

Interprofessional Education Module on Post-Intensive Care Syndrome for Internal Medicine Residents

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ABSTRACT

Background: Prevention of post-intensive care syndrome (PICS) in critically ill patients requires interprofessional collaboration among physicians, physical therapists, occupational therapists, speech-language pathologists, and nutritionists. Interprofessional education promotes interprofessional collaborative practice, yet formalized interprofessional education during residency is uncommon.

Objective: We sought to improve internal medicine residents' knowledge of interprofessional roles in the intensive care unit (ICU) and confidence in managing PICS by designing a virtual multimodal training module.

Methods: We created a 3-hour virtual module with physical therapy, occupational therapy, speech-language pathology, and nutrition experts. First, learners reviewed PICS and multidisciplinary interventions to optimize patient recovery. Second, attendees watched videos created by physical therapy and occupational therapy colleagues demonstrating mobility strategies to manage ICU-acquired weakness and delirium. Third, participants learned how speech-language pathology experts evaluate and manage swallowing disorders. Finally, attendees identified common nutritional therapy challenges with a trivia session. Participants completed pre- and postcourse assessments.

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Results: Thirty-four residents completed both pre- and postcourse assessments (52% response rate). The mean objective assessment score improved from 51% to 79% ($P < 0.001$). All respondents reported that their knowledge of PICS increased, and almost all (97%) believed that their knowledge of interprofessional roles increased. Respondents' confidence in facilitating discussions about critical illness recovery significantly improved, from 77% rating as either not very confident or not at all confident before the course to 94% rating as somewhat confident or very confident after the course ($P < 0.001$).

Conclusion: This single-site pilot study suggests that integrating interprofessional training in PICS education using virtual platforms may improve residents' knowledge of interprofessional roles in the ICU and confidence in managing PICS.

Keywords:

intensive care; interprofessional education; graduate medical education; curriculum; interprofessional collaborative practice

Post-intensive care syndrome (PICS) describes the physical, cognitive, and psychiatric impairments experienced by survivors of critical illness and has significant health, financial, and quality-of-life implications for patients and families (1). It is estimated that 25–80% of patients who survive critical illness experience one or more PICS impairments, and this percentage is expected to rise with the coronavirus disease (COVID-19) pandemic, as patients with severe illness often require prolonged intensive care unit (ICU) stays (1, 2). Current strategies to prevent PICS include implementation of the ABCDEF bundle (Assess, prevent, and manage pain; Both SAT and SBT trials; Choice of analgesia and sedation; Delirium: assess, prevent, and manage; Early mobility and exercise; and Family engagement and empowerment), an evidence-based multidisciplinary guide for optimizing patient recovery that emphasizes minimizing sedatives, preventing delirium, and early mobilization in the care of critically ill patients (1, 3). Interprofessional collaboration among physicians, nurses, and specialists in physical therapy (PT), occupational therapy (OT), speech-language pathology (SLP), and nutrition is critical to the

successful implementation of PICS prevention strategies.

Integration of interprofessional collaborative practice (IPCP) is a core educational requirement for graduate medical learners, and the Accreditation Council for Graduate Medical Education mandates that programs provide trainees with interprofessional learning opportunities (4). Interprofessional education (IPE) is intended to train health professionals in IPCP and occurs when “two or more professions learn with, about, and from each other to enable effective collaboration and improve health outcomes,” thus promoting collaborative practice (5). Despite awareness about the importance of teaching IPE so that residents graduate with competency in IPCP, consensus on how to best incorporate IPE into graduate medical education (GME) is lacking (6). Some programs use teaching on bedside rounds, whereas others lack IPE altogether (6, 7). Currently, IPE is most commonly taught in undergraduate medical education, where medical students learn alongside other interprofessional students at similar training levels (8, 9). Implementing IPE in

GME is inherently more challenging because of the unique position of residents as both learners and providers: they are not yet fully accredited professionals, but in the hierarchical structure of healthcare workers, residents are more closely aligned with practicing interprofessional colleagues or residents of their respective specialties (e.g., pharmacy residents) (6). Although most residency programs protect residents' educational time, liberating interprofessional colleagues to engage in IPE with residents requires financial and time commitments from the health system for these professionals to participate outside of direct patient care. Adequate funding and coordination across specialties serves as a major barrier to IPE adoption in GME (6, 7, 9, 10).

To teach internal medicine residents about PICS and interprofessional collaboration, we designed and piloted a novel educational intervention using a virtual interprofessional training module that incorporates didactics, simulation videos, and interactive learning strategies to increase learners' knowledge of interprofessional roles in patient recovery within the ICU and confidence in managing PICS.

