



The Resident Learning Journey in the Medical Intensive Care Unit

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ABSTRACT

Background: The medical intensive care unit (MICU) offers rich resident learning opportunities, but traditional teaching strategies can be difficult to employ in this fast-paced, high-acuity environment. Resident perspectives of learning within this environment may improve our understanding of the common challenges residents face and inform novel approaches to transform the MICU educational experience.

Objective: We conducted a qualitative study of internal medicine residents to better understand their approach to learning the critical care activities that they are entrusted to perform in the MICU.

Methods: Using a thematic analysis approach, we conducted six focus group interviews with 15 internal medicine residents, separated by postgraduate year. A trained investigator led each interview, which was audio-recorded and transcribed verbatim for analysis. Our diverse research team, representing different career stages across the continuum of learning to minimize interpretive bias, identified codes and subsequent themes inductively. We refined these themes through group discussion and sensitizing social learning theory concepts using Wenger's community of practice and organized them to create learner archetypes and a conceptual framework of resident learning in the MICU.

Results: We identified three thematic resident learning categories: learning goals and motivation, clinical engagement, and interprofessional collaboration. We distinguished three learner archetypes, the novice, experiential learner, and practicing member, to describe progressive resident development within the interprofessional MICU team, the challenges they frequently encounter, and potential teaching strategies to facilitate learning.

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Conclusion: We developed a conceptual framework that describes the resident's journey to becoming a trusted, collaborating member of the interprofessional MICU team. We identified common developmental challenges residents face and offer educational strategies that may support their progress. These findings should inform future efforts to develop novel teaching strategies to promote resident learning in the MICU.

Keywords:

internship and residency/education; interprofessional education; intensive care units

The medical intensive care unit (MICU) offers rich opportunities for internal medicine residents to learn common principles of critical care practice and the physician's role within a highly-skilled, interprofessional team. However, the complex, unpredictable environment of the MICU often undermines the daily routines that support traditional structured and bedside teaching activities (1, 2). Clinical and schedule demands can challenge the feasibility of asynchronous or simulation-based education delivery, and the fast pace and high acuity of critical care practice can also limit opportunities for graduated resident autonomy that are important for learning (3–8).

Research regarding learning in the MICU has primarily focused on enhancing resident education using simulation or asynchronous electronic resources (4–6, 9). Less is known about clinical learning experiences within the intensive care unit (ICU) environment, with studies discussing the optimal

approach to specific concepts such as conflict resolution (10–12) and the learner's perspective of what makes a teacher effective (13, 14). There is limited information from a resident perspective about how they learn to perform their entrusted activities within the MICU environment and the barriers they encounter (15). The MICU provides internal medicine residents with the opportunity to care for patients with a broad range of common and complex clinical conditions and offers them an immersive interprofessional team experience during their training. A more complete understanding of the learning challenges residents face during their MICU experience and the strategies they use to overcome them could transform our current approach to education delivery and take full advantage of the exceptional learning opportunities in this clinical setting. Wenger first theorized that communities of practice form the building blocks of a

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social learning system (16). A community of practice is composed of a group of individuals with a shared purpose who advance their collective knowledge through regular interaction. New individuals who enter this community must learn the essential elements of what Wenger describes as social competence to be recognized as trusted, skilled, collaborating team members. Social competence is historically and socially defined by the community and refers to the ability of an individual to understand the community's collective purpose and to work together using well-established expectations, shared workflows and resources, and effective interpersonal relationships.

Considering this social theory of learning within the MICU environment is appealing. Interprofessional teams share the common goal of providing the best possible care to their critically ill patients. They coordinate the diverse talents of their team members to effectively deliver complex care using well-delineated admission and rounding routines, protocol-based care pathways supported by electronic health record order sets, and clearly defined roles and responsibilities. In this study, we explored how residents approach learning these skills when they join the MICU interprofessional team and what factors influence their journey toward becoming trusted, collaborating team members.

METHODS

We conducted a qualitative study using thematic analysis to explore residents' MICU learning experience. Thematic analysis is a systematic process used frequently in qualitative research to identify patterns related to subjects' descriptions of their experiences (17).

