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Brief Report

From Learners to Leaders: Developing Clinician Educators Through Specialized Residency Training

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Introduction

The responsibilities of clinician educators (CEs) have progressively grown beyond simple excellence in bedside teaching to encompass responsibilities such as curriculum development, research, and administration.[1] This is reflected in the triad of characteristics of a modern CE as proposed by Sherbino et al: active clinical practice, application of educational theories, and engagement with educational scholarship.[2] In procedural specialties, the growing use of simulation-based training has added another set of required competencies. Some suggest that the completion of graduate-level educational programs is required to meet these demands although CE tracks during graduate medical education are uncommon in procedural specialties and often emphasize didactic learning with limited opportunities to implement this knowledge and engage in educational scholarship.[3] Whereas additional postgraduate training is valuable, this is often impractical for early career physicians as they navigate the difficult transition from clinical training to faculty.[4]

Recognizing that the final year of residency can be a critical point of career divergence for those interested in clinical education and to support the professional identity formation of qualified trainees, the Department of Anesthesiology at Washington University School of Medicine developed the Anesthesiology Clinician Educator Residency Track (ACE Track) to support the professional identity formation of qualified trainees interested in clinical education. Grounded in the Accreditation Council for Graduate Medical Education Clinician Educator Milestones, which provide a structured framework to assess and support the development medical educators across domains such as teaching, feedback, curriculum design, and educational scholarship, the program equips residents to excel as medical educators and begin to develop their professional identity as educators.[5,6] Moreover, by embracing the essential traits of a modern CE, the ACE Track curriculum creates the foundation from which participants can launch careers in academic medicine.

Materials/Methods

The ACE Track is an educational pathway combining didactic instruction, teaching, mentorship, and research throughout the final year of anesthesiology residency (CA-3), postgraduate year 4 (PGY-4). It is supervised by 3 faculty members with expertise in education (the Associate Vice Chair for Faculty and Educator Development, the Vice Chair for Education, and the Residency Program Director for Research and Scholarship) with the overarching goals to support residents in developing educational knowledge and skills and gaining insight into careers in medical education. The pathway includes 3 distinct components: instruction in educational theory and skills, active involvement in bedside and classroom teaching, and engagement in educational scholarship projects.

The ACE Track is structured as a longitudinal curriculum with didactic sessions, workshops, and dedicated project time spread throughout the academic year. Residents receive approximately 40 days over the course of the academic year free of clinical responsibilities to allow for focused involvement in ACE Track activities and, critically, meaningful contribution to scholarly projects. Residents in good academic standing are invited to apply for the ACE Track at the end of the third year of residency (CA-2/PGY-3). As part of the competitive application process, residents describe how participation in the ACE Track would support their intended career and propose specific educational projects that fit within their specific areas of interest. A selection committee, including the Residency Program Director, Assistant Program Director, and Vice Chair for Education, review all applications.

Residents in the ACE Track participate in "Developing Expertise in Clinical Education," a 6-month course for early career faculty taught by the department's Associate Vice Chair for Faculty and Educator Development, who holds a doctoral degree in education. Select sessions, such as effective clinical teaching, are taught in collaboration with clinical faculty who participated in the course in previous years for added clinical education

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context and perspective. The course covers didactic teaching, learning theory, clinical teaching, educator identity development, safe and effective learning environments, and effective feedback. Applications for the course are open to early career clinical educators in the department each fall. Cohorts have varied slightly in size from 9 to 17 participants. Virtual, synchronous sessions are offered twice per month to allow for flexibility and accommodate clinical schedules. The course is evaluated using a retrospective pre-post survey and culminates in a final reflective assignment.