METHODS

Our module was designed, implemented, and evaluated according to Kern's six-step model for curriculum design (11). We conducted a needs assessment to guide the development of goals and objectives; it also identified a paucity of knowledge of interprofessional roles within the ICU, which is a core competency as outlined by the Interprofessional Education Collaborative (IPEC) (12). We assembled a multidisciplinary team consisting of an internal medicine resident physician, a critical care physician, a physical therapist, an

occupational therapist, a speech-language pathologist, and a registered dietician to serve as an interprofessional team of instructors. The team identified the key roles and responsibilities of each discipline in the care of critically ill patients and designed specific learning objectives targeting the physician audience (Figure 1). We intentionally designed a teaching strategy that incorporates interprofessional roles into PICS education to create a relevant interprofessional learning experience, as discussed by Oandasan and Reeves (13).

We created a 3-hour virtual learning experience that was delivered during our institution's mandatory weekly didactic conference for internal medicine residents. This novel implementation strategy was informed by constraints on in-person teaching because of the COVID-19 pandemic. First, learners participated in an interactive, online didactic session led by a senior internal medicine resident and reviewed the physiological changes that occur in critical illness, the impact of PICS on patients and families, and evidence-based interventions to optimize patient recovery. Second, PT and OT colleagues led a combined didactic and demonstrative session at which attendees compared the roles of PT and OT in the ICU and viewed prerecorded videos demonstrating mobility strategies to reduce ICU-acquired weakness and delirium (*see* the data supplement). The videos were filmed to simulate care in the medical ICU at our quaternary care academic medical center. Third, participants watched a prerecorded video on swallow assessment with SLP experts and discussed diagnosis and management of swallowing disorders (*see* the data supplement). Fourth, registered dietitians led an interactive, online gamified session in which attendees identified common challenges and

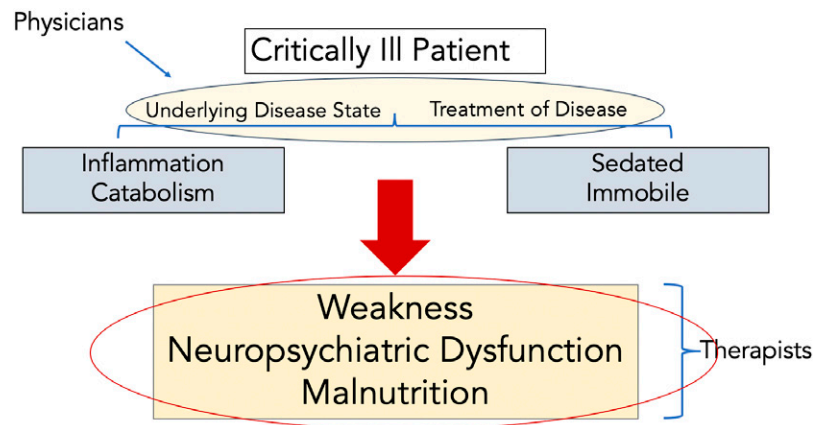


Figure 1. Representation of the roles of physicians and therapists in the care of critically ill patients. Physicians often focus on diagnosing and managing underlying disease states, which leads to systemic inflammation and may require prolonged sedation and immobilization. Both processes may result in weakness, neuropsychiatric dysfunction, and malnutrition, which are often addressed by therapists in the care of critically ill patients.

complications with nutritional therapy in the ICU. Finally, the session concluded with a reflective exercise, an important component of IPE teaching strategies (13), in which learners considered how knowledge of PICS and the role of interprofessional colleagues may affect their future practice.

To evaluate our module’s ability to increase learner awareness of the importance of interprofessional collaboration, we assessed knowledge of interprofessional roles in the ICU, guided by the IPEC competency framework and IPE assessment recommendations (12, 14, 15). To gauge the efficacy of our educational intervention, we considered both knowledge acquisition and learner confidence. On precourse assessment, attendees were asked five multiple-choice questions to measure knowledge of PICS and the roles of PT, OT, SLP, and nutrition, and they were asked to rate confidence in their ability to facilitate discussions about critical illness recovery using a four-point Likert scale (*see the data supplement*). After the session, participants answered the same precourse assessment questions and rated how much the module

increased their knowledge of PICS and the roles of PT, OT, SLP, and nutrition (*see the data supplement*). Objective knowledge gain was measured using a paired one-tailed *t*-test analysis of mean pre- and postcourse assessment multiple-choice question scores. To determine if residents’ confidence significantly changed, a McNemar statistical test was performed, and responses were dichotomized into confident and not confident, where a change from not confident to confident and a *P* value <0.05 was considered to indicate significance. Postcourse assessment subjective questions were analyzed using simple statistics. The study was reviewed by the University of Washington Institutional Review Board and deemed exempt.

