



EMRA Fellowship Guide

Opportunities for Emergency Physicians

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EMRA Fellowship Guide 2018

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Table of Contents

Addiction Medicine	1
Administration/ED Operations/Patient Safety & Quality Improvement	6
Aerospace Medicine	13
Cardiovascular Emergencies	19
Critical Care	
Anesthesia Critical Care Medicine	24
Internal Medicine Critical Care Medicine	31
Neurological Critical Care	39
Surgical Critical Care	47
Disaster Medicine	54
Emergency Medical Services (EMS)	62
Forensic Emergency Medicine	69
Geriatric Emergency Medicine (GEM)	73
Health Policy	78
Informatics	85
Injury Control	91
International Emergency Medicine/Global Emergency Medicine	96
Medical Education	105
Neurovascular/Stroke	111
Observation Medicine	116
Occupational and Environmental Health	121
Pain Medicine	126
Palliative Care	131
Pediatric Emergency Medicine	139
Population Health and Social Emergency Medicine	145
Research	150
Resuscitation	157
Simulation	164
Sports Medicine (PCSM, Primary Care Sports Medicine)	172
Tactical Medicine	177
Telemedicine	183
Toxicology	188
Ultrasound	194
Undersea and Hyperbaric Medicine	199
Wilderness Medicine	204
Women's Health	211

Addiction Medicine Fellowship

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INTRODUCTION

Description of the specialty

Addiction medicine physicians work in clinical medicine, public health, educational, and research settings to advance the prevention and treatment of addiction and substance-related health conditions, as per the Addiction Medicine Foundation (AMF, formerly the American Board of Addiction Medicine or ABAM) Scope of Practice.

The 2014 National Survey on Drug Use and Health demonstrated that of the 21.2 million Americans who needed treatment for substance use disorders, only about 10% had received specialized treatment services. Though many barriers to treatment exist, one barrier to adequate treatment opportunities is a shortage of physicians with specialized training in addiction medicine. Other challenges arise from insufficient training in medical schools and graduate medical education, leading to limited appreciation of the biological mechanism of addiction and its foundation in the bio-psycho-social framework. According to the Addiction Medicine Foundation, there are 55 approved addiction medicine fellowships in 27 states and the District of Columbia. This number continues to grow. The AMF holds a goal of supporting 65 fellowship programs by 2020, and 125 by 2025.

Emergency departments are often the only point of contact with the health care system for many out-of-treatment patients with active substance use and with substance use disorders, which highlights the importance of ED-based programs that provide screening, brief intervention, and referral to treatment (SBIRT), overdose prevention education, or otherwise facilitate treatment enrollment.

History of the specialty/fellowship pathway

Addiction medicine has had a seat in the American Medical Association House of Delegates since 1988, and it was recognized as a “self-designated specialty” in 1990. The American Society of Addiction Medicine (ASAM) supervised certification in addiction medicine from 1984-2008. In 2009, the ABAM assumed supervision of the certification, and it transitioned from being a certification by specialty society to a board certification. In March 2016, the American Board of Medical Specialties (ABMS) recognized addiction medicine as a subspecialty under the American Board of Preventative Medicine (ABPM), beginning the final step to becoming an ACGME approved specialty. The first board exam in Addiction Medicine was administered in 2017, and is currently administered yearly in the fall. Addiction psychiatry was recognized by ABMS as a subspecialty in 1991 and maintains an independent board certification process through the American Board of Psychiatry and Neurology.

As addiction medicine transitions to an ACGME recognized subspecialty under the purview of preventive medicine, a full 1-year fellowship training program will be required following completion of a primary specialty residency. Some fellowships offer an additional year of research or other scholarly training in addiction medicine. A written exam is required for board certification. Additional training avenues exist today, but these will be closed after the grandfathering period, which ends in 2022.

Why residents choose to follow this career path

Emergency physicians with an interest in prevention of unhealthy substance use and in the treatment of substance use disorders both during and after an ED visit are most likely to pursue this pathway. Addiction medicine fellowships provide specific training for clinicians regarding the knowledge and skills required to provide clinical care for patients with substance use disorders.

How do I know if this path is right for me?

If you have a specific interest in providing care for and improving the lives of patients affected by substance use and substance use disorders, and you are considering additional training, this path may be for you.

Career options after fellowship

Depending on specific skills and training obtained during your fellowship, you may work in a variety of clinical, policy, and research settings. Many academic emergency departments prefer to hire fellowship-trained faculty, and if you are drawn to addiction medicine, a fellowship can provide you

the skills and experience to establish your niche in emergency medicine. Other opportunities can be found at specialized treatment centers, private practice, government agencies, consulting, and in health policy.

Splitting time between departments

This can likely be arranged if desired, depending on departmental funding and staffing. Training in addiction medicine will equip you to provide clinical care for patients at a variety of inpatient and outpatient addiction treatment settings.

Academic vs. community positions

Many physicians taking this route will take academic positions, although the need for addiction specialists is significant, and community/private practice options will be available.

IN-DEPTH FELLOWSHIP INFORMATION

Number of fellowship programs

There are 55 AMF certified fellowship programs as of 2018, each with 1-4 training slots per year. AMF addiction medicine fellowships focus on the clinical care of patients with substance use disorders and many have an additional research component. A comprehensive document containing helpful information about each program may be found at: <https://www.addictionmedicinefoundation.org>.

Another option that would not result in addiction medicine board certification but would provide enhanced training is to pursue either a general research or an injury prevention fellowship with a focus on substance use or addiction medicine. Additional information can be found in the chapters for the respective fellowships.

Finally, other options to gain research training in addiction medicine include institutional K awards such as Yale University’s 3 year NIDA-funded Drug Abuse, Addiction and HIV Scholar K12 Program (DAHRS), the National Clinical Scholars Program (NCSP), or individual K awards. One would need to investigate how to integrate this training into the clinical requirements to be able to apply for the board examination.

Differences between programs

Within AMF certified addiction medicine programs, wide variation exists with regard to specific rotations, clinical training opportunities, and research requirements, although all programs provide a firm foundation in clinical addiction medicine. Individual program requirements will vary based on how the

fellowship is funded and structured, as well as the clinical needs of the affiliated program. Core rotations include outpatient treatment, inpatient treatment, and detoxification. Fellowships may offer a special focus on adolescent substance use prevention.

If you pursue a research fellowship, the DAHRS or NCSP program, or an injury prevention fellowship, you may not receive significant training in clinical addiction medicine, and will likely not be eligible to sit for board certification.

Length of time required to complete fellowship

Most are 1-2 years. Generally, one year of clinical work is required for ABMS board certification, with some programs offering the potential for an additional research year.

Skills acquired during fellowship

This is highly variable across types of fellowships. The clinical addiction medicine fellowships focus on the clinical care and treatment of substance use disorders. Many fellowships also offer research or education training skills.

Typical rotations/curriculum

Traditional addiction medicine fellowships likely will focus on in- and out-patient management of substance use disorders. Research-focused addiction medicine fellowships may be largely research, with clinical EM, and little to no time working in specialized treatment centers.

Board certification after Fellowship

The American Board of Medical Specialties has recently recognized addiction medicine as a multidisciplinary subspecialty. Board certification is regulated by the American Board of Preventative Medicine. Currently there are three pathways to board certification, however, by 2022, all candidates will be required to complete a fellowship training program prior to sitting for the board examination. Current ABAM diplomats and addiction medicine practitioners meeting specific requirements may be eligible for board certification via “grandfathering” prior to 2022. The current specific requirements are delineated by the ABPM and can be found online at <https://www.theabpm.org/>

Average salary during fellowship

Salary varies depending on the program, but may be less than traditional EM-based fellowships. Some programs may allow moonlighting.

PREPARING TO APPLY

How competitive is the fellowship application process?

Traditional addiction medicine fellowship slots may go unfilled, although competitiveness varies by program. DAHRS and NCSP are small programs that usually have a very competitive application pool.

Requirements to apply

Graduation from an ACGME approved residency is generally required, although some programs will consider AOA trained applicants. Some addiction medicine programs may not be open to residents trained in EM, although most will consider EM trained applicants. Check individual program materials for specific program details.

Research requirements

Research expectations vary by program. Prior research experience and publications will be expected for most research-based fellowships.

Suggested elective rotations to take during residency

Rotations in toxicology, addiction medicine, injury prevention, or a research elective with a substance abuse focus may be helpful.

Suggestions on how to excel during these elective rotations

You will find allies who can foster specific exposures, experiences, and connections if you pursue these rotations as a motivated learner with a focused interest in addiction medicine.

Should I complete an away rotation?

Away rotations are not necessary, but may be helpful for gaining experiences that are not available at your own institution.

What can I do to stand out from the crowd?

Performing relevant away rotations and electives, publications in the realm of addiction medicine, and involvement in national organizations will make you an exceptional candidate.

Should I join a hospital committee?

This is not necessary, however, this type of experience could be very helpful in shaping your views of the benefits, challenges, and nuances intrinsic to the clinical practice of addiction medicine. It may help you establish connections within your community and the field, establish interest, round out your application, and most importantly, may allow you the opportunity to start making an impact in your community.

Publications other than research

Publications are generally viewed favorably, but not necessary for most addiction medicine fellowships.

How many recommendations should I get?**Who should write these recommendations?**

Requirements will vary by program. Plan to provide 3 letters of recommendations from individuals who have worked with you, who support your choices to pursue additional fellowship training, and who can attest to the qualities that will make you successful in research, policy or providing clinical care for patients with substance use disorders. One of these should be from your EM residency program director or chair.

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

Yes, although you should use that time to expand on this interest and further explore this field of medicine.

What if I'm a DO applicant?

AOA trainee acceptance may vary from program to program; check individual program literature prior to applying.

What if I am an international applicant?

There are no current barriers to international applicants.

APPLICATION PROCESS

How many applications should I submit?

This will be highly variable depending on which types of programs you choose. As a general rule, apply to as many programs as you can. Don't apply to programs in locations where you don't want to live or whose curriculum does not fit your career goals.

How do I pick the right program for me?

Talk to mentors, people in your field, and physicians who do the kind of work you are interested in pursuing. This route is a bit off the beaten path, so it's about knowing what you want and finding a program whose needs fit with your goals.

Common mistakes during the application process

Contact program directors early and ensure eligibility prior to applying. Be sure to have your application submitted as soon as possible.

Application deadlines

Deadlines vary, but it is best to research programs as early as possible to find a program that suits you well. Keep an eye on changing deadlines and new opportunities as programs become accredited for new fellowships and increased numbers of training positions. You should reach out to programs you are interested in as early as possible in the application cycle to get the specifics of their application process, but some positions may go unfilled, so your application may be considered at any time.

Tips for writing your personal statement

This is your chance to convey who you are and why you are interested in addiction medicine. Explain not only what sparked your interest in this field, but also how you plan on contributing to this specialty as a whole.

Is this a match process?

No.

What happens if I don't obtain a fellowship position?

Depending on your exact interest, there is always another way to get involved. Reach out to your mentors, program directors, and physicians doing the kind of work you are interested in pursuing.

INTERVIEW PROCESS

How do I stand out from the crowd?

Your background in EM already sets you apart. Your job is to communicate how that can be an asset to the fellowship program and your career in addiction medicine.

What types of questions are typically asked?

Expect to discuss your past clinical training and interest in addiction medicine, and your goals/expectations for fellowship training and beyond.

How many interviews should I go on?

At least a handful, but this will vary based on your geographic preferences as well as the kind of program you are interested in.

PREPARING FOR FELLOWSHIP

Textbooks to consider reading

Herron A, Brennan TK. The ASAM essentials of addiction medicine. Philadelphia, PA: Lippincott Williams & Wilkins; 2015.

Ries RK, Fiellin DA, Miller SC, Saitz R. The ASAM principles of addiction medicine. Philadelphia, PA: Lippincott Williams & Wilkins; 2014.

Important skills to practice while in residency to prepare for fellowship

Patient communication, motivational interviewing, empathy, and patient advocacy.

Tips on how to succeed as a fellow

Similar advice as with residency: show up early, work hard, be enthusiastic, and treat others as you would like to be treated.

CONCLUSION

Additional resources

Websites

<https://www.addictionmedicinefoundation.org>
<https://www.theabpm.org>

Journals

- Addiction
- Drug and Alcohol Dependence
- Substance Abuse
- Journal of Substance Abuse Treatment
- Addiction Science & Clinical Practice

National organizations

- [American Society of Addiction Medicine](#)
- [Addiction Medicine Foundation](#)
- [American Board of Preventative Medicine](#)
- [Association for Medical Education in Substance Abuse](#)
- [College on Problems for Drug Dependence](#)

Conferences

ASAM, AMERSA, and CPDD are all excellent annual meetings that offer competitive travel awards for those in training. These travel awards are an opportunity not only to offset the costs of attending the meeting, but also put you on the radar of experts in the field and provide additional mentorship opportunities. Applications for these are often due up to six months prior to the meetings.

How to find a mentor

This is crucial to your success in finding a fellowship that suits your needs. Look for experts who are doing the type of work or research you want to learn. If you are still defining your interests, cast a broad net and talk to several people with different backgrounds and foci in addiction medicine to see what appeals most. Use the internet, PubMed, and [NIH Reporter](#) to identify potential mentors. If your goal is to become an independently funded NIH researcher, find a mentor who has NIH funding. Remember that mentors do not need to be in the field of EM. Most people with expertise in addiction medicine are passionate about their work and are highly invested in the development of the field.

Administration/ED Operations/ Patient Safety & Quality Improvement Fellowships

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INTRODUCTION

Description of the specialty

Successful physicians have long known that the practice of medicine is equal parts art and science, but today's physicians also must be knowledgeable about the business of medicine. Administrative and operations fellowships in emergency medicine were designed to prepare residency graduates with the administrative, quality, health policy, patient safety, research, and operational skills necessary to lead an emergency department, hospital, or health care system, and to research the best approaches to ED operations. At some academic medical centers, institution-wide fellowships focused solely on patient safety and quality improvement have also been created.

History of the specialty/fellowship pathway

The first administrative EM fellowship was created by EPMG in California in 1990 and was followed by two more in 1993, one in Chicago founded by EMSCO Management Service and another at Orlando Regional Medical Center co-sponsored by EmCare. These first three fellowships were described in a 1995 publication of *Physician Executive* by Dr. Byron Scott, one of the earliest graduates of Orlando's Administrative Fellowship Program. Since that time, more than 30 EM administration and operations fellowships have come into existence, in addition to a dozen non-EM-specific patient safety fellowships.

Why residents choose to follow this career path

EM residency graduates interested in addressing patient care from a systems perspective, becoming a researcher in ED operations, and/or pursuing departmental or hospital-wide leadership roles may consider this career path.

Although a fellowship is not required to pursue this career path, fellowship training can lead to earlier opportunities to take ownership over impactful projects in an emergency department, creation of scholarship in this area, and mentorship to help cultivate your leadership and research skills. Fellowships may also help subsidize the cost of your graduate degree as a trade-off for the decreased salary you may make during your time as a fellow.

How do I know if this path is right for me?

If you see challenges as opportunities, if you enjoy thinking about the way patients flow through your department and how their care can be made more streamlined and safe, and if you are interested in the art and science of ED operations, then an administrative fellowship may be right for you.

Career options after fellowship

There are a number of career options available after fellowship, including medical director, patient safety and quality improvement officer, director of physician group practice, director of observation medicine, chief medical officer, payer leadership positions, health policy leadership positions, or research leadership positions, including the burgeoning field of health care delivery science.

Splitting time between departments

Unlike clinically based fellowships, splitting time between departments is not applicable for EM administrative fellows, however physicians with this skillset may have fewer clinical shifts in order to complete administrative projects and responsibilities.

Academic vs. community positions

Emergency departments need policies and protocols to run smoothly in both academic and community settings. The administrative and operational needs of each department will depend upon the patient population, local resource availability, and relationships between the emergency department and other services in the hospital. Fellowships exist in both settings; however, research-based fellowships are exclusively run out of academic medical centers.

Some fellowships are sponsored by local or regional groups of providers, while others are affiliated with large nationwide contract management groups. The clinical responsibilities, administrative responsibilities, and research requirements also vary among programs. Some fellowships are focused on operations at the department-level, while others also provide exposure to leading a hospital or health care system.

IN-DEPTH FELLOWSHIP INFORMATION

Number of programs

As of April 2018, there are more than 30 EM admin fellowship programs. Additionally, there are more than a dozen patient safety & quality improvement fellowships available to EM residency graduates.

- EM-Specific Admin Fellowships at Academic Centers
- Baylor College of Medicine
- Baystate Medical Center
- Carilion Clinic/Virginia Tech
- Emory University School of Medicine
- George Washington University (Medical Leadership & Operations)
- George Washington University (Operations Research)
- Harbor-UCLA
- Johns Hopkins University
- Loma Linda University
- Maricopa Medical Center
- New York Presbyterian Queens
- New York Presbyterian-Weill Cornell
- NYU Langone Health (Healthcare Leadership & Operations)
- NYU Langone Health (Kenneth and JoAnn G. Wellner Fellowship in Emergency Department Safety and Quality)
- Northwestern University
- Oregon Health & Science University
- Orlando Regional Medical Center
- St. Louis University
- Stanford University
- Staten Island University Hospital
- SUNY Downstate/Kings County
- Keck School of Medicine/LAC+USC
- The Ohio State University
- University of Chicago
- University of Colorado
- University of Massachusetts
- University of Michigan
- University of North Carolina
- Yale University
- EM-Specific Admin Fellowships with Contract Management Groups
- Emergent Medical Associates (Los Angeles Area)
- Envision (Available at Various Sites Nationwide)
- University of South Florida (TeamHealth)
- Vituity (Available at Various Sites Nationwide)
- EM Hybrid (Academic/Community) Programs
- ACEP/IES Administration, Quality, Informatics, and Policy Fellowship
- UCLA — VEP Healthcare

- UCLA — Antelope Valley Hospital
- Institution-Wide Admin Fellowships at Academic Centers
- Northwell Health
- Institution-Wide Patient Safety & Quality Improvement
- Christiana Care
- Harvard Medical School
- Kaiser Permanente Northern California
- NorthShore University HealthSystem
- Our Lady of the Lake
- Regions Hospital/Health Partners
- University of Florida College of Medicine — Jacksonville
- University of Pennsylvania
- VA Interprofessional Fellowship Program in Patient Safety (Six Sites)

Differences between programs

There are significant differences between programs advertised as administrative fellowships. Programs vary from a series of leadership lectures and hospital committee appointments offered by large contract management groups to traditional fellowship models at academic centers requiring peer-reviewed research and involvement with resident education.