We used these themes to inform the creation of learner archetypes to better describe common developmental challenges that residents face as their entrusted role within the interprofessional team matures. We used sensitizing concepts from Wenger's theory of communities of practice to further guide our analysis and to develop a conceptual framework to provide a detailed characterization of the resident MICU learning experience. Our team consisted of individuals across the continuum of learning. T.L.H. was a third-year internal medicine resident during this project, who conducted all our focus groups and informed our data analysis discussions with detailed perspectives from his immediate MICU experiences. A.S.N., D.J.K., D.R.N., and J.G.P. are practicing pulmonary/critical care physicians and education leaders within our division who provided diverse viewpoints as early- and mid-career practitioners with extensive graduate medical education experience. A.P.S. is a qualitative medical education researcher who brought a rich perspective of medical education and qualitative research methods.

Setting, Participants, and Data Collection

We recruited internal medicine residents (postgraduate year PGY-1 to PGY-3) by e-mail solicitation at Mayo Clinic who had completed a rotation at St. Mary's Hospital MICU within the past 12 months. Resident physicians complete a 4-week MICU rotation each academic year, including both day and night shifts as well as participation in resident-only and mixed advanced practice provider-resident teams. All teams are supervised by a fellow and an attending physician. Residents play an integral role in the MICU teams, progressing from

primary patient providers to collaborative team leaders over time. We enrolled consecutive resident volunteers and assigned them to focus groups separated by PGY level. Focus groups provided us with the opportunity to broadly explore how residents approach learning in the MICU and obtain an in-depth understanding of the developmental challenges that they experience during their required MICU rotations.

Focus groups were led by a resident peer (T.L.H.), trained in qualitative research and focus group facilitation to minimize power differentials that may impact participants' responses. Residents provided informed consent before participating in a focus group. A focus group guide was developed through an iterative process using the study's aims, existing MICU clinical activities, interprofessional team composition, and existing curriculum with input from two collaborators with extensive prior experience in qualitative research (A.P.S. and D.J.K.) (18, 19). Study team members met regularly to perform concurrent analysis during data collection. Recruitment ended when the research team determined that the responses of the resident participants achieved sufficiency for the research question, as evidenced by the rich data obtained from in-depth focus groups (20). We performed six focus groups that consisted of 15 total residents, including 6 (40%) women. Participants included 6 (40%) PGY-1, 6 (40%) PGY-2, and 3 (20%) PGY-3 residents. Focus groups were conducted during the spring of 2020 via video teleconference (Zoom Video Communications Inc.) because of the coronavirus disease (COVID-19) pandemic. Although several resident participants reported that the pandemic had impacted their last MICU rotation, the

majority had completed their MICU experiences before this period and its disruptive influences.

Data Processing and Analysis

Focus groups were audio recorded and transcribed verbatim, and T.L.H. completed field notes with initial impressions after each session. We uploaded transcripts to the qualitative research software NVivo 11.0 for Windows (QSR International Pty Ltd.) to facilitate data analysis. Two investigators (T.L.H. and A.S.N.) started our exploratory thematic analysis with a thorough review of transcripts and field notes. We developed initial codes from these preliminary impressions and applied them to the transcripts, combining, separating, and clarifying them to develop the final codebook through regularly scheduled discussions. The investigator team met regularly to review and discuss the coded data and refine them iteratively into themes. We defined each theme with an accompanying narrative description to clearly apply it to the research question and inform understanding. We kept meeting minutes and tracked code book changes to help fulfill the criteria for trustworthiness (17–19, 21, 22). Using theory-informing inductive data analysis, we identified elements of Wenger's theory of communities of practice that guided the organization of our data into learner archetypes and the development of our conceptual framework (23).

Ethical Considerations

This study was reviewed and approved by the Mayo Clinic Institutional Review Board (IRB# 18-011840). Oral consent was obtained from all participants before the start of each focus group. Participation was voluntary, and participants could withdraw from the study at any point. All

participant data was deidentified during transcription to maintain anonymity.

RESULTS

Residents described many unique aspects of their MICU rotation that impacted their learning experience. The three major thematic categories we identified in our analysis were: 1) learning goals and motivation; 2) clinical engagement; and 3) interprofessional collaboration. These themes informed the development of the three archetypes used within our theoretical framework for progressive resident development: the novice, the experiential learner, and the practicing member. Although these archetypes roughly approximated each PGY level, the rate of individual learner progression through these archetypes over time varied by individual. Representative quotes are included with identification by resident.