RESULTS

Sixty-five internal medicine residents attended the educational module, and 34 participants completed both pre- and postcourse assessments, representing a 52% response rate. Objective assessment revealed knowledge gains of one or two questions from pre- to postcourse assessment, as demonstrated by

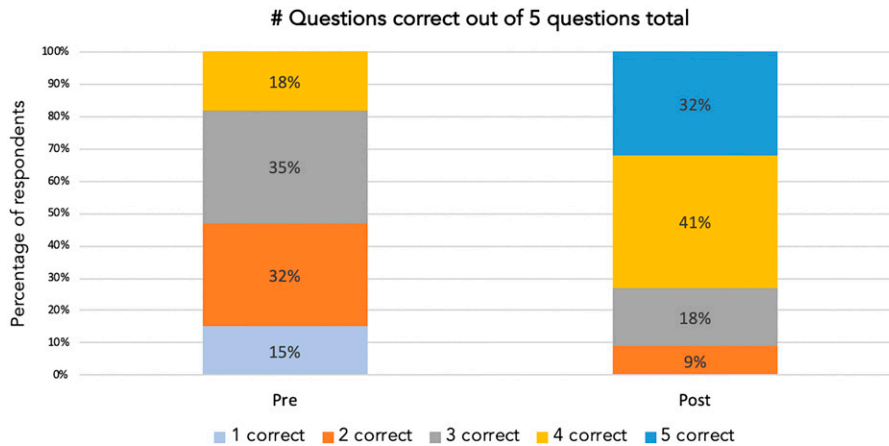


Figure 2. Pre- and postcourse assessment comparison of the number of multiple-choice questions (out of five total) answered correctly by respondents ($n = 34$). On the precourse assessment, 53% of respondents answered three or four questions correctly and no participants answered five questions correctly. On the postcourse assessment, 91% of respondents answered at least three questions correctly.

improvement in the total number of questions answered correctly (Figure 2; see Figure E6 in the data supplement). Mean objective assessment scores improved from an average score of 51% on the precourse assessment to 79% on the postcourse assessment ($P < 0.001$). Subjective assessment demonstrated that 100% of respondents believed that the module increased their knowledge of PICS, and almost all (97%) respondents believed that their knowledge of interprofessional colleagues, including PT, OT, SLP, and

nutrition experts, increased (see Figure E7). Respondents' confidence in facilitating discussions with patients and families about critical illness recovery also significantly improved, from 77% of respondents' rating themselves before the course as either not very confident or not at all confident to 94% rating themselves as somewhat confident or very confident after the course ($P < 0.001$) (Figure 3). Attendees provided written feedback indicating that they found the content engaging, educational, and practical

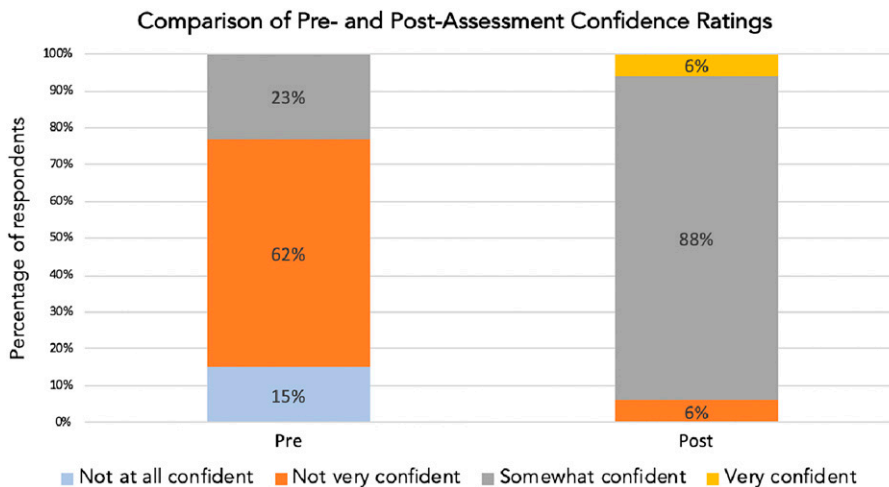


Figure 3. Pre- and postcourse assessment comparison of attendees' confidence in their ability to facilitate discussions with patients and families about their expectations for recovery from critical illness ($P < 0.001$).

overall. Examples of participants' comments include that the module "did a great job filling in gaps in our critical care training," and served as "a timely reminder that critical illness and its consequences extend beyond the ICU." Other comments included "it is nice to learn the perspective and roles of other non-physician team members," and "learning how therapists help patients recover from critical illness gives me more common ground for engaging them in patient care and discussions." One constructive comment stated that there was too much time spent watching videos.

