

Honoring Excellence in Pulmonary and/or
Critical Care Medicine Education

2016 Awards Program



Sunday, March 6, 2016
The Westin Riverwalk
San Antonio, Texas



Association
of Pulmonary and
Critical Care Medicine
Program Directors

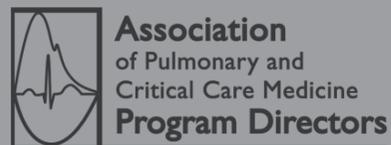
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ABOUT APCCMPD

The Association of Pulmonary and Critical Care Medicine Program Directors (APCCMPD) inspires, develops, and supports teaching excellence in pulmonary and/or critical care medicine fellowship programs.

The APCCMPD recognizes and invests in educators to share transformative teaching practices and to support the development of novel teaching formats that advance the profession.



ORIGINS

In 1984, the APCCMPD was organized with the basic mission of improving communications amongst program directors, providing a mechanism of communication among stakeholder organizations relative to matters involving training, the quality of training, the possibility of accreditation and the funding of individuals seeking training in pulmonary medicine.

The American College of Chest Physicians generously provided administrative support. In 2009, the APCCMPD incorporated to form a 501(c)(6) not-for-profit organization.

TODAY

In 2014, the APCCMPD became an independently operated 501(c)(6).

APCCMPD's leadership and support of Pulmonary and Critical Care Medicine Training Programs and faculty is widely recognized. The APCCMPD aspires to foster excellence in training and mentoring of the next generation of educators in pulmonary and critical care medicine. We value Education as a Profession, Responsiveness, Supportiveness, Inclusiveness, and Advocacy.

Building on that foundation, APCCMPD offers a broad array of services and resources to help training programs provide high-quality training and education.

BOARD OF DIRECTORS



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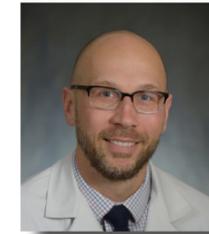
JOYCE REITZNER, MBA, MIPH
Executive Director

The Darlene Buczak Award for Educational Excellence

The Darlene Buczak Award for Educational Excellence recognizes pulmonary and critical care medicine training program directors for their outstanding contributions and commitment to medical education and training.

This award is bestowed to one APCCMPD member each year. Applicants must submit an abstract describing a successful innovative educational method they have applied in their training programs. The selected awardee receives a \$500 award and travel to the annual conference.

CONGRATULATIONS 2016



JASON WAGNER, M.D.
University of Pennsylvania

*A Longitudinal Curriculum for Training Pulmonary and
Critical Care Medicine Fellows in the Principles of
Quality, Safety, and Value*

RUNNER-UP Kannan Ramar, M.D., M.B.B.S. | Mayo Clinic

APCCMPD Honors
the Contributions All
Applicants Are Making
to Advance the Next
Generation of Educators

Jan Kasal, M.D. | Mercy Hospital Saint Louis
Michael McCurdy, M.D. | University of Maryland

The APCCMPD Research in Medical Education Award

The APCCMPD Research in Medical Education Award recognizes pulmonary and critical care medicine training program directors, associate program directors, key clinical faculty or fellows-in-training for their outstanding contributions and commitment to medical education research.

CONGRATULATIONS 2016



BISHOY ZAKHARY, M.D.

New York University School of Medicine

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

1ST RUNNER-UP Kannan Ramar, M.D., M.B.B.S. | Mayo Clinic
2ND RUNNER-UP Radhika Shah, M.D. | University of Maryland

APCCMPD Honors
the Contributions All
Applicants Are Making
to Advance the Next
Generation of Educators

Rosemary Adamson, M.D. | University of Washington
Jan Kasal, M.D. | Mercy Hospital Saint Louis
Andrey Pavlov, M.D. | Stony Brook University
Abdulghani Sankari, M.D., Ph.D. | Wayne State University
Andrew Schiff, M.D. | Rutgers Robert Wood Johnson Medical School
Joshua Smith, M.D. | University of Wisconsin School of Medicine

The Inaugural Outstanding Educator Award

Members of the Association of Pulmonary and Critical Care Medicine Program Directors (APCCMPD) work diligently foster excellence through training and mentoring of the next generation of pulmonary and critical care physicians. One way they honor their peers who demonstrate excellence in the development of future physicians is through the annual Outstanding Educator Award (OEA). The OEA recognizes clinicians who are exemplary clinician educators.

CONGRATULATIONS 2016



HENRY FESSLER, M.D.

Professor of Medicine and Public Health
Assistant Dean for Undergraduate Medical Education
Director, Fellowship Training Program in Pulmonary and
Critical Care Medicine
Johns Hopkins University School of Medicine and
The Bloomberg School of Public Health

Henry E. Fessler, MD is Professor of Medicine and Public Health at Johns Hopkins University School of Medicine and the Bloomberg School of Public Health. After graduating from Cornell University and Rutgers – Robert Wood Johnson School of Medicine, he completed residency training at Hartford Hospital. Dr. Fessler came to Johns Hopkins for fellowships in the Division of Pulmonary and Critical Care at the School of Medicine and the Department of Environmental Physiology at the School of Public Health. He trained under the mentorship of Solbert Permutt, Roy Brower, and Robert Wise. This experience formed the foundation of a fruitful collaboration that has resulted in over 100 papers, editorials, chapters, and books.

For the entirety of his nearly three decades on the faculty at Johns Hopkins, Dr. Fessler has been an educator. In the school of Medicine, he led the pulmonary section of the pathophysiology course in the prior curriculum, and directs the integrated Genes-to-Society course in the new curriculum, comprising over 1000 classroom hours taught by 350 faculty. He created and led a new, required clerkship in critical care medicine for senior students. In 2014, he was appointed Assistant Dean for Undergraduate Medical Education.

Dr. Fessler has been program director for the Pulmonary and Critical Care Medicine Fellowship since 2005. As PD, he has mentored more than 100 fellows while increasing the percentage of female PCCM fellows from 25 to 65%. Ninety-five percent of his graduates over the past 10 years have taken jobs in academic medicine. A past-president of the APCCMPD, he credits the Association for the opportunities it provided him to impact fellowship training nationally, including helping to write the ACGME milestones for Internal Medicine subspecialties and the curricular milestones and entrustable professional activities for Pulmonary and Critical Care Medicine fellows. He is an Associate Editor of the Annals of the American Thoracic Society and the Guest Editor of the 2016 medical education theme issue.

More than any personal accomplishments, Dr. Fessler most values the friendships he has made, and the successes of the students, fellows, and colleagues he has advised. His career achievements were abetted by his wife Joan, a preschool teacher, who provided guidance on behavior modification of fellows using reward charts and time-out chairs. Joining the family business, his nephew is a Pulmonary and Critical Care physician-scientist at the NIEHS and his daughters are both medical students.

2016 Outstanding Educator Award Nominees



HENRY FESSLER, M.D.