Length of time required to complete fellowship

Fellowships vary in length from 1-2 years. Most 2-year fellowships will include a graduate degree such as a Master's of Business Administration (MBA), Master's of Health Administration (MHA), or a Master's of Public Health (MPH), although some do not. Some fellowships may result in advanced-level work (PhD), particularly those that focus on the science of ED operations.

Skills acquired during fellowship

Fellows should gain training in quality improvement, research, patient safety, economics/finance, billing/coding/reimbursement, health policy, risk management, process improvement, leadership, operations, staffing, utilization management, patient satisfaction, and medical informatics, as well as other areas that may be relevant to their interests and capstone projects. Outside of the clinical environment, fellows participating in programs that offer advanced degrees, will have the opportunity to learn information specific to their degree. Students completing traditional MBA programs will typically have the opportunity to choose electives and will have the opportunity to be exposed to a wider breadth of topics compared to healthcare-specific or executive MBA programs.

Typical rotations/curriculum

Clinical Responsibilities

Clinical responsibilities again vary across fellowships. Typically, the fellow will work as an attending physician in the clinical environment, either seeing patients primarily or supervising learners. It is important to balance protected time (not having a full clinical workload) to develop fellowship interests, but to work clinically enough to have a sense of operations and frontline staff. Fellows at most academic fellowship programs will work approximately 8 shifts per month.

Research Responsibilities

Most academic programs require fellows to conduct one or more IRB-approved research projects for publication in a peer-reviewed journal as part of their fellowship completion requirements. Other scholarly work, such as authoring presentations or book chapters, is encouraged. Fellowships with contract management groups or community sites will also typically require completion of a capstone project, though there may be less emphasis on publication.

Obtaining Advanced Degree

The paradigm of department chairs and medical directors learning “the business side of medicine” on the job is over. Today's physicians-in-training will most likely require an MD/MBA or equivalent training to become the next generation of physician leaders-prepared to create and manage the health systems of tomorrow. Contract management groups are often trying to create an internal leadership pipeline for their organizations, and if you stick with the group that trains you, obtaining an advanced degree may have no effect (positively or negatively) on your career trajectory. Most two-year academic administrative fellowships are coupled with completion of an MBA program, though some programs may also offer an MHA, MPA, or MPH. Generalized MBA programs will provide exposure to classmates from all industries and usually allow students more flexibility in choosing their courses, while executive or healthcare-specific MBA programs are less flexible and students may not have the opportunity to learn lessons from other industries that could potentially be applied to healthcare. MBA programs at top universities will typically require completion of the full MBA application used by general applicants, including the GMAT, while some MBA programs will automatically guarantee a spot to whomever is selected as the program's administrative fellow. Most, but not all, fellowship programs with an affiliated advanced degree fully subsidize the cost of the degree.

Administrative Responsibilities

These vary significantly from fellowship to fellowship, and it is vitally important to ask details about what your responsibilities will be. Be sure the fellowship's area of focus, and the areas of expertise of the core fellowship faculty match your areas of interest.

Board certification afterwards?

Administrative, quality improvement/patient safety, and operations fellowships are non-ACGME accredited and there is no additional board certification. However, other advanced credentials are available, such as the American Association for Physician Leadership's Certified Physician Executive (CPE) program or by becoming a Fellow of the American College of Healthcare Executives (FACHE) or the American College of Medical Quality (FACMQ).

Average salary during fellowship

Because of the wide variety of training formats, some programs at academic centers will pay on a PGY scale, while other academic programs may pay up to \$100,000 per year in salary. Fellowships based at contract management groups may pay you an hourly attending rate for your clinical shifts, in addition to a leadership stipend. It is important to consider your moonlighting opportunities and/or free tuition, if pursuing an advanced degree, as part of your overall compensation.

PREPARING TO APPLY

How competitive is the fellowship application process?

As a non-ACGME fellowship that does not use a centralized application process, there is no data available regarding the competitiveness of administrative fellowships, however not all programs are filled each year.

Requirements to apply

- Letter of interest/intent
- Updated CV
- Completion of ABEM-certified EM residency program
- 3 letters of recommendation (program director, administrative mentor)
- Some programs may require a GMAT score (determine if this is a requirement at programs you are interested in early so that you have time to study and receive your score before the fellowship/MBA program application deadline)
- Ability to obtain a medical license in the state you would like to complete your fellowship

Research requirements

Research is generally not required to apply, but demonstrating some evidence of scholarship in the area is helpful for your application, particularly for research-focused operations fellowships.

Suggested elective rotations to take during residency

Many residency programs offer administrative or medico-legal rotations where residents can spend time with department/hospital leadership learning the nuts and bolts of how the hospital/department is run or with risk-management specialists to learn more about ways to reduce patient harm, as well as reduce your risk of future liability. Residents may also consider completing the [Institute for Health Care Improvement's Open School](#) "Basic Certificate in Quality and Safety" course, which can be completed free of charge if your institution already has a subscription.

Suggestions on how to excel during these elective rotations

Several qualities are important for any administrative fellow. First, you must demonstrate leadership potential and the ability to manage change. Second, be sure that any projects you are involved in are executed fully. Delivering a polished final project is far more important than loose associations with many failed change efforts.

Should I complete an away rotation?

Away rotations are generally not necessary, especially given the length of time it takes to complete most administrative projects. That being said, if you have a fellowship that particularly interests you, see if you can visit or shadow for a couple of days.

What can I do to stand out from the crowd?

Demonstrate the ability to take an idea from conception to execution. This can be at the residency, department, or hospital level.

Should I join a hospital committee?

Any involvement with relevant administrative, research, quality, operations, IT, etc., is helpful. If you do join a committee, make sure to have an active role, and be able to describe your particular efforts for that committee.

Publications other than research

Any publication that shows that your contribution to a project or an area of expertise that you have is helpful.

How many recommendations should I get? Who should write these recommendations?

Most fellowship programs required 3 letters of recommendation. One letter should be from your residency program director and another should be from an administrative mentor.

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

Yes, as long as you continue to demonstrate interests in relevant content areas.

What if I'm a DO applicant?

There are no barriers for DO applicants.

What if I am an international applicant?

Please contact individual programs regarding whether they accept international applicants. In general, international applicants are usually required to be certified by the Educational Commission for Foreign Medical Graduates (ECFMG). You also must have a visa (traditionally a J-1).

APPLICATION PROCESS

How many applications should I submit?

As a non-ACGME fellowship that does not use a centralized application process, there is no data available regarding the competitiveness of administrative fellowships. Thus, it is hard for us to make recommendations about how many programs to which an applicant should apply. Our general advice is that you should only apply to programs that you would seriously consider accepting a fellowship offer from. Look also for programs that will best help you meet your future career goals.

The number of programs an applicant should apply to will be influenced by many factors, including geography and the areas you hope to gain expertise in during your fellowship training. For example, if you know you want to stay in a certain geographic area or stay on as faculty at a particular institution or there are only a few programs with an emphasis on what you would like to be your area of focus, your options are limited. If you're open to relocating anywhere in the country and want to be on a fast track to becoming a medical director, you may consider applying more widely or looking at programs offered by contract management groups.

How do I pick the right program for me?

There are a number of questions that an applicant must answer before deciding which program is right for them, including whether they want to be academic faculty — teaching residents and publishing peer-reviewed research — or whether they want to work in the community as part of a private group.

Applicants with specific interests in patient satisfaction, research, health policy, patient flow, observation-medicine, clinical pathways, resource utilization may find that certain programs offer faculty expertise or mentorship in these areas.

Common mistakes during the application process

Common mistakes include not being aware of important application deadlines for each program, not having a clear idea of what you hope to gain by completing the fellowship program, and not understanding the differences between degree-granting and non-degree granting fellowship programs.

Application deadlines

Deadlines are highly variable by program. Applicants should begin researching programs at least 1 year prior to completing their training to identify programs they may be interested in, making note of each programs application deadlines.

Tips for writing your personal statement

Be able to briefly explain your background, how it shaped you into the person you are today, what your future goals are, and how the program will help you get to where you hope to be.

Is this a match process?

No.

What happens if I don't obtain a fellowship position?

If you don't obtain a position during your first attempt, get a job with a group that will allow you opportunities for early leadership within your department. Become involved with hospital committees.

Reach out to programs that you were interested in and ask what you could do to become more competitive in the future. Reapply during the next application cycle if you are still interested..

INTERVIEW PROCESS

How do I stand out from the crowd?

During your interview, stand out from the crowd by being able to highlight your ongoing interest in this field by providing concrete examples of your prior leadership and accomplishments in terms of projects completed and your specific contributions.

What types of questions are typically asked?

In addition to typical interview questions, expect to answer focused questions regarding your leadership style, conflict management, and your 5-year plan.

How many interviews should I go on?

Similar to the number of programs you should apply to, consider where you are geographic and academic interests overlap. Since there is not a match process and many programs may offer rolling acceptances, start interviewing at places which you are most interested in first.

PREPARING FOR FELLOWSHIP

Textbooks to consider reading

- Crane JC, Noon C. The Definitive Guide to Emergency Department Operational Improvement. Boca Raton, FL: Productivity Press, 2011.
- Hall RW. Patient Flow: Reducing Delay in Healthcare Delivery. New York: Springer Publishing, 2013.
- Jensen K, Kirkpatrick DG. The Hospital Executive's Guide to Emergency Department Management. Danvers, MA: HealthLeaders Media, 2014.
- Jensen K, Mayer TA. The Patient Flow Advantage: How Hardwiring Hospital-Wide Flow Drives Competitive Performance. Pensacola, FL: Fire Starter Publishing, 2015.
- Kayden S, et al. Emergency Department Leadership and Management: Best Principles and Practice. Cambridge: Cambridge University Press, 2015.
- Langley GJ, et al. The Improvement Guide: A Practical Approach to Enhancing Organizational Performance. San Francisco: Jossey-Bass, 2009.
- Litvak E. Managing Patient Flow in Hospitals: Strategies and Solutions. Oakbrook Terrace, IL: Joint Commission Resources, 2010.
- Mayer TA, Jensen K. Hardwiring Flow: Systems and Processes for Seamless Patient Care. Gulf Breeze, FL, Fire Starter Publishing, 2009.
- Strauss RW, Mayer TA. Strauss & Mayer's Emergency Department Management. New York: McGraw-Hill Education, 2014.

Important skills to practice while in residency to prepare for fellowship

The most important thing a resident can do to become a leader in any capacity is to become clinically excellent. Without this, you will not have credibility to be a leader in your department.

Take advantage of opportunities to become involved with resident process improvement projects. Demonstrate ongoing commitment and complete projects in a timely manner.

Tips on how to succeed as a fellow

As a new fellow, it is important to clarify expectations with your program director and other members of the leadership team early and often. Be proactive. Tackle areas of knowledge deficiency. Find a balance between doing things you're good at and taking on projects from which you can learn.

CONCLUSION

Additional Resources

Journals

- The American Journal of Medical Quality
- BMJ Quality
- BMJ Quality and Safety
- Chicago Booth Review
- Harvard Business Review
- Health Affairs
- Health Care: The Journal of Delivery Science and Innovation
- Implementation Science
- The International Journal of Quality in Health Care
- The Joint Commission Journal on Quality and Patient Safety
- Journal for Healthcare Quality
- The Journal of Clinical Outcomes Management
- Journal of Graduate Medical Education
- The Journal of Healthcare Risk Management
- Patient Safety and Quality Healthcare
- Quality Management in Health Care

Podcasts

- [AAEM Podcasts](#)
- [AAEM Podcasts: EM Operations Management](#)
- [New Directions in Health Care](#) by The Commonwealth Fund
- [Urgent Matters](#)
- [WIHI — A Podcast from the Institute for Healthcare Improvement](#)

Twitter Resources

1. @AmericanMedicalAssn
2. @ACHEconnect
3. @AHRQNews
4. @CDCgov
5. @commonwealthfnd
6. @CMSinnovates
7. @CMSgov
8. @DrJessePines
9. @HarvardBiz
10. @Health_Affairs
11. @HealthITNews
12. @HHSGov
13. @HHSMedia
14. @HHS_Health
15. @IHIOpenSchool
16. @JSchuurMD
17. @KHNews
18. @lowninstitute
19. @modrnhealthcr
20. @PhysiciansLead
21. @PolicyRx
22. @Publici
23. @RSQ_Solutions
24. @RWJF
25. @theIHI
26. @theIOM
27. @Urgent_Matters

National organizations

- [American Association for Physician Leadership](#)
- [American College of Emergency Physicians \(ACEP\)](#)
- [ACEP EM Practice Management & Health Policy Section](#)
- [ACEP Freestanding Emergency Centers Section](#)
- [ACEP Observation Medicine Section](#)
- [ACEP Quality Improvement & Patient Safety Section](#)
- [ACEP Committees](#)
 - CEDR: Clinical Emergency Data Registry Committee
 - Clinical Policies Committee
 - Coding & Nomenclature Advisory Committee
 - Medical-Legal Committee
 - Public Relations Committee
 - Quality and Performance Committee
 - Reimbursement Committee
- [ACEP 911 Network](#)
- [American College of Healthcare Executives](#)
- [American College of Medical Quality](#)

- [Emergency Medicine Residents' Association](#)
- [Society for Academic Emergency Medicine](#)
 - Academy of Administrators in Academic Emergency Medicine
 - Observational Medicine Interest Group
 - Operations Interest Group
 - Patient Safety Interest Group
 - Medical Quality Management Interest Group
- Conferences
- [ACEP Scientific Assembly](#)
- [Emergency Department Directors Academy*](#)
- [Leadership & Advocacy Conference*](#)
- [Reimbursement and Coding Conferences](#)
- [ACMQ Medical Quality Meeting](#)
- [Emergency Department Practice Management Association \(EDPMA\)](#)
- [Solutions Summit*](#)
- Institute for Healthcare Improvement [Annual National Forum on Quality Improvement in Health Care](#)
- [The Academy for Emerging Leaders in Patient Safety: The Telluride Experience](#)
- [*Travel scholarship available from EMRA](#)

How to find a mentor

Residents should seek mentorship from their academic department chair or vice chair, medical directors of the departments where they work, and/or other research faculty and hospital administrators involved in emergency department operations, patient safety, quality improvement, clinical pathways, clinical decision support, observation, or other areas of mutual interest.

Aerospace Medicine Fellowship

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INTRODUCTION

Description of the specialty

Aerospace medicine is a specialty that resides within preventive medicine and focuses on the promotion of the health of pilots, astronauts, flight crewmembers, passengers, and patients being transported. While many specialties deal with abnormal physiology in normal conditions, aerospace medicine is commonly described as normal physiology in abnormal conditions.

History of the specialty/fellowship pathway

Paul Bert, a French physiologist of the 19th century, is considered the father of aviation medicine. His observations of the effects of high and low pressure on balloonists are considered the catalyst for further research in the field. In 1918 four physicians became the first American “flight surgeons” after attending aviation school. By 1948, the first center for space research was established in the United States, and the term space medicine was coined the same year. In 1953 the specialty was officially recognized within the medical community. With almost one-quarter of the world’s population traveling by air yearly, and considering the growing interest in and exploration of aerospace environments, this specialty produces experts in maintaining health and safety in such environments.

Why residents choose to follow this career path

Residents who are interested in discovering, preventing, and managing adverse physiologic responses to an individual in a hostile aerospace environment pursue this career path.

How do I know if this path is right for me?

Are you interested in the effects of low barometric pressures and oxygen tension on the human body? How about the short- and long-term effects of microgravity? Are you interested in learning about topics such as microgravity-induced bone loss, space adaptation syndrome, galactic and cosmic radiation exposure, G force-induced loss of consciousness, vertigo, or desynchronization? Would you like to participate in the prevention and investigation of aircraft/spacecraft accident investigations? If you answered yes to these questions, this may be the career path for you.

Career options after fellowship/residency

Physicians who have completed this training program have found employment in (but not limited to) the following agencies: National Aeronautics and Space Administration (NASA), Federal Aviation Administration, National Transportation and Safety Board, airline medical departments/clinics, aerospace manufacturing, commercial spaceflight operations, military or other government aviation departments, etc.

Splitting time between departments

Traditionally, the physicians who complete this training primarily take positions solely within the field of aerospace medicine. However, this is not to say that splitting time between a position within emergency medicine and within aerospace medicine is impossible. Some may choose multiple part-time jobs, whereas others may hold multiple appointments within the same hospital system. It will take a bit of negotiation to convince different departments to hire you and agree on a schedule that allows you to split time (including holidays and vacations). Prior to negotiations, consider how much time you wish to spend in each position and seek advice from other physicians who have experience with dual appointments. When you enter such negotiations, remember that your training in both fields makes you a valuable and unique physician.

Academic vs. community positions

This field typically offers more positions for physicians in the community, private, and government sector.

