course topics; approximately 1 hour each

1. Understanding the Time Value of Money; Interpreting Balance Sheets
2. Basics of Investing, Risk, and Return
3. Budgeting Strategies at Different Stages of Professional Development
4. Managing Debt
5. Understanding Psychological Barriers to Decision Making
6. Negotiating Employment Contracts
7. Evaluating Needs and Selecting Insurance
8. Selecting and Dealing with Financial Advisors

A Do-It-Yourself Ultrasound Simulation Model for Vascular Access

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INTRODUCTION

Beside ultrasound has become an integral part of the evaluation and treatment of hospitalized patients. It is routinely used to assist the clinician with bedside procedures and as an important diagnostic tool. Among other benefits, ultrasound guidance for vascular access and various other bedside procedures has improved the safety of these procedures, especially for young physicians in training (1, 2). Ultrasound simulation training is essential and is offered at a variety of residency and fellowship programs in the United States. Simulation equipment in addition to ultrasound machines is a large expense, often seen by institutions as a barrier to ultrasound-simulation training (3, 4). We report the successful application of a reusable and inexpensive do-it-yourself (DIY) vascular ultrasound model in the internal medicine and critical care ultrasound-simulation curriculum.

ABSTRACT PRESENTATION

We sought to minimize cost by substituting expensive vascular access ultrasound simulation models costing > \$400 with a more affordable DIY model for under \$10 using household products shown in figure 1a. This ultrasound simulation model was made using unflavored gelatin, Psyllium husk, Penrose drains and food color. Psyllium husk was added to the gelatin to mimic the speckled appearance of soft tissues under ultrasound. Different sizes of Penrose drains were placed within the model to simulate blood vessels as shown in figure 1b and 2. Filling the same length of Penrose drains with varying volumes of colored water simulated veins and arteries on compression with ultrasound. Filling a Penrose drain with Psyllium soaked in water simulated a thrombus on ultrasound. This was successfully used to teach internal medicine residents and pulmonary/critical care fellows in ultrasound guided needle control and was received as a high fidelity simulation model.

DISCUSSION

Needle control under ultrasound is a skill that follows a steep learning curve. This model, like other commercially available ultrasound models, helps trainees learn and perfect needle control skills. Commercially available models are not always affordable for training institutions, particularly those in resource-limited developing countries. The use of chicken meat and tofu has been used in the past for ultrasound simulation, but invokes a recurring cost (5, 6). This DIY model provides an opportunity to learn optimal needle control, decrease procedure time and improve the safety of procedures at a minor expense.

CONCLUSION

Residents and fellows can be trained on a DIY vascular access ultrasound model at a significantly lower cost compared to commercially available models.

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FIGURE 1A. The DIY ultrasound simulation model
FIGURE 1B. Ultrasound transverse view of a simulated blood vessel

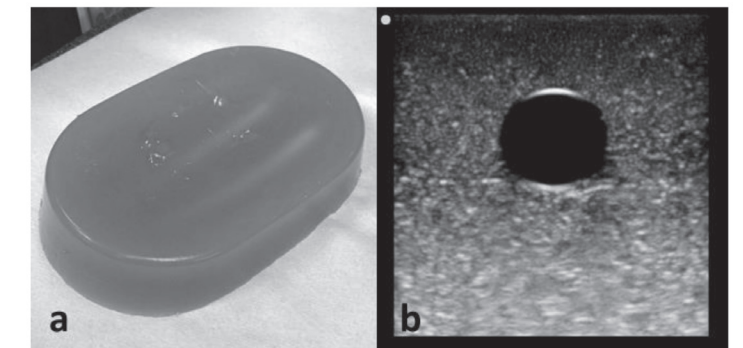
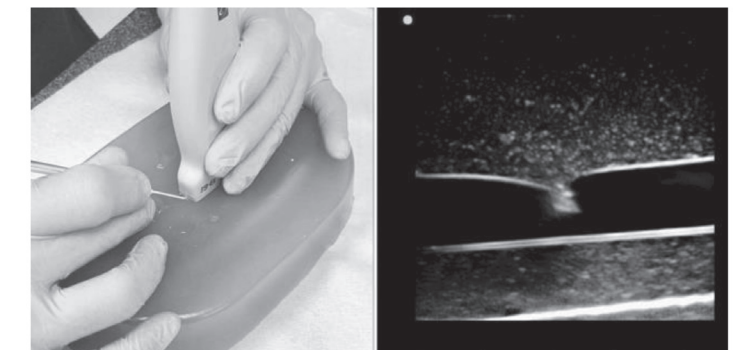


FIGURE 2. Synchronized images showing the simulated placement of an ultrasound-guided arterial line



Physician Wellness in a Pulmonary and Critical Care Medicine Fellowship Program

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INTRODUCTION

Fifty percent of US physicians experience significant burnout. Features of burnout include depersonalization, emotional fatigue and a sense of low personal accomplishment. Prevention is imperative to prevent the extreme effects which are medical errors and physician suicide. Residents and fellows, when compared to the general population, have exhibited increased odds of burnout. Because of the significant effects of burnout, the ACGME is requiring an increased focus on physician well-being in training programs.