*Professor of Medicine & Public Health, Division of Pulmonary & Critical Care
Assistant Dean for Undergraduate Medical Education
Director, Fellowship Training Program in Pulmonary & Critical Care Medicine
Johns Hopkins University School of Medicine*

B.A., Cornell University College of Arts and Sciences
M.D., Rutgers Medical School
Internship & Residency, Hartford Hospital, Connecticut
Fellowship (Clinical), Pulmonary & Critical Care Medicine, Johns Hopkins School of Medicine
Fellowship (Research), Dept. of Environmental Physiology, Johns Hopkins School of Hygiene & Public Health



JENNIFER MCCALLISTER, M.D.

*Associate Professor of Clinical Internal Medicine
Director, Pulmonary & Critical Care Medicine Fellowship
Vice Chair of Education, Department of Internal Medicine
Division of Pulmonary, Allergy, Critical Care, and Sleep Medicine
The Ohio State University Wexner Medical Center*

B.S., West Virginia University School of Pharmacy
M.D., West Virginia University School of Medicine
Residency, Dept. of Internal Medicine, Wake Forest University Baptist Medical Center
Chief Resident, Dept. of Internal Medicine, Wake Forest University Baptist Medical Center
Fellowship, Section on Pulmonary & Critical Care Medicine, Allergy & Immunologic Diseases, Wake Forest University Baptist Medical Center



JOHN OROPELLO, M.D.

*Professor of Surgery and Medicine, Department of Surgery
Program Director, Critical Care Medicine
Co-Director, Surgical Intensive Care Unit
The Mount Sinai Hospital*

B.A., Bernard Baruch College
M.D., St. George's University School of Medicine, Grenada
Residency, Coney Island Hospital, SUNY Downstate
Fellowship (Pulmonary), Dept. of Medicine, Coney Island Hospital, SUNY Downstate
Fellowship (Critical Care), Dept. of Surgery, The Mount Sinai Hospital
Fellowship (Sleep), Clinilabs (Sleep Disorders Institute), New York



JAY RYU, M.D.

*Dr. David E. and Bette H. Dines Professor of Pulmonary and Critical Care Medicine
Consultant, Division of Pulmonary and Critical Care Medicine
Senior Advisor, Mayo Pulmonary and Critical Care Education Program
Mayo Clinic College of Medicine*

B.A., Johns Hopkins University
M.D., Johns Hopkins University School of Medicine
Residency, Mayo Graduate School of Medicine
Fellowship (Community Internal Medicine), Mayo Graduate School of Medicine
Fellowship (Pulmonary & Critical Care Medicine), Mass. General Hospital, Harvard Medical School
Fellowship (Thoracic Diseases), Mayo Graduate School of Medicine
Former Director, Mayo Pulmonary and Critical Care Fellowship Program
Member, Mayo Teacher of the Year Hall of Fame



DAVID SCHULMAN, M.D., M.P.H.

*Associate Professor of Medicine
Director, Pulmonary and Critical Care Medicine Fellowship Training Program
Associate Division Director for Education, Division of Pulmonary, Allergy and Critical Care Medicine
Emory University School of Medicine*

B.A., Yale College
M.D., Johns Hopkins University School of Medicine
M.P.H., Boston University School of Public Health
Internship & Residency, University of Rochester
Fellowship (Pulmonary & Critical Care Medicine), Boston University School of Medicine
Training (Sleep Medicine), Boston University School of Medicine

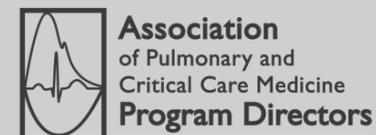


ADITYA UPPALAPATI, M.D., M.S.

*Assistant Professor of Clinical Medicine
Key Faculty, Pulmonary and Critical Care Medicine, Fellowship Training
Chair, Clinical Competency Committee, Pulmonary Critical Care Fellowship
Houston Methodist Hospital*

M.B.B.S., Kempegowda Institute of Medical Sciences, India
M.S., Sports Medicine-Exercise Physiology, Eastern Michigan University
Residency, University of Pittsburgh Medical Center (UPMC)
Fellowship, Critical Care Medicine, Mount Sinai School of Medicine

2016 Darlene Buczak Award Applicant Abstracts



Winner

A Longitudinal Curriculum for Training Pulmonary and Critical Care Medicine Fellows in the Principles of Quality, Safety, and Value

Primary Author: Jason Wagner, MD

Co-Authors: Maryl Kreider, MD
Meeta Kerlin, MD
William Schweickert, MD

University of Pennsylvania
Philadelphia, Pennsylvania



INTRODUCTION The last iteration of Accreditation Council for Graduate Medical Education (ACGME) milestones and Clinical Learning Environment Review (CLER) informs educators that proficiency in training post-graduates now includes actively engaging them in the areas of safety, quality, and value. With a paucity of resources to guide educators on accomplishing this task (1), we offer an example of a longitudinal quality, safety, and value curriculum (QSV) that provides post-graduates with several opportunities to demonstrate competency in these domains.

ABSTRACT PRESENTATION In response to the latest ACGME core competencies, we created a multifaceted curriculum in 2014 for our fellows at the University of Pennsylvania. This curriculum seeks to provide fellows with an integrated experience to gain sufficient knowledge and experience to master core competencies that address quality, safety, and value.

Introductory Lectures: To ensure that each trainee has sufficient knowledge we provide three introductory lectures at the beginning of each academic year. These lectures provide both the initial exposure to QSV principles as well as opportunities for upper year fellows to consolidate their knowledge. The lectures include (1) understanding the local patient safety culture, (2) strategies for conducting successful quality improvement, and (3) incorporating value-based decision making into patient care. We emphasize how interrelated each of the topics is with respect to delivering high-quality care.

Year One: Each fellow leads a one-hour Morbidity and Mortality case conference devoted to operationalizing key aspects of safety and quality improvement. Cases are assigned after being culled by a hospital patient safety. Under active mentorship, fellows present a brief case summary and review the relevant evidence. They then spend the bulk of the conference facilitating a discussion utilizing key quality improvement tools such as timelines, root cause analyses, and priority matrices. These conferences culminate with fellows devising preliminary action plans that are then submitted to unit-based clinical leadership teams to foster departmental quality improvement. Programmatically, their presentations and submitted action plans serve as documentation to help assess milestones.

Year Two: Second year fellows primarily focus on pursuing research interests. As part of their scholarly development, we build on the QSV curriculum by assigning them with a longitudinal quality improvement project. With departmental multidisciplinary mentorship, we have our fellows use a quality improvement tool called an A3 to execute a project from start to finish. These projects first require successfully framing the problem, understanding the current condition, and conducting a root cause analysis. They then devise countermeasures for quality improvement and implement these measures within our healthcare system. Project examples include improving care transitions for patients discharged from the intensive care unit to long-term acute care hospitals as well as reducing the number of readmissions for patients with chronic obstructive pulmonary disease. These presentations along with the completed A3 serve as additional data to assess milestone progression.