IN-DEPTH FELLOWSHIP INFORMATION

Number of fellowship programs

There are 3 civilian programs, as well as 2 military options:

- [Mayo Clinic](#)
- [Wright State University](#)
- [The University of Texas-Medical Branch in Galveston](#)
- [US Air Force Residency in Aerospace Medicine](#) at Wright-Patterson Air Force Base
- [US Navy Residency in Aerospace Medicine](#) in Pensacola, Florida

Differences between programs

The Mayo Clinic is a true fellowship and only accepts applicants who have completed a residency program. Wright State, the University of Texas, and the Navy will accept applicants with a minimum of 1 year of internship completed and thus are considered more of a residency program. (Note: Wright State gives preference to those who have completed residency training, and the Navy requires all applicants to meet the standards of a Naval Flight Surgeon). While the military programs are open only to military physicians, it is a simple process to transition into the Medical Corps for each branch of service.

The Mayo Clinic offers an opportunity to obtain a pilot's license if inclined and qualified. The program includes obtaining a Master's of Public Health; the Wright State University program includes a Master's of Science in Aerospace Medicine; the University of Texas offers either a Master's of Public Health or a Master's of Science degree; The Navy program includes a Master's of Public Health through the University of West Florida. Wright State University offers an Aeromedical Transport Operations pathway specifically designed for those with emergency medicine training who are interested in the administrative aspects of aeromedical transport.

Length of time required to complete fellowship

All of the programs are 2-year training programs.

Skills acquired during fellowship

Fellows will gain the skills to become an aerospace specialist and will be leaders, educators, researchers, administrators, and master clinicians in this field. They will learn how to manage and optimize the health of those in aerospace environments. They will be able to promote aerospace operational safety and apply ergonomic concepts to this environment. They will also be trained in facilitating optimum care of patients transported in aerospace environments.

Typical rotations/curriculum

- Research
- Master's degree coursework
- Aerospace Medicine basic flight surgeon training
- Flight familiarization
- Military and civilian aviation experiences
- Space medicine experiences
- Hypobaric and hyperbaric experiences
- Basic and advanced aerospace and aeromedical sciences
- Electives such as travel medicine, administration, etc.
- Flight Medicine clinic
- Radiation health

Board certification afterwards?

This fellowship is accredited by the Accreditation Council for Graduate Medical Education (ACGME) and those who complete this training will be board eligible for certification in aerospace medicine by the American Board of Preventive Medicine (ABPM).

Average salary during fellowship

Resident compensation and ancillary expense coverage varies from program to program. Interested candidates are encouraged to inquire about each program. Applicants to the Navy and Air Force programs will be active duty, and their pay is set by the standard military pay scales, searchable online.

PREPARING TO APPLY

How competitive is the fellowship application process?

The Mayo Clinic only takes 1 applicant per year. Wright University and The University of Texas both take 1-4 applicants per year. The Navy program publishes a notice every summer, called BUMED 1524, that includes number of spots and the process for application.

Requirements to apply

The Mayo Clinic requires a minimum 3-year accredited residency and board eligibility or board certification. Wright State University, the University of Texas, and the Navy require a minimum 12-month internship at an accredited residency, where 11 of these months must have included direct patient care. Both Wright State and the University of Texas encourage completion of a prior accredited residency program. The Air Force requires applicants to have served as an Air Force flight surgeon for two years as a prerequisite.

Research requirements

Research is not required to apply for these programs but is strongly encouraged. Research should ideally be within the field of aerospace medicine if possible and also should be near publication and/or submitted for publication.

Suggested elective rotations to take during residency

These include, but are not limited to, the following: hyperbaric medicine, research, NASA aerospace medicine, flight medicine clinic, EMS rotation focusing on flight exposure, global health and travel medicine, aerospace toxicology, health policy, etc.

Suggestions on how to excel during these elective rotations

Be interested and engaged during your rotations and demonstrate your enthusiasm and willingness to be a part of the team. Arrive early and stay late. Be courteous to everyone, all staff and patients alike. Read every night and continue to expand your knowledge base. Your electives are excellent opportunities to find colleagues to write letters of recommendation. With this in mind, it is important to treat every clinical day as if it is an interview day and strive to place your best foot forward.

Should I complete an away rotation?

While you do not need to complete an away rotation, it may be helpful for you to gain exposure in the field and also to help you network. Because this is a small and unique field, chances are your residency program offers limited exposure. There are 2 away electives to consider:

- [Wright State University offers a 4-week rotation](#) for both medical students and residents. This rotation is available in October only and includes didactic sessions and various site visits and clinical exposure.
- [NASA offers a semi-annual 4-week aerospace medicine clerkship](#) during April and October and accepts both residents and fourth-year medical students.

What can I do to stand out from the crowd?

Your CV should include activities that display your interest in aerospace, demonstrate your leadership skills, and indicate your research experience. Top applicants will have demonstrated interest in aerospace in multiple areas, including having completed an aerospace medicine elective rotation or clerkship, and

may even have obtained a private pilot's license. Seek opportunities such as blog post authorship, literature reviews, lecturing, and attending national aerospace conferences. Becoming chief resident would also be helpful (but is not required). Consider joining a national organization to demonstrate your interest in the field.

Should I join a hospital committee?

Transport medicine and/or safety committee involvement may be useful, and leadership opportunities in general are helpful in building a CV and gaining experience.

Publications other than research

This is highly encouraged. Use FOAMed to your advantage and become active in blog posts and podcasts. Seek out writing opportunities in magazines and journals. *EM Resident*, published by EMRA, is always looking for authors. Twitter and Facebook, while not traditionally considered publications, may be a great way to network and also to increase the EM community's knowledge about aerospace topics.

How many recommendations should I get? Who should write these recommendations?

Each program has its own requirements about the number of recommendations required (typically 3 letters). However, all programs at minimum require a letter of recommendation from either your program director or your department chair.

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

Yes! Clinical experience is highly valued, especially among those who wish to eventually work as a NASA flight surgeon. The key for applying after residency is to make sure you continue to be involved in leadership and publication activities beyond residency. You do not want 5 years to pass without adding something new to your CV.

What if I'm a DO applicant?

All programs accept USMLE and/or COMLEX scores.

What if I am an international applicant?

The Mayo Clinic will accept J-1 visas and occasionally an H1B visa. Wright State University's program is NASA-funded and thus can only accept U.S. citizens. University of Texas receives government funding and thus can only accept U.S. citizens as well. The Navy program accepts NATO physicians who have first applied through

their respective military service and meet requirements established by their country and the U.S. Embassy.

APPLICATION PROCESS

How many applications should I submit?

Applicants should apply to all programs they would seriously consider attending if offered a position.

How do I pick the right program for me?

Applicants should pick a program in a location where they can imagine living for 2 years, where they feel comfortable, and where they can be successful. Your fellowship program should clearly and strongly believe in you and be supportive of your future goals. Do not ignore your inner voice; if you feel uncomfortable at the program during an interview, this may not be the fellowship for you. If you have a spouse or significant other, do not forget their opinion, especially when it comes to program location and their ability to work or thrive in that city.

Common mistakes during the application process

Be truthful on your CV. Be cautious of listing too many projects, especially those that are incomplete or in which you did not have a clear or strong role. It is better, for example, to have 1 complete research project than 3 projects in data collection phase. Your letters of recommendation should be from writers who are strongly supportive of you. If your letter writers seem a bit uncertain when you ask them to write a letter for you, take this as a sign to find someone else. Pay attention to the details, such as making sure there are no grammatical errors and meeting all deadlines. Be courteous to all those with whom you interact, both via email and in person. Being rude to a program coordinator is a guarantee to sink your chances at that program.

Application deadlines

Both the Mayo Clinic and Wright State University have their own application processes, for which additional information can be found on their websites. The University of Texas uses ERAS. Please contact each program and inquire about whether an additional application is required for their master's programs as well. The Navy deadlines are included with the BUMED 1524 notice published each summer, but are generally mid-October. The Air Force deadline is also usually mid-October.

Tips for writing your personal statement

Your personal statement should express your personality and, more important, express your interest in aerospace medicine. Do not fall into the trap of simply repeating what you have already listed in your CV. The best personal statements read as a story and grab your attention from the beginning to the end. Write about that life experience or perhaps patient encounter that initially sparked your interest in the field. Finally, consider explaining how this fellowship would help you attain your long-term career goals.

Is this a match process?

No.

What happens if I don't obtain a fellowship position?

Do not become discouraged. Many apply 2 or more times before being accepted because of the limited available positions. We also recommend taking a hard look at your application. Talk to the programs that rejected you and gently ask why so you can address these gaps. It also may be wise to ask someone in a leadership position, such as your program director, to look at your application to help identify weaknesses.

Take steps to increase your activities and also exposure within the aerospace medicine field. Practice your interview skills. Attend national conferences in the field to help you network with physicians and prepare to apply again next year. Worst-case scenario, there are physicians who are involved in this field without completing a fellowship. Seek out these physicians so they can help you build your niche in aerospace medicine.

INTERVIEW PROCESS

How do I stand out from the crowd?

Strive to appear confident in yourself and your abilities without sounding arrogant. Know your application well and be ready to discuss anything listed on it. Be engaging with your interviewer. Be careful not to talk too much or dominate the conversation, but also do not be disengaged or overly quiet. Let your enthusiasm for aerospace medicine and also for their program shine. Make sure to send thank-you letters to all of your interviewers and to the program coordinator afterwards.

What types of questions are typically asked?

- Why are you interested in aerospace medicine?
- Why are you interested in specifically attending our program?
- Tell me more about “blank” that you have listed here on your CV.
- What are your 5- and 10-year career goals?
- Do you have any flight experience?
- Tell me more about your research experience.
- Describe to me your dream job.

How many interviews should I go on?

Applicants should attend all interviews offered (assuming you applied only to the programs you want to attend).

PREPARING FOR FELLOWSHIP

Textbooks to consider reading

- Davis JR, et al. Fundamentals of Aerospace Medicine. 4th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2008.
- Gradwell D, Rainford DJ. Ernsting's Aviation and Space Medicine. 5th ed. Boca Raton, FL: CRC Press, 2016.
- Clement G. Fundamentals of Space Medicine. New York, NY: Springer; 2004.
- Reinhardt R. Basic Flight Physiology. 3rd ed. New York, NY: McGraw-Hill Education; 2007.

Important skills to practice while in residency to prepare for fellowship

First and foremost, you should strive to become an excellent clinician during residency. Strive to expand your knowledge base of aviation and space medicine if possible. Seek activities that will build your skills in leadership, administration, clinical education, and research.

Tips on how to succeed as a fellow

Fellowship is a unique opportunity for you to gain experience, skills, and expand your knowledge base while under the guidance of mentors and attending physicians. Take advantage of every opportunity and purposefully seek out opportunities beyond the usual course and clinical work. Take time to read every day, and strive to be a master clinician within this field. Remember to always be considerate, dedicated, courteous, and compassionate. Work hard at your master's degree and excel at your coursework. Continue to network and build rapport with those within the field and work toward achieving your dream job after fellowship.

CONCLUSION

Additional Resources

Journals

- Aerospace Medicine and Human Performance

Blogs

- [Aerospace Medicine Safety Blog](#)
- [Go Flight Medicine](#)
- [Naval Aerospace Medical Institute](#)

National organizations

- [Aerospace Medical Association](#)
- [Space Medicine Association](#)
- [American Society of Aerospace Medicine Specialists](#)
- [Society of NASA Flight Surgeons](#)
- [Airlines Medical Directors Association](#)
- [Society of US Naval Flight Surgeons](#)

Conferences

- Aerospace Medical Association Annual Scientific Assembly
- American College of Preventive Medicine annual meeting
- United States Naval Aeromedical Conference

How to find a mentor

There is no central website that assigns mentors to those interested in the field of aerospace medicine. We encourage you to network with physicians in this field via conferences, away rotations, and email.

Cardiovascular Emergencies Fellowship

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INTRODUCTION

Description of the specialty

The cardiovascular emergencies fellowship gives emergency physicians more specialized knowledge and skills related to cardiovascular emergencies. These skills include, but are not limited to: reading and interpreting echocardiography, stress electrocardiography and nuclear medicine studies, and caring for the critically ill patient in cardiogenic shock or with a deadly congenital arrhythmia that is bound for coronary care unit (CCU) care. These skills will allow the fellow to teach emergency physicians, residents, and medical students, as an associate professor or residency director at an academic institution. Other opportunities include research or serving as director of an observation, chest pain, or clinical decision unit.

History of the specialty/fellowship pathway

Cardiology fellowships traditionally are a pathway exclusively available for internal medicine graduates as a 3-year fellowship. However, within emergency medicine, there has been a growing interest in this field. Furthermore, cardiovascular emergencies are an important and common problem in emergency medicine, and while emergency physicians are familiar with and have expertise in cardiovascular emergencies, there remains a gap of knowledge compared to traditionally trained cardiologists. In the early 2000s, cardiovascular emergency fellowships were developed to address this gap. There are currently 3 fellowship opportunities available. These fellowships are currently not accredited by the ACGME and there is no board certification.

Why residents choose to follow this career path

Residents have chosen this career path to develop an academic niche, to further expand echocardiography skills, to become researchers, and to serve as EM/ cardiology liaisons or directors of clinical decision, observation, or chest pain units.

How do I know if this path is right for me?

This is the right path if you have a strong academic interest in cardiovascular medicine and/or are interested in teaching and have a passion for all things related to cardiovascular emergencies. If you are interested in observation medicine/chest pain units, but the observation fellowship does not fit your wants and needs, this could be the right fellowship for you.

Career options after fellowship

These include academic teaching positions, as well as administrative or director positions in a clinical decision/ general observation/chest pain observation unit. Consider the retention rate at your program of interest. Some tend to offer attending positions to their fellows, while others pursue those with outside experience.

Economic and lifestyle benefits notwithstanding, the decision to pursue fellowship should ideally be based on personal interest and satisfaction. Completing this fellowship does not necessarily mean you will have different career options or make a higher salary compared to traditional emergency physicians. Emergency medicine pay is largely specific to the location and environment of practice. This sentiment is adequately captured by Dr. Ali Fzard, an emergency cardiology fellowship graduate:

“I did the fellowship knowing that I would take a pay cut that year when compared to working clinically as an EP. However, the fellowship has opened many doors for me. It helped set me apart from other candidates during my job search and I think helped me secure my current clinical position at Baylor University Medical Center in Dallas, which I am very happy with. It also allowed me to stay active academically. I lecture to medical students and EP’s on cardiovascular emergencies topics, author chapters in cardiology related publications, do clinical research, and help my entire health system develop best practices and guidelines that are used throughout our entire hospital system! I recently also became an assistant medical director of the ED, and the medical director of our hospitals observation unit.”

Academic vs. community positions

This fellowship prepares the cardiovascular emergencies fellow to work in both the academic as well as the community setting, but is more an academia-driven fellowship. Physicians who have more interest in research and/or education of medical students/residents/fellows tend to gravitate toward this fellowship and go onto academic positions. Training in this fellowship would give one the appropriate knowledge base and skill set to teach how to perform and read ECHOs, how to interpret stress tests and Nuclear imaging as well as teach observation medicine. You will be known as the Cardiovascular expert in both the academic and community setting, giving you a niche and improved job security in both settings.

A graduate of the Stanford Fellowship was hired by an EM group to help open and run several Chest Pain units and had his MBA paid for by them. Others have chosen to take research-heavy positions working with cardiologists and EM faculty to create multi-center hybrid cardiovascular and EM-focused projects.

IN-DEPTH FELLOWSHIP INFORMATION

Number of programs

There are 3 programs currently:

- [University of Maryland Medical Center](#)
- [Stanford University](#)
- [University of Virginia](#)

Differences between programs

The curricula and emphasis on different aspects of training will vary, but most are similar in clinical, research, and teaching responsibilities.

Length of time required to complete fellowship

At the time of this writing, all three available fellowships offer one-year positions.

Skills acquired during fellowship

Clinical management of cardiovascular emergencies, cardiovascular emergency related research and general research skills, proficiency in echocardiography, stress testing protocols and their interpretation, advanced electrocardiography interpretation, pacemaker/ automatic implantable cardioverter-defibrillator (AICD) interrogation and interpretation, left ventricular assist device (LVAD) management, and chest pain/ observation unit operation.

Typical rotations/curriculum

Curriculum traditionally includes: echocardiography, cardiology consult service, nuclear cardiology, stress electrocardiography, cardiac critical care unit, arrhythmia/electrophysiology service, pediatric cardiology, and research. The didactic curriculum will often include emergency medicine lecture series, cardiology lecture series, and joint emergency medicine/cardiology conferences. Fellows are also typically involved in resident education both clinically and in didactics, and may work part-time as a clinical instructor/attending.

Board certification afterwards?

No.

Average salary during fellowship

This will vary at different institutions. Most fellows get paid as a clinical instructor/fellow. Some programs allow you to work part time as an attending.

PREPARING TO APPLY

How competitive is the fellowship application process?

There are limited positions currently available. However, the application pool is also traditionally small. Usually 2-3 fellows are interviewed and 1 is chosen, but it varies on the number of applicants in the application cycle.

Requirements to apply

Candidates must have completed an ACGME approved residency in emergency medicine and be ABEM board certified or board eligible in emergency medicine.

Research requirements

Research is not required, but can strengthen your application especially if the research is related to the field of cardiovascular medicine. Strive to have a project near completion prior to the submission of your fellowship application.

Suggested elective rotations to take during residency

Rotations to consider include cardiac anesthesia, ultrasound elective with focus of TTE and TEE, chest pain observation units, inpatient cardiology services, research electives, and pediatric cardiology services. Experience in point of care ultrasound is helpful, but not required.