The MICU Learning Environment

Residents described the MICU as a more complex environment than other practice settings that they experienced, with high patient acuity and frequent, often emotional interactions with patients and their families. The resulting charged environment, combined with residents' heavy sense of clinical responsibility, created frequent opportunities for memorable learning moments during their daily activities.

“I can speak for a patient that I was following very closely . . . things were going fairly well with him until we had to do a procedure; it was a bedside EGD, and the patient coded on us. Be mindful, this is literally my first inpatient rotation back in July, probably first week, and my patient already coded, and I felt like [. . .] I was partially responsible for that. And so, what was really a good teaching moment for that is getting out of that and doing the debriefing on the code and what things went well.”
- Resident 1

Residents also felt the dynamic nature of critical care practice was a strength. It provided them with regular opportunities to receive immediate feedback on their clinical decisions, such as seeing the physiologic response after starting a vasopressor, with rapid reinforcement (or immediate correction), and opportunities to explore the associated reasoning. Interestingly, residents described the collaborative support and autonomy they experienced working within a smaller team at night as significant facilitators of their learning experience.

“It’s always different between the day and the night shift. I think of every rotation, and I think that’s true of the MICU. I wish that the nighttime culture and the way that you are an independent practitioner of medicine at night and the camaraderie that comes with it could transition more to the day. I just feel like there’s this sense of you’re there, and you have to handle it at night that I really enjoy, and I think pushes you to learn.”
- Resident 2

Residents also identified the integral role that the interprofessional team played in their daily activities. They identified MICU rounds as an important part of their daily routine to develop a clear understanding of key clinical issues and plans for the day and recognized the value of interprofessional participation in that process. Although their experience with individual team members varied, residents often identified their interactions with advanced practice providers, nurses, respiratory therapists, and pharmacists as valuable opportunities for individual learning and gaining a better understanding of common practices and expectations.

“I had a couple of situations where I actually called a patient’s family from within the room, so that way nursing could actually hear what we were saying since our nursing staff are more frequently in contact with patient’s family than we are oftentimes. From

that standpoint, really knowing what they share with family and witnessing those conversations was really helpful, at least to my learning, and being a good team player on our patient's team.” - Resident 3

Across our focus groups, residents consistently underlined the importance of team camaraderie, collaboration, support, and trust to foster a strong educational environment. Residents described limited use of our extensive MICU curriculum resources, instead favoring more easily accessible resources formatted for rapid reference. We also identified that although residents valued formal teaching sessions highly, they had difficulty describing what they had learned, often citing the complexity and volume of information presented or clinical distractions during these experiences. The importance of reflection on the learning process was emphasized at every resident level.

Thematic Categories

We identified three major thematic categories to help describe the resident MICU learning experience. The first, learning goals and motivation, related to what residents were interested in learning through their MICU experience and what drove their desire to learn. The second, clinical engagement, represented how residents learned through their daily work in the MICU and the strategies that impacted this learning. The third, interprofessional collaboration, described how resident interactions with interprofessional team members contributed to their learning.

Archetypes

We developed a conceptual framework with three learner archetypes to better describe the resident's journey to social competence by theme within this MICU community of practice. Table 1

summarizes the core attributes of each of these learner archetypes.

The novice learner. The novice learner's primary motivation to learn during their ICU rotation is survival, with other goals general and poorly defined. Novice learners described a pressing need to learn daily ICU routines and the basics of their role and responsibilities (i.e., how to navigate the electronic medical record, admit and present patients, and efficiently perform daily tasks). The novice learner turns to their senior residents, fellows, and attendings for clear expectations and specific feedback to guide them throughout their rotation. Residents described being given the time and opportunity to reflect on a specific question, offer a clinical decision, and then discuss the result as essential to their learning process.

“I spent so much time looking up each of the details of the different pressors and the distinctions and trying to figure out what the right thing to do was. And because I had the responsibility for that decision, I think I learned a lot more about pressors in that night than I did, probably the rest of the rotation.” - Resident 4

Novice learners often found their administrative and clinical workload burdensome and difficult to manage, distracting them during dedicated teaching activities and limiting studying they did outside work. They preferred focused learning with only one to two relevant teaching points per patient on rounds and admitted to becoming distracted during longer rounding discussions thinking about the work of the day that needed to be done.