ABSTRACT PRESENTATION

The Fellowship Wellness Curriculum at NYU consisted of social activities (bowling nights, class dinners), career planning sessions, education on sleep deprivation and fatigue, and panel discussions on difficult issues, such as work life balance. We also have monthly fellowship meetings to allow the fellows to address any issues pertaining to their training. In order to assess the state of wellness in our program and areas for improvement, we administered the Modified Maslach Burnout Questionnaire. The questionnaire utilizes a likert scale, and has four different groups of questions designed to assess emotional exhaustion, depersonalization, professional satisfaction, and personal accomplishment. The test was distributed to all of the twenty-three fellows in our program through an anonymous online survey. Twenty-two of our twenty-three fellows completed the survey. Questions that assess for emotional exhaustion revealed that at least 50% of our fellows had negative responses which place them at high risk for burnout. This number decreases to approximately 13% for other question domains. Although responses for professional satisfaction were positive overall, more than 50% of our fellows think about giving up medicine for another career.

DISCUSSION

Being able to develop compassion satisfaction and connect with one's patients has been shown to help combat burnout. The literature shows that a combination of personal and group targeted approaches have been helpful with a focus on stress reduction, mindfulness and small group discussion. Based on the survey results, we formed a Wellness Task force comprised of two fellows from each class led by an Assistant Program Director. We expanded our curriculum to include professional development workshops covering both career development during fellowship, as well as, the job search. Additionally, we improved personal wellness by increasing the focus on healthy lunches during noon conference. Other facets of our program include an annual charity drive, movie nights with films portraying aspects of physician life, and work life balance panel discussions for the fellows. Lastly, there has been an increased focus on stress reduction and resiliency through financial planning talks. Also, we will pilot small group discussions facilitated by our hospital psychiatrist to help reduce emotional burnout. We will survey the fellows after the initial round to determine if this was felt to be beneficial. Given the challenging nature of our profession, it is possible that the high degree of emotional exhaustion in our fellowship is due to compassion fatigue, instead of burnout, or combination of the two. Compassion fatigue is defined as the "emotional, moral and physical distress, which occurs as a consequence of caring and bearing witness to the suffering of others." This entity has been studied in Emergency Medicine Programs but has not been evaluated in the critical care setting. The ProQOL questionnaire has been utilized to assess for this entity.

CONCLUSION

Our fellows experience a significant degree of emotional exhaustion despite many tools already in place to promote wellness. We plan to administer the ProQOL Questionnaire to assess whether this burnout is instead compassion fatigue, as well as whether the degree of burnout is more prevalent in one of the fellowship classes. The Modified Maslach will also be re-administered in the Spring after fully implementing our new curriculum.

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FIGURE 1.

Q3 - I feel emotionally drained from my work

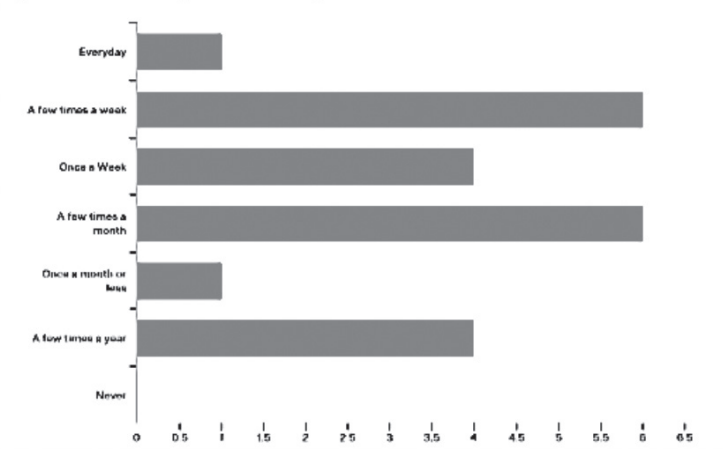
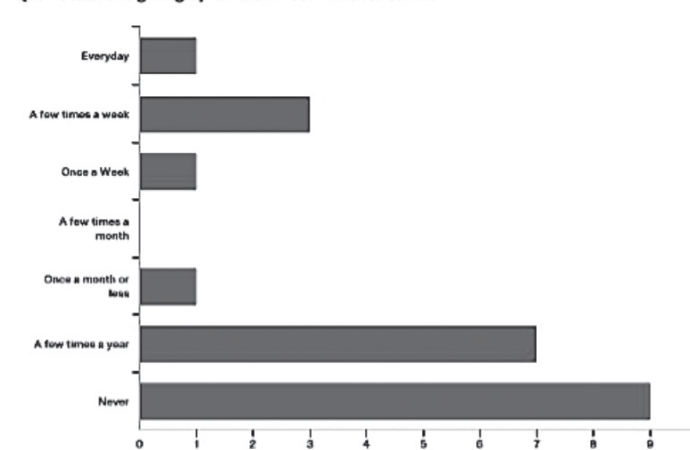


FIGURE 2.