DISCUSSION

This novel educational intervention used a multimodal, virtual, and interactive format to address the challenge of teaching resident physicians about the importance of IPCP by integrating interprofessional teaching with a curricular topic, in this case PICS. Our results suggest that this educational format may improve resident knowledge of PICS and the roles of PT, OT, SLP, and nutrition, as well as their confidence in facilitating discussions about the expectations of recovery from critical illness with patients and families.

New approaches for the integration of IPE in GME are important, as current standards are lacking. IPE is often taught informally during rounds or passively through classroom learning activities (6, 7). These methods may fail to clarify the critical roles played by interprofessional colleagues, may lack deliberate and focused learning objectives, and may not allow practical applications to specific scenarios. In our intervention, residents learned from interprofessional colleagues, rather than alongside them, in a clinically relevant educational experience. Although this model does not

reflect the true intent of IPE, which specifies interprofessional colleagues' learning together, it represents a novel approach to the complexities of implementing IPE in GME by creating opportunities for residents to learn about the essential roles of other specialties in caring for critically ill patients. Bridging this knowledge gap represents an important step toward achieving IPCP.

Using a structured approach to curriculum design, our educational module used an interprofessional framework to teach a specific curricular topic and enhanced learners' understanding of the value, skills, and roles of the interprofessional care team in a specific clinical environment.

Improving knowledge of other professions' roles in assessing and addressing the healthcare needs of patients achieves one of four major IPCP competencies articulated by the IPEC, a panel with representation from six national associations of the schools of the health professions, including the Association of American Medical Colleges (12). Our strategy of integrating interprofessional teaching with a relevant clinical topic may address learner concerns that IPE is less important than their profession-specific education (15) and suggests that IPCP is most relevant for learners when situated within a real-world clinical framework.

Strengths and Limitations

In this pilot, using virtual platforms with videos and standardized content facilitated the delivery of a high-yield and interactive educational experience to a large audience, which may be reproducible with minimal effort; it does not require physical space or financial resources, reduces the burden of coordinating schedules among numerous professionals, and can be adapted depending on the time available.

The complexity of coordinating IPE for busy residents and other interprofessional colleagues has led to slow adoption of IPE in GME and a lack of consensus about activities that improve IPCP in real-world clinical scenarios (10, 16). Our unique format allows residency programs to integrate teaching on interprofessional collaboration into existing educational spaces.

Limitations of this study include implementation of this module at a single institution with an approximate 50% response rate in evaluations, thus restricting generalizability and making our results prone to selection bias, as some attendees who did not respond may have rated their experiences differently. Furthermore, our study was focused on evaluation of participant experience and did not assess if the intervention improved clinical skills, IPCP, and/or competency in real-life clinical situations. Finally, our module included only resident physician learners and did not include other health professionals as participants; thus it did not represent true IPE. Further research on the impact of this educational intervention on learners in clinical practice, for both IPCP and management of PICS, is required.

Future opportunities include creating dedicated IPE sessions with interprofessional colleagues to build communication skills and improve the safety of handoffs in clinical settings. Virtual IPE and video sessions may also

be used as a strategy for teaching other core residency curricular topics. Possibilities include incorporating pulmonary rehabilitation into chronic lung disease teaching or respiratory therapy into mechanical ventilation education. Inviting interprofessional colleagues to help facilitate the teaching sessions and learn alongside residents could deepen the impact of IPCP on resident physicians and improve collaboration in real-world scenarios. Similar curricula could be repeated for different residency programs and/or institutions to increase sample size.

Conclusions

Recognition, prevention, and management of PICS require a multidisciplinary, interprofessional approach to care, yet formal education about interprofessional team members and their roles is often overlooked in GME. This study provides preliminary evidence that a virtual IPE module has the potential to improve resident knowledge of interprofessional roles in patient recovery within the ICU and confidence in managing PICS and requires confirmation in future research.

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