Year Three: Fellows ensure that their quality improvement interventions are durable and also present their completed work during one of the core morning conferences to demonstrate competency. Throughout their training experience, we encourage fellows to present their work in the form of institutional presentations as well as abstracts for submission to both national conferences and journals.

DISCUSSION It is important for training programs to devise comprehensive strategies to train fellows in quality, safety, and value.

CONCLUSION We believe that the description of this comprehensive curriculum in quality, safety, and value can aid other training programs as they try to incorporate educational approaches to ensure that they are providing their trainees with experiences to master core competencies in these domains. In future work, we hope to explore the impact of this curriculum on trainee perception of preparedness as well as provide data on scholarly pursuits.

Reference 1: Courtright KR, Weinberger SE, Wagner J. Meeting the Milestones. Strategies for Including High-Value Care Education in Pulmonary and Critical Care Fellowship Training. *Annals of the American Thoracic Society*, Vol. 12, No. 4 (2015), pp. 574-578.

1st Runner-up

Innovative Intervention to Improve Pulmonary and Critical Medicine Fellows Research Training

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Co-Authors: Jay Ryu, MD
Darlene Nelson, MD

Mayo Clinic
Rochester, Minnesota



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

ABSTRACT PRESENTATION

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

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

DISCUSSION The introduction of a research month in the first year of fellowship resulted in greater fellow satisfaction and substantial increase in publications.

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

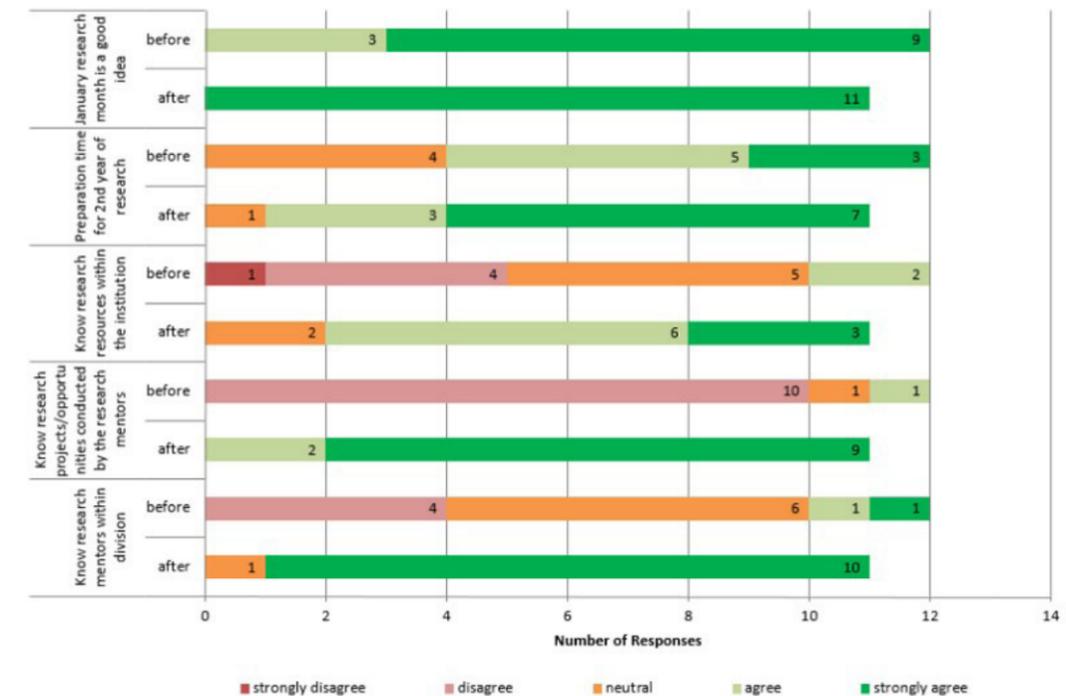
Reference 1: ACGME Program Requirements for Pulmonary and Critical Care Medicine; 2012

Reference 2: Kirkpatrick DL, Kirkpatrick JD. Evaluating training programs, 3rd ed. San Francisco, CA: Berrett-Koehler; 2006.

Reference 3: Richards JB, Kelly E, Fessler H, Roberts DH. A novel survey tool to assess pulmonary and critical care fellows' attitudes regarding acquiring teaching skills during fellowship training. J Grad Med Educ. 2013 Sep;5(3):506-9.

Graphics/Tables:

Figure: Survey Results

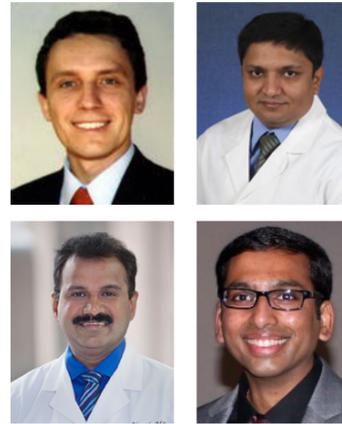


Using Online Technology for Critical Care Ultrasonography Teaching Conferences in Multiple Sites Simultaneously

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Co-Authors: Zafar Jamkhana, MD
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Saint Louis, Missouri

Aditya Uppalapati, MD
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Houston, Texas



INTRODUCTION Night shifts, clinical rotations in multiple training sites, vacations, and attending to urgent or emergent patient care issues are some of the barriers for trainees to participate in important educational conferences. There is need to redesign medical education and training to keep up with the technological advances. Real-time streaming of data-rich video files in Pulmonary and Critical Care training programs has not been described. We evaluated the feasibility of implementing such an approach to deliver critical care ultrasonography teleconference to multiple training sites.

ABSTRACT PRESENTATION

OBJECTIVE To evaluate the feasibility of delivering case-based teaching of critical care ultrasonography using high quality video conferences by linking multiple sites. To evaluate feedback from pulmonary and critical care medicine fellows on their experience.

METHODS We used commercially available web-based software, which allows multiple simultaneous direct video and audio streams to remotely deliver critical care ultrasound conferences. We utilized web survey to evaluate feedback from fellows.

RESULTS We started organizing monthly critical care ultrasonography conferences from April 2014, linking presenters and audiences from both Critical Care Medicine and Pulmonary and Critical Care Medicine programs at two separate institutions, Mercy Hospital and Saint Louis University Hospital in Saint Louis, Missouri. Both faculty and trainees presented selected cases focused on specific critical care ultrasound topics. Amount of transmitted data was much larger than comparable non-ultrasound topic because of large size of ultrasound video files. In order to overcome the occasional difficulty with lower transmission speed of video-intensive content directly from our computers, we used de-identified video files uploaded to cloud-based server. Final delivery of video data stream was seamless, allowing equivalent educational experience (including live interactions) for both sites. We discussed background literature and clinical aspects of the cases. Conferences were recorded to allow later viewing. We asked the trainees to rank several aspects of the new conference format, on scale 1-5 (1=strongly disagree, 2=disagree, 3=neither disagree or agree, 4=agree, 5=strongly agree). We averaged the ratings to each question. There were 13 responders. Conference was regarded as an interesting method of learning, and speakers were rated highly (on 1-5 scale, answer 4=38%, 5=62%, average rating 4.62). All attendees felt the conference increased their knowledge of critical care ultrasonography (4=23%, 5=77%, average 4.77). Case based approach coupled with didactics (4=31%, 5=69%, average 4.69) was well received and attendees were likely to apply the new knowledge in patient care (4=38%, 5=62%, average 4.62). All attendees look forward to attending the future sessions (4=31%, 5=69%, average 4.69). Majority wished to increase number of participating sites in future (2=8%, 3=8%, 4=38%, 5=46%, average 4.23).