Q10 - I think of giving up medicine for another career



A Longitudinal Curriculum for Training Critical Care Fellows in Bedside Ultrasonography

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INTRODUCTION

Critical care ultrasound (CCUS) is a noninvasive tool used for diagnostic evaluation and procedural guidance in critically ill patients. CCUS aids the clinician in the assessment of unspecified shock states, acute respiratory failure, hemodynamics, and source identification in septic shock in intensive care unit (ICU) patients. Specific curricula have been reported across multiple specialties. Current ACGME guidelines recommend the use of ultrasound to improve safety and success of many procedures done in the ICU. No official statement has been published regarding formal CCUS training during critical care medicine (CCM) fellowship by the ACGME. We describe a longitudinal CCUS curriculum used to teach thoracic, abdominal, and vascular ultrasound, along with basic echocardiography.

ABSTRACT PRESENTATION

The CCUS curriculum consisted of two distinct educational domains. The first was a cognitive domain which included ultrasound principles and physics, knobology, and image interpretation skills. The second was the image acquisition domain. All content was based on learning objectives as recommended by the 2009 ACCP/SRLF consensus statement on CCUS training. (1) The curriculum was delivered to the learners in 3 phases. The first of which was distance learning online modules covering basic ultrasound principles and physics, knobology, and image interpretation skills. This was followed by a 1-day boot camp with traditional didactic teaching with problem based learning sessions that emphasized clinical application of CCUS findings and hands-on preceptor led training with live models. Lastly was a longitudinal review over a 6 month period emphasizing image portfolio development with periodic mentor review and built in educational time for multidisciplinary CCUS conferences. The pre-specified goal was to obtain 10 basic echocardiograms, 5 lung/pleural, 5 abdominal, and 5 diagnostic vascular ultrasounds, interpret these exams, and discuss findings with the ultrasound mentor. A total of 30 Critical Care fellows from 4 academic centers in the southeastern U.S. undertook the CCUS curriculum. Fellows were evaluated prior to the onboarding learning modules with a pre-test evaluating the cognitive domain. Timing of evaluations is outlined in Figure 1. Cumulative score on this pretest was 55.6%. The cognitive domain was then post-tested after the onboarding and boot camp phases had been completed and the cumulative score was 57.9% (p=NS). The image acquisition domain was pre-tested using a standardized checklist on a simulated patient prior to the boot camp phase with a mean score of 51.5%. After 6 months of longitudinal learning, fellows were post-tested in image acquisition with a mean score of 87.5% (p = 0.012). (Table 1)

DISCUSSION

We found that despite comprehensive onboarding didactics and an intensive 1 day boot camp style course, fellows did not achieve an improved performance upon evaluation of basic ultrasound physics and principles, knobology, and image interpretation. These results contradict our own pilot data (n=5) and other centers experience with a boot camp style educational intervention which have shown competence in the cognitive domain without a longitudinal experience. (2,3) Data collection is ongoing to test proficiency in the cognitive domain at 6 months into the longitudinal phase of the curriculum. Competency in the performance of image acquisition was achieved after 6 months of longitudinal learning.

CONCLUSION

These data suggest that using onboarding didactic distance learning techniques coupled with a boot camp style intensive experience does not lead to immediate competence in the cognitive and image interpretation domain of CCUS. Data collection is ongoing regarding competence in the cognitive domain after 6 months of the longitudinal curriculum. With the addition of a longitudinal experience based on image portfolio development, dedicated CCUS learning integrated into fellowship training, and strong mentoring, proficiency in image acquisition skills can be achieved.

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FIGURE 1. Graphic Representation of CCUS Curriculum

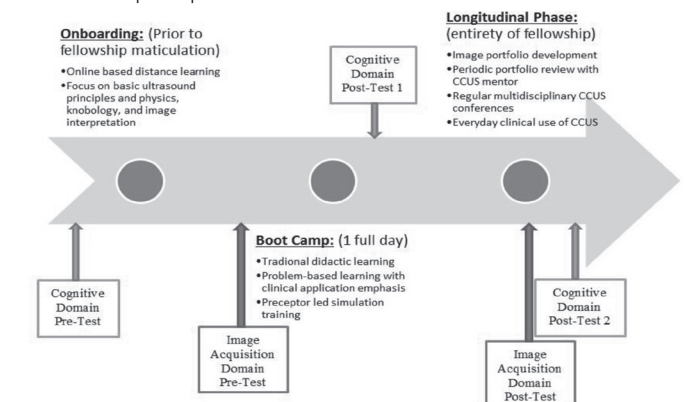
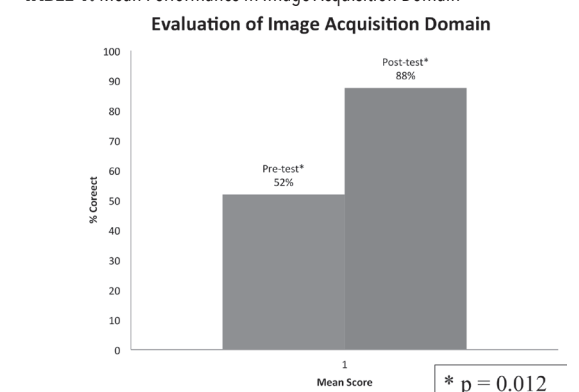


TABLE 1. Mean Performance in Image Acquisition Domain



Promoting Humanism in Pulmonary & Critical Care Medicine: For Fellows, By Fellows

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INTRODUCTION

Humanism in healthcare is characterized by a compassionate relationship between physician and patient. It reflects attitudes and behaviors that are sensitive to the values and background of others. Trainee burnout, poor cross-cultural interactions and limited understanding of how patients experience illness are a few factors that impair trainees' provision of humanistic care. Inattention to well-being may lead to job dissatisfaction, emotional exhaustion and psychological impairment. We developed a fellow-devised and fellow-directed curriculum to strengthen practice of patient-centered care and to promote physician well-being.