Suggestions on how to excel during these elective rotations

Treat every day as an interview day and strive to make the best impression possible. Arrive early, stay late, and be a team player. Read daily to expand your knowledge base. Make sure you are courteous to everyone and provide the best patient care possible.

Should I complete an away rotation?

Because there are only a few fellowship programs, it may be worth considering an away rotation at one of these institutions to get a better feel for their program and to “audition” there. This is not required and plenty of physicians have obtained fellowship positions without completing an away rotation.

What can I do to stand out from the crowd?

Build a CV with activities that clearly demonstrate your interest in this field while also demonstrating your leadership abilities.

Should I join a hospital committee?

Hospital committees can be an excellent way to develop your leadership skills, assuming you have meaningful contribution to the committee. However, your CV should reflect your interests, rather than a mash-up of unrelated projects.

Publications other than research

Publications other than research — such as chapters, case reports, blog posts, podcasts, etc., especially regarding cardiovascular topics — can certainly support your application. These are excellent opportunities to further educate both yourself and your fellow emergency medicine physicians.

How many recommendations should I get? Who should write these recommendations?

Traditionally three letters of recommendation are requested, one of which should be from either your program director or department chair. The other two should be from faculty members who are strongly supportive of you and can attest to your interest in this field of medicine. While not required, if you do an elective in a cardiology-specific rotation, a letter from that elective can be very helpful.

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

Yes. Remain competitive by continuing activities that build on your interest in and knowledge of cardiovascular topics.

What if I'm a DO applicant?

No foreseen issues.

What if I am an international applicant?

Contact each program directly to inquire.

APPLICATION PROCESS

How many applications should I submit?

An applicant should apply to all places s/he would seriously consider a fellowship position if offered.

How do I pick the right program for me?

Look at the curriculum and assess if it matches your interests and career goals after fellowship. Location is also an important consideration.

Common mistakes during the application process

- Missing application deadlines.
- Submitting an incomplete application.
- Failing to demonstrate specific interest in cardiovascular emergencies on your CV.
- Submitting letters of recommendations from faculty members who are weakly supportive.
- Not being known by the program of interest prior to applying.

Application deadlines

Contact each program directly for application instructions and deadlines. Generally, candidates should start the process roughly 1 year prior to their planned fellowship start date.

Tips for writing your personal statement

Avoid simply repeating your CV in your personal statement. Instead, focus on writing about what sparked your interest in cardiovascular emergency fellowship and end your statement with a summary of your proposed career goals after completing fellowship.

Is this a match process?

No.

What happens if I don't obtain a fellowship position?

Take a step back and examine your application with a critical eye to identify weaknesses. Ask programs for tips on how to improve your application. It may be worth asking your program director from residency to review your application for weakness as well. Once you have identified these areas, spend the next year working on improving your application and re-apply. Worst-case scenario, it is possible to build your niche within this field without attending a fellowship.

INTERVIEW PROCESS

How do I stand out from the crowd?

Come prepared with questions about the fellowship that cannot be easily found on the program's website. Make sure you can clearly voice why you wish to complete fellowship and your plans for a career post-fellowship training. Practice with a member of your residency leadership prior to your interviews.

What types of interview questions are typically asked?

- Why are you interested in a cardiovascular emergency fellowship?
- Why are you specifically interested in attending our program?
- What are your strengths and weakness?
- Tell me more about "blank" that you list here on your CV.
- What makes you unique?

How many interviews should I go on?

You should attend all interviews offered, assuming that you only applied to programs that you would seriously consider attending if offered a fellowship position.

PREPARING FOR FELLOWSHIP

Textbooks to consider reading

Mattu A. Cardiovascular Emergencies. Dallas, TX: American College of Emergency Physicians; 2014.

Important skills to practice while in residency to prepare for fellowship

Focus on ECG interpretation and echocardiography skills. It will also be helpful to gain research experience during residency, because many programs also focus on cardiovascular emergency-related research opportunities. In addition, leadership skills and familiarity with observation/chest pain pathways would be beneficial.

Tips on how to succeed as a fellow

Fellowship is a unique time to expand your skillset under the guidance of mentors. Take advantage of all opportunities offered, such as with research, course work, certifications, and/or advanced degrees. Read every day and strive to become an expert within this niche of medicine. However, make sure to also stay balanced and make time for your family, friends, and hobbies to prevent burnout.

CONCLUSION

Additional Resources

Journals

- Journal of Cardiovascular Emergencies
- Cardiovascular Ultrasound

Blogs

- [R.E.B.E.L EM](#)
- [ECGWEEKLY](#)
- [Life in the Fast Lane \(LITFL\) ECG Library](#)
- [R. Smith's ECG blog](#)

Podcasts

- <http://www.ultrasoundpodcast.com>

National organizations

- American Society of Echocardiography
- [American College of Chest Physicians](#)
- [American Heart Association](#)

Conferences

- American College of Cardiology Annual Scientific Assembly
- American Society of Echocardiography Annual Scientific Assembly

How to find a mentor

There is no central website that helps link interested candidates with leaders in this field. To find a mentor, consider networking by reaching out via email, attending national meetings, etc.

Anesthesia Critical Care Medicine Fellowship

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INTRODUCTION

Description of the specialty

Anesthesia critical care medicine (ACCM) is a critical care subspecialty fellowship offered to graduates of residency training in anesthesiology, emergency medicine (EM), surgery, surgical subspecialties, and Ob/GYN. The focus of ACCM is the care of the critically ill patient with a specific focus on surgical, trauma, and medical related critical care pathology, although a variety of focused and broad-based critical care training models exist. After completing fellowship training, emergency medicine-critical care medicine (EM/CCM) candidates sit for the anesthesia critical care medicine examination to become a board-certified critical care physician (intensivist) after applying through the American Board of Emergency Medicine (ABEM); similar to fellowship graduates of internal medicine CCM (IM/CCM) training programs (both groups apply through ABEM for ABMS formal certification).

History of the specialty/fellowship pathway

ACCM started with the improved care of the critically injured trauma patient during World War II. The anesthesiologist who took care of the patient during the initial stabilizing surgery continued to care for them as they left the operating theater and proceeded to newly designed shock and recovery units. The American College of Anesthesia began offering the critical care medicine exam in 1986. There are now 57 ACCM ACGME-approved fellowships that offer critical care medicine training.

In 2013 the anesthesia pathway became the newest option for EM-trained physicians to enter a critical care medicine fellowship. Currently, EM physicians entering an ACCM fellowship must complete two consecutive years of fellowship training at an ACGME accredited ACCM fellowship that has an American Board of Anesthesiologists (ABA)-approved EM/CCM training curriculum.

Why residents choose to follow this career path

The educational goals for emergency physicians entering an ACCM fellowship are to assure competency in all realms of critical care medicine, including the care of surgery, trauma, and medical critical care related conditions. This is appealing to many applicants who want their training to be focused on the critical care management of a broad multidisciplinary range of patients.

How do I know if this path is right for me?

ACCM is a great option for people who would like to be proficient in the care of both medical and surgical intensive care unit (ICU) patients. Depending on your program's EM/CCM curriculum, you will receive multidisciplinary exposure to the care of surgical ICU, medical ICU, and specialty ICU patients. Additionally, you will be exposed to advanced airway techniques, surgical procedures/pathology, organ support devices, and gain advanced experience in hemodynamic monitoring and management.

Career options after fellowship

Career options are broad, with intensivists working in mixed multidisciplinary intensive care units, surgical ICUs, cardiothoracic ICUs, neurosurgical ICUs, and medical ICUs. There are both academic and community hospital positions available, but you will likely have to approach the medical directors in the ED and ICU yourself. Additionally as the number in intensivist trained emergency medicine physicians increases, various ED-ICU models are being developed. There are also groups like CEP America, Kaiser, and Intermountain Health (to name a few) who staff both specialties.

Splitting time between departments

ACCM physicians with a core residency background in anesthesiology often split clinical time between the ICU and operating room (OR) in academic settings or in managed health care corporations. In large academic centers, this model works well for EM physicians as well (substituting ED time for OR time). In the community setting, this may be more difficult, because most private EM groups don't staff ICUs. But with creativity and flexibility, a variety of career options can be created (ie, splitting time between staffing groups, institutions, or clinical areas).

Academic vs. community positions

Academic institutions generally have more academically diverse patients, strictly because of the increased number and variety of specialties caring for patients. Academic centers may also have additional educational and research opportunities that community

centers may not have. Community-based fellowships, however, may allow for more autonomy and bedside procedures when it comes to caring for patients, as some subspecialties may not be as readily involved in daily care.

IN-DEPTH FELLOWSHIP INFORMATION

Number of fellowship programs

Currently [more than 25 ACCM programs](#) have approved EM/CCM curriculum tracts.

Differences between programs

ACCM fellowship programs are structured around the 1-year fellowship clinical curriculum that anesthesia trained fellows complete: 12 months long, 9 of which must be spent caring for ICU patients, but not necessarily in the surgical ICU. ACCM programs differ in the surgical subspecialties that are available, medical ICU (MICU) experience, and opportunities for elective time. Programs also differ in how they fulfill the required ICU time. Of note, ACCM programs can offer no more than two months of dedicated research time during the fellowship training.

Length of time required to complete fellowship

All ACCM fellowships with an approved EM/CCM tract have a 2-year training cycle.

Skills acquired during fellowship

During fellowship, you will become an expert in resuscitation, procedures, and the long-term management of critically ill patients in surgical and medical units. Some ACCM programs also offer specific cardiothoracic intensive care unit and neurosurgical intensive care unit opportunities. Some programs also offer additional opportunities to perform advanced procedures (ie, echocardiogram, percutaneous tracheostomy, intracranial pressure monitor placement) with the goal of proficiency and future credentialing.

Typical rotations/curriculum

Curricula vary in both the core ICU time and elective time. Most ACCM fellowships offer the EM trainee multidisciplinary clinical exposure with required clinical ICU time in various settings (surgical ICU, medical ICU, cardiothoracic ICU, neuro ICU, coronary care unit, etc.). Similar to residency, you will have a block schedule. Typical elective rotations options might include nutrition, palliative care, bronchoscopy, advanced airway management, trauma, ultrasonography (transthoracic echocardiogram and transesophageal

echocardiogram), extracorporeal membrane oxygenation (ECMO), hematology/blood bank, and other pertinent critical care electives, depending on the location.

Board certification afterwards?

After successful completion of the 2-year fellowship (and completion of your primary EM certification process), you are eligible to sit for the ACCM boards. Once passed, you will obtain board certification as an intensivist through the American Board of Emergency Medicine. This is similar to the IM/CCM certification process.

Average salary during fellowship

Salaries for fellows will vary. Since you are in an ACGME-accredited program, your salary will generally follow the same structure as resident salaries and benefits at that institution. Fellows are generally paid at their corresponding postgraduate year level (PGY-4s, 5s, 6s), established by the local GME office. Most programs will allow you to supplement your income with moonlighting (under standard ACGME duty hours regulations).

PREPARING TO APPLY

How competitive is the fellowship application process?

It is competitive to get accepted into a critical care fellowship. Since this is a relatively new specialty for EM physicians, there are a growing number of ACCM programs approved for emergency physicians, yet it remains competitive. Current match statistics can be found on the “Statistics” tab at <https://www.sfmitch.org/SpecialtyInsideAll.aspx?id=25&typ=1&name=Critical%20Care%20Anesthesiology#>

Requirements to apply

Emergency physicians must have completed four months of critical care training during residency (this is a standard EM training (RRC) requirement).

Anesthesia CCM Fellowship programs use the [San Francisco Match](#) (SF Match). **It is important for you to register with the match (typically opens Nov 1, 1.5 years prior to expected start date).** You should also contact the program coordinator at the programs of your interest ahead of time (remember, the program coordinator is often your first and potentially last contact person at the program; be respectful). There is a \$100 registration fee with SF Match.

There is no centralized application process for ACCM; however, there is [a common application form](#) found on the Society of Critical Care Anesthesiology (SOCCA) website and on the [SF Match website](#). All programs require this common application form. Some programs will also request supplemental application materials (this is usually done after they review your common application form).

You will need to polish your resume, write a personal statement, request letters of recommendation (LOR: 1 should be from your program director; at least 1-2 should be from a practicing intensivist but the more the better), gather medical school diploma, USMLE reports, in-training exam reports, etc. These materials are uploaded into SF Match which then distributes your materials to the ACCM programs you select. Typically your letter writers will upload their LOR into the SF Match system. Again, please also be aware that the application process starts early.

Research requirements

There is no specific research requirement. However, having a strong research experience and/or academic project in critical care medicine can make your application highly competitive and may be more strongly considered for research-heavy fellowship programs.

Suggested elective rotations to take during residency

Experience various ICU settings at the beginning of residency. You should understand the positives and negatives of being an Intensivist and solidify your interest in critical care. Remember, CCM training is more than just “fun” procedures. Rotations in the medical ICU, cardiac ICU, surgical ICU, neurological ICU, and pediatric ICU will allow you to witness the daily routine of an intensivist. As you approach your PGY2 or PGY3 year, you may plan to do an elective month in an ICU.

Suggestions on how to excel during these elective rotations

Books, articles, and podcasts can improve your knowledge in the care of critically ill patients (see list of additional resources at end of this chapter). It is also important to be a good team player with all members of the critical care team. Ask the respiratory therapist and nurses for their opinions and suggestions. Thoroughly know your patients and their current issues on rounds. Make sure you assimilate the data and identify the current CCM diagnosis. Be willing to do procedures, show up early to pick up patients, and be excited to learn about your patients.

Take notice of how your attendings start their day. Does he or she come one hour early to review all labs and imaging? Some may even examine all the patients and start interventions prior to rounds. Ask them for their routine and the tricks they have found to be useful for daily rounds. As a resident on the rotation, very often you are only focused on the patients you have. Once you start gaining comfort and experience in the ICU, try to step in the shoes of the attending. Focus on every patient on rounds, know who the sickest ones are every day, and have a disposition plan days in advance. Actively initiate family discussions, palliative care consults, and code status talks. When a new patient is admitted, plan in your head how the trajectory of the patient will be, and have back up plan A, B, C in case patient status deteriorates or changes. For example: "If levophed requirement hit 0.3 mcg/kg/min, we will add a second agent, perform a bedside ultrasound, and if the ultrasound shows this, we will do XXX."

Should I complete an away rotation?

It is neither common nor required to do an away elective in ICU. If you would like to get a different set of ICU experience than what your residency program offers, you may contact the fellowship program of your interest. You should however plan this well ahead of time.

What can I do to stand out from the crowd?

Your application should demonstrate you as a competent, well-rounded, and reliable physician. You should have meaningful activities in critical care medicine. You might get involved in a research or academic project starting early in your intern year. Almost all fellowship programs will ask for your research experience and competitive applicants have research abstract presentations or publications. It is also worthwhile to reach out to a mentor in critical care medicine (strong letters of recommendation are paramount). Consider attending a national conference that offers an EM/CCM section. Getting involved in hospital committees can be worthwhile. You should have strong board exam scores, in-training exam scores, and letters of recommendation.

Should I join a hospital committee?

Getting involved in hospital committees related to ED and ICUs can expose you to the administrative side of hospitals and allow you to understand the roles of intensivists/ED physicians beyond the patient care. This will also allow you to be involved in improving critical care medicine care at your local hospital and is a nice addition to your CV.

Publications other than research

It is good to have publications, including blog posts, podcasts, book chapters, and magazine articles.

How many recommendations should I get? Who should write these recommendations?

You will need at least 3 letters of recommendations. One letter from your program director is a requirement for all programs. You will also need 1-2 letters from intensivists. You can get one from your research mentor as well. These should be *strong* recommendations from authors who know you well. It can be helpful to help draft information or experiences that you want them to include in your LOR.

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

Yes, but you need to make this time after residency valuable. Get involved in writing and/or research in critical care medicine. Join a critical care committee at your hospital. Become or remain involved in national CCM organizations during this time. Unplugging from critical care medicine will not look good on your application. In general, working as an attending is not a bad idea and will help your skills as a clinician. Make sure you have a critical care medicine mentor that will help ensure that you make this time productive and demonstrate your continued interest in critical care medicine.

What if I'm a DO applicant?

There is an osteopathic pathway in critical care medicine, but it can be difficult. Email individual programs to ask if they accept DO candidates (and COMLEX scores). If you are a DO but trained in an allopathic program, it is easier to apply to allopathic CCM programs.

What if I am an international applicant?

Contact programs directly to inquire whether or not they accept international applicants.

APPLICATION PROCESS

How many applications should I submit?

You should apply only to programs you are interested in working as a fellow. However, if your goal is to get accepted into any program or if you are concerned about the strength of your application, then you should plan on applying to many programs. [ABA](#) and [EMRA Match](#) each offer a list of approved 2-year curriculum ACCM training programs.

How do I pick the right program for me?

The program of your interest should offer multidisciplinary critical care that matches your career goals, train you to be a well-rounded intensivist, and complements your future career goals. Some programs will require you to work in the ED, and some will have no EM time unless you moonlight. Look at individual programs and evaluate whether they have trained emergency medicine graduates in the past or if they have emergency medicine-critical care medicine faculty, as prior experience may make your fellowship training more valuable.

Common mistakes during the application process

- Being late. Don't wait; apply early.
- Rushing your letter-writers. Give them plenty of time.
- Shading the truth on your CV. Honesty is the ONLY policy.
- Not enlisting help. Get your mentors involved early. A personal connection from your mentor to a program of your interest is extremely valuable.
- Stressing out. Be flexible and have a positive attitude.