DISCUSSION Although not rigorously measured, our novel approach appears to offer equivalent, interactive educational experience to all participants, regardless of where they are physically located. In addition, contents may be viewed later at participant's convenience. Leveraging web technology could allow to significantly increase the number of teaching sites. Recent expert statement (1) acknowledged role of internet in critical care ultrasonography training.

CONCLUSION Critical care ultrasound conferences linking multiple sites are feasible using web-based, real-time, audio and video streaming. Loss of quality of ultrasound videos due to transmission of high amount of data between individual sites may be overcome by uploading large data files to cloud. Feedback from attendees is excellent. Further study is required to objectively quantify its impact on the learning of trainees, and to better understand its role in an era of duty hour regulations for trainees.

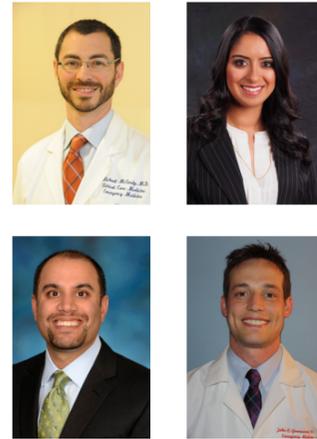
Reference: Expert Round Table on Ultrasound in ICU. (2011). "International expert statement on training standards for critical care ultrasonography." Intensive Care Med 37(7): 1077-1083.

CCProject.com – It Takes A Village To Train An Intensivist...

Primary Author: Michael T. McCurdy, MD

Co-Authors: Radhika M. Shah, MD
Nirav G. Shah, MD
James H. Lantry III, MD
John C. Greenwood, MD

University of Maryland Medical Center
Baltimore, Maryland



INTRODUCTION Numerous challenges exist in critical care medicine fellowship training programs to provide reliable, comprehensive, and high quality education. Academic faculty have increased pressure to produce clinical revenue, limited time, and varying interest for teaching. Clinical fellows' didactic time is limited due to ACGME duty hour restrictions, away rotations, clinical demands, or insufficient dedicated curriculum. As a result of these challenges, there has been an emergence of online resources in an effort to synthesize the copious amount of emerging data in the field of critical care, serve the generational preferences for this teaching modality, and increase accessibility of knowledge (asynchronous learning) (1). However, the quality of such online curricula can be variable and suboptimal. We propose that a proactively developed website designed to provide high quality, critical care education to fellows can increase accessibility of didactics to trainees and ensure accuracy, reliability, and quality of educational materials.

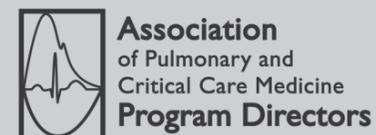
EDUCATIONAL STRATEGY We developed the website "CCProject.com" to serve as an online platform for fellowship programs to proactively integrate their recorded didactics into a dynamic, online academic community focused on providing free, high quality, critical care education to fellows. The website includes a review of weekly lectures with video-cast and written summary, shared educational pearls, and reflections on trainee clinical experiences. Critical care fellows were surveyed to assess the website's effect on medical knowledge, skills, and impact on clinical practice.

IMPACT AND OUTCOMES Surveyed fellows confirm that this educational modality expanded their medical knowledge, taught them new skills, and changed how they practice medicine (2). Participation in fellowship-based, crowd-sourced critical care education yields multiple benefits to programs and trainees alike. Fellows can supplement their own clinical experiences by reviewing their colleagues' shared clinical cases and utilize the online didactics to efficiently target their areas of weakness. Programs integrating this format into their didactics can demonstrate to the ACGME that all fellows can reliably access core didactics, showcase their high quality didactics, store lectures or cases from prior years, provide a venue for their best speakers to gain notoriety, and benefit from the didactic strengths of other institutions. This type of online curriculum, with purposeful program leadership integration, is the future of medical education.

Reference 1: Scott KR, Hsu CH, Johnson NJ, Mamtani M, Conlon LW, DeRoos FJ. Integration of Social Media in Emergency Medicine Residency Curriculum. *Ann Emerg Med.* 2014; 64:396-404.

Reference 2: Lantry J, Greenwood J, Shah NG, McCurdy MT. MarylandCCProject.org: Using an E-Community to Enhance Critical Care Fellowship Education. 2014 International Conference of the American Thoracic Society. San Diego, California, May 16-21, 2014.

2016 APCCMPD Research in Medical Education Award Applicant Abstracts



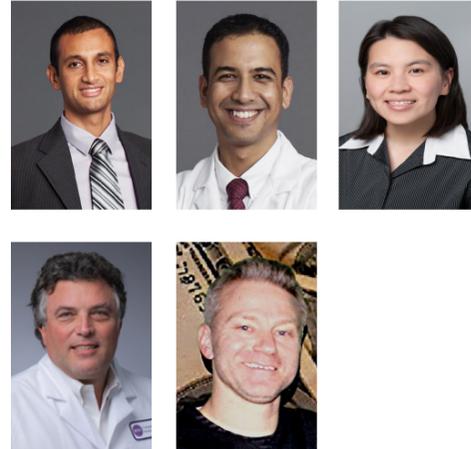
Winner

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

Primary Author: Bishoy Zakhary, MD

Co-Authors: Vikramjit Mukherjee, MD
Lily Kam, MD
Brian Kaufman, MD
Kevin Felner, MD

New York University School of Medicine
New York, NY



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

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

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

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

- Reference 1:** Brodie D, Bacchetta M. Extracorporeal membrane oxygenation for ARDS in adults. *N Engl J Med.* 2011;365(20):1905-14.
- Reference 2:** Burton KS, Pendergrass TL, Byczkowski TL, et al. Impact of simulation-based extracorporeal membrane oxygenation training in the simulation laboratory and clinical environment. *Simul Healthc.* 2011;6(5):284-91.
- Reference 3:** Brazzi L, Lissoni A, Panigada M, et al. Simulation-based training of extracorporeal membrane oxygenation during H1N1 influenza pandemic: the Italian experience. *Simul Healthc.* 2012;7(1):32-4.