ABSTRACT PRESENTATION

A needs assessment was compiled from previously validated questionnaires on mindfulness, stress and burnout. Nine fellows completed the questionnaire. Each month, a fellow leader – under faculty supervision - becomes a 'mini-expert' in a curriculum topic by exploring relevant materials and creating an interactive discussion forum. Session topics range from moral distress to spirituality in medicine to resilience in training. Fellow participants are engaged via various techniques and resources including meditation, literature and narrative medicine. In addition, the program addresses several ACGME-mandated areas of focus: recognition of impairment in self and peers; fatigue mitigation; accountability to patients, society and the profession; sensitivity to a diverse patient population; leadership and communication.

DISCUSSION

Selected notable results from the needs assessment include: 78% felt emotionally drained after work; 33% stated they have difficulty respecting patient values in decision-making; 45% reported that they talked about work in a negative way; 22% reported they did their job mechanically; 56% felt that work demands interfered with relieving patient suffering; 33% felt they did not tolerate work pressure well. After five sessions, the baseline questionnaire was re-administered with marked improvements in several areas. Only 22% felt emotionally drained after work; zero fellows felt they had difficulty respecting patient values in decision-making, and 12 reported talking about work in a negative way. While the course is in its early stages, qualitative reviews indicate that learned strategies are immediately applicable to self-care and patient care. As supervisors and mentors to junior trainees, fellows model learned strategies in daily interactions. Faculty have been inspired to engage via literature review and faculty development sessions in topics of humanism and well-being.

CONCLUSION

Trainee-devised programs in humanism and well-being may be more impactful than those devised at the program- or system-level. This is a unique program where fellows are both leaders and participants. The curriculum can be easily adopted and adapted (with zero financial investment) for medical trainees at any level.

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Transitioning A Fellowship To The Digital Age: Daily Electronic Evaluations And Electronic Portfolios

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INTRODUCTION

The ACGME's Next Accreditation System requires training programs to document milestone performance at 6-month intervals during a trainee's education. Our program identified certain barriers that made the Clinical Competency Committee (CCC) meetings and milestone selection process difficult: rotational evaluations provided limited insight into a trainee's performance, mentors did not have access to trainees' data until immediately before the CCC meeting, and the trainees did not have a central repository of all their performance data. We aimed to redesign our evaluation system and create an electronic portfolio for our fellows that would be readily available and mobile friendly for use in a variety of settings.

ABSTRACT PRESENTATION

Our trainees rotate with numerous faculty members over the course of a month. Frequently, end of rotation feedback included comments like "good fellow" or "should read more." In order to elicit more specific, task-directed feedback, we developed an evaluation tool sent to faculty on a daily basis. Mobile digital evaluation forms have been shown to be effective in residency programs.^{1,2} We modified our previous monthly evaluations, mapped to ACGME milestones, and created a daily evaluation tool in Qualtrics. Faculty were sent a text message every day during the work week (Monday through Friday) as a reminder to complete the evaluation. We allowed our ICU faculty to choose one topic to evaluate each day (Image 1). Our goal was for faculty to complete at least two evaluations completed per week for each fellow in the ICU (8 per month) for a total of 16 evaluations per month (2 fellows rotating per month). We assessed the faculty performance of these evaluations from May 2016 through October 2017, with a goal of 248 total evaluations performed. We did not include fellows from other programs that rotate through our ICU in this analysis. During the study period, 173 evaluations were performed on 11 fellows, for a 69.8% completion of target number of evaluations. Fellows had a mean of 5.1 evaluations per month, and a range among fellows of 0 to 34 total evaluations completed. For fellows with low numbers of daily evaluations, we elicited additional feedback from faculty. Among the evaluations completed, we identified 109 comments with meaningful specific feedback directed at individual tasks (63.6% of evaluations). To combat the latter issues, our fellowship coordinator created individualized electronic portfolios in an intranet website called MyPort. MyPort is password protected to allow access to the mentor, trainee, and program directors. The portfolio is organized to provide an at-a-glance view of a trainee's competency throughout training. This is achieved by offering graphic representation for peer-peer comparison data including in-training exams, procedure log completion, and milestone placements (Image 2). The trainee is able to view their personal scores relative to the class average. Since MyPort is mobile friendly, it can be viewed on the go for instant review of valuable feedback. All daily evaluations are made available on MyPort at the completion of a rotation for fellows to view.