“When you're rounding, and you're going on for half an hour about something, at one patient, it gets overwhelming, and you're just stressed. You're thinking about your notes, and you're not listening” - Resident 5

Novice learners also described a limited understanding of the roles and

Table 1. Major attributes by theme and resident learner archetype

Archetype	Motivation, Learning Goals	Clinical Engagement	Interprofessional Collaboration
Novice	Survival	Consumed by daily tasks Preference for focused learning moments	Limited role clarity Insecurity
Experiential learner	Autonomy	Developing diagnostic and management skills Learner vulnerability, evolving professional identity	Growing understanding of team roles Interpersonal conflict
Practicing member	Improving independent clinical and team management skills	Refining common, complex decision-making Teaching and mentoring junior residents	Leveraging interprofessional roles Developing team leadership skills

responsibilities of other interprofessional MICU team members, leading to uncertainty and insecurity during common clinical interactions.

“From an actual acute event standpoint, I forget what was happening exactly, but the team was on rounds, and there was one patient on our team; I wasn’t the intern for them, but I had the pager, so I went to try and help out, and they were on a vent, and I didn’t know what was happening. And the nurse said, “Why don’t we try a little bit of fentanyl?” And I said, “Yeah, that sounds like a good idea” (laughs) and then she was able to guide me through what we should have been doing, and the patient did fine.” - Resident 6

Novice learners are very motivated to prove themselves, and residents described significant satisfaction when they had opportunities to make meaningful contributions to patient care activities. Repetition (rounding and presenting the same patient for consecutive days) and family communication (which forced residents to organize and summarize active clinical issues in layperson’s terms) facilitated these efforts. Serving as a primary participant in goals of care

conversations was also an important learning experience.

“I really liked the opportunity to be heavily involved in goals of care conversations, starting to think about the care of the patient more holistically, not just focused on necessarily what we can do to make them better but what we can do for them as a whole person.” - Resident 5

The experiential learner. Experiential learners have become familiar with the MICU environment and its community, with growing skills and confidence. Their primary motivation is to assert and strengthen their physician role, learning by doing to increase the scope of their entrusted activities within the interprofessional team. Common goals included independently identifying critically ill patients who required immediate intervention (sick vs. not sick) and understanding the indications for MICU admission. They viewed their clinical activities as an opportunity to practice and hone their clinical decision-making skills, including making initial diagnostic and management decisions in

the setting of undifferentiated critical illness with incomplete information. They relied on these experiences to gain greater facility with common interventions unique to the ICU environment (i.e., vasopressors, ventilators, and ultrasound exams) and found family conversations particularly valuable to grow their confidence and communication skills. With one notable exception, experiential learner study strategies were haphazard and often augmented by rapid electronic references, podcasts, and popular entry-level critical care textbooks.

“Learning in the MICU is really challenging because there’s only so much that you can read or so many videos of how to do a central line . . . I think what a lot of us feel is that there’s nothing like doing something in the moment and having that immediate feedback either from the patient, from the [attending], watching your vitals. And there are a lot of people that say the MICU is almost like a physiology lab because things happen moment by moment. And that’s how you learn physiology. [. . .] Learning by doing and actually getting your hands in there is what works the best.” - Resident 3

The autonomy that the experiential learner seeks is not without risk. Their evolving understanding of MICU practice often results in unfamiliar situations and stereotyped responses to different clinical syndromes. Because of this, the experiential learner seeks immediate feedback on their decisions as their highest-value learning strategy. In addition to traditional interactions with supervising fellows and faculty, residents identified advanced practice providers as an important resource for learning best practice habits, anticipatory planning, and efficiency in the ICU.

“I remember one evening when I was getting an admission and just having basic questions on approach, and I was really amazed with how knowledgeable and how much of a team player the NPs and PAs are. They have so much knowledge, and I think even more the experience that I personally lack that they were able to fill.” - Resident 7

The experiential learner seeks trust and recognition as a valued physician member within the interprofessional team.

However, their variable facility with the responsibilities required of this role and mixed understanding of interprofessional team member responsibilities can lead to breakdowns in communication and collaboration during daily clinical activities. These experiences negatively influence the learning environment from the resident perspective and can lead to insecurity and conflict.

