The Transition From Emergency Medicine Resident to Critical Care Fellow: A Road Map

Nicholas J. Johnson MD, Patrick J. Maher MD, Jenelle Badulak MD, and Andrew M. Luks MD

ABSTRACT
Emergency medicine (EM) residents now have a number of opportunities for fellowship training in critical care medicine (CCM). The aim of this review is to help EM residents navigate the application process, transition to fellowship, and start planning their careers beyond fellowship. Pathways to advanced training in CCM available for EM residents include internal medicine-CCM, anesthesiology-CCM, surgical critical care, and neurocritical care. Each has unique prerequisites, application timelines, and training requirements. EM residency graduates generally already have well-developed crisis management and team leadership skills and excel with procedures such as airway management, vascular access, and bedside ultrasound. Potential areas for growth for EM trainees include critical care physiology, end-of-life care, longitudinal inpatient care, and perioperative medicine. Career opportunities for physicians trained in EM and CCM are diverse and include options in community or academic settings. Some choose EM or CCM exclusively or engage in a mix of both. Academic positions with joint opportunities in EM and CCM are desirable, but can be challenging to negotiate. Many EM-CCM physicians serve as topic experts in their respective groups for clinical care, quality improvement, education, or research involving the interface between the ED and intensive care unit. As career paths in critical care continue to grow in popularity, EM residents, as well as CCM faculty and program directors, should be aware of the available fellowship options, as well as training and career development needs specific to EM residents.

Emergency physicians (EPs) are experts at resuscitating critically ill patients.1 On this foundation, many graduates of emergency medicine (EM) residency programs have developed an interest in critical care beyond the walls of the emergency department (ED).1–3 The reasons for this, while varied, likely include a desire to engage in longitudinal care and delve more deeply into critical care pathophysiology. In the past, some EPs pursued training via combined EM-internal medicine (IM) pathway or certification by sitting for the European Diploma of Intensive Care. Others trained via unaccredited paths and lobbied for years for defined training and certification opportunities.1,3,4 Because of these efforts, over the past 5 years, a number of training and board certification opportunities have become available.

In this article, we describe a road map for EM residents who are interested in pursuing critical care training and for faculty who might advise them. We begin by reviewing steps for preparation for critical care medicine (CCM) fellowship during residency training, including rotation selection, scholarly work, and mentorship. We also discuss the various training pathways, including prerequisites and application timelines. We review the limited available literature, supplemented with the experiences of our trainees and faculty. We then examine some special considerations for the EM-trained CCM fellow, including potential areas for growth, elective rotations, and academic and
professional development. Finally, we discuss the transition to the attending role, including career options and the job market.

**PREPARATION DURING RESIDENCY**

Once a resident develops an interest in further critical care training, preparation during residency is essential, as these fellowships are highly competitive. Important considerations include clinical rotation selection, scholarly activity, mentorship, critical care tracks, and involvement in professional organizations.

**Clinical Rotations**

Critical care rotations are an essential part of EM residency, particularly for prospective CCM fellows. These rotations serve several purposes including providing opportunities for career exploration and affirmation, enhancing residents’ understanding of critical care topics, facilitating identification of potential career mentors or referees for the fellowship application process, and fulfilling prerequisites for selected fellowship training pathways (Table 1). Other helpful clinical rotations during EM residency for the different training pathways include inpatient medical and surgical rotations; IM subspecialty rotations such as pulmonology, infectious diseases, and cardiology; palliative care rotations; ED-based critical care unit rotations; and critical care consultative services.

**Scholarly Activity**

While completion of a scholarly project is a residency review committee requirement for all EM residents, it is also an important opportunity for strengthening a critical care fellowship application. Scholarly activity is a way to demonstrate interest and investment in the field and can take one of several different forms. For example, involvement in critical care research, whether basic science, translational, or clinical outcomes research, can familiarize applicants with CCM literature while potentially leading to published manuscripts. Quality improvement projects, including the development of clinical protocols, can present leadership opportunities for improving care from the ED into the intensive care unit (ICU) environment. Educational initiatives, such as curriculum development, offer skills building opportunities for future clinician educators and enhance the resident’s foundational knowledge in critical care topics. Scholarly productivity is becoming particularly important at competitive programs as the number of EM-trained applicants increases.