DISCUSSION

MyPort has allowed for more effective mentor-mentee relationships since both parties have access to up-to-date information and can formulate action plans in a partnership. We recognize we still have areas of improvement as we have not achieved our target goal of evaluations completed each month. We aim to use the data collected to provide further feedback to our faculty to improve evaluation completion with inclusion of meaningful feedback.

CONCLUSION

With these innovations, we believe we are transitioning our fellowship from the paper age to the digital age. In the process, we are providing our fellows with meaningful feedback and a user-friendly system to review their performance over time.

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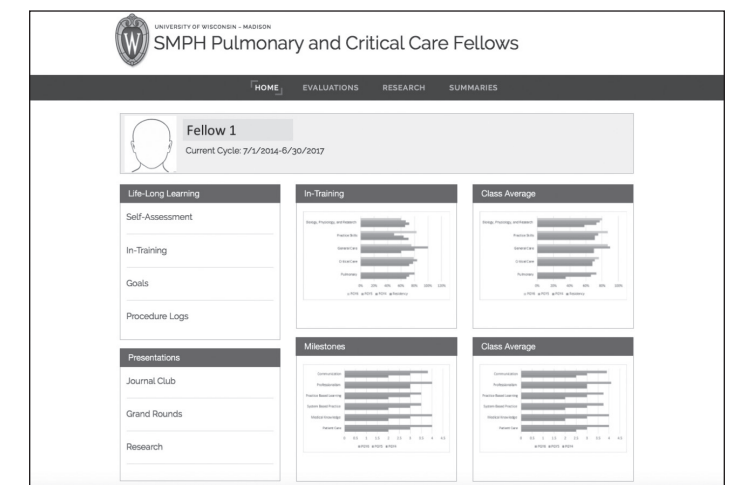
IMAGE 1.

WISCONSIN
UNIVERSITY OF WISCONSIN-MADISON

Please choose one topic

- Recognition of Systems Errors and Quality Improvement
- Communication with Families
- End of life circumstance
- Transitions of care
- Interactions within the Interprofessional Team
- Mechanical ventilator support

IMAGE 2.



APCCMPD Abstract Award for Medical Education Research

The **APCCMPD Abstract Award for Medical Education Research** recognizes Pulmonary and 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 and/or Critical Care.

Congratulations to the 2018 awardees:

FIRST PLACE:

Morgan I. Soffler, M.D.

Beth Israel Deaconess Medical Center

RUNNER-UP:

Abdulrazak Alchakaki, M.D.

Wayne State University/Detroit Medical Center

2018 FIRST PLACE AWARD

Putting the Pieces Together: A Novel Simulation Assessment Exercise for the Evaluation of Medical Student Competency

Morgan I. Soffler, M.D.

Anica Law, M.D.

Sara Boubherhan, M.D.

Daniel Ricotta, M.D.

Jakob I. McSparron, M.D.

Asha M. Anandaiah, M.D.

Amy Cohen, Ed.M.

Amy Sullivan, Ed.D.

Richard M. Schwartzstein, M.D.

Margaret M. Hayes, M.D.

Beth Israel Deaconess Medical Center



BACKGROUND

Evaluation of medical students during the clerkship years is challenging due to resource constraints and a lack of standardized assessment tools. Current methods have been shown to be too subjective (1) and lead to grade inflation (2). Assessment methods that are feasible, objective, standardized, and can identify variation in student performance would be a valuable addition to current practices. Despite widespread use of simulation-based medical education, there is a paucity of data on the use of simulation as an assessment tool. Simulated patients with acute illness provide a unique opportunity for learners to display many key competencies in short patient interactions. The goal of our study is to determine the efficacy of a summative simulation exercise, highlighting care of acutely ill patients, as a means of competency-based assessment of internal medicine clerkship students.

METHODS

Medical education and critical care experts iteratively created three simulation cases (1-hypertensive crisis, 2-sepsis, 3-acute renal failure) and checklists to assess key aspects of evaluation and management of patients with acute illness. Medical students near the end of their internal medicine clerkship at Beth Israel Deaconess Medical Center are eligible to participate. Students participate in three 15-minute simulation scenarios and complete post-session surveys focused on critical thinking and self-assessment, including a rating of certainty in diagnosis and management. A third party evaluator with expertise in medical student training compares and ranks students based on simulation performance checklist assessments and clerkship evaluations across key competency domains highlighted by the AAMC (3) – history taking, physical exam, clinical management, communication/professionalism, and critical thinking. We are obtaining qualitative data on students' attitudes about the use of simulation for assessment via focus groups.

RESULTS

Forty students are eligible during the August 2017-April 2018 enrollment period. Thus far, 20 students have participated in the study and 4 declined. Total summative scores (Figure 1-red) ranged from 37-71% with a lower quantile (25th percentile) of 48% and an upper quantile (75th percentile) of 58%. Students scored highest in communication (median 80%, range 40-100%), history taking (median 71%, range 54-88%), and clinical management (median 71%, range 43-86%). Students scored lowest in physical examination (median 56%, range 25-88%), critical thinking (median 46%, range 7-81%), and diagnostic investigation (median 44%, range 25-56%) (Figure 1). The critical thinking domain had the largest distribution of scores (lower quantile of 34%, upper quantile of 58%) (Figure 1). Ten students (50%) felt their performance during the simulation exercise reflected their overall clinical performance well, while four students (20%) felt their performance during the simulation exercise was not reflective. There was no correlation between student self-rated certainty in diagnosis and management or number of hypotheses (differential diagnoses) generated. Preliminary data show no significant correlation between student self-rated certainty and performance score (Spearman's correlation 0.4, $p=0.12$) (Figure 2).

