

All Together Now: Implementation of an Interprofessional Critical Care Educational Curriculum

Avraham Z. Cooper¹, Cindy Byrd², Jessica L. Elefritz³, Anthony T. Gerlach³, Archana Hinduja⁴, Jennifer McCallister^{1*}, Daniel Vazquez⁵, and Claire V. Murphy³

¹Division of Pulmonary, Critical Care, and Sleep Medicine, Department of Internal Medicine, ²Division of Advance Practice, Department of Nursing, The Arthur G. James Cancer Hospital and Richard J. Solove Research Institute, ³Department of Pharmacy, and ⁴Department of Neurology, The Ohio State University Wexner Medical Center, Columbus, Ohio; and ⁵Department of General Surgery, Cleveland Clinic Akron General, Akron, Ohio

ORCID IDs: 0000-0003-1129-5011 (A.Z.C.); 0000-0003-1662-2499 (C.B.); 0000-0001-5690-471X (J.L.E.); 0000-0001-5631-4218 (A.T.G.); 0000-0001-8388-8882 (A.H.); 0000-0002-2710-7268 (J.M.C.); 0000-0001-5339-8735 (C.V.M.).

Delivery of complex care in the intensive care unit (ICU) requires a collaborative, team-based approach (1, 2). This has become increasingly apparent during the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic. Interprofessional education (IPE) facilitates collaboration among healthcare professions and prepares trainees to succeed in a teamed environment (1, 3). Studies demonstrate that IPE enhances knowledge, skills, and attitudes across healthcare

disciplines and improves patient-centered outcomes (4–6). Despite calls for the inclusion of IPE in advanced critical care training, successfully implemented models are lacking (7).

Our institution offers critical care training, including physician fellowships (medical, surgical, anesthesia, and neurosciences), a pharmacy residency, and advanced practice provider (APP) fellowships. Although we pride ourselves on our programmatic diversity, program management was

(Received in original form March 18, 2021; accepted in final form June 29, 2021)

This article is open access and distributed under the terms of the Creative Commons Attribution Non-Commercial No Derivatives License 4.0. For commercial usage and reprints, please e-mail Diane Gern.

*J.M. is Associate Editor of *ATS Scholar*. Her participation complies with American Thoracic Society requirements for recusal from review and decisions for authored works.

Some costs associated with the Interprofessional Education Series, such as travel expenses and honoraria for external speakers, were partly funded by institution-approved display fees from Pfizer, Merck, La Jolla Pharmaceutical Company, and Allergan.

Correspondence and requests for reprints should be addressed to Claire V. Murphy, Pharm.D., B.C.P.S., F.C.C.M., Lead Specialty Practice Pharmacist, Critical Care, Department of Pharmacy, The Ohio State University Wexner Medical Center, 410 W. 10th Avenue, 368 Doan Hall, Columbus, OH 43210. E-mail: Claire.murphy@osumc.edu.

ATS Scholar Vol 2, Iss 3, pp 304–308, 2021
Copyright © 2021 by the American Thoracic Society
DOI: 10.34197/ats-scholar.2021-0039BR

historically siloed, resulting in redundant didactic content. We developed an institution-wide IPE curriculum, the Interdisciplinary Education Series (IES), and assessed feasibility and acceptability after implementation.

METHODS

The Critical Care Education Committee (CCEC) was formed in 2018, consisting of leadership from each program. The CCEC identified curricular objectives—coverage of core critical care topics, advancement of evidence-based practice, and cultivation of interdisciplinary collaboration—and met monthly to coordinate the curriculum.

IES comprised three components: a case-based interactive conference, a trainee-led journal club, and grand rounds (Figure 1). Topics relevant to all programs were prioritized, addressing clinical care and other general domains (e.g., leadership, practice management, and burnout). Trainees were provided with a standardized template for journal club presentation. Faculty members and invited speakers developed their own content and

presentations for the didactic conferences and grand rounds. A total of 36 trainees, including 28 physician fellows (18 pulmonary critical care medicine [PCCM], 4 surgical critical care medicine [SCC], 4 neurocritical care [NCC], and 2 anesthesiology critical care [ACC]), 6 APP fellows, and 2 pharmacy residents, were eligible to participate in IES. Attendance was required for PCCM and APP fellows, whereas trainees from the other programs, faculty, and staff were strongly encouraged to attend. IES represented the first ever interprofessional critical care curriculum at The Ohio State University, and any content covered was not duplicated in existing program-specific education. IES was approved as a Regularly Scheduled Series with Category 1 designation.