Combining residents and early career faculty in the course sessions offers additional opportunity for identifying potential faculty collaborators and provides space for rich discussion of the topics from both the faculty and learner perspectives while reinforcing the idea that CE identity development is an ongoing process. The knowledge and skills acquired in this course are applied and reinforced as residents take on leadership roles in the education of medical students on anesthesiology rotations and junior anesthesiology residents. These including directing sessions in the simulation center, facilitating medical student case presentations, and co-leading professional development workshops for faculty and staff. Mentorship is provided by faculty leaders in these areas: Simulation sessions are led under guidance from our residency program leaders, facilitation of medical student presentations is guided by our Medical Student Director, and development and facilitation of professional development workshops is supported by the Associate Vice Chair for Faculty and Educator Development.

The ACE Track fosters purposeful collaboration by matching residents with faculty partners whose educational projects align with the residents' professional interests. Faculty partners, who are typically residency leadership team members or rotation directors, are paired with ACE Track residents based on shared interests or project goals. For example, a resident interested in curriculum development might work with a rotation director planning a curriculum redesign. We draw from this group because they are already engaged in educational work; whereas there is no financial incentive, they benefit from added support to advance projects they are already pursuing. Matching involves aligning residents' goals with department education leaders' ongoing initiatives. A continuously updated spreadsheet lists faculty goals and anticipated projects, serving as a resource during pairing discussions. Faculty partners commit to setting clear project outcomes; receive guidance and check-ins from the Associate Vice Chair for Faculty and Educator Development; and are expected to disseminate their work locally or nationally, modeling engagement in the scholarship of teaching and learning.[7]

Results

Implementation of ACE Track for 3 years has enhanced career development of participants, improved educational programming, and advanced the local culture around education. In 2022–2023, we had 1 participant; in 2023–2024, we had 2 participants; in 2024–2025, we reached our maximum capacity of 3 residents. Residents have taken on leadership roles in medical student education, curriculum development, and educational scholarship. Notable achievements of participants include the creation of a professionalism and career development curricula for fellows, facilitation of simulation sessions for medical students, and contributions to national conferences through workshops and abstract presentations (see Table 1 for an overview of outcomes). Ongoing data analysis indicates improvements in self-perceived knowledge and skills in educator competencies among participants to date (see Table 2 for retrospective pre-post survey items) though this assessment tool has not been validated.

Open responses to survey questions indicate positive reactions; for example, 1 resident shared, "Learning effective clinical education skills as I take the step from 'full-time learner' to 'full-time anesthesiologist' will forever affect the way I process my experiences in the OR." Others have cited personal development and professional goal setting as benefits (see Table 3).

In total, 6 residents have completed the ACE Track. Of these 6 residents, 5 decided to pursue fellowship training after residency, and so far, 3 have specifically embedded education into their postgraduation plans (see Table 4 for specific outcomes by participant). One participant reflected, "My goals are now to become an assistant professor within an academic setting and meaningfully impact resident education for the better." Additionally, interest and participation in the ACE Track has grown during each of the first 3 years of the program (1 applicant in 2022–2023 for 1 spot, 2 applicants in 2023–2024 for 2 spots, and 5 applicants for 2024–2025 reaching our maximum capacity of 3 spots). Requests for traditional research elective blocks has remained stable during these years (an average of 1–2 residents per year), but interestingly, we have experienced an increase in these residents utilizing research block time for education projects.

Discussion

Whereas CE pathways during residency have become increasingly common over the past decade, procedural specialties have been poorly represented. In a recent review of education tracks, 18 distinct programs were reviewed, none of which was tailored to anesthesiology or surgical residents.[3] A CE track for anesthesiology residents in the intervening period focuses on the acquisition of teaching skills.[8] The ACE Track represents the further evolution of these programs by emphasizing the implementation of educational skills in real-world situations and participation in education scholarship and curriculum development.

A significant advantage of the ACE Track is its structure as a longitudinal curriculum rather than a single month. This promotes sustained professional growth and the continuous application and refinement of skills learned as part of the "Developing Expertise in Clinical Education" course. Extending the program over the course of an academic year also enables participants to conduct meaningful educational scholarship projects from conception to implementation and evaluation. As the field of medical education grows, the longitudinal nature of the ACE track allows for new components to be added, such as those involving diversity, equity, and inclusion; professional coaching; and conflict resolution, without sacrificing

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current activities.