Application deadlines

ACCM programs typically start accepting applications in December/January (1.5 years prior to the fellowship start date). Individual programs have their own deadlines. Interviews are on a rolling basis (check with individual programs), with the interview season between December and May. The SF Match takes place in May (13 months prior to fellowship start date).

Tips for writing your personal statement

Your personal statement should be a professional and eloquent explanation of your interest in critical care medicine, your career goals, and accomplishments. Rather than restating your resume, explain things that set you apart from others. Share an interesting story or experience. Often this will translate to further

conversation on your interview day. Be prepared to talk about your personal statement. Request feedback on your personal statement from your mentors.

Is this a match process?

Yes. ACCM participates in a match process. [You will need to register with SFMatch](#). The match happens in May (13 months prior to your fellowship start date).

Exceptions to the Match

There are 6 agreed-upon instances where a program and an applicant may agree to a position outside of the match. But both program and applicant must still enroll in the match.

1. Applicants who are in active military service at the time of application.
2. Applicants who are making a commitment to come to the institution of the CCM fellowship for more than one year. (Some ACCM programs have interpreted this to include EM/CCM applicants).
3. Applicants who are enrolled in an anesthesiology residency outside of the USA at the time of the application.
4. Applicants who reside outside the USA at the time of application or who are not eligible for ABA certification due to non US training
5. Applicants whose spouse or partner is applying for a GME-approved post graduate training program in a medical specialty in the same region as the CCM fellowship
6. Internal candidates

Complete exceptions can be viewed on the [SOCCA Match Exceptions page](#).

What happens if I don't obtain a fellowship position?

Since ACCM match happens in May, you will still have time to explore options. If you are still interested in a specific ACCM program, it may be beneficial to reach out to them and express your continued interest (and that you didn't match). Training spots do open up due to unforeseen issues. You may also decide to apply through other pathways which usually open after July: Surgery or Medicine. You should honestly review your application packet together with your mentor. If needed, consider a year of strengthening your application by gaining further experience in critical care medicine or a skill-set pertinent to this specialty (i.e., ultrasound or EMS), prior to applying again. Remember, you are still going to be a well-trained emergency medicine physician with a good job market and a good lifestyle.

INTERVIEW PROCESS

How do I stand out from the crowd?

Get to know any alumni from that program, as it may be brought up during interviews. Read about the program prior to the interview and be ready with questions.

At minimum, review their website so you can speak intelligently about the program and the curriculum (and potential flexibility), relationships with other services, etc. Additionally:

- Be a member of SCCM, ACEP critical care section, SAEM critical care section, and/or EMRA — critical care committee. Also consider joining SOCCA.
- Have publications in critical care medicine literature.
- Make sure you have recommendation letters from other intensivists and not only from EM faculty.
- Compile ample experience in critical care medicine through rotations and elective rotations.

What types of interview questions are typically asked?

- What are your career goals?
- How are you planning on incorporating EM with CCM?
- State your goals/reasons for pursuing a career in critical care or emergency care.
- List and describe the 3 most challenging aspects you see as a critical care and emergency care physician.
- What do you see as the differences between your current role and your role in critical care or emergency care?
- Explain how you interact with a multidisciplinary team.
- How did you deal with a bad interaction that you have had?
- Tell me about a critical care medicine patient experience.
- Tell me more about XXXX from your personal statement.

How many interviews should I go on?

Typically try to go to all of them so you will have all options; this will also help you gain an understanding of the different types of programs and curriculums that exist. Do not rank a program that you didn't visit; you never really know a program until you are actually there.

PREPARING FOR FELLOWSHIP

Important skills to practice while in residency to prepare for fellowship

- Be the best emergency physician you can to serve as a foundation for fellowship.
- Be ready to pass your EM boards, because you will take them in the fall of your first year in fellowship.
- For CCM boards...both SCCM and Chest have board-review style critical care medicine questions available.

Tips on how to succeed as a fellow

- Sort out life-matters early: you will definitely be busier than you were in residency.
- Consider setting up moonlighting opportunities ahead of time after you receive your match results, medical license, DEA, and approval from your fellowship program. Sometimes hospital credentialing and state license application can take over a year. However, remember that different programs have different policies regarding moonlighting. Regardless, all moonlighting hours are counted against GME work hour regulations.
- Do not be afraid to ask CCM Attending questions for your understanding. Ask every Attending what their daily routine is and how they organize the data about their patients.
- Be cordial with all the support staff. Ask the nurses, techs, respiratory therapist, and other ancillary staff for their opinions.
- Manage early morning non-urgent distractions well. You will eventually develop your own style. The golden 1-2 hours pre-round is when you need to focus, gather all the information, and examine the sickest if not all the patients. Sometime the team members may come up to ask you questions that are not urgent and may interrupt your flow. After each interruption it will take you a few minutes to regain focus. You will find on certain days after being interrupted five times in thirty minutes, you will run out of time to review your patients. This of course does not apply to sick patients who need your attention.
- For every patient prior to rounds, you should have the plan of the day and disposition.
- Arrive prepared to discuss the logic behind your plans/thoughts.
- If you are in charge of day rounds, have back up plans for the night team.

- Walk around the unit multiple times throughout the shift if time permits. Facetime with nursing, families, and at the bedside is paramount for success as an Intensivist.
- Update the family as often as possible. Build a connection with your team, patient, and family.
- Human connections can help decrease burnout and give you a sense of satisfaction and fulfillment. Two years is a long time to work in the ICU. Remember burnout happens when you cannot do the things you value most (hobbies, family time, etc). Reorganize your time outside of fellowship to allow these experiences.

CONCLUSION

Textbooks to consider reading

- [Marino PL. The ICU Book. Philadelphia, PA: Lippincott Williams & Wilkins; 2013.](#)
- [Parrillo JE, Dellinger RP. Critical Care Medicine: Principles of Diagnosis and Management. Philadelphia, PA: Mosby; 2013.](#)
- [Kollef and Isakow. Washington Manual of Critical Care Medicine, 2nd Edition. Lippincott Williams & Wilkins; 2013.](#)
- [Farcy et al. Critical Care Medicine, Second Edition. McGraw-Hill Education / Medical; 2 edition; 2016.](#)
- [Recent NEJM CCM Articles](#)

Additional resources

[SOCCA Fellowships Overview](#)

[SCCM Guidelines](#)

[SCCM LearnICU](#)

[Surviving Sepsis Campaign](#)

[Critical Care Reviews](#) — awesome resource with [top studies performed in 2017](#) and many top guidelines.

Subscribe to the weekly newsletter for the newest studies.

[Bronchoscopy Simulator](#)

[EMCrit Blog](#)

[Pulm Crit Section of EMCrit](#)

[Life in the Fast Lane](#)

Board prep for anesthesia

[Chest SEEK Questions](#)

[SCCM Critical Care Board Review](#) — live courses and self-directed learning

National organizations

SCCM

ACEP — Critical Care Section

EMRA Critical Care Committee

SAEM — Critical Care Section

SOCCA

Conferences

SCCM and SOCCA all have annual conferences.

SCCM also offers an ECMO course that is worth considering.

ACEP/SAEM offer critical care medicine section/committee meetings, which are all fantastic ways to network and get more involved with this specialty.

How to find a mentor

Any EM-CCM physician at your program would be your best option. Also [check out this CCM virtual mentorship website](#), which links interested EM physicians with EM-CCM mentors.

If interested, Dr. Wessman can be contacted at: Brianwessman@wustl.edu

Internal Medicine–Critical Care Medicine Fellowship

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INTRODUCTION

Description of the specialty

On Sept. 21, 2011, the American Board of Subspecialties voted to allow critical care medicine as the 7th subspecialty for emergency physicians. Since then, the American Board of Emergency Medicine (ABEM) and the American Board of Internal Medicine (ABIM) have reached an agreement that allows EM-trained physicians who complete an Internal Medicine–Critical Care Medicine (IM-CCM) fellowship to sit for the CCM board certification. Thus, the EM physician who completes a fellowship and passes the boards can become a board certified medical intensivist.

Of special note, there is currently a shortage of intensivists — it is estimated that only 1 in 3 patients admitted to the Intensive Care Unit (ICU) are treated by an intensivist. At the same time, the demand for intensivists is increasing as the population ages. The dual trained EM-CCM trained physician uniquely addresses the growing intensivist shortage, and helps to strengthen the delivery of critical care in the emergency department.

History of the specialty/fellowship pathway

Despite multiple hurdles, more than 140 emergency medicine physicians since the 1970's have trained in and are practicing critical care medicine today. In the past, EPs would take the European Society of Intensive Care Medicine board certification examination, which was accepted as an equal standard. It was these successful physicians who chose to pursue critical care medicine despite not having an officially-recognized pathway for board certification within the U.S. that paved the way for the current acceptance of the subspecialty.

Why do residents choose this career path?

EM-trained individuals who seek IM-CCM fellowships are typically those who seek to improve the integration of critical care practices in the ED to ensure a seamless delivery of care to the critically ill patient. With an aging population and the increasing prevalence of ED boarding, EPs will have greater exposure to critically ill patients than ever before. Advanced training in critical care medicine will give EPs advanced training in the skills necessary to improve the delivery of care to these patients.

Residents who choose to pursue IM-CCM fellowships are ultimately credentialed as medical intensivists, which is defined as a physician focused on comprehensive care of the critically ill medical patient. IM-CCM fellows may choose to gain additional exposure to surgical patients in mixed medical-surgical ICUs or through surgical ICU rotations.

Individuals who choose this route of training are those who not only enjoyed their ICU experiences, but who also envision themselves leading an ICU team, planning day-to-day patient care and discharges, and being intimately involved with the spectrum of biopsychosocial patient care. CCM is a specialty that requires its practitioners to be meticulous in their knowledge of their patients and ensuring that all their needs are met efficiently, as intensivists are expected to manage multiple unstable patients simultaneously.

Career options after fellowship

Some physicians may want to practice only critical care medicine or only emergency medicine after fellowship. Other physicians, however, prefer to split their time between two departments. Many hospitals have allowed EM-CCM physicians to split time between two departments, but there are also plenty of hospitals unaware of such a model. You may need to sell yourself and the model to potential employers, and show how this arrangement would benefit the hospital system. Be aware that once you pave the way, you are setting the example for future EM-CCM physicians in that health system. However, some hospital systems may not be ready and you might not get the deal you are looking for. The best thing to do is solicit help from others who have already paved the way and can give you first-hand advice. Focus on finding a place where you can grow as faculty, with the infrastructure to support your professional goals. Do not be afraid to cold-call programs, as job openings are not always openly advertised. Send your CV to employers and ask for time to chat. Make your goals clear — both to yourself and to your employer — from the onset.

One promising development in EM-critical care is the emergency department (ED) ICU. An ED ICU is an ICU-like unit, with similar capabilities and staffing, that lies within the ED. These units would serve to provide maximal resuscitation to the critically ill patient within the first hours of their medical care. The idea is, that after a few hours of aggressive resuscitation, some patients may improve and would no longer require ICU level of care. The EM-CCM physician would be uniquely positioned to staff these units, with training focused on the identification, resuscitation, and management of the critically ill patient. While the concept of the ED ICU is appealing to many CCM-minded EPs, there remain many political, financial, and logistical questions that require answering until ED ICUs become a widely available career opportunity.

Splitting time between departments

You can decide that you want to practice both emergency medicine and critical care as an attending, and it is important decide what mix you would like. Some physicians are contracted for a 50-50 split between the two departments, some are contracted for 75-25, etc. Many physicians find working in both fields highly satisfying and helpful in preventing burnout. It is possible to have a dual career in both academia and in community hospitals.

Be aware that the hours of a full-time EM physician are different from the hours of a full-time intensivist. Thus, try and avoid having one department “buy your time” from the other in terms of hours, because each department has separate ideas of what full-time means. The best way to do this is to figure out the expectations in terms of hours, salary, productivity, and clinical time for full-time physicians within each individual department, and then take percentages from that.

Make sure the kind of split you choose is sustainable, with flexibility in your contract to make alterations if needed. Hospital employee groups are the easiest to be hired in because otherwise you are trying to convince two independent groups to hire you. When independent groups are unavoidable, sometimes you may be hired primarily within EM and then fight for ICU time, or you may be hired primarily by ICU and then later obtain time in the ED (perhaps via moonlighting). Sometimes you may need to be employed by two different institutions to get your goal jobs, but this is not ideal.

Academic vs. community positions

There are important distinctions to make between community and academic medicine. Community jobs tend to focus more on clinical practice, and have optional opportunities to get more involved in administration or quality improvement. Academic positions, on the other hand, tend to have a significant portion of time dedicated to nonclinical commitments such as teaching, research, and administration. EM-CCM physicians may opt to find a niche as the critical care expert of their department; developing new critical care protocols/pathways, and developing CCM-based quality improvement projects. Academic centers have ICUs that are highly segmented, whereas in the community the patients are often grouped only into medical or surgical, or in a combined medical-surgical ICU.

IN-DEPTH FELLOWSHIP INFORMATION

Number of programs

At the writing of this, 35 programs offer CCM fellowship opportunities [according to ERAS](#). 28 of these programs participated in the 2018 match cycle. There are other programs that may accept applicants outside the ERAS match that should be contacted individually. [EMRA also has a list](#) of IM-CCM fellowship opportunities.

Length of time required to complete fellowship

2 years

Typical rotations/curriculum during fellowship

ABIM CCM policies require all critical care fellowships to provide 12 months of clinical experience. Six months of these are required to be devoted to the care of critically-ill medical patients. Programs will have small differences between which ICU setting they divide these months of critically ill clinical experience. For example, surgical units are often comprised of half medical patients and programs may choose to have two “surgical” units count as one month of medical ICU time. Other supporting rotations programs choose to include may include pulmonology, infectious disease, cardiology rotation etc and a variable amount of time set for research, electives, and vacation.

Differences between programs

All programs will train you to be an excellent intensivist. There will be varying experience among programs training emergency graduates, so assess if a program can tailor critical care education to emergency

graduates. Determine whether the program uses fellows in supervisory roles or as hands on workers. You should evaluate each program’s non-ICU schedules and electives to find those allowing you to pursue specific interests or strengthen areas where you have little experience (i.e. extracorporeal membrane oxygenation (ECMO), Bronchoscopy, Research, Education, Ultrasound, Palliative care.) In addition, the ill patient population can vary between programs based on supporting specialties. Strong transplant surgery, interventional cardiology, cardiothoracic surgery, burn center, cancer care, and infectious disease programs will create variations between illness and therapy common at different programs. It is also important to consider the size of each institution’s ICU as well as night coverage. Some hospitals may have a single team, 12 bed ICU, while others can have 50+ beds split among teams but cross covered by 1 fellow overnight supervising residents. Consider the division of care between the ED and ICU. Programs with strong EM residencies may perform a majority of acute critical care while programs with weak or no residency may involve you performing procedures and directing care as soon as the patient is deemed critically ill.

Skills acquired during fellowship

Each program will provide an excellent baseline training to deliver high quality critical care. You will improve your already strong training in resuscitation and develop a predictive thought process of the patient’s care during hospitalization, assessing potential needs and complications. Through didactic sessions and clinical training, you will obtain in-depth knowledge about the physiology, clinical presentation, and treatment of disease states that lead to life-threatening illnesses. You will also become an expert at many technical skills, especially central line placement, airway management, bronchoscopy etc. Remember to ask programs about ED exposure/moonlighting when interviewing. While this is not the focus of fellowship, when possible it is important to maintain your skill as an emergency physician if planning to split your practice afterwards.

Board certification afterwards?

Yes. Current pass rate for EM-CCM trained graduates is 100%.

Average salary during fellowship

Salary will be in accordance with ACGME for a PGY4-6 respectively with small variations. Ask each program about specific benefits provided.

PREPARING TO APPLY

How competitive is the fellowship application process?

With the increased interest and growing acceptance of EM graduates in critical care medicine, EM-CCM fellowships have steadily become more competitive. In that regard, it is suggested by many program directors that preparations begin as early as your first year of residency.

Requirements to apply

The only requirement to apply is that applicants must complete a residency in either emergency medicine or internal medicine. Be aware that you will need to upload your medical school transcript and dean's letter into ERAS. All of your USMLE step scores will also need to be uploaded, inclusive of your Step 3 score. Some programs also require copies of your in-service scores so remember to keep copies of these through the years. ABIM requires for emergency medicine applicants to have six months of direct patient care experience in internal medicine, of which three months must have been in a medical intensive care unit. However, this does not need to be achieved during residency, and many programs are apt with building in the remaining mandated time into your fellowship.

Research requirements

All applicants are required by ACGME to have a completed scholarly project/ activity during the residency period. Research in a CCM related area is certainly helpful for your application, however it is not a requirement. Additional projects and works of high quality such as peer-reviewed publications will increase your attractiveness. Any project placed on your resume should be one in which you were intricately involved and prepared to speak about during your interviews. Presentations at national conferences such as ATS, CORD, ACEP, SAEM and SCCM are advised and looked favorably upon. It is better to have one completed project rather than several incomplete ones.

Completion of a QI or academic research project is also a requirement for all CCM fellowship programs. Baseline expectations are a poster or abstract presentation, case report, review article or QI project. Thus, showing that you can complete a project during residency will look favourable to a fellowship program as proof that you can execute such projects.

Suggested elective rotations to take during residency

As noted above, ABIM currently requires emergency medicine trained physicians to have 6 months of internal medicine rotations (3 of which must be MICU) before supervising internal medicine residents. It is best to complete as many of these during residency as possible. While most fellowships are flexible and do not require you have all 6 months completed prior to the onset of fellowship; some PDs have noted they will rarely consider anyone with less than 4 months. Some fellowships may allow you to fulfil this requirement by using elective time during your first few months of the program. Others have separate non-resident medical rotations where you work alongside mid-levels in the interim until the requirement is fulfilled.