**Mentorship**

In a young field like EM-CCM, mentorship is important for career success. Faculty mentors may be drawn from a diverse pool, including residency program directors, EM-CCM faculty, and intensivists from other specialties. Many residents have found input from multiple mentors with varied backgrounds to be helpful. Mentors can help early in residency with arranging for additional clinical rotations, facilitating networking, and overseeing research or academic projects. Later in residency, they are essential for navigating the application process. As the field grows, an increasing number of programs may have faculty who are dual trained in EM-CCM who can offer insight into the career models available after training. For institutions without EM-CCM faculty, virtual mentorship has been a successful model. Additional

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**Table 1**

<table>
<thead>
<tr>
<th>Training Pathway</th>
<th>Board Certification Available?</th>
<th>Prerequisites</th>
<th>Application Platform</th>
<th>Applications Open</th>
</tr>
</thead>
<tbody>
<tr>
<td>IM</td>
<td>Yes</td>
<td>6 mo of IM-based rotations; 3 mo in MICU</td>
<td>ERAS*</td>
<td>July, 1 year prior to fellowship start</td>
</tr>
<tr>
<td>Surgery</td>
<td>Yes</td>
<td>None; preparatory year embedded in fellowship</td>
<td>SAFAS or individual</td>
<td>May/June, 1 year prior to fellowship start</td>
</tr>
<tr>
<td>Anesthesia</td>
<td>Yes</td>
<td>4 mo of critical care training</td>
<td>SF Match</td>
<td>November, 1.5 years prior to fellowship start</td>
</tr>
<tr>
<td>Neurocritical care</td>
<td>Yes (via UCNS)</td>
<td>None</td>
<td>SF Match</td>
<td>October, 1.5 years prior to fellowship start</td>
</tr>
</tbody>
</table>

ERAS = Electronic Residency Application Service; IM = internal medicine; MICU = medical intensive care unit; SAFAS = Surgical Critical Care and Acute Care Surgery Fellowship Application Service; SF = San Francisco; UCNS = United Council for Neurologic Subspecialties. *While most (but not all) IM-based programs accept applications through ERAS, there is currently no National Resident Matching Program process.
guidance can be found through discussion boards with EM-CCM faculty through the American College of Emergency Physicians (ACEP) and residents and fellows through the Emergency Medicine Residents’ Association the (EMRA) Critical Care Division (https://www.emra.org/committees-divisions/critical-care-division/).7,9

**Critical Care Tracks**

One comprehensive way to address the needs of the EM resident bound for fellowship is the use of a critical care track.9 These tracks aid residents in developing a clinical or scholarly niche and provide structure to prepare for a career in academics or fellowship training.10 They generally include the following components: additional clinical rotations, structured mentorship, scholarly projects, collaborative meetings, and didactics. Critical care tracks provide graduating EM residents with necessary clinical skills, familiarity with the critical care literature, mentorship and scholarly support, and strong letters of recommendation to succeed as an applicant and critical care fellow.

**Professional Societies and Networking**

Residents can immerse themselves in the EM-CCM community through their professional society and create opportunities for networking and national leadership. Many professional societies in EM and CCM have EM-CCM–focused sections or groups (Table 2). The EMRA Critical Care Division serves to inspire interest in EM-CCM among medical students and residents, provide resources and guidance for the application process, publish educational products in EM-CCM, and facilitate networking among current EM-CCM fellows (https://www.emra.org/committees-divisions/critical-care-division/). Similar interest groups operate within ACEP (https://www.acep.org/criticalcare-section/), the Society of Critical Care Medicine (SCCM; http://www.sccm.org/Member-Center/Sections/Pages/Emergency-Medicine.aspx), the American Association of Emergency Medicine (AAEM; http://www.aaem.org/membership/critical-care-section), and the Society for Academic Emergency Medicine (SAEM; http://community.saem.org/communities/community-home?CommunityKey=5dc206d8-d248-4f71-aecd-e0490cdc3ba9).11–13 Attending section meetings during national conferences is a great way to interact with others in the field, including fellowship program directors and faculty.