Graphics/Tables:

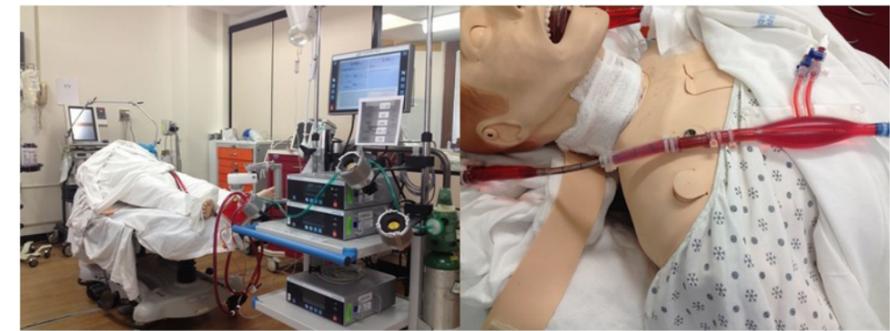


Fig 1: VV-ECMO simulation setup. A Laerdal SimMan 3G was connected to a running VV-ECMO circuit composed of a Rotaflow pump, a Macquet Quadrox-iD oxygenator, and a dual-lumen Macquet Avalon catheter. To maintain flow in the circuit, the catheter tip was placed in a bladder reservoir and sealed.

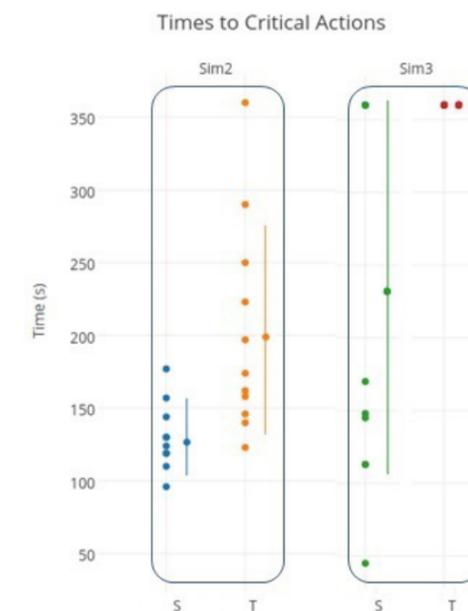


Fig 2. Plot of times to critical actions for each individual in the Simulation (S) and Traditional (T) groups with mean \pm standard deviation for each dataset. During Sim2, the critical action was pump exchange for pump failure. During Sim3, the critical action was to administer a fluid bolus for access insufficiency. Time to critical action was shorter in the simulation group for Sim2 and for Sim3.

1st Runner-up

Effectiveness of Hands-On Tutoring versus Self-learning to Teach Invasive Mechanical Ventilation to Critical Care Trainees

Primary Author: Kannan Ramar, MD, MBBS

Co-Authors: Bernardo Selim, MD
Ronaldo Sevilla Berrios, MD

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BACKGROUND Physicians require extensive training to achieve proficiency in mechanical ventilator (MV) management of the critically ill patient. Andragogy (self-directed learning) has been postulated as the pillar of adult learning theory, however it is unclear if this strategy is appropriate to teach mechanical ventilation (MV) to critical care trainees. Therefore, our hypothesis/objective was to test whether critical care trainees will achieve higher scores on standardized MV testing after participating in a hands-on tutorial as compared to self-learning strategy alone.

METHODS First year Pulmonary and Critical Care Medicine (PCCM) trainees (n=6) and Critical Care Medicine (CCM) (n=8) trainees were recruited to participate. Baseline and post intervention satisfaction survey was conducted using the Likert scale. Baseline assessment of MV knowledge, including ventilator waveform analysis, was performed by administering a validated 25 multiple choice question pretest to all participants. For 2 weeks the CCM trainees were exposed to self-directed learning through didactic materials on MV, while the PCCM trainees received an active intervention consisting of hands-on tutoring and a workshop. One week washout was allowed prior to final testing with the same pretest questions (posttest).

RESULTS Results were reported using mean and proportions. Matched pair analysis was used with the participants considered as their own control. A total of 14 trainees were initially enrolled but only 13 (7 CCM and 6 PCCM trainees) completed all the evaluations and were included in the final analysis. The CCM and PCCM trainees scored similarly in the pretest (64.4 vs 52.4% respectively, p=0.13). Following their respective interventions the posttest scores increased significantly in both trainee groups (Table 1), however no significant difference was observed based on the intervention type (74% vs 77.2% p=0.39). The absolute improvement with the hands-on-tutoring appeared to be slightly higher than the self-directed-learning strategy (change in improvement in score of 9.7% vs 24.6% p=0.07). Adjustments for prior length of ICU training among trainees did not affect the results. The satisfaction survey results using Likert scale were overall significantly positive about the hands-on-tutoring.

CONCLUSIONS Both hands-on tutoring and self-directed learning approaches were associated with significant improvement in trainees posttest scores. However, the likelihood of learning improvement trend toward higher scores and higher satisfaction scores occurred with the hands-on tutoring group compared to the self-directed learning group along with improved satisfaction.

Reference 1: Lievens, Filip, Charlie L. Reeve, and Eric D. Heggstad. "An examination of psychometric bias due to retesting on cognitive ability tests in selection settings." *Journal of Applied Psychology* 92.6 (2007): 1672.

Reference 2: Usher, Robin, and Ian Bryant. *Adult education as theory, practice and research: The captive triangle*. Routledge, 2014.

Reference 3: Cranton, Patricia, and Edward W. Taylor. "Transformative learning theory: Seeking a more unified theory." *The handbook of transformative learning: Theory, research and practice* (2012).

Graphics/Tables:

Table 1. Standard testing score summary of CC and PC groups

Groups	CC (N=7)	PC (N=6)	P-value*
Pre-Intervention	64.4% ± 9.6%	52.4% ± 9.6%	0.13
Post Intervention	74% ± 13.9	77.2% ± 13.6%	0.39
Absolute Improvement	9.7% ± 10%	24.6% ± 10.4%	0.07
P-Value**	0.01	0.03	

Data present as Mean ± SD

*P-value on individual analysis using Wilcoxon-Rank test. **P-Value of pair analysis using Wilcoxon-Singed Rank Test

2nd Runner-up

Effective Learning in High Cognitive Load Critical Care Simulation

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BACKGROUND Simulation has consistently proven to be an effective teaching technique that has yet to be uniformly incorporated in Pulmonary and Critical Care programs. High-fidelity simulations (HFS) most accurately reflect the critical care environment, but these stressful scenarios often demand a high cognitive load from the participants. These complex learning tasks stand in direct contrast to the more commonly accepted cognitive load learning theory in medical simulation, which suggests that simulation should decrease cognitive load by limiting the number of learning objectives and distracting tasks (1). We hypothesize that a new approach to critical care simulation utilizing a higher cognitive load can increase fidelity and will continue to improve participants' knowledge and performance in managing rare clinical scenarios. We propose that HFS with high cognitive load should be included in Pulmonary and Critical Care curricula nationwide.