“Some of the things that I found was a source of strain in the interpersonal team was . . . when everybody comes around for bedside rounds, oftentimes nursing will communicate things that I have not heard when asking them personally, right before rounds . . . that would’ve changed my plan, and they’ll add that right at the very end . . . and it’s always tough . . . you take those situations kind of personally, and you just have to be objective about it. But it sometimes seems like it’s more antagonistic than it should be.” - Resident 8

The practicing member. In contrast to the experiential learner, practicing members have a mature understanding of their physician role and responsibilities. Their primary motivation to learn is driven by their desire to refine their autonomous decision-making, which is prompted by a variety of factors such as curiosity, professionalism, or preparation for their future career. Although opportunities to hone core skills unique to ICU practice remained important, practicing members reflected the desire to understand more complex critical care decision-making (i.e., when to intubate or use prone positioning). They often described using reflection and debriefing with their supervising fellows and attendings to confirm their thought processes.

“We had a couple patients who got pretty unstable either on admission or later or both, and so after they had stabilized, then I would ask the fellow to go

through it with me and just make sure we were on the same page about why we did what at each step kind of . . . I really wanted to make sure that the way I was thinking through was appropriate.”
- Resident 9

During daily clinical activities, residents described expanding their understanding of the ICU role within the inpatient continuum of care, assuming more responsibility for leading rounds, teaching, and mentoring junior residents. As these responsibilities often overlapped with their supervising fellow and attending activities, they experienced intermittent tensions because of the varied styles and expectations that they encountered. In these situations, using their proscribed role within our MICU rounding framework and collaboratively developing plans, including significant clinical decisions and teaching points, with their supervisors before rounds maximized both efficiency and the educational environment for all team members.

“I like the structure [of rounds], with the dedicated time and order of operation for who speaks when and how much time they get, at least ballpark (laughs). [. . .] And at least for me, it gave me some time to look, praround on what we were going to talk about, whether it was talking about sepsis-3 guidelines or what have you. It just was nice to tailor some sort of salient point that the interns could take to the particular case that we have.” - Resident 10

Practicing members have a much more sophisticated understanding of interprofessional team roles and abilities and are learning to leverage these talents to better monitor and manage a larger cohort of patients. Although these interactions are not without conflict at times, residents exhibited significant maturity in the way they approached these challenging moments with interprofessional team members.

“One thing I do a lot that I think is really helpful is just ask, ‘What ideas do you have? What do you

think we should do?’ And then a lot of times the nurses will have ideas like, ‘Well, we could do this,’ and a lot of times those are great ideas, or sometimes there’s a reason that maybe that’s not a good idea. I think just always making sure that everyone’s opinion is able to be expressed and then addressed and go from there is really helpful.” - Resident 9

DISCUSSION

In this study, we describe three different resident learner archetypes that together capture different stages of the resident journey toward social competence within the MICU interprofessional team. Within this conceptual framework, professional identity formation is a socialization process. The themes that we identified roughly approximate the domains of Wenger’s community of practice, with a learner moving from legitimate peripheral participation to full membership within a group over time (24–26). Resident motivation and learning goals represent the lens through which residents view their MICU clinical activities and interprofessional interactions along this journey. This framework provides a guide to diagnosing resident trajectories toward social competence in the MICU and offers educational strategies that may facilitate resident progress toward this goal (Table 2).

The novice learner needs an early and clear understanding of their role and responsibilities, orientation to daily clinical workflow, and elimination of unnecessary cognitive load whenever possible (26). As daily clinical tasks consume most of their attention, their learning relies heavily on observing and modeling other team member behaviors. Repetition, focused opportunities to make meaningful clinical decisions, and regular participation in patient and family discussions will provide important moments for legitimate

Table 2. Suggested approaches to support learner progression by resident learner archetype

Archetype	Motivation, Learning Goals	Clinical Engagement	Interprofessional Collaboration
Novice	Model clinical behaviors	Decrease cognitive load Provide clear expectations and specific feedback	Ensure legitimate participation
Experiential learner	Identify opportunities for experience Integrate structured reflection	Provide guided autonomy with close supervision	Facilitate dedicated interprofessional interactions
Practicing member	Regular debriefing to align thought processes Develop habits for independent practice	Practice collaborative decision-making with team leadership Create teaching opportunities	Coach team management skills

participation, especially when coupled with time to reflect and immediate feedback.