In addition to opportunities based in the professional societies, a number of online networking options exist. For example, the Coalition for Critical Care Medicine in the Emergency Department (C3MED) was formed in 2003 and hosts an active e-mail discussion forum (c3med@yahoogroups.com) utilized by many EM-CCM faculty and fellows around the country.

**TRAINING PATHWAYS**

Graduates of EM training programs may pursue a number of training pathways in critical care, each with their own unique prerequisites, emphasis, and training requirements. They are summarized below and in Table 1, and an application timeline is depicted in

<table>
<thead>
<tr>
<th>Society/Organization</th>
<th>General Timeline for Abstract Submission*</th>
<th>General Timeline for Meeting Date*</th>
<th>EM-CCM Section?</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Academy of Emergency Medicine</td>
<td>November</td>
<td>March</td>
<td>Y</td>
</tr>
<tr>
<td>American Association for the Surgery of Trauma</td>
<td>June</td>
<td>September</td>
<td></td>
</tr>
<tr>
<td>American College of Chest Physicians</td>
<td>April</td>
<td>October</td>
<td>Y</td>
</tr>
<tr>
<td>American College of Emergency Physicians</td>
<td>April</td>
<td>October</td>
<td>Y</td>
</tr>
<tr>
<td>American Heart Association</td>
<td>June</td>
<td>November</td>
<td></td>
</tr>
<tr>
<td>American Thoracic Society</td>
<td>October</td>
<td>May</td>
<td></td>
</tr>
<tr>
<td>Eastern Association for the Surgery of Trauma</td>
<td>July</td>
<td>January-February</td>
<td></td>
</tr>
<tr>
<td>Emergency Medicine Resident’s Association</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Neurocritical Care Society</td>
<td>May</td>
<td>September</td>
<td></td>
</tr>
<tr>
<td>Society for Academic Emergency</td>
<td>November</td>
<td>May</td>
<td></td>
</tr>
<tr>
<td>Society of Critical Care Medicine</td>
<td>August</td>
<td>January-February</td>
<td></td>
</tr>
<tr>
<td>Society of Critical Care Anesthesiologists</td>
<td>January</td>
<td>April-May</td>
<td></td>
</tr>
<tr>
<td>Western Trauma Association</td>
<td>October</td>
<td>February-March</td>
<td></td>
</tr>
</tbody>
</table>

CCM = critical care medicine.

*These represent approximate dates; specific dates may vary from year to year.
Figure 1. Because board certification is likely essential for any new fellowship graduates planning to practice in the ICU setting, the opportunity for board certification should be an important factor when considering the appropriate pathway. Additional information about each pathway is available on the American Board of Emergency Medicine (ABEM) website (https://www.abem.org/public/).

**IM-CCM**

In 2011, the ABEM and the American Board of Internal Medicine (ABIM) agreed to co-sponsor board certification in IM-CCM for EPs. This 2-year pathway requires a minimum of 12 clinical months, 6 of which must involve caring for critically ill medical patients. An additional 3 months must involve caring for critically ill nonmedical patients. The remaining 12 months can be used for additional clinical training or academic development. Given this, the IM-CCM pathway may better suit applicants with an interest in research or academic medicine, as some programs allow substantial time for academic development when compared to the time available in other training pathways. Generally, these programs prepare fellows to work in a medical ICU (MICU), although many include significant exposure to surgical, neurologic, cardiac, and other aspects of critical care. Of note, the ABIM requires that only ABIM-certified individuals supervise IM residents in the MICU setting; only this training pathway fulfills this requirement for EM-trained intensivists.

EPs entering this pathway must complete at least 6 months of direct patient care experience in IM, of which at least 3 months must be in a MICU before they can supervise IM residents. This may be completed either prior to entering fellowship (i.e., during residency) or during the first year of fellowship before rotations that require IM resident supervision.

Although many programs participate in Electronic Residency Application Service (ERAS) not all do, so applicants should check with each program individually. Although there has been discussion among IM-CCM program directors at the national level about the possibility of a match, IM-CCM currently does participate in the National Resident Matching Program.
Programs typically interview and select candidates on a rolling basis. This can pose a significant challenge for applicants, who may begin to receive offers, and pressure to accept them, before they have had the opportunity to complete all of their interviews.