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

RESULTS Participants' comfort level managing massive hemoptysis significantly increased after the HFS, despite the intentionally high cognitive load. Average scores on pre- and post-simulation questionnaires that assessed knowledge surrounding the management of massive hemoptysis significantly increased from 77.5% to 96.2% ($p = 0.001$).

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

Reference 1: Fraser K, Ayres P, and J Sweller. Cognitive Load Theory for Design of Medical Simulations. *Simul Healthc*. 2015 Oct;10(5):295-30.

Novel Multidisciplinary Online Bronchoscopy Curriculum

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BACKGROUND Bronchoscopy has traditionally been taught using the apprenticeship model of see one, do one, teach one [1]. Trainees often receive little bronchoscopy-specific training prior to performing their first procedure on a patient. Complicating matters, style and technique often vary by supervisor depending on their own training, experience, and specialty. Lack of preparation prior to performing bronchoscopy may cause trainees significant anxiety and put patients at risk. A recent Chest guideline recommended that bronchoscopy training programs incorporate multiple modalities, including e-learning [2]. We redesigned the bronchoscopy curriculum at our institution with the following goals:

1. Develop a concise and widely available curriculum, so trainees could review the entire curriculum prior to starting training and review pertinent aspects as just in time learning later.
2. Provide adequate cognitive training to prepare novice bronchoscopists for their first procedure.
3. Standardize bronchoscopy training across three large hospitals and several subspecialties: pulmonary medicine, medical critical care, surgical critical care, thoracic surgery and otolaryngology, head & neck surgery.

METHODS A multidisciplinary bronchoscopy education working group with representatives from all relevant specialties was formed. Five areas of bronchoscopy education were defined:

- Consent, indications and risks
- Preparation for bedside bronchoscopy
- Upper airway anatomy and anesthesia
- Lower airway

Learning objectives and content were developed for each area by individual working group members and reviewed by the whole group to ensure consensus. The final product is a series of narrated videos that incorporate written content, high-quality illustrations, simulated patient interactions, and real bronchoscopies on live patients. Each module is less than ten minutes long and all are available online. We created pre- and post-tests designed to assess the learning objectives for each module.

The modules and tests were made available to trainees at our institution in 2014 and broadened to a multi-institutional group in 2015 [3]. The evaluation includes five-point Likert scale questions to assess trainees' comfort level with each module topic.

RESULTS In 2014, all incoming pulmonary/critical care and anesthesiology/critical care trainees at our institution reviewed the modules prior to their program start date. Pre- and post-tests demonstrated trainees knowledge regarding bronchoscopy increased after viewing the modules (mean scores 65% and 80% respectively, $p < 0.05$). Informal feedback indicated the trainees found the modules valuable; they felt better prepared for and less anxious about their first bronchoscopies. Many trainees reviewed the material prior to subsequent procedures.

In 2015, trainees from six other institutions also reviewed the modules and tests (see table 1 for participant characteristics). Test scores were very similar on the pre- and post-tests (mean 65% and 69% respectively, p=non-significant). Comfort level scores increased in all of the domains and the increase reached significance for three areas: comfort with setting-up equipment for bedside bronchoscopy, anesthetizing the upper airway (see figure 1), and performing bronchoalveolar lavage.

CONCLUSIONS By curriculum that has been very well received by early trainees. In 2014 local trainees demonstrated cognitive improvement and in 2015 trainees from multiple institutions reported significantly improved comfort levels. It is interesting that in 2015, trainees cognitive scores did not significantly improve after reviewing the modules. In 2014, participants reported that the post-test felt harder, so some questions were switched between tests for 2015. This may explain the difference between years. However, we intend to analyze this further to determine whether particular content areas can be improved, or whether the assessment questions need revision.

Future plans include additional modules on bronchoscopic biopsies, development of a simulation curriculum for hands-on training, and wider dissemination of the curriculum.

Reference 1: Simoff, MJ. Learning to look through the bronchoscope. Chest 2015;148(2):301-303

Reference 2: Ernst, A., Wahidi, MM., Read, CA. et al. Adult bronchoscopy training: Current state and suggestions for the future: Chest expert panel report. Chest 2015;148(2):321-332

Reference 3: <http://www.isis.washington.edu/services/pulmonary>

Graphics/Tables:

Figure 1. Comfort level with anesthetizing the upper airway (mean scores 2.73 pre-test and 3.53 post-test, p<0.05).

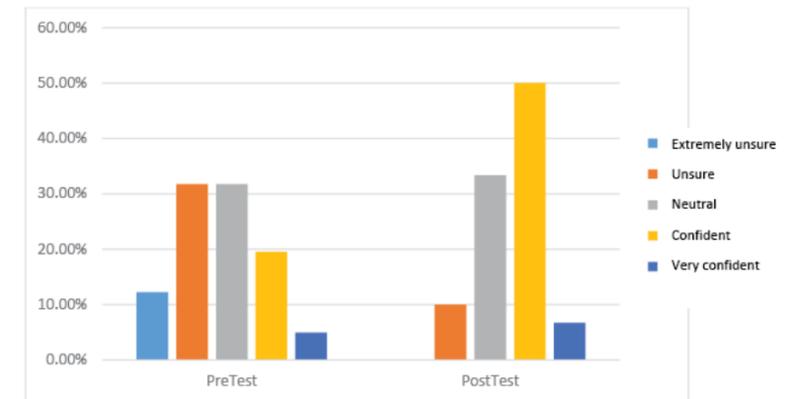


Table 1. Characteristics of participants

		Participant numbers (N (%))			
		2014		2015	
		Pre	Post	Pre	Post
Institution	University of Washington	11 (100)	10 (100)	15 (37)	11 (37)
	Rutgers – Robert Wood Johnson			8 (20)	7 (23)
	University of California, San Diego			5 (12)	5 (17)
	Oregon Health & Sciences University			5 (12)	4 (13)
	Mt Sinai Beth Israel			3 (7)	3 (7)
	University of California, San Francisco			3 (7)	
	Staten Island University Hospital			1 (2)	
	Other			1 (2)	
Year of training	Post-graduate year 4	6 (55)	6 (60)	34 (83)	24 (80)
	Post-graduate year 5	3 (27)	3 (30)	4 (10)	4 (13)
	Post-graduate year 6	2 (18)	1 (10)	2 (5)	2 (7)
	Other			1 (2)	
Specialty	Pulmonary Critical Care	6 (55)	6 (60)	28 (68)	20 (67)
	Emergency Medicine Critical Care	1 (9)	1 (10)	3 (7)	3 (7)
	Anesthesia Critical Care	2 (18)	2 (20)	4 (10)	4 (13)
	Surgical Critical Care	2 (18)	1 (10)	4 (10)	1 (3)
	Internal Medicine Critical Care			1 (2)	1 (3)
	Pulmonary			1 (2)	1 (3)
Prior bronchoscopies*	0			8 (20)	6 (20)
	1-5			16 (39)	14 (47)
	5-10			3 (7)	2 (7)
	10-20			6 (15)	4 (13)
	>20			8 (20)	4 (13)
Total participants		11	10	41	30

*data on number of prior bronchoscopies not obtained in 2014

Feasibility of Online Technology for Critical Care Ultrasonography Teaching Conferences at Multiple Institutions

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BACKGROUND Point of care ultrasound has become the standard of care in management of critically ill patients. However, some of the barriers like not having enough number of trained faculty in critical care ultrasound, clinical rotations in multiple sites, night shifts and duty hours of fellows have hindered the critical care ultrasound training for fellows (1). Video conferencing has been shown to be an effective tool in learning and clinical practice (2). The purpose of our study was to evaluate the feasibility of a web based video conferencing involving two educational institutions for continued training of critical care fellows in ultrasound.