The CCEC developed anonymous pre- and postimplementation surveys and administered them to trainees via REDCap (8, 9). The presurvey, querying prior IPE exposure and incorporating the Readiness for Interprofessional Learning Scale (RIPLS) questionnaire, was sent to all trainees. The RIPLS questionnaire consists

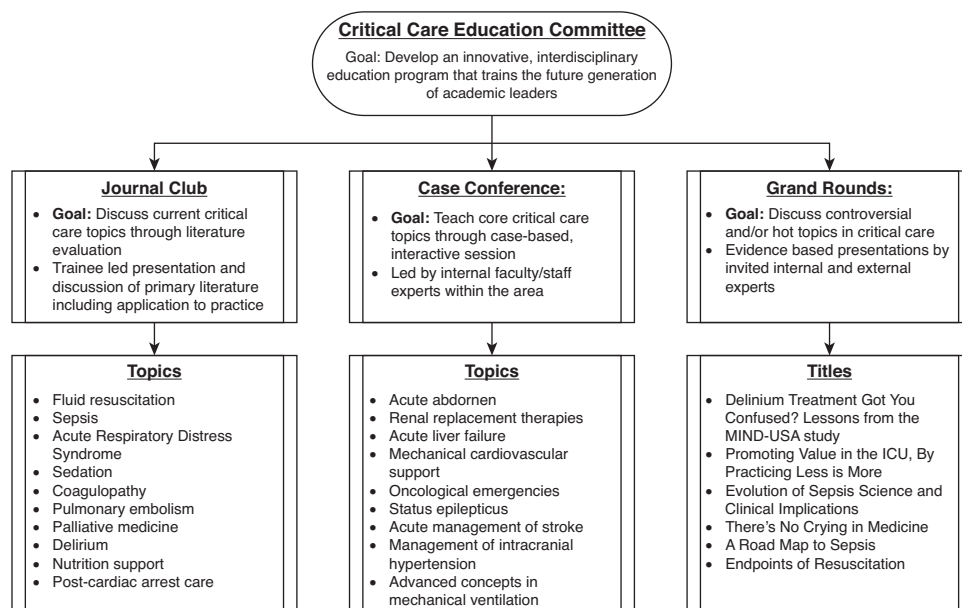


Figure 1. Structure and content of the 2018–2019 Interdisciplinary Education Series. ICU = intensive care unit.

of 23 self-reported questions using a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree) across three domains: teamwork and collaboration, patient centeredness, and sense of professional identity (10, 11). For domains 1 (teamwork and collaboration) and 2 (patient centeredness), higher scores indicate positive attitudes toward these areas. For domain 3 (sense of professional identity), a higher score indicates a negative attitude toward other professions. RIPLS was chosen because it specifically assesses the attitudes of health sciences trainees around IPE. The post-survey, sent only to trainees who completed the presurvey, included the RIPLS questionnaire and solicited feedback on the structure and content of the curriculum. Survey participation was encouraged but voluntary, and we offered no incentives. Feasibility was assessed using costs and resources required for implementation. Acceptability was assessed via session attendance and survey responses. Descriptive statistics were performed with nominal data presented as frequency (percent) and continuous data as mean \pm standard deviation or median (25–75% interquartile range) as appropriate. The pre- and post-RIPLS scores were compared using paired sample *t* tests. Free text responses to the survey were scanned for recurring themes, but a formal thematic analysis was not performed. Institutional review board approval was not required as the surveys constituted programmatic improvement.

RESULTS

IES began in August 2018, consisting of 25 hour-long sessions over the academic year (10 journal clubs, 10 case conferences, and 5 grand rounds; Figure 1). All time required for IES administration was volunteered by CCEC members within their own administrative responsibilities. Costs for travel and

honoraria for external speakers totaled approximately \$2,500, which was offset by institution-approved industry sponsorship.

IES sessions were well attended, with a median of 29 (27–33) attendees per session, including trainees (16 [12.5–17.5]) and faculty and staff (14 [10–19.5]). All programs were represented, with median attendance of 8 (4.5–8) PCCM fellows, 1 (1–2) SCC fellow, 2 (1–2.75) NCC fellows, 1 (1–1.5) ACC fellow, 5 (4–5.5) APP fellows, and 1 (1–2) pharmacy resident. Faculty attendance encompassed all critical care specialties, with median attendance of 2 (1.5–4) pulmonologists, 1 (1–1) general surgeon, 1 (1–1) neurologist, 1 (1–1) anesthesiologist, 3 (2–4) APPs, and 2 (2–4) pharmacists.

Overall, 28 of 36 eligible trainees (78%) completed the presurvey, including 20 physician fellows (14 PCCM, 3 SCC, 2 NCC, and 1 ACC), 6 APP fellows, and 2 pharmacy residents. The majority of respondents were ages 31–40 years (53.6%), with the remainder between 20 and 30 years of age. Half reported 5–9 years of service since completing their highest level of education, 12 (42.9%) 0–4 years, and two (7.1%) >10 years. Half of the respondents reported prior experience with IPE, predominantly simulation-based learning and integrated lectures.

Of the 28 eligible trainees, 25 responded to the postsurvey (89%), with 17 physician fellows (12 PCCM, 3 SCC, 1 NCC, and 1 ACC), 6 APP fellows, and 2 pharmacy residents responding. They appreciated the multidisciplinary nature of the curriculum and noted a sense of community among critical care divisions that had not previously existed. IES also became a forum for discussion of active local studies, which subjectively increased inclusion of multiple ICUs in clinical trials and quality-improvement projects. The content and

thrust of feedback was consistent across different training programs.