CONCLUSIONS

Based on our preliminary results, a simulation assessment exercise evaluating medical student performance in the care of patients with critical illness shows a wide distribution of scores, particularly in the domains of critical thinking and physical examination. In our further analysis, we hope to compare this variability and student performance ranking with that of standard clerkship evaluations. We hypothesize that further data collection and analysis will support that simulation assessment scenarios and standardized assessment instruments can detect learner areas for improvement, beyond that of more standard clerkship evaluations, and therefore contribute to improved feedback and learning. The discordance between student certainty and total performance score may indicate a poor correlation between actual student performance and self-perception of performance, perhaps reflecting the less reliable nature of student evaluation in a classical clinical clerkship.

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2. Bowen RES, Grant WJ, Schenarts KD. The sum is greater than its parts: clinical evaluations and grade inflation in the surgery clerkship. *Am J Surg* 2015;209(4):760-764.
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FIGURE 1. Distribution of scores for each domain assessed for all three cases (grey) and for total score for all three cases (red). Medians are represented by vertical white lines with lower and upper quantiles to the left and right, respectively.

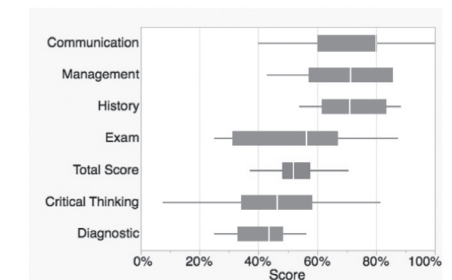
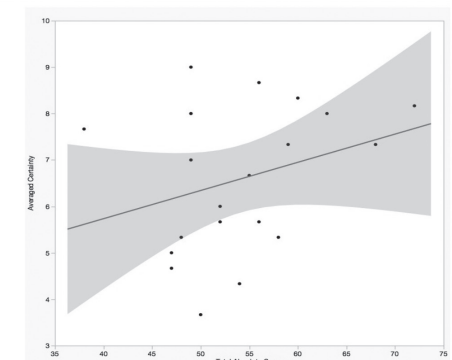


FIGURE 2. Student self-reported certainty is not correlated with observer-related total performance score.



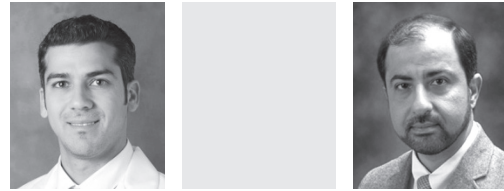
2018 RUNNER-UP AWARD

A Novel Simulation-Based Mastery Curriculum for Mechanical Ventilation (MV) in Pulmonary & Critical Care Training Programs

Presenter/Author: **Abdulrazak Alchakaki, M.D.**
Wayne State University/DMC

Authors: **Norman Theaker, Th.D., R.R.T.**
John Dingell VA hospital

Abdulghani Sankari, M.D., Ph.D.
Wayne State University/DMC



BACKGROUND

Competency in proficient and safe mechanical ventilation (MV) is very important in pulmonary and critical care medicine training. Most academic medical centers utilize a didactic based method for MV teaching[1, 2]. However, there is a clear gap in proficiency between MV didactics and applying the knowledge in real-life clinical applications with critically ill individuals with changing lung mechanics. This gap may affect clinical outcomes including mortality and morbidity. To improve MV education in our program, we created a mastery curriculum for learning MV that aims to improve knowledge and acquire essential competencies for safe and evidence-based clinical practice.

METHODS

This course curriculum blends didactics, high fidelity simulation (SimMan 3G) with bedside MV rounds to optimize MV competency and retention. The training team is comprised of the program director, medical education fellow, respiratory therapist (RT) and simulation coordinator. We used iron lung to simulate waveforms throughout different scenarios. Each trainee underwent the following chronological steps: 1) A baseline knowledge test. 2) A sixty-minute didactic lecture. 3) A baseline one-on-one session using a high fidelity simulation manikin and standardized clinical scenarios that test different MV competencies using a standardized checklist (Table 1) over a 40 minute period followed by structured debriefing for 10 minutes. 4) A follow-up session with RT to learn knobs, waves, and scalars over approximately 60 minutes. 5) Two sub-groups joined the education fellow and RT for bedside MV rounds in MICU for 60 minutes. 6) A second one-on-one simulation session with debriefing performed approximately 2 weeks later, and 7) completed a post-course knowledge test. Each trainee completed a post-course survey using Likert scale (1-5) to evaluate learners' satisfaction with different domains of the course. A total 34 item-checklist was used for the mastery simulation sessions in order to assess various MV competencies including indication for ventilation, initiation, troubleshooting, and liberation of MV