METHODS We used commercially available software (Fuze), which allows multiple direct video and audio streams to remotely deliver conferences. From April to October 2014, we organized critical care ultrasonography conferences, linking presenters and audiences at two separate institutions - Saint Louis University Hospital and Mercy Hospital, St. Louis, Missouri. Both faculty and trainees presented selected cases focused on critical care ultrasound topics. Microsoft power point presentations and all the relevant video clips, which had deidentified patient information were initially uploaded to the fuze application. The live presentation had a link which was sent out to all the fellows and was able to be accessed on any computer or smart phone and from any place during the conference time. The conference was also able to be recorded as a video podcast and was available to all the fellows after the presentation. The trainees were asked to rank several aspects of the new conference format on a scale of 1-5 (1=strongly disagree, 2=disagree, 3=neither disagree or agree, 4=agree, 5=strongly agree). An average of the final ratings for each question was calculated.

RESULTS There were few initial technical problems in uploading the content. After resolving the issues the videoconference was able to be streamed seamlessly. There were 13 responders. Conference was regarded as an interesting method of learning and speakers were rated highly (4=38%, 5=62%, average rating 4.62). All attendees felt the conference increased their knowledge of critical care ultrasonography (4=23%, 5=77%, average 4.77). Case based approach coupled with didactics was well received (4=31%, 5=69%, average 4.69) and attendees were likely to apply the new knowledge in patient care (4=38%, 5=62%, average 4.62). All attendees looked forward to attending, participating in the future sessions (4=31%, 5=69%, average 4.69). Majority wished to increase the number of participating sites in future (2=8%, 3=8%, 4=38%, 5=46%, average 4.23).

CONCLUSIONS Critical care ultrasound conference of data-rich content using web-based, real-time audio and video link between multiple sites is feasible. Fellow's educational experience in critical care ultrasound was enhanced. This technology could allow to increase the number of teaching sites and share their practices, experiences to teach and train fellows at other locations. Further study is required to objectively quantify its impact on attendee's knowledge and learning, and also to better understand its role in an era of duty hour regulations for trainees.

Reference 1: Eisen LA, et al. Barriers to ultrasound training in critical care medicine fellowships: a survey of program directors. Crit Care Med. 2010 Oct;38(10):1978-83.

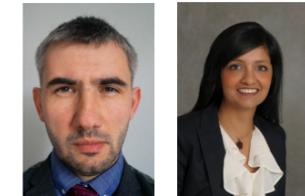
Reference 2: Augestad KM, et al. Overcoming distance: video-conferencing as a clinical and educational tool among surgeons. World J Surg. 2009 Jul;33(7):1356-65.

A Standardized, Repetitive, Case-Based Simulation Curriculum for Medical Residents Integrated into the Clinical Schedule Improves Critical Care Knowledge, Skills, and Confidence

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BACKGROUND Traditional bedside teaching does not achieve consistent results in critical care related knowledge and procedural skills among Internal Medicine (IM) residents. Here we investigate whether a unique case-based simulation curriculum integrated into residents schedules improves critical care related knowledge, procedural skills, and confidence.

METHODS 91 IM residents in groups of 15-20 completed 6 two-hour teaching modules integrated into their rotations schedule every five weeks. Early teaching modules deconstructed common clinical presentations into component knowledge and skill competencies. Later sessions focused on integrating and practicing previously learned knowledge and skills within a complex case-based scenario.

RESULTS Short term knowledge retention improved between pre- and post-tests in each module ($p < 0.05$). There was no significant long-term knowledge extinction as evaluated by comprehensive retention test ($p > 0.05$). Participants attained adequate hands-on skills (assessed by direct observation) and increased confidence level in their ability to manage complex critical care scenarios (assessed by confidence surveys).

CONCLUSIONS We have developed an innovative standardized deductive-inductive case-based critical care simulation curriculum and have demonstrated significant improvement in critical care related knowledge, skills performance, and confidence among participating IM residents as a result of the implementation of this curriculum. We suggest that our teaching paradigm and content should serve as a model for IM residency programs across the nation.

Reference 1: Almoosa K, Goldenhar L, Puchalski J, Ying J, Panos R. Critical Care Education During Internal Medicine Residency: A National Survey. J Grad Med Educ. 2010;2(4):555-561.

Reference 2: Singer B, Corbridge T, Schroedl C, Wilcox J, Cohen E, McGahie W, Wayne D. First-year residents outperform third-year residents after simulation-based education in critical care medicine. Simul Healthc. 2010;8(2):67-71.

Reference 3: Garcia-Barbero M, Caturla J. Teaching Critical Care in Europe: Analysis of a survey. Crit Care Med. 1996;24(4):696-704.

Graphics/Tables:

Table 1. Mean scores of Pre, Post, and retention tests.

	Module #						Retention test
	1	2	3	4	5	6	
Pre-test N [@]	50	57	72	72	74	74	60
Pre-test mean score (+/-SD)	76.0 (22.50)	51.8 (23.56)	70.1 (24.70)	68.9 (22.74)	74.9 (20.95)	67.7 (23.32)	87.2 (4.58)
Post-test N [@]	58	40	75	63	82	73	60
Post-test mean score (+/-SD)	87.2 (17.45)	80.6 (20.01)	83.0 (20.62)	88.6 (15.54)	91.5 (16.34)	92.0 (14.22)	86.0 (7.18)
Wilcoxon-rank sum 1-tailed p	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	0.357

[@]Not all residents returned their pre-/post- tests.

Table 2. Results of confidence surveys.

	Module #						Cumulative over the curriculum
	1	2	3	4	5	6	
Increased confidence level	89%	94%	100%	92%	83%	95%	91%
Completed the module	66	65	65	60	60	64	67 [@]

[@]Not all residents returned their confidence surveys.