The number of medical rotations you have during residency will vary depending on if you are coming from a 3 or 4 year program. Those from 3 year programs generally have less time to obtain the required rotations and as such should plan to use their elective time to make up the difference if needed. MICU electives are of course preferable however it is important to note that surgical/trauma ICU, Cardiac ICU (CICU) and Neuro-ICU rotations are considered helpful in making you a well-rounded resident who is prepared for fellowship. Consultation services are generally not counted towards the 6 month total as you must be part of the primary care team in order for a rotation to count. Also be aware that some programs do not count CICU rotations towards the 6 month requirement as they are sometimes regarded as surgical based rather than medicine. Other electives to consider include nephrology, cardiology, infectious disease, and pulmonary.

Suggestions on how to excel during these elective rotations

Show your dedication and commitment to the specialty especially on your ICU rotations. Be prepared to arrive early, know your patients well and stay late if necessary. Staying abreast of the current literature is key, as well as being well-versed in the fundamentals of critical care. Presentations should be polished and concise. Be respectful to your team members and regularly interact and update patients and their relatives. Show excellent communication skills and speak up when concerned. Procedural competency and resuscitation skills are paramount.

Should I complete an away rotation?

If your home institution does not have a critical care fellowship or a faculty member who is well-known in the critical care community and/or a strong intensivist group, it is worth considering an away rotation. This is also a good avenue for you to gain a strong letter for your fellowship application and network with other physicians in the critical care field. It can be difficult to fit an away rotation into your schedule as a second-year resident. Sometimes it is easier to find an away rotation at a competing health system within your city or state than to travel far for a rotation.

What can I do to stand out from the crowd?

The short answer is to be a well-rounded emergency physician who excels clinically as well as shows leadership capabilities. Be involved in meaningful critical care activities. If you have a critical care program at your hospital attend the lectures and introduce yourself to faculty. If you don't have a local program, networking through conferences and getting a mentor through EMRA's Virtual Mentor will help. Aim to be involved with the well-known critical care groups, such as EMRA and ACEP CC divisions and SCCM. Interacting with members of these groups is a good way to meet like-minded people and potentially be involved with ongoing projects they may be conducting. Being a chief resident is certainly advantageous, however the focus should be to establish yourself as a hard-working, enthusiastic and reliable resident who is academically sound.

Should I join a hospital committee?

Consider joining a hospital CCM committee, if available at your institution, as this can serve as an excellent networking tool and resume builder. This allows for exposure to other intensivists who may serve as mentors and potential future letter writers.

Publications other than research

Other opportunities include, but are not limited to book chapters, blog posts, magazine articles, and podcasts.

**How many recommendations should I get?
Who should write these recommendations?**

ERAS allows for a maximum of 4 letters of recommendation. Programs require a minimum of 3 letters, one of which must be from your program director or department chair. The others should be written by intensivists, preferably medical, who

have worked with you and know you well. It is also acceptable to have letters written by surgical and anesthesia intensivists. Emergency and Internal CCM intensivists are considered of similar value. While having letters of recommendation (LOR) from well-known physicians in the field or CCM Program directors would be desirable, a strong recommendation from a lesser-known intensivist is better than an impersonal LOR from a MICU PD. Be open when asking your writers for a "strong letter of recommendation" as if they feel they cannot provide one, it is better to find another writer than to submit a luke-warm LOR. Letters should emphasize a strong work ethic, professional communication, and passion for the field. Letters from away rotations that are IM-CCM based can be very useful.

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

In general, working as an attending is not a bad idea and will help your skills as a clinician, but you need to make this time after residency meaningful. Get involved in writing and/or research in critical care. Join a critical care committee at your hospital. Become involved in national critical care organizations. Make sure you have a critical care mentor that will help ensure that you make this time as productive as possible.

What if I'm a DO applicant?

The merger of AOA and ACGME for emergency accreditation will hopefully strengthen DO applicants and further support equality between DO and MDs. DOs already make up a large portion of internal medicine residents and have proven worthy of matching subspecialties. There will be added difficulty but it is possible to match. Contact individual programs to confirm they are receptive and whether all three USMLE Steps are required.

What if I am an international applicant?

The same requirements generally exist for international applicants, inclusive of taking the USMLE and having high board scores. The biggest challenge will be whether the program is willing to sponsor your visa. It is best to contact individual programs to discuss this prior to applying.

APPLICATION PROCESS

How many applications should I submit?

Apply only to those places where you would honestly consider working. That being said, it is better to get too many offers for fellowship than to have no offers at all. Unlike residency, there is no specific number of interviews that you need to shoot for to gain a position, but it is recommended to apply to at least 10. Be aware that the majority of these programs use ERAS, but there are a handful of programs that do not. You can find out which programs use ERAS by referring to their website as listed in section 2a. There is a bit of a loophole in that Pulmonary-CCM programs are allowed to apply for a critical care track within their program and could potentially take you as a fellow. There are only a handful of programs that will do this, and there is no current way of tracking them. If you are interested in a specific area of the country, email the Pulmonary-CCM programs to see if they would be willing to consider you under a critical care track.

How do I pick the right program for me?

Your goal is to find a program that has a sick patient population, exposes you to different critical care environments, and has a curriculum that matches your needs/interests/goals. Remember that in some programs, the fellow is in more of a supervisory role, while in others the fellow is the worker of the team. You need to decide in which environment you learn better; if you learn by doing, then you should pick a program that allows you to do the work. During your interview, try to get a feel for the faculty, nursing staff, and other fellows to make sure you fit in. If you will be the first EM resident in a program, be aware that you are blazing a trail, and how you perform will determine if they take future EM applicants.

Common mistakes during the application process

Submit your application as soon as it opens on ERAS, and make sure it is complete. Be truthful; do not over-inflate your accomplishments. Make sure your application demonstrates a clear critical care interest. Give your letter writers plenty of time to complete and upload your letters of recommendation so they can be sent with your application to programs in July. Pay attention to the small details, and ensure there are no spelling or grammatical errors on your application.

Application deadlines

Applications are processed through the ERAS service, which generally opens in June. Applications are generally submitted no later than August-September. As this is ERAS, you will have to pay a fee for a token to start the application process, and another fee to send your application to a program. Interviews are usually held in August through early October, with offers made in mid-October, although each program tends to work a little differently.

Tips for writing your personal statement

Your personal statement should address why you are interested in critical care medicine. The best personal statements tell a story and have something unique/interesting that sets you apart from the pack. Try and keep a list of interesting ICU cases during your residency, as this can be a branch point for your personal statement. Do not regurgitate what is already listed on your CV; rather, your personal statement should be a mature reflection on what it means to be an intensivist. Let your personality show through and display yourself as thoughtful, intelligent, and insightful. [This website](#) can help you find inspiration. Remember to send your personal statement to multiple people to help edit and fine-tune your masterpiece.

Is this a match process?

While many programs process application packets through ERAS, there is no formal match process for IM-CCM.

What happens if I don't obtain a fellowship position?

You will need to evaluate your application, preferably with someone in a critical care leadership position, and look for deficiencies therein. Spend the next year addressing these deficiencies and also practicing your interview skills. Do not be afraid to re-apply.

Depending on one's dedication to ICU-based care, advanced resuscitation fellowships may be an option. While there are only a few of these programs around the country, they may be an option to consider for critical care-minded EPs. These fellowships are not ACGME approved, and typically focus on translational research in areas such as acute resuscitation, intensive care, emergency medical services, and echocardiography..

INTERVIEW PROCESS

How do I stand out from the crowd?

As with any interview, preparation is key. Find out as much about the program and the influential people in it as possible. Make sure you have good reasons for why you want to attend that specific program. Treat every interview as if it is your number 1 choice. Arrive early and have available printed updated copies of your CV on hand. Your goal is to show your strength as a candidate and your commitment to the field. Avoid being aggressive or coming off self-absorbed. This is your opportunity to let your personality shine and show them why you are the best candidate for the job. Highlight your strengths and accomplishments. Highlight the skills you possess as an EM trained physician compared to IM counterparts (US, Procedures, Decisiveness). If there is an opportunity to meet the current fellows either on a night before social or during lunch or a didactic session on the interview day, you should capitalise on it. These are the people who know the program best and your future potential colleagues. It is strongly recommend having a mock interview prior to the actual interviews to ensure you present your best self.

What types of questions are typically asked?

You will likely be asked about specific experiences you had during your ICU rotations or during the care of a critically ill patient. You will be expected to demonstrate that you have good clinical knowledge and understanding of the field. Some interviews will have structured pre-set questions or scenario based questions looking to elicit key things such as your task solving skills or how you deal with difficult situations. Take your time and think about your answers. Acknowledging your weaknesses and mistakes and how you have overcome them to better yourself is always looked at favorably.

Be prepared to discuss your interest in critical care medicine and your career goals. Know some of the hot topics within the field. Be well acquainted with everything in your application and prepared to discuss it in detail if needed. Questions about your leadership experiences, publications, research projects, are all fair game. Not knowing your research makes it seem as if you played a superficial role. Show your enthusiasm about the program at which you are applying and have pre-set questions of your own which are thoughtful and insightful and not something easily answered by the institution's website.

How many interviews should I go on?

There is no recommended number. Given the competitiveness of the specialty, it is advised to attend as many as possible. Ideally, you should attend any interview offered at programs that you would seriously consider an acceptance offer from.

PREPARING FOR FELLOWSHIP

Textbooks to consider reading

- Irwin RS, et al. Irwin and Rippe's intensive care medicine. Philadelphia: Wolters Kluwer, 2018
- Fink MP, et al. Textbook of critical care. Philadelphia, PA: Elsevier, 2017
- Layon AJ, et al. Civetta, Taylor, & Kirby's critical care. Philadelphia: Wolters Kluwer, 2018
- Marin, PL. Marino's the ICU book. Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 2014.
- Tobin MJ. Principles and practice of mechanical ventilation. New York: McGraw-Hill Medical, 2013.
- Levitov A, Mayo PH, Slonim AD. Critical care ultrasonography. New York: McGraw-Hill Education Medical, 2014
- Winters ME. Emergency Resuscitation of the Critically Ill, 2nd Ed. S.I: ACEP, 2017
- Brown CA, Sakles JC, Mick NW. The Walls manual of emergency airway management. Philadelphia, PA: Wolters Kluwer, 2018.
- Awdish R. In shock: my journey from death to recovery and the redemptive power of hope. New York: St. Martin's Press, 2017

Important skills to practice while in residency to prepare for fellowship

- Become proficient in central lines, arterial lines, intubation, thoracentesis and paracentesis. Learn to place peripheral IVs with US. Fight for chest tubes and esophageal balloon tamponade procedures.
- Ultrasound knowledge, RUSH, ECHO, RUQ and lung exams
- Improve your task switching ability and organization to manage multiple sick patients
- Become comfortable running resuscitations with excellent communication and task assigning
- Patient ventilation support devices and invasive ventilator management
- Become familiar with having difficult conversations and discussing goals of care

Tips on how to succeed as a fellow

Develop a well-organized work / life schedule. Fellowship will have longer hours as compared to emergency medicine residency. It is important to develop healthy habits like sleep hygiene, exercise and leisure activities early in your career to help prevent burnout even beyond fellowship. Be sure to make time for family and friends, don't forget your support system.

CONCLUSION

Additional Resources

Journals

Circulation
NEJM
Chest
JAMA
Lancet
Journal of Trauma
Anesthesiology
Critical Care
Critical Care Medicine
Intensive Care Medicine
Annals of Emergency Medicine
Journal of Emergency and Critical Care Medicine
American Journal of Respiratory and Critical Care Medicine

Podcasts

[EMCrit](#)
[iCritical Care podcast by SCCM](#)
[Intensive Care Network](#)
[Medscape Critical Care podcast](#)
[Critical Care Perspectives in EM](#)
[RAGE podcast](#)
[ICU Rounds](#)

Clinical Resources/Websites/Blogs

[SCCM Learn ICU](#)
[Thinking Critical Care](#)
[Intensive Care Network](#)
[Maryland Critical Care Project](#)
[Critical Care Reviews](#)
[Life in the Fast Lane](#)
[Pulm CCM](#)
[The Bottom Line](#)
[Deranged Physiology](#)
[Resus.me](#)
[R.E.B.E.L. EM Critical Care](#)

National organizations

The [EMRA Critical Care Committee](#) is a great resource, is resident- and fellow-based, and offers multiple opportunities for involvement — including a critical care conference travel scholarship. The [ACEP Critical Care Section](#) connects all EM physicians interested and/or trained in critical care medicine. SAEM recently created a [Critical Care Interest Group](#) as well. The [Society of Critical Care Medicine](#) connects critical care physicians regardless of their initial residency training.

Other organizations to consider: ACCP, ATS, EAST, and the American Heart Association

Conferences

The EMRA Critical Care Division has biannual meetings in conjunction with the SAEM Annual Conference and ACEP Scientific Assembly, and the critical care sections of SAEM and ACEP have annual meetings during their respective conferences. SCCM has annual meetings in January. There are multiple other meetings, including but not limited to:

Social Media and Critical Care (SMACC) Conference
Essentials of EMCrit Conference
American Thoracic Society Conference
European Society of Intensive Medicine
UPENN Therapeutic Hypothermia conference
UMMC Critical Care Conference
Weil/UC San Diego Symposium on Critical Care and Emergency Medicine
Northern New England Critical Care Conference
Rocky Mountain Regional Critical Care Conference

How to find a mentor

Within your home institution, mentors to consider would be your program director and the director of your medical intensive care unit. You should establish a mentor early during residency and do your part to foster this relationship by bringing questions and scheduling regular meetings. Search out feedback from your mentor and apply it. [A virtual mentorship program](#) has been established to help guide interested residents through the decision to apply and through the application and interview process. This website is unique in that it connects you to faculty who are both EM and CCM trained.

Neurological Critical Care Fellowship

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INTRODUCTION

Description of the specialty

Neurointensivists are physicians who are board-certified in Neurology, Neurosurgery, Internal Medicine, Emergency Medicine, Surgery, Pediatrics, or Anesthesia and complete additional fellowship training to provide comprehensive multisystem care to the critically ill neurologic patient. The neurointensivist's unique niche is the interaction between the brain and all other organ systems in the critically ill patient.

The number of dedicated neuroscience intensive care units (NICUs) is increasing, especially with advancing technology to diagnose and treat stroke patients and the proliferation of primary and comprehensive stroke centers. Dedicated neuroscience ICUs with specialty-trained intensivists and nurses have also been demonstrated to improve patient outcomes. Neurointensivists use and interpret data from advanced specialty-specific neuromonitoring tools, including continuous electroencephalogram (EEG), transcranial doppler, intracranial pressure and tissue oxygenation monitors, and microdialysis catheters. One of the unique aspects of neurocritical care is that the patients and families are living through a crisis of cognitive identity. The neurocritically ill patient has not only sustained injury to an organ system, but in many cases to the one organ system that defines personhood. This has a different set of implications than injury to the heart, lungs, or any other organ. In this sense, the neurointensivist has a very important role in helping patients and families grapple with issues around end of life, goals of care, loss of identity, and the bioethical principles that underlie each of these issues. The opportunity to help a patient and family through the worst imaginable crisis is simultaneously a privilege and a challenge.

History of the specialty/fellowship pathway

The Neurocritical Care Society (NCS) was formed in 2003. Board-certification pathway first opened in October 2005, and has always been open to EM physicians. EM residents can become neurocritical care certified by passing the exam after completing a 2-year fellowship in neurocritical care following completion of residency training, or completing a one-year neurocritical care fellowship following the completion of a general critical care fellowship.

Why residents choose to follow this career path

Neurocritical care has always been a multidisciplinary specialty and has actively sought involvement of EM physicians. Outcomes for neurocritically ill patients presenting to the emergency department (ED) are dependent upon initial care, and EM trained neurointensivists are uniquely positioned to optimally bridge this transition of care from one setting to the next. Neurocritical care-trained EM physicians still represent a small, but growing niche and as such have significant specialty value to many organizations from both an EM and neurocritical care perspective. For those interested in understanding and manipulating physiology, neurologically injured patients may have significantly more variables and subtleties than other critical care patients. Lastly, for those interested in research, neurocritical care is a young and dynamic field, particularly regarding therapies during the first few hours, and as such there are still large areas for defining/refining care and making significant academic contributions.

How do I know if this path is right for me?

If you find yourself wanting to know more about the downstream implications of the choices you make when caring for neurologically-injured patients in the ED, (traumatic brain injury, subarachnoid hemorrhage, ischemic and hemorrhagic stroke, status epilepticus, etc.), are interested in developing a deeper understanding of systemic and cerebral physiology, and want a second practice environment in which you provide care outside of the acute ED setting for critically ill patients, this fellowship is for you. If you enjoy the complex interactions with patients and family around issues of critical illness, personhood, brain death, palliative care and ethics, this field will provide many opportunities for clinical and academic pursuits. Completion of this fellowship will also open a wide variety of career options and leadership roles in both fields after fellowship. Because this specialty, and particularly its intersection with EM is young, you may have both the opportunity and necessity of defining your own career path. Therefore, it is optimal to give significant thought to your career and practice goals prior to pursuing this fellowship training.

Career options after fellowship

There are opportunities for practice either in community practice or academics. Smaller community and even academic centers may be lacking in resources for a dedicated NICU, so assisting in the creation of one or at least taking a leadership role in education of other providers in a mixed ICU may be possible. If you continue to provide care in the ED as well, you may also become the de facto “stroke expert” and possibly even general critical care expert for your colleagues and/or trainees. Research opportunities and consulting/working with industry regarding device development, monitoring techniques, and computer-aided interpretation of the tremendous amounts of data generated by multimodality real-time monitoring are all possibilities as well. Even at large academic centers, there will likely be a variety of quality improvement projects in the ED-based care of neurocritically ill patients.