There were no significant changes in RIPLS scores after implementation of IES (Table 1). Preimplementation scores did indicate a high level of respect for other professions, teamwork, collaboration, and patient centeredness, even before exposure to IES.

DISCUSSION

Implementation of IES was feasible and acceptable. It generated a sense of community among critical care specialties, facilitated sharing of knowledge and expertise, and enhanced the institution's educational and research missions. It also allowed trainees from different disciplines to teach each other, particularly during journal club. Although there was no significant change in RIPLS scores after completion of IES, baseline scores indicated a high preexisting level of readiness for interprofessional learning.

Although the initiation of IPE in advanced critical care training might seem daunting, our experience demonstrates that with adequate planning and buy-in from program leadership, it is feasible. We recommend aggregation of key stakeholders into a steering committee, early delineation of

curricular goals, use of active learning techniques to maximize engagement, and regular solicitation of feedback to facilitate continual improvement.

Limitations of this intervention include that it occurred at a single, large academic medical center, a potential threat to generalizability. Outcomes were limited to participant experience and cultural impacts. A formal thematic analysis on free text responses was not performed.

IES remains active today and was successfully transitioned to synchronous, virtual learning during the SARS-CoV-2 pandemic. Though challenging, this transition enhanced access to external speakers and increased faculty and staff attendance. The virtual platform facilitated active learning with integrated polling questions, chat functionality, and breakout rooms for small group discussions.

Conclusions

Implementation of an interprofessional critical care education curriculum at an academic medical center was feasible and acceptable. We believe IES can serve as a model for IPE in advanced critical care training programs.

Author disclosures are available with the text of this article at www.atsjournals.org.

Table 1. Readiness for Interprofessional Learning Scale (RIPLS) questionnaire domain scores before and after implementation of the Interdisciplinary Education Series

	Before (n = 25)	After (n = 25)	P Value
Domain 1: teamwork*	4.58 ± 0.44	4.62 ± 0.44	0.69
Domain 2: patient centeredness*	4.62 ± 0.41	4.59 ± 0.45	0.68
Domain 3: professional identity†	2.17 ± 0.76	2.10 ± 0.97	0.81

Results reflect the mean ± standard deviation of responses to individual survey questions within each domain of the RIPLS questionnaire (11).

*Responses based on 5-point Likert scale (1 = Strongly disagree, 5 = Strongly agree); higher score indicates positive attitudes toward the domain.

†Responses based on 5-point Likert scale (1 = Strongly disagree, 5 = Strongly agree); higher score indicates negative attitudes toward other professions.

REFERENCES

1. Thistlethwaite J. Interprofessional education: a review of context, learning and the research agenda. *Med Educ* 2012;46:58–70.
2. Michalsen A, Long AC, DeKeyser Ganz F, White DB, Jensen HI, Metaxa V, *et al.* Interprofessional shared decision-making in the ICU: a systematic review and recommendations from an expert panel. *Crit Care Med* 2019;47:1258–1266.
3. Herath C, Zhou Y, Gan Y, Nakandawire N, Gong Y, Lu Z. A comparative study of interprofessional education in global health care: a systematic review. *Medicine (Baltimore)* 2017;96:e7336.
4. Guraya SY, Barr H. The effectiveness of interprofessional education in healthcare: a systematic review and meta-analysis. *Kaohsiung J Med Sci* 2018;34:160–165.
5. Reeves S, Perrier L, Goldman J, Freeth D, Zwarenstein M. Interprofessional education: effects on professional practice and healthcare outcomes (update). *Cochrane Database Syst Rev* 2013;2013:CD002213.
6. Tisherman SA, Spevetz A, Blosser SA, Brown D, Chang C, Efron PA, *et al.* A case for change in adult critical care training for physicians in the United States: a white paper developed by the critical care as a specialty task force of the society of critical care medicine. *Crit Care Med* 2018;46:1577–1584.
7. Siuba MT, Bauer SR, Mireles-Cabodevila E. Continuous medical education changes practice: one year after SMART and SALT-ED. *Crit Care Explor* 2019;1:e0017.
8. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform* 2009;42:377–381.
9. Harris PA, Taylor R, Minor BL, Elliott V, Fernandez M, O'Neal L, *et al.*; REDCap Consortium. The REDCap consortium: building an international community of software platform partners. *J Biomed Inform* 2019;95:103208.
10. Reid R, Bruce D, Allstaff K, McLernon D. Validating the Readiness for Interprofessional Learning Scale (RIPLS) in the postgraduate context: are health care professionals ready for IPL? *Med Educ* 2006;40:415–422.
11. Parsell G, Bligh J. The development of a questionnaire to assess the readiness of health care students for interprofessional learning (RIPLS). *Med Educ* 1999;33:95–100.