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

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BACKGROUND Central venous catheter (CVC) placement is one of the most common procedures used for resuscitation and management in the intensive care unit (ICU). In academic medical centers, ICU central lines are mainly managed by trainees, making CVC training highly important for pulmonary and critical care fellows to reduce errors and central line associated complications such as blood stream infection (CLABSI) rates [1,3]. In order to improve CVC placement education for our trainees, we started training all fellows (new and old) on a standard CVC placement using Northwestern University validated curriculum and simulation-based mastery learning program [2]. The curriculum goal was to increase placement effectiveness and reduce error rates. In addition the program included metrics to measure improvement in skills and adherence to standard practice over time using simulation techniques with Ultrasound.

METHODS Two faculty trainers attended a 2 days mastery training course and were responsible for training all staff and trainees at WSU program. Each trainee underwent the baseline skills and written CVC placement knowledge assessments then watched 8 video modules/lectures on basic anatomic landmarks, sterility principals and Ultrasound techniques. The trainees were administered a 20-question baseline evaluation, and a 20-question evaluation at the conclusion of the training. Following the baseline assessment a deliberate training was provided to every trainee in one-on-one sessions using central simulation center (SimLearn) and clinical scenarios. The scenario was followed by a critique and discussion session led by the trainer physician. Each trainee did a simulated CVC and the performance was assessed using a check list of 28 items. The test was followed by a debrief session on overall performance in the central line placement. The performance of CVC placement was considered successful (pass) if 4 or fewer from 28 points were missed on the simulation test.

RESULTS 17 (100%) fellows have completed the program since March 1, 2015. Of these 13 passed the central line training practical test and 4 failed (Score<80% or > 5 points on practical test). Median score was 24/28 (±2). First year trainees had similar scores to second and third year fellows (23.3±1 vs. 24.0±2, P = 0.65). There was no difference between first year fellows 5 of the 6 (83%) rate of passing and second/third year fellows 8 of the 11 passing rates (73%) (P = 1.0). Despite the simulation training, significant number of trainees did not follow standard sterility techniques (58%), missed timeout procedure (48%) or incorrectly position patient before for CVC placement (41%) on final practical test.

CONCLUSIONS Simulation-based learning for CVC placement can be used in training pulmonary and critical care fellows at different stages of their training to probe strength and weaknesses. Years of training did not affect overall scores of performance of central line placement or passing rate. Future plan is to do 6 months follow up reassessment of CVC placement and compare progress in performance and assess outcome.

Reference 1: Barsuk, Jeffrey H., et al. "Use of simulation-based education to reduce catheter-related bloodstream infections." Archives of internal medicine 169.15 (2009): 1420-1423.

Reference 2: Barsuk, Jeffrey H., et al. "Simulation-based mastery learning reduces complications during central venous catheter insertion in a medical intensive care unit*." Critical care medicine 37.10 (2009): 2697-2701.

Multidisciplinary Simulation Training for Airway Management: Efficacy of a Brief Intervention

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BACKGROUND Hands on experience is important to obtain the technical skills required to perform bedside invasive procedures; however, managing an airway requires both proper technique and effective leadership of a medical team during an airway emergency. Simulation training is effective for both technical skill development and team building (1,2). We chose to train our critical care fellows and critical care APNs in airway management in a multidisciplinary setting using simulation training (3), and assessed the efficacy of our brief training sessions with a pre and post-test.

METHODS Five Pulmonary and Critical Care fellows at Robert Wood Johnson University Hospital and two Critical Care advanced practice nurses attended two half-day training sessions utilizing a simulation mannequin to manage airway teams and perform endotracheal intubations. Several clinical scenarios were developed to simulate a patient in acute respiratory failure. Each trainee was required to lead an airway team for at least one scenario and verbalize their thought process throughout the simulation. In order to simulate a realistic scenario, ancillary staff including respiratory therapy and ICU nurses took part in the exercise. The trainees performance as team leader was assessed by the preceptors via checklist examining key technical and communication skills. Having a backup plan was considered a key component of the exercise. Individualized feedback was provided to the trainees immediately following each session. Trainees completed a ten question pre and post test aimed to determine knowledge and comfort with airway management using multiple choice and scalar questions, and the results were analyzed.

RESULTS Prior to the simulation training session, six out of seven participants indicated a comfort level of managing an airway at a level of 3 or less (average 2.7) on a scale of 1-10, with 10 indicating highest level of comfort. On the post-test, 4 out of 7 participants indicated a comfort level of 6 or above (average of 4.9). Additionally, prior to the simulation training session 6 out of 7 participants indicated that their comfort level of leading a team was 3 or below (average of 2.6), and post-session, 6 out of 7 participants rated their comfort level of leading a team as 4 or above (average of 5.2). The pre-training general knowledge assessment revealed that the majority answered correctly for 5 out of the 6 questions with a mean percentage correct of 73.7%. The post-training assessment was comprised of more difficult questions and revealed that the majority answered correctly for 5 of the 6 questions with a mean percentage of 73.8%. No differences were noted between the critical care fellows and critical care APNs.

CONCLUSIONS Brief simulation training sessions were an effective method for teaching airway management algorithms and leadership of a medical team during an airway emergency for Pulmonary and Critical Care fellows and Critical Care advanced practice nurses. Longer follow up is needed to assess retention of this knowledge.

Reference 1: Mosier, J. et al. The Impact of a Comprehensive Airway Management Training Program and Critical Care Medicine Fellows: A Three Year Experience. *Ann Am Thorac Soc* Vol 12, No 4, pp 539-548, Apr 2015.

Reference 2: Ernst, A., Wahidi, MM., Read, CA. et al. Adult bronchoscopy training: Current state and suggestions for the future: Chest expert panel report. *Chest* 2015;148(2):321-332

Reference 3: Holtschneider, ME, et al. Interprofessional Simulation: Prioritizing Interprofessional Competencies to Improve Patient Outcomes. *J. Nurses Prof Dev.* 2015. Sept-Oct 31(5):305-6.

Graphics/Tables:

Table 1: Results of Brief Intervention in Airway Simulation Training

	Pre-test Mean	Pre-test Variance	Post-test Mean	Pre-test Variance
Comfort with airway management	2.7	3.9	4.9	4.81
Comfort with leading team	2.6	4.95	5.2	2.9

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

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

METHODS A prospective, randomized crossover study included three separate fellowship programs: Pulmonary and Critical Care, Cardiovascular Disease, and Hematology-Oncology. The study was performed between October 2014 and March 2015. All fellows were included and randomized to one of two groups (with subsequent cross over to the opposite group): Pages or No Pages. Paging reminders that included conference title, location, and time, were sent 30 minutes prior to every conference for those in the intervention arm. Attendance was collected through a standard attendance log using self-registration.

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

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

Reference 1: Cacamese SM, Eubank KJ, Hebert RS, Wright SM. Conference attendance and performance on the in-training examination in internal medicine. *Med. Teach.* 2004;26(7):640-644.

Reference 2: McDonald RJ, Luetmer PH, Kallmes DF. If you starve them, will they still come? Do complementary food provisions affect faculty meeting attendance in academic radiology? *Journal of the American College of Radiology.* 2011;8(11):809-810.

@APCCMPD