Splitting clinical time between departments

As with many EM physicians with critical care training, you will be able to split time between two departments, and many choose different ratios of clinical time depending on individual interest and departmental staffing needs. Depending on the degree of cross-training you receive during your fellowship (as programs differ significantly) and the structure/patient mix in various ICUs, you and your institution may also have interest in splitting time between general medical and trauma/neurosurgical ICUs. This is also an area of negotiation between you and your department chair(s) and there is no one right answer. Generally speaking, spending time in both for the start of your career may be valuable to clarify interests and to leave options open. There are many different models of dividing your clinical time, and much of this will depend on which department holds your primary appointment (EM or Neurology). Consider that some institutions contract with groups for ED coverage rather than employing all physicians, which may complicate or benefit schedule splitting between multiple departments.

Academic vs. community positions

This is a personal decision, but before starting fellowship it is wise to consider that while the number of NICUs is growing rapidly, a certain patient volume is required to maintain adequate support staff and services (neuro IR, continuous EEG, real-time MRI availability). As such, a fully capable NICU may require a larger volume hospital to support it. Clearly, all the usual considerations regarding tradeoffs between academic and community positions, including salary, workload, liability, research opportunity, etc., still apply to neurointensivists.

IN-DEPTH FELLOWSHIP INFORMATION

Number of programs

The [United Council for Neurological Subspecialties lists 69 accredited programs](#) in neurocritical care.

Differences between programs

Because it is a newer specialty, there is in general greater program-to-program variability in neurocritical care (NCC) than in other critical care specialties, although all meet accreditation requirements. One of the most important considerations is where emergency medicine falls in their conceptualization of neurocritical care. Most fellowships are open to neurology, EM, internal medicine, anesthesia, pediatrics, surgery and neurosurgery-trained applicants.

Neurocritical fellowships often fall into one of several categories. Some have a strong history of training EM providers and therefore may be better equipped to recognize your unique needs (ie, less procedural/resuscitation training and more focus on neuroimaging, neuromonitoring, etc.). Some do not have a strong history of EM involvement, but recognize the unique strengths and viewpoints of EM-trained providers and are excited/actively recruiting EM applicants. Some are fairly rigid and accept largely neurology applicants. These are still excellent programs, but you will have to make your career interests and needs very clear early in the process to ensure they are understood and will be met.

While there may be an initial bias toward going somewhere more “EM-friendly”, it is important to also recognize that this runs the risk of less detailed training in neurology-specific topics. Ideally you want a program where you are a respected team member (not viewed as a lesser-trained physician with respect to neurology), but also one that pushes you to excel in neurology/neurosurgery specific topics. If you don’t feel “behind” in some areas when you start, the program probably isn’t pushing these areas hard enough (since you will be competing with people who have spent several years learning these topics).

Other differences between programs to consider:

- Open vs. closed vs. cooperative ICUs
- Extent of cross-disciplinary training
- Acuity of patients in NICU
- Ownership of “joint” patients, for example traumatic brain injury patients (trauma ICU vs. neuro ICU). Do you get to manage medical/surgically sick patients in your neuro ICU or in other ICUs during training?

- Degree to which you will be involved in “routine”/less acute cases such as low-risk perioperative monitoring, small strokes, neurointact IPH, etc.
- Extent of procedural training/availability (ie, does neuro ICU do bronchoscopy, chest tubes, and intubations? Or do you maintain currency with these procedures elsewhere?)
- Availability of moonlighting — primarily for skill maintenance as you will be out of the ED for a prolonged period of time.
- Role on non-NICU blocks (ie, primary fellow vs. observer)
- Role of fellow: supervisory or hands-on

Length of time required to complete fellowship

Two years

Skills acquired during fellowship

The skills you will hone include (but are certainly not limited to):

- Neurocritical care patient management
- Implications of cardiovascular and ventilator management on intracranial pressure/cerebral perfusion pressure/cerebral metabolism
- Understanding indications for procedural vs. operative vs. medical management of neurologic and neurosurgical patients, including those presenting to the ED
- Managing infectious and cardiac complications of NICU patients
- Understanding of multiple therapies to manage intracranial pressure and optimize cerebral perfusion
- External ventricular drain (EVD) management
- Antiepileptic management
- Management of multiple neurologic conditions rarely discussed in EM curriculum, including uncommon central nervous system infections, motor neuron disease, etc.
- Diagnostic skills
- Continuous EEG
- Transcranial Doppler use and interpretation
- Multimodality monitoring interpretation
- Varying degrees of ultrasound usage
- Procedural skills
- General critical care skills (variable by program): airway management, bronchoscopy, venous access (most NICUs prefer subclavian central lines and many require central access for administration of hypertonic saline, providing a large volume of these procedures), chest tubes

- Neuro-specific procedures, such as ventriculostomy/parenchymal monitor placement, are uncommonly taught to neurointensivists. Most attendings do not find maintaining credentialing and liability coverage to be financially viable based on volume and prefer that neurosurgery perform these procedures, although some programs will teach them to neurocritical care fellows. Often insertion of modified central lines for targeted temperature management will be taught, although some institutions prefer surface cooling only.

Typical rotations/curriculum

Contact individual programs for details; rotations are highly variable, especially regarding non-NICU blocks and the amount of clinical/ICU vs. research/elective time.

Board certification afterwards?

The United Council of Neurologic Subspecialties (UCNS) accredits training programs (fellowships) and awards board certification. Please note that many neurologic subspecialties are not covered by the Accreditation Council of Graduate Medical Education (ACGME) and the American Board of Medical Specialties (ABMS) at this time, but applications for this are in the works. This is generally NOT perceived in a negative light.

Average salary during fellowship

PGY 4 and 5 vs. 5 and 6 (as per your number of resident years already completed)

PREPARING TO APPLY

How competitive is the fellowship application process?

There are often a few unfilled spots in the country, although not many. Some programs prefer neurology resident applicants and consequently applying from EM is quite competitive, while others are actively recruiting EM applicants and therefore much more open.

Requirements to apply

There are no specific requirements other than completion of training in one of the approved specialties (EM, IM, neurology, neurosurgery, surgery, pediatrics, anesthesiology). Each program has individual requirements and should be contacted directly (many will require USMLE Step 3, for example).

Research requirements

There are no formal research requirements, but clearly research is beneficial to your application, particularly if in an area that spans the intersection of emergency medicine and neurocritical care.

Suggested elective rotations to take during residency

This will be dependent on your total amount of elective time, but rotations to consider include:

- Neurological Intensive Care Unit (NICU) — an absolute must!
- Other critical care rotations for broad critical care skill base
- Helpful more neuro-based rotations: EEG/neurophysiology monitoring, stroke, epilepsy — in general these are very useful for rounding out your education and demonstrating interest but consider them only if you have time.

Suggestions on how to excel during these elective rotations

Keep an open mind. Remember that in general you will be learning from a specialist in an area in which you have fairly limited experience and information; pay attention to what they're saying, and if they are managing patients differently than you might choose to, try to understand why.

As usual, show up on time, know your patients, read about your patients and try to gain more in-depth knowledge regarding the specialties involved (epilepsy, for example).

Learn the personalities and communication styles/preferences of your various consultants. This will also benefit you greatly in the future for learning the type and order of information that different consultants (interventional neurology, for example) would like.

Should I complete an away rotation?

Depending on the quality of your home NICU (if it exists), this may or may not be beneficial. If your home NICU is less developed, then an away rotation is a must. If you already have a NICU block in your residency training, then your elective time would be better spent on more neuro-focused activities and not "another" NICU month, since you will be doing many of these in your fellowship and ideally should already have excelled in your month at your home institution. Take into consideration that letters of recommendation are an important part of the application process, and a letter from an established and well-respected neurointensivist is highly valuable.

What can I do to stand out from the crowd?

The usual activities: join professional societies, go to conferences, and essentially demonstrate both that you have specific exposure to the field (so you know what you're involving yourself in) and a commitment to it. Get involved in the Neurocritical Care Society; there are plenty of opportunities to get involved in projects to increase your exposure to neurocritical care and to get to know some of the leaders in the field.

Should I join a hospital committee?

Joining hospital committees, in particular those focused on ICU-based topics like ethics, palliative care, and especially brain death and organ donation may be helpful if you are interested. Certainly, stroke committees may be helpful as well.

Publications other than research

Publications other than research, such as opinion pieces, are always helpful as well.

How many recommendations should I get? Who should write these recommendations?

Generally, most programs require 3 letters, and many will accept additional letters. One will come from your program director, and ideally one should come from the director of your NICU month (whether that be home or away rotation). Additional letters can come from a faculty mentor, research advisor, or an EM-based intensivists or stroke team liaison. As stated earlier, letters of recommendation are an important part of the application process, and a letter from an established and well-respected neurointensivist is highly valuable.

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

This depends on the length of time spent as an attending and what you do during that time. The goal should be to demonstrate your time was spent on neurocritical care-related activities and fits into an overall career plan, including what you want to do post-fellowship. It shouldn't look like you're applying for a fellowship position because you're bored/frustrated with your current position. That said, fellowship can be a valuable road back into academics for those who have been practicing in the community and find themselves less competitive for academic positions. If you are returning to fellowship training after being an EM attending, spend free time with projects, research, committee-work with neurologists, neurosurgeons, and neurointensivists at your hospital. Letters attesting to your growth and contributions to neurocritical care as faculty are important.

What if my medical degree is from an Osteopathic program?

In order for an EM physician to sit for UCNS boards, one must be ABMS certified/eligible in emergency medicine. This means that as a DO applicant you must have gone to an ABEM residency (not ABOEM) and completed a UCNS-accredited fellowship to sit for boards.

Some fellowships may still allow applicants from ABOEM residencies — however, one would not be board-eligible in neurocritical care. Contact specific programs for details if interested in pursuing this route.

What if I am an international applicant?

Visa issues may become a concern and this will again be very program-specific. However, similar to its history of significant interest in multidisciplinary contributions, NCS has a strong history of international involvement and is historically very welcoming of those with significant contributions to make.

APPLICATION PROCESS

How many applications should I submit?

Generally, you should try to find as much information as possible regarding specific programs, and then apply only to the ones in which you have significant interest. Attendings from your home program, either EM or neurology, may be able to help you with this. Unlike some critical care specialties, most spots in neurocritical care are filled using a “match” process through [SF Match](#) similar to residency. It is unlikely that you will be offered on-the-spot jobs, and having too many interviews isn't necessarily a problem, but don't waste time and effort applying to places you would not want to attend. As with any match process, gauge the number of applications to the strength of your application: the stronger your application, the fewer programs you will need to consider.

How do I pick the right program for me?

Figure out your career goals and then try to match them with a program. The personalities of the people in the program are very important. How well do you feel you fit in with them? Are they supportive of your goals? Do they understand your goals and why someone from EM would be applying? Fellowships in general and in neurocritical care in particular are much smaller than residencies, so your interactions, positive or negative, with a handful of attendings will define your experience to a significant extent. This may be a difficult assessment to make in the brief time of an interview day, so returning to spend some clinical time with the program, if that is an option, may be helpful.

It cannot be overstated that the tenor of the program and relationships with your attendings and coworkers is one of the components of fellowship that can make it an excellent experience or a challenging and frustrating one.

It also may be valuable to ask program directors what they want to see their graduates doing or what they have done in the past to determine how well the program's priorities match yours. Ensure that you have read the papers and research by some of the key faculty you are interviewing with, as this will determine the slant of the department and skew of their clinical exposure and connections within neurocritical care.

Common mistakes during the application process

Applicants who try to change their goals or personality to match a program.

Even if this gets you in, it will not make you happy. There will be constant friction, and neither you nor your institution will have their needs met during your 2 years. Do not accept offer from a program that doesn't offer what you want and won't be flexible.

Being overly positive or negative about your EM background.

Remember, this puts you in a significant minority as compared to most applicants, but you have unique strengths and weaknesses. Don't see yourself as a less-well-trained candidate, but also don't underestimate the amount of neuro/critical care background that you lack. See yourself as a differently-trained candidate. Make sure the program knows you see yourself as this.

Asking obvious questions.

If the answer to your question is on the website, it proves you haven't bothered to do even basic research into the program.

Asking small-picture questions.

You are investing half a million dollars of lost income and 2 years of your life into furthering your career. Ask big-picture questions regarding your training and the future. Questions such as what the call schedule is like or how many weeks of vacation you have are not appropriate attending-level questions and really don't matter on this scope. However, discussing these questions with the fellows during dinner is fine.

Not attending a pre- or post-interview dinner.

Meeting the existing fellows in an informal setting to gauge their personalities and goals and determine

whether you could see yourself as one of them. Remember that it's informal but still part of the interview process — on both sides.

Not treating administrative personnel with respect and graciousness

Fellowship coordinators are the backbone of a program — and they will offer their opinion as to how they were treated by applicants during the process. If you can't treat administrative or other staff well (nursing, techs, etc.), that is a clear red flag that you will have problems with teamwork and communication.

Not showing interest in the process during the interview

This should not need to be said, but texting or answering your phone during any part of the interview where somebody is speaking with you or presenting information shows a lack of respect for the presenter or interviewer and stands out in spades. Remember that your academic achievements and CV got you to the interview, and the interview day is mostly to gauge whether or not your personality will be a good fit.

Application deadlines

All programs participate in SF Match. Registration is incredibly early! You may start registering October 2018 to match for a July 2020 position (no, this is not a typo — 21 months!) Match results are available in June, 13 months prior to your start. The application timetable can be obtained from the [SF Match website](#).

Tips for writing your personal statement

Be genuine. Make it clear why you are interested in doing what you want to do. Legitimate interest and passion is usually obvious in your statement. Many program directors will recognize genuine interest and passion which will carry you through difficult months and make you successful in the long term.

Include and highlight relevant interests or activities that aren't already on your CV. This is your chance to express yourself as an interested, committed, and thoughtful person.

Your personal statement is also a great chance to make it clear what strengths you bring to the table as an EM applicant. Express in writing why an EM applicant is interested in this career path.

In general, do not embellish on your application. Be honest about your accomplishments; being caught in a fabrication reflects a lack of character and will likely put you to the bottom of the list if not earn you the classification of "do not rank."

Is this a match process?

Yes, through [SF Match](#).

What happens if I don't obtain a fellowship position?

Your options include finding one of the spots that are available after the match (there usually are a few), applying again for the next cycle (ideally while working on enhancing your CV in the interim), or working as an emergency medicine attending (which can also be quite rewarding). If you have a strong interest in neurology, critical care, and neurocritical care, you can often supplement that through informal training and still position yourself, particularly at medium-sized institutions, as the local “expert” in the topics that interest you.

INTERVIEW PROCESS

How do I stand out from the crowd?

Make sure you read your personal statement before your interview and use the interview as a way to highlight important points/make points that are related or supportive. Don't contradict your personal statement or make it seem irrelevant!

Make it clear what you bring to the table for the organization rather than focusing on things from your perspective. Many may have only a vague idea of the skills you have obtained during residency but would be interested in topics such as general critical care/resuscitation skills, as well as general knowledge of how to make neurocritical care concepts “work” in a real-life/chaotic ED to improve the care of patients closer to their injuries. EM providers often also have ultrasound training of interest to neurocritical care departments.

Be as knowledgeable as you can about the neurocritical care specialty. Read about the history of its development and most importantly be able to articulate what your niche interest is within neurocritical care, such as brain death, epilepsy, intracranial pressure (ICP) management, etc. Don't make this up on the fly — give this a lot of thought and have conversations with your EM or neurology attendings who have a stake in neurocritical care to gauge whether your areas of interest are feasible, practical, and/or need some refinement. The applicant who has a good sense of the neurocritical care landscape and where he/she wants to fit into it presents as someone who has goals and has been thoughtful about planning a career path. This doesn't mean you can't change direction during or after fellowship but it shows that you have been thoughtful and insightful about the process.

What types of questions are typically asked?

You will get all the standard questions for any interview, but overall the most prevalent one is why an emergency medicine physician would want to be a neurointensivist. Have a true/passionate answer ready and don't react defensively. People are genuinely interested and curious! They are spending two years of time training you to be their colleague, and they expect that some portion of your practice should be alongside other neurointensivists.

How many interviews should I go on?

Many people try to maximize their total number of interviews, but often stratifying may be a better strategy. Interview with a couple programs from each tier. Your home institution or a trusted mentor may be able to provide insight on how competitive of a candidate you are. Often this may come from your neurology department, not your emergency department, to further fine-tune this number.

PREPARING FOR FELLOWSHIP

Textbooks to consider reading

You will know early enough — again, greater than a year in advance — where you will be matching that it is probably best to directly contact your future program director and find out what you should be reading. That said, any general neurocritical care textbook would be valuable. If you have extra time, background reading of a general hospital neurology textbook may be helpful to better understand some of the neurology “zebras.”

Important skills to practice while in residency to prepare for fellowship

- General critical care skills, both procedural and cognitive
- Neurology exam: This will probably not be as detailed as a real “neurologist” neurology exam — and often can't be due to patients' clinical status or acuity of their condition — but you should gain an understanding of how to examine patients who are intubated/critically neurologically injured. Focus on things like cranial nerves, brainstem reflexes, and abnormal posturing. Understanding of the NIHSS as well as a good posterior circulation exam is also a must for EM neurointensivists. Subtle findings in seizures and understanding of clinical localization of lesions in critically ill patients are also helpful.

Tips on how to succeed as a fellow

The biggest factor is a significant change in mindset from traditional emergency medicine thinking. In addition to correcting problems, critical care is partially about anticipating and preventing them with a good understanding of a patient's longitudinal course. This requires greater attention to detail. Many patients have more complex interrelated issues that may not be emergencies but still must be addressed to productively move their care forward.