RESULTS

Seven PGY4 trainees have completed this course as part of the orientation boot camp. Each trainee spent less than 5 hours to complete all 7 steps. All of them demonstrated significant improvement in the knowledge test with mean score (53.3% and 79.0%, $p < 0.005$) at baseline and post-course tests, respectively (Figure 1). The average of completed MV competency items during simulation has improved from 15.4 /34 items (45.4%) at baseline to 24.9/34 (73.1%) on the second session ($p < 0.005$) (Figure 2). The course was highly rated by trainees with mean score (4.5 /5 on the Likert scale) and perceived as an effective interactive education for new MV learners

CONCLUSIONS

This novel simulation-based mastery curriculum was an effective method to teach new learners mastery of the basic competencies in MV. It supplements didactics with interactive hands-on MV sessions. In addition, it allows direct observation/assessment of trainees' in a controlled environment. We are planning a further follow-up to assess long-term retention and implementation of the curriculum to different levels of trainees. Improving MV training using simulation and structured mastery learning techniques may affect clinical outcomes, however, future studies are needed to assess its impact.

REFERENCES

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- Spadaro, S., et al., Simulation Training for Residents Focused on Mechanical Ventilation: A Randomized Trial Using Mannequin-Based Versus Computer-Based Simulation. *Simul Healthc*, 2017.

TABLE 1. Mechanical ventilation competency checklist

Initiating MV	A	B
1 Indications for Hypoxia, hypercapnia, AV protection / invasive vs. NIV		
2 Check code status (Discuss with patient or review chart)		
3 Tidal volume (P/W consideration)		
4 Checked vital signs after intubation		
5 Ordered CXR To assess the endotracheal tube position		
6 Ordered ABG (30 min after intubation)		
7 Assessed need for sedation & analgesia (R/S after intubation)		
8 Follow up on ABG		
9 Follow up on CXR		
10 Elevated HOB to at least 30°		
11 Chlorhexidine mouth wash		
12 VTE/CI prophylaxis		
1 days later		
13 Always pressure alarms recognition and requesting respiratory pause.		
14 Always pressure alarms intervention (For high PEEP: lung exam, CXR and reduce volume; PEEP may need to increase sedation. For high P. peak: lung exam, suction, bronchodilator, sedation)		
1 day later		
15 Dysynchrony recognition (Flow hunger, double triggering, missing triggering)		
16 Dysynchrony intervention (Increasing flow/ change mode, check pressure threshold)		
1 day later		
17 Unstable Auto PEEP recognition (Resulted from high volume and increased RR) and disconnecting the circuit.		
18 Initiating appropriate MV to prevent dynamic hyperinflation and auto PEEP (Low RR, low volume, bronchodilator, sedation)		
2 days later		
19 Lung protective ventilation in (ARDS) appropriate PEEP dosing, reduce Vt, RR (as per ARDSnet guidelines)		
Weaning MV		
20 Assessed readiness for weaning; Resolving indication for MV		
21 Stable vital signs		
22 Assessed P/O2 & PEEP requirement (CSP >50%, P/O2 >45)		
23 pH >7.3 (in high-risk patients)		
24 Assessed for secretions/ suctioning		
25 Assessed awakening trial (Sedation discontinued)		
26 Assessed neurological status (following commands and cough)		
27 Stopped tube feeding and gastric suctioning (if needed)		
28 Raised the head of the bed prior to extubation (>45 degree)		
29 Started SBT (Assessing VS, duration (at least 30 min trial))		
30 Interpreting RSB (cut off value of 10%)		
31 Assessment of cuff leak		
32 Correct cuff leak technique (inflating for air leak, recognizing air leak on MV)		
33 Considered Oxygen supplementation/NIV/ HFNC if needed post extubation		
34 Assessment of patient respiration post extubation for stridor and/or RR >30		

FIGURE 1. Average MV knowledge test score per trainee

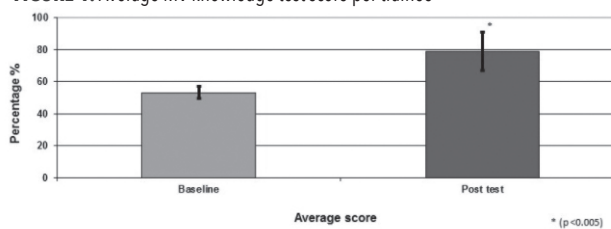
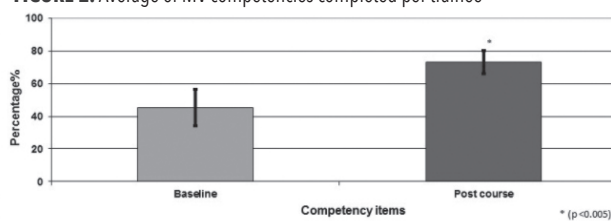


FIGURE 2. Average of MV competencies completed per trainee



APCCMPD 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 and/or Critical Care. 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.