The feasibility of the ACE Track lies in funding the nonclinical time that participating residents receive across the year. This requires departmental support and clinical coverage as residents are relieved of operating room duties on the days they engage in education-related activities. This cost is partially offset by the reduced faculty burden for certain educational responsibilities. For instance, ACE Track residents lead orientation sessions and simulations for rotating medical students, and they deliver didactics and workshops during resident education time, which are roles traditionally filled by faculty.

Our program allows CA-3 residents to apply for elective time to pursue research, which previously encompassed education-related projects under the broader umbrella of basic or translational research. As interest in educational scholarship has grown, residents now apply specifically to the ACE Track instead of requesting traditional research time. Residents may not participate in both the ACE Track and separate research electives, and this helps maintain a manageable program scope and ensures equitable access to protected time.

Additional program costs include attendance at a spring education conference, which is supported by the departmental education budget (covering registration, travel, meals, and lodging), whereas poster printing is typically funded through residents' personal educational discretionary funds. To keep expenses low, we also leverage existing institutional resources. For example, ACE Track residents serve as facilitators for interprofessional simulation days funded by the medical school. These types of activities offer rich teaching experiences at minimal departmental cost. Administrative support is provided by our program coordinators and chief residents, included as part of their regular duties.

Some limitations arise that require flexibility; for example, there are occasionally days on which clinical demands necessitate ACE Track residents be pulled into a clinical placement. Ability to adapt to these changes as they arise can present challenges to educational projects and commitments. As interest in protected education time grows among our residents, we have reached a limit in terms of the number of learners we can accommodate in the track. This presents the challenge and next step of finding additional ways nonselected residents can still meaningfully engage in education development and projects. Another key next step will be longitudinally tracking outcomes from our participants across a variety of domains, including scholarly contributions to the field of anesthesiology education, curriculum development and delivery, teaching effectiveness, and leadership roles in education, among others. Additionally, future efforts to utilize a validated program evaluation tool would strengthen our ability to identify meaningful longitudinal outcomes. With adaptation to account for the clinical demands and scheduling structures of other programs, we believe that this longitudinal model combining career development, protected time, and mentorship can be successfully implemented in a variety of training programs.

Conclusion

The ACE Track is novel longitudinal curriculum for senior anesthesiology residents with an interest in medical education to obtain foundational experiences in all aspects of the field: knowledge acquisition, practical application, and scholarship. The pathway has been well-received by those who have participated, and the increase in applications is suggestive of the professional value of the ACE track. Overall, we are hopeful that the ACE track offers a model for other procedural specialties.

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Abstract

Introduction: The growing responsibilities of clinician educators in academic medicine necessitates structured training opportunities during residency. However, such programs are uncommon in procedural specialties. We developed the Anesthesiology Clinician Educator Residency Track (ACE Track) at Washington University School of Medicine to bridge this gap by fostering professional identity formation and preparing residents for careers in medical education.

Materials/Methods: The ACE Track is a longitudinal program integrating didactic instruction, teaching, mentorship, and educational scholarship during the fourth postgraduate year. Participants engage in coursework on educational theory, lead medical student and resident teaching sessions, and develop scholarly projects under faculty mentorship. Residents receive protected time to focus on educational initiatives, and selection is competitive based on career interest and project proposals.

Results: Over 3 years, the ACE Track has enhanced participant career development, expanded educational programming, and strengthened the department's educational culture. Graduates have taken on leadership roles, developed curricula, and contributed to national education conferences. Survey data indicate increased self-perceived competency in educational skills, professional identity formation, and career clarity.

Discussion: The ACE Track is a novel program that equips anesthesiology residents with foundational skills in medical education. Positive participant feedback and increasing applications suggest its value in academic career development, offering a framework for clinician-educator training in procedural fields.