The experiential learner needs structured autonomy support, an approach in which educators provide sufficient information or choices to help guide them to an appropriate decision while providing enough oversight to reduce the risk of error and interprofessional conflict (27, 28). These learners may benefit most from focused learning experiences on common critical care practices with structured opportunities for reflection, either using rapid access resources or debriefing (29). Dedicated learning experiences with interprofessional staff may offer an effective strategy to accelerate their understanding of team roles and mutual respect.

Practicing members are eager to perform the tasks that will be expected of them in independent practice and desire frequent feedback to compare and align their thought processes with their supervisors. The best approach to developing their interprofessional team management,

leadership, and educator skills in the MICU setting clearly requires more study (30).

Our findings echo another recent qualitative description of resident perspectives in a Canadian ICU system, which highlighted resident difficulty navigating the complex ICU environment and the mismatch between resident foundational knowledge goals and the teaching on advanced topics that they often received as major learning barriers (15). These residents were similar in experience to our novice learners, and their identified themes affirm our findings. Our study expands on this foundation to describe the longitudinal evolution of resident learning perspectives over time through multiple MICU rotations and broadens the discussion of the role that educators may play in this environment to include both interprofessional interactions and potential teaching strategies.

The use of entrustment decisions to operationalize safe, progressive learner engagement in clinical practice with progressive decreases in supervision is not a new concept in competency-based medical education (31, 32). Implementation of

these concepts, however, has proven challenging both because of the vast array of clinical competencies expected of a practicing physician and limits in opportunities for longitudinal direct observation because of the transient nature of a rotating resident schedule. Some authors have suggested that these entrustment decisions should focus instead on adaptive expertise, a learner's ability to adapt to different healthcare situations, cope with risks, and ask for help (33). These concepts align well with social learning theory, which argues that learning opportunities occur at the boundary between individuals outside of and members within a community of practice when competence and experience must converge (16).

An older survey of pulmonary critical care program directors identified other staff or residents, outside of the responsible attending or fellow, as a major source of resident teaching only 7% of the time (34). In contrast, the residents we interviewed described extensive learning opportunities during their daily, informal interactions with interprofessional staff. Our findings suggest that the integral roles that residents fulfill to deliver complex, coordinated care—and the regular interactions they have with more experienced interprofessional team members in the process—together teach them the core tenants of social competence that allow collaborating MICU team members to entrust them with increasing responsibility. A deliberate, structured approach to empower interprofessional team members within the MICU educational environment to serve as resident guides with the common goal of providing safe, effective patient care may therefore accelerate resident learning motivation, adaptation, and engagement (35). A recent

pilot study demonstrated that an ICU nurse orientation program on effective teamwork and the nursing role in resident education was feasible and well-received (36). Further study is needed to determine whether similar efforts may favorably impact resident development.

Limitations

This was a single-institution study, and we recognize that other internal medicine training programs may offer different MICU educational experiences that could alter the trajectory and developmental challenges residents face during their journey to social competence. In addition, although we were limited to three total PGY-3 participants, we felt that the depth of the resident responses and the added perspectives of our PGY-3 co-investigator enabled sufficiency to be obtained for this group. The majority of resident experiences that informed our focus group discussions also occurred before the COVID-19 pandemic, and although these findings may inform educator efforts to rebuild the MICU educational environment, they do not necessarily reflect the largely detrimental changes that many institutions have experienced during the intervening period.

We also recognize that there are many factors that influence resident progression to social competence and that the archetypes that we offer describe one small piece of a larger, more complex process of resident development throughout their training experience. Residents move through multiple different communities of practice throughout their training, in a different order on the basis of their rotation schedule and with different clinical experiences. Our conceptual framework, which informs learning strategies in the MICU alone, falls short of informing this longitudinal learning experience with

progressive entrustment in a broader range of clinical settings. Increasing meaningful participation and belonging of residents within a team-based, social learning system will also require a greater understanding of the interprofessional perspectives in the MICU and other practice settings. Recognizing the considerable staff turnover that many MICUs have experienced because of the ongoing COVID-19 pandemic, further research is needed to inform the feasibility, timing, and best approach to integrate these appealing but challenging concepts within the traditional structure of residency education.

Conclusions

We describe several unique features of the MICU learning environment that contribute to the resident's learning experience. We developed a conceptual

framework to describe resident stages of development on their journey to become a trusted team member within the MICU community of practice, including common challenges and potential educational strategies for support. This framework may serve as a guide to monitor resident progress and should inform future efforts to develop novel teaching strategies to promote resident learning in the MICU.

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