Congratulations to the 2018 awardee:



Robert Kotloff, M.D.
Professor of Medicine
Cleveland Clinic

Dr. Kotloff is a graduate of Yale University School of Medicine and completed residency training at Temple University Hospital, and fellowship training at the Hospital of the University of Pennsylvania. He is currently Chairman of the Department of Pulmonary Medicine at the Cleveland Clinic. He is an active clinician who has worked in the field of advanced lung disease and lung transplantation for the past 27 years. In addition to his clinical activities, Dr. Kotloff has made medical education and scholarship a focus of his career. He has authored over 100 peer-reviewed articles, reviews, and book chapters and has edited or co-edited six books. He previously directed the Pulmonary and Critical Care Fellowship Training Program at the University of Pennsylvania for 24 years. He has served as Chair of the Pulmonary Disease Test Writing Committee of the American Board of Internal Medicine, Chair of the Transplant Network of the American College of Chest Physicians, and as President of the Association of Pulmonary and Critical Care Medicine Program Directors. Previous editorial board positions include Associate Editor of the *American Journal of Respiratory and Critical Care Medicine*, Section Editor for *CHEST*, and Associate Editor of the *Annals of the American Thoracic Society (AnnalsATS)*. He currently is the Senior Deputy Editor for *AnnalsATS*.

APCCMPD Emerging Educator Award

The **APCCMPD Emerging Educator Award** honors an up-and-coming clinician educator. The recipient is selected for his/her work in delivering and promoting medical education in Pulmonary and/or Critical Care Medicine through various means at the local and regional level.

The APCCMPD honors the contributions of all 2018 nominees:

Kathryn A. Hibbert, M.D.

Instructor of Medicine
Harvard Medical School
Boston, MA

Christina C. Kao, M.D., Ph.D.

Assistant Professor
Baylor College of Medicine
Houston, TX

Paru S. Patrawalla, M.D.

Assistant Professor of Medicine
Icahn School of Medicine at Mount Sinai
New York, NY

Jennifer L. Stahl, M.D.

Clinical Assistant Professor
East Carolina University
Greenville, NC

Amit Taneja, M.D.

Assistant Professor of Medicine
Medical College of Wisconsin
Milwaukee, WI

Congratulations to the 2018 awardee:



Margaret "Molly" Hayes, M.D.

Assistant Professor of Medicine
Harvard Medical School

Dr. Hayes is an Assistant Professor in Medicine at Harvard Medical School and a medical intensivist at Beth Israel Deaconess Medical Center. She obtained her medical degree from Tufts University School of Medicine and then completed Internal Medicine and Pulmonary and Critical Care training at Johns Hopkins University in Baltimore, MD. She also served as Assistant Chief of Service (Chief Resident) for one year at Johns Hopkins. During that year she realized her passion for medical education and since then has taught in numerous CME courses and is the co-director of two of Harvard's highest rated CME courses, Principles of Critical Care Medicine for the Non-Intensivist and Principles of Medical Education: Maximizing your Teaching Skills. She is also an active member of the American Thoracic Society's Education Committee, where she is a vice chair of the critical care core and chair of the educational consulting working group, as well as the Section on Medical Education.

Dr. Hayes is currently an Associate Program Director for the Internal Medicine Residency, the director of Medical Critical Care Education at BIDMC, the clerkship director for the Intensive Care Medicine Clerkship at BIDMC/HMS and an assistant MICU Director. She is an active member of the fellowship program evaluation committee and mentors education fellows through the division of PCCM and the Shapiro Institute for Education and Research. Her clinical time is spent in the medical intensive care unit and she has active roles on the Massive and Submassive Clot on Call Team (MASCOT) and ECMO team. Her educational and research interests are creating novel ways to educate trainees on critical care concepts, studying effective methods to teach communication in the ICU, evaluating critical thinking teaching and learning, and assessing the use of videotaping as an educational coaching tool for PCCM fellows.

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, for research projects that further adult pulmonary and critical care graduate medical education.

Congratulations to the 2018 awardee:



Paul Bergl, M.D.

The Medical College of Wisconsin

Fellows Leading Standardized Bedside ICU Rounds: A Clinical and Educational Intervention

The APCCMPD honors the contribution of all 2018 applicants:

Sahar Ahmad, M.D.

Stony Brook University Hospital

Efficacy of a Blended Learning Model for PCCM Fellowship Ultrasound Education

Margaret (Molly) Hayes, M.D.

Harvard Medical School/Beth Israel Deaconess Medical Center

Video Review of Teaching as a Means of Evaluation Assessment and Coaching (VTEACH): A Bundled Intervention to Improve PCCM Fellows' Small Group Teaching

Diana Kelm, M.D.

Mayo Clinic

Identifying Characteristics of Effective Teachers of Invasive Bedside Procedures: A Multi-Institutional Qualitative Study

Lekshmi Santhosh, M.D.

University of California San Francisco

IPASS-ICU: A Multi-Institutional Approach to Improving ICU-Wards Handoffs and ICU Education

Michelle Sharp, M.D.

Johns Hopkins University

Investigating Trainee Burnout and Wellness programs in Pulmonary and Critical Care Medicine

Joshua Sill, M.D.

Eastern Virginia Medical School

Academic Pulmonary and Critical Care Medicine: A Specialized Training Curriculum

Honoring Excellence in Pulmonary and/or Critical Care Medicine Education



Association
of Pulmonary and
Critical Care Medicine
Program Directors