**Surgical Critical Care**

In 2013, the American Board of Surgery broadened its eligibility criteria to allow certification in surgical critical care (SCC) for EPs. The first year of this 2-year fellowship is a “preparatory year as an advanced preliminary resident in surgery” during which the EP gains expertise in the management of surgical patients. The exact composition of this year is at the discretion of individual SCC program directors but is designed to provide broad exposure to the care of perioperative patients; the number of surgical ICU months is limited to three during this year. Because the exact structure of this year remains at the discretion of individual programs, applicants should discuss with program leadership how this year will meet their educational needs. The second year is a traditional SCC fellowship, during which 8 months must take place in a surgical ICU. Graduates typically seek employment in a surgical ICU.

Many SCC programs accept applications on a rolling basis beginning in the spring or summer in the year prior to matriculation. While SCC uses the NRMP, programs vary on the process by which they handle EP applications. Some programs accept applications via the Surgical Critical Care and Acute Care Surgery Fellowship Application Service (SAFAS), but others require individual applications.

**Anesthesiology Critical Care Medicine**

**ACCM**

Also approved in 2013, Anesthesiology Critical Care Medicine (ACCM) is the newest pathway to board certification in critical care for EPs. Two years of training are required. Fellows must complete 3 months of rotations with a surgical focus within the first 6 months of training and a total of 12 months caring for surgical patients over the course of the fellowship program. Research electives are limited to no more than 2 months. Graduates typically seek employment in surgical ICUs.

To be eligible for this pathway, EPs must complete 4 months of critical care training during residency. ACCM applications are accepted on a rolling basis beginning in the winter or spring in the year prior to matriculation. ACCM programs participate in the San Francisco (SF) Match (www.sfmatch.org).

**Neurocritical Care**

The United Council for Neurologic Subspecialties (UCNS), an organization separate from the American Board of Medical Specialties, has accepted EPs for training and certification in neurocritical care for many years, and a number of fellowship programs have a history of training EPs. This pathway is also 2 years, with a heavy emphasis on critically ill neurologic patients and other aspects of critical care. The UCNS maintains a fellowship database (www.ucns.org), and the majority of programs participate in the SF Match.

**EM/IM/Critical Care Pathway**

EPs who have trained via the combined EM/IM pathway are eligible for any of the above critical care fellowships. In addition, there are several combined 6-year EM/IM/critical care programs throughout the country. Applicants apply separately to EM/IM programs during the residency application process. The decision to complete the critical care portion can be made before or during residency, depending on the individual program.

**FELLOWSHIP CONSIDERATIONS**

The transition from EM resident to CCM fellow is both exciting and challenging. Generally, critical care fellows work longer hours than the latter years of most EM residencies with greater on-call responsibilities, although variability exists among fellowship programs.

In terms of core critical care knowledge, EM-trained fellows fare well compared with their counterparts. In 2014, the pass rate for the 25 EPs who sat for the IM-CCM examination was 100%, compared with 89% among all candidates.14 In 2015, the pass rate was 85% for both EPs and all candidates taking the IM-CCM examination. With regard to ACCM candidates, the pass rates for EPs in 2015 was 82%, compared with 77% among all candidates.15 An older study compared scores on the SCCM’s Multidisciplinary Critical Care Knowledge Assessment Program over a 4-year period at a single training program16 and found no difference in mean scores between fellows with backgrounds in EM or surgery.

Emergency medicine–trained critical care fellows enter fellowship training with significant procedural expertise acquired during residency. These skill sets in
Airway management, arterial and venous access, tube thoracostomy placement, and point-of-care ultrasound are highly valued in the ICU and often lead to opportunities to teach not only residents, but also other fellows.

As with critical care fellows from all residency training backgrounds, EP physicians have knowledge and skills gaps that warrant attention during fellowship. In addition to skill sets that apply to all trainees, such as mechanical ventilation and cardiorespiratory physiology, specific knowledge deficits unique to EM-CCM fellows may include IM topics (such as infectious diseases, pulmonology, nephrology, endocrinology, and hematology-oncology), perioperative care, and nutrition. Additional training in palliative and end-of-life care is often necessary for all fellows given the protracted nature and complexity of many patient care situations in the ICU. Additional exposure to these topics may be achieved through ICU or elective rotations and/or independent learning during residency and fellowship training.