Keywords: Education, professional identity formation, curriculum development

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Tables

Table 1. *Overview of ACE Track resident outputs and projects.*

Domain	Participant Activities
Teaching	• Center for Interprofessional Practice and Education standardized patient experience facilitator for occupational therapy, physical therapy, pharmacy, nursing, and medical students • Lead medical student simulation sessions • Co-lead department-wide educator development workshops with faculty (data reporting,[a] conflict resolution,[a] effective board review,[a] point-of-care ultrasound,[a] and clinical teaching[a])
Curriculum development	• Residency curricula (ultrasound skills[a] and transition to independent practice[a]) • Fellowship curricula (professionalism) • American Board of Anesthesiology key word of the week[a] • Curated resources related to American Board of Anesthesiology Advance outline[a]
Education scholarship	• Attend and present at the Society for Education in Anesthesiology annual conference • Facilitation of conference workshops • Contribute to additional education scholarship projects as co-author and/or co-presenter
Professional development	• Participate in clinician educator course

[a]Indicates activities unique to individual ACE Track participants based on projects/areas of interest.

Table 2. *Survey items.*

Retrospective Pre-Post Survey Questions
• I am able to define "clinician educator."[a]
• I am able to use the Clinician Educator Milestones to support my professional development.[a]
• I am able to define and deliver effective feedback.[a]
• I am able to apply active learning strategies to my didactics instruction.[a]
• I am able to understand how implicit biases may impact learning environments.[a]
• I am able to describe psychological safety and its importance for learners.[a]
• I am able to confidently plan for clinical teaching opportunities.[a]
• The following is how I would rate my interest in a career as a clinician educator.[b]
• How do you envision your future career?[c]
• What type of educational projects or topics are you interested in?[c]
• How would you describe the role of a clinician educator.[c]

[a]Indicates items rated on a 4-point Likert scale (*strongly disagree*, *disagree*, *agree*, *strongly agree*).

[b]Indicates item rated on a 5-point rating scale (1 = *not at all interested*, 3 = *moderately interested*, 5 = *extremely interested*).

[c]Indicates open-response questions repeated in pre-post surveys for comparison.

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Table 3. *Open-response comments from the post-program survey.*

Survey Responses
• "I [was] in the middle of determining long-term goals for myself, and this experience significantly helped me. I now see myself as a clinician educator and suspect I will remain in academic medicine. I was unsure, but this track helped me assess what I want for myself—and it will involve clinical education."
• "The ACE Track has given me a chance to pause at the peak of my residency experience to reflect."
• "This elective allows personal and professional development that is not often available or achieved while working in health care."
• "Learning effective clinical education skills as I take the step from 'full-time learner' to 'full-time anesthesiologist' will forever affect the way I process my experiences in the OR."
• "I have improved confidence in my abilities to teach and give feedback as a rising attending physician."

Table 4. *Individual ACE Track participant outcomes.*

Participant	ACE Track Scholarly Output(s)	Fellowship	Posttraining Status Year 1
1	• SEA Conference Workshop Presentation	Obstetric	Private Practice
2	• SEA Conference Abstract Presentation • Two coauthored manuscripts in progress	Cardiothoracic	Academics, Residency Rotation Director
3	• SEA Conference Abstract Presentation	Regional	Private Practice
4	• SEA Conference Idea Lab Presentation	Cardiothoracic/ Critical Care	To be determined
5	• SEA Conference Idea Lab Presentation • Washington University School of Medicine Education Day Abstract Presentation • Washington University School of Medicine Education Day Abstract Presentation	N/A	Military Medicine
6	• SEA Conference Abstract Presentation • SEA Conference Idea Lab Presentation • Association of American Medical Colleges Group on Faculty Affairs Conference Abstract Presentation • Washington University School of Medicine Education Day Abstract Presentation	Cardiothoracic	Academics

Abbreviation: SEA, Society for Education in Anesthesia.