Leading an ICU team is a new experience for most fellows, including those from an EM-CCM background. EM-CCM fellows must master the art of conducting patient-centered, efficient, and educational ICU rounds with a multidisciplinary team of doctors, nurses, pharmacists, and other staff. Teaching during rounds requires not only a mastery of critical care concepts and literature, but also thoughtful delivery and timing sharpened by practice and preparation.

CAREER CONSIDERATIONS

Unlike most EM residency graduates, EM-CCM fellows are often applying for two jobs, one in EM and one in critical care. This requires careful planning and negotiation. Because CCM fellowships take only 2 years, it is important to start the career planning process early (Figure 2). We recommend beginning the job search during the summer before the second year of fellowship. Just as in residency, the importance of strong mentoring relationships during fellowship cannot be overstated.

A wide variety of career configurations exists for EM-CCM graduates. In addition to deciding among academic, community, or a hybrid setting, EM-CCM fellows may practice EM, critical care, or both. According to one survey of EM-CCM fellowship graduates, approximately half practiced both EM and CCM, and nearly two-thirds practiced in academic institutions, although this survey is 6 years old and was completed prior to the availability of board certification.17

Emergency department–based critical care units represent another emerging, unique career opportunity for EM-CCM physicians.18 The Resuscitation and Acute Critical Care (RACC) Unit at Stony Brook University and the Emergency Critical Care Center (EC3) at the University of Michigan are examples of this effort.19,20 These units vary in design and structure, but they generally aim to provide more comprehensive and prolonged critical care to ED patients, often in response to crowding of inpatient ICUs.

A key challenge described by many graduates of EM-CCM fellowships is securing attending time in the ICU, especially at academic medical centers, where the ICUs are often controlled by departments of medicine, anesthesiology, or surgery who have an incentive to staff the units with faculty from their department. EM graduates have not traditionally filled the role of intensivist, except at a few institutions,17 and are often primarily employed by EM departments or divisions, which have not traditionally administered or been financially linked to the ICUs. Within academia, many individuals found success by first interfacing

Figure 2. Timeline of key events during fellowship for EM-CCM fellows. ABEM = American Board of Emergency Medicine; CCM = critical care medicine.
with EM department chairs or division heads, who have facilitated interactions with critical care leadership. A complete discussion of how to handle negotiations to secure a role in the ED and ICU is beyond the scope of this paper.

Many EM-CCM academic faculty have become leaders in research, education, quality assurance, and clinical care. Some have become independently funded investigators, but it can be challenging to balance practice the ED and ICU while maintaining an active research career. A number of seminal studies and guidelines in critical care were authored by EM-CCM academic faculty.21–24

Physicians trained in both EM and CCM are uniquely positioned within the healthcare system, possessing insight into delivery of care across a wide spectrum. There are a variety of ways to improve the practice of medicine as a whole through clinical pathway developments, quality improvement, research, and facilitating intraspecialty and intraprofessional communication and mutual understanding.

Outside of academia, demand for critical care specialists exists is anticipated to remain high given concerns about a national intensivist shortage.25–27 Further, some data suggest that interest in critical care practice among many IM, surgery, and anesthesiology residents has waned.28–30 One barrier to joining private practice critical care groups is that many of these groups also provide inpatient and outpatient pulmonary medicine services at their affiliated hospitals. Because EM-CCM fellows do not receive formal training or certification in pulmonary medicine, this is a potential barrier to hiring, but many individuals have successfully joined private groups.

CONCLUSION

The training pathways for emergency physicians interested in critical care medicine are varied and complex, each with their own unique clinical emphasis, training requirements, and application processes. Residents, and the faculty who advise them, should learn about the various training options and requirements and work closely with an informed mentor who can help them navigate the process.

References

17. Mayglothling JA, Gunnerson KJ, Huang DT. Current practice, demographics, and trends of critical care trained