The critical care arena also often involves significant adjustment to the presence of additional consultants with their own, differing opinions. In the Emergency Department, consultants usually do not come unless you ask them to, however, in neurocritical care they may be following the patient longitudinally or have been consulted by a previous team. This increases the number of political issues which you may need to manage. This is particularly true regarding neurosurgical patients; once an attending has operated on a patient, he/she has opinions on care and a vested interest in seeing that the patient does well, regardless of whether the attending of record at your institution is the neurosurgeon or neurointensivist.

All the usual residency skills regarding being on time, courteous, professional, and having good communication skills certainly still apply.

Do not stop learning, both through reading and especially through discussions with your consultants. There will be a large amount of neurology and neurosurgery literature with which you are unfamiliar. Seeking out information and opinions from the (many) consultants which whom you interact is incredibly valuable.

Seek out mentorship and career advice. This potentially includes those outside of your institution, particularly if you do not have attendings from an EM background. Your neurology-trained attendings will have very valuable advice for you, but are likely less familiar with the competing priorities you will need to manage for the EM half of your career (assuming you plan to retain clinical time/appointments in the ED).

The first part of your fellowship is the time to lay low, get a feel for the landscape and practice diplomacy. Be the leader of a team. Develop excellent relationships with your nursing staff; they can make you or break you. Choose your battles later. Come out of the gate being confident, collaborative and willing to learn from everyone. Building a team around you will save you in times of crisis. If the nurses consider you trustworthy, dependable and accessible, they will keep you informed. If not, they will go around you and this will erode your position. This is key to knowing what is going on with every aspect of your team and patients.

Remember that your fellowship director, medical director and attendings will be writing you letters and helping you get your next job. Be thorough, detail-oriented and diligent about follow-through. Be attentive to each attending and his/her preferences. Don't be frustrated by different attending preferences or styles — it is to your benefit to see many different styles as you develop your own.

Take time to teach medical students and residents. This is recognized and speaks volumes about your dedication. Your role encompasses not only patient care, but family communications, trainee education and consultant collaboration.

CONCLUSION

Additional resources

- [Neurocritical Care Society](#) publication *Neurocritical Care*
- Any journals specific to your area of interest (traumatic brain injury, stroke, cardiac arrest, etc.)

National organizations

[NCS](#)

[SSCM Neuroscience Section](#)

[ACEP Critical Care Medicine Section](#)

[EMRA Critical Care Committee](#)

[AAEM Critical Care Section](#)

Conferences

NCS (Neurocritical Care Society)

SSCM (Society of Critical Care Medicine)

ACEP (American College of Emergency Physicians) Scientific Assembly

AAN (American Academy of Neurology) — especially if interested in more “neuro” as opposed to neurocritical care topics

SAEM (Society for Academic Emergency Medicine)

Critical Care Interest Group

AAEM (American Academy of Emergency Medicine)

How to find a mentor

Ask anybody and everybody you know! EM neuro-intensivists are a small but rapidly growing group — and as such are hard to find, but are very interested in expanding and increasing their numbers. Do not forget this specialty exists all on its own but spans neuro, critical care, and EM. Valuable mentors and professional contacts may exist in any of those departments, plus in basic neuroscience nonclinical specialties if you have a particular interest in research.

Surgical Critical Care Fellowship

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INTRODUCTION

Description of the specialty

Critical care medicine became an ACGME-approved subspecialty for emergency physicians in 2011. In 2012, the surgical critical care fellowship (SCC) pathway was approved for emergency physicians interested in becoming board-eligible intensivists. As of 2016, emergency physicians can become board-certified intensivists by pursuing one of the three pathways: surgery, internal medicine, and anesthesia. Given the growing acuity within emergency departments, persistent shortage of intensivists nationwide, and an increased interest in ED-based Intensive Care Units (ICUs), pursuing a board-eligible critical care training pathway has become an attractive career option for emergency physicians.

History of the specialty/fellowship pathway

In 2012, the American Board of Surgery (ABS) broadened its eligibility criteria to allow ABEM diplomates board certification in SCC. This is the result of the approval by the American Board of Medical Specialties (ABMS) of a resolution submitted by the ABS. This pathway requires 2 years of training. The first year is a preparatory year during which you will gain clinical experience in the foundations of surgery, management of complex surgical conditions, and exposure to critical care training. This includes pre-operative and post-operative management of surgical patients, advanced care of injured patients, complex wound management, and procedures related to critical care. The exact composition of this year is at the discretion of the SCC program directors, and each SCC program must submit a proposal for the first-year curriculum to the ABS for approval. The second year is a traditional SCC fellowship, during which 8 months must take place in surgical ICUs.

Why residents choose to follow this career path

Emergency physicians who may want to consider additional critical care training are those who have enjoyed treating critically ill patients beyond their initial resuscitative phase in the ED. These physicians thrived in their ICU rotations during residency and are interested in improving the care of critically ill patients from the moment the patients enter the ED to their transition to (and care within) the ICU to hospital discharge. They enjoy learning about relevant critical care topics such as ventilator management, sepsis, shock, acute lung injury, extracorporeal support, parenteral nutrition, pain management and sedation, and goals-of-care discussions. Those who pursue the SCC (or anesthesia critical care) fellowship pathway rather than internal medicine programs have particularly enjoyed taking care of surgical patients, as these pathways usually put more emphasis on pre- and post-operative management and complications, trauma, and hemorrhagic shock.

How do I know if this path is right for me?

Most EM residencies have established ICU rotations, but consider setting up additional rotations through surgical ICUs as a senior resident so you are given more responsibilities. Get in touch with current EM-trained intensivists about their careers, clinical activities, and lifestyle, to see whether this career path fits with your personal goals. A great way to meet many EM-intensivists in one setting is to attend the critical care section meetings at ACEP and SAEM, through EMRA's mentorship program, and the emergency medicine section of the Society of Critical Care Medicine (SCCM). You may also want to follow intensive care related podcasts or blogs listed at the end of this chapter.

Career options after fellowship

There are many career options available after SCC fellowship. Fellowship-trained intensivists will be able to work in many types of ICUs, including SICU, trauma ICU, neurosciences ICU, cardiac surgery ICU, transplant ICU, medical ICU, and mixed ICU. There is also a growing role for ED based ICUs. They may want to split time between the ED and the ICU, with varying ratios based on their interests and the institutional needs. They can work in a community setting or an academic institution. They may also want to pursue research, educational, or administrative roles in addition to their clinical duties.

Splitting time between departments

Many fellowship-trained physicians choose to split their time between the ICU and the ED. Some spend more time in the ICU or in the ED, while others also mix in time on the trauma service. While you must have

fellowship training to work in a surgical ICU, it does not have to be a SCC fellowship. Those who have trained with multi-disciplinary IM-CCM programs with adequate exposure to surgical patients have had successful careers in surgical ICUs.

Those looking for jobs in institutions without precedence of EM-intensivists may need to negotiate with two or more departments to create a suitable employment agreement. It is important to determine what each department's full time employment means, as different departments will have different requirements. Clear expectations need to be agreed upon up front.

Academic vs. community positions

Academic institutions tend to have more specialized ICUs, whereas community hospitals tend to have mixed units. In general, there is more research infrastructure and greater focus on education within academic institutions.

IN-DEPTH FELLOWSHIP INFORMATION

Number of programs

As of 2018, SCC programs accepting EM applicants include:

[Albany Medical Center](#)
[Carolinas Medical Center](#)
[Johns Hopkins University](#)
[Massachusetts General Hospital](#)
[Medical College of Wisconsin](#)
[Methodist Health](#)
[Michigan State University](#)
[St. Luke's Hospital](#)
[Stony Brook](#)
[University of Iowa Hospitals and Clinics](#)
[University of Maryland R Adams Cowley Shock Trauma Center](#)
[University of Michigan](#)
[University of Pennsylvania](#)
[University of Texas Southwestern](#)

Please refer to [EMRA Critical Care Committee](#) for an updated list of the SCC fellowships that currently accept EM applicants.

Differences between programs

There are many differences between the structure and roles of each fellowship's first year, or "advanced preliminary resident in surgery" year, sometimes

referred to as the Supplementary Education Program in Surgery for the Emergency Physician (SEPSEP). For many programs, the curriculum of the first year has evolved considerably, since this is still a very new pathway. Applicants should contact each program director to gain further insight into what the first year entails. Because the first year varies greatly between programs, prior graduates of the SCC pathway can be an excellent resource when comparing different programs.

The experience of the second year is largely similar to an institution's SCC fellowship. As such, applicants should inquire about the diversity, volume, and role of that year's training. It is also helpful to determine the types of jobs that the EM-SCC fellows secure after completion of the fellowship. Again, reaching out to prior graduates can be helpful in this respect.

Length of time required to complete fellowship
2 years.

Skills acquired during fellowship

You will become an expert in the critical management of all forms of shock, coagulopathy, renal failure, lung injury, ICU nutrition, infectious disease, sedation, and mechanical ventilation.

You may also gain exposure to management of extracorporeal membrane oxygenation (ECMO) and procedures, such as the surgical airway, percutaneous gastrostomy, resuscitative endovascular balloon occlusion of the aorta (REBOA), venous cutdown, and cannulation for ECMO.

Typical rotations/curriculum

The first year consists of 12 months of intermediate-level surgical experience in the management of patients with complex surgical pathology. Services that are acceptable to the ABS for this experience include but are not limited to:

- Emergency general surgery
- Trauma surgery
- Burn surgery
- Solid organ transplantation
- Vascular surgery
- Cardiothoracic surgery
- Surgical oncology
- Surgical infections
- Orthopedic surgery
- Neurosurgery
- Pediatric surgery
- Surgical ICU - may not comprise more than 3 months of the total 12 months

The second year focuses on exposure to various SICUs, and often includes elective and research months to further pursue academic interests within the realm of SCC.

Board certification afterwards?

The ABS SCC board certification examination is a 1-day examination consisting of approximately 200 computerized, multiple choice questions. The exam lasts 5 hours and is offered in September of each year. An examination content outline is available at [SCC Certifying Examination Content Outline](#).

To be eligible, ABEM diplomates must complete a "preparatory year as an advanced preliminary resident in surgery" prior to entering a one-year ACGME-accredited fellowship in SCC at the same institution that the preliminary year was completed. Upon successful completion of the SCC certification examination, ABEM diplomates will need to participate in the [ABS maintenance of certification \(MOC\) program](#) to maintain their SCC certificate. The ABS has not offered a provision (grandfathering clause) for ABEM diplomates who had completed a SCC fellowship before July 2013 to become certified in SCC. Please visit https://www.absurgery.org/default.jsp?certscce_abem for additional details regarding SCC board certification and continuous certification. Emergency physicians will then undergo the same recertification process as other surgical intensivists through the ABS.

Average salary during fellowship

Typically, fellows will receive a salary commensurate with their PGY-level (4 or 5) depending upon whether they graduated from a 3- or 4-year EM program.

PREPARING TO APPLY

How competitive is the fellowship application process?

The SCC fellowship application process is fairly competitive because there are relatively few programs and limited spots available.

Requirements to apply

Completion of 3- or 4-year ACGME-accredited EM residency.

Research requirements

Research is encouraged but not required. Applicants should pursue projects they find interesting, which may include clinical or basic science research projects, clinical protocol design, or qualitative improvement projects that aim to improve the care of critically ill

patients in the ED or ICU. The project should ideally lead to poster or podium presentations and/or publications.

Suggested elective rotations to take during residency

ICU rotations with senior-resident level responsibility and additional trauma surgery outside of your required trauma months.

Suggestions on how to excel during these rotations

To excel during these rotations, it is important that you know your patients, their pathologies, and management. As with all other rotations, be proactive in procedures, stay on top of the literature, and offer to teach junior residents and students. Above all, show interest and motivation to learn.

Should I complete an away elective rotation?

Yes, if your home institution does not offer any of the suggested rotations. If there is a program of particular interest to you, consider completing an away rotation there. Be sure excel during your away rotation as your performance will be reflected in your recommendation letter.

What can I do to stand out from the crowd?

Ways to stand out include national or institutional leadership positions, research that leads to publications, continuity of interests, interest and expertise in education, and outstanding letters of recommendation, particularly from surgical intensivists. Some applicants have also completed prior fellowships such as a resuscitation or ultrasound fellowship. While the skills learned previously are helpful and may differentiate the applicant from their peers, the graduating SCC fellows will have adequate knowledge in these fields.

Should I join a hospital committee?

Yes, if your interest and time permits. Some helpful hospital committees to join include: resuscitation, critical care, transfusion, pharmacy, quality improvement, and/or palliative care.

Publications other than research

Additional publications beyond research would potentially help and strengthen your application. These include blog posts, book chapters, reviews, case reports, podcasts, and/or videocasts.

How many recommendations should I get? Who should write these recommendations?

Three recommendation letters are generally required. In addition to soliciting a letter from your EM program director or chair, it is important that you highlight your performance in the ICU. To do so, you should solicit letters from intensivists. If your program does not already have ICU rotations built in the curriculum, doing an elective in an ICU (preferably SICU) as a senior resident will really help to demonstrate your dedication to this pathway as well as a way to secure a recommendation letter. Though not always possible, getting a letter of recommendation from someone that has trained at the location where you are applying would be helpful. An away rotation at your desired program can also help you secure a letter which will differentiate you as an applicant.

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

Yes, but you should make the attending year(s) worthwhile by enhancing your critical care knowledge and skills.

What if I'm a DO applicant?

The same set of rules and recommendations apply to the DO applicants as long as they are completing an allopathic residency program.

What if I am an international applicant?

The SCC Program Requirements state that applicants must have completed an ACGME-accredited residency program. Programs accredited by the Royal College are usually acceptable, while others are often not. Find out which programs accept international applicants and the type(s) of visa they can sponsor prior to submitting your application. Once accepted to a fellowship, it is important to submit all requested documentation promptly in order to avoid delays in visa approval.

APPLICATION PROCESS

How many applications should I submit?

Similar to residency, applicants should apply to as many places as possible within their geographic preference. Do not apply to a program if you would not be willing to live in that area.

How do I pick the right program for me?

If you decide that applying to an SCC fellowship is the right choice for you, then look closely into each fellowship's curriculum, the EM fellows' roles during each rotation, geography, and the alumni network.

Attempt to reach out to programs and correspond with current or past fellows, if possible, to get a better feel for the program. There is significant variability in the first year curriculum across programs.

Common mistakes during the application process

The biggest mistake people make is not submitting all the required information in a timely fashion. Starting in 2015, many SCC programs have instructed applicants to go through the [Surgical Critical Care and Acute Care Surgery Fellowship Application Service](#) (SAFAS). The Surgical Critical Care Program Directors Society is strongly encouraging programs to use SAFAS for applicants. Applicants may create an account and follow the applicant instructions provided by [SAFAS](#). The SAFAS applications open in January and are accepted through August 15 of each year.

Most SCC programs will require applicants to submit the following items with their application:

- Personal statement
- 3 letters of recommendation
- Curriculum Vitae
- Copy of your medical school transcript
- USMLE scores
- Copy of ECFMG (if applicable)

Some SCC programs accept applications on a rolling basis beginning in the spring or summer in the year prior to matriculation. The process varies among programs, so it is important to check with each program individually about application requirements and deadlines. It is also important that applicants secure recommendation letters from intensivists in addition to their EM program director.

Application deadlines

August 15 if you apply through SAFAS; otherwise, aim to submit as early as possible. It is also important to reach out to programs once you have submitted your application to ensure they have received your completed application and that nothing is missing. This is also why it is important not to wait until the deadline to submit your application.

Tips for writing your personal statement

It is important to formulate a cohesive discussion on your interest in critical care and how that will help to enhance your training in EM. Some topics of discussion may include: What got you interested in EM-CC in the first place? Why is SCC important to you? What do you

plan to do with your SCC training after you are done? Who inspired you? What have you done to further your interest in SCC?

Is this a match process?

This may be different for each program, so it is best to ask the fellowship directors to see if they are putting their EM-SCC positions into the match. As with the application, it is important to reach out early so you do not miss any deadlines.

What happens if I don't obtain a fellowship position?

Use the next year (or few years) to enhance your application and make yourself a better future EM-intensivist. Some examples may include, but are not limited to, another fellowship such as ultrasound, resuscitation, research, medical education, or simulation. Alternatively, you may decide to take an attending job, maybe even at the institution where you are interested in furthering your SCC training.

INTERVIEW PROCESS

How can I stand out from the crowd?

In general, applicants who stand out are those who have shown commitment during their training to EM-CC. Examples include research, education, national awards, institutional quality improvement projects, and leadership roles, such as chief resident or service on national critical care committees.

What types of questions are typically asked?

Why critical care?

Why SCC rather than another critical care training pathway?

Tell me about a challenging critically ill patient that you had.

What are some challenges in critical care medicine?

Do you have any questions about the program? *It is very important to do your homework regarding the program itself, the institution, and many of the faculty before the interview.*

How many interviews should I go on?

Because SCC spots are limited and fairly competitive, applicants should aim to go on as many interviews as possible until they have received an offer.

PREPARING FOR FELLOWSHIP

Textbooks to consider reading

- Marino PL. The ICU Book. 4th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2013.
- Farcy DA, Chiu WC, Flaxman A, Marshall JP. Critical Care Emergency Medicine. New York, NY: McGraw Hill; 2011.
- Mattox K, Moore E, Feliciano D. Trauma. 7th ed. New York, NY: McGraw Hill; 2012.
- Society of Critical Care Medicine. Comprehensive Critical Care: Adult. Mount Prospect: SCCM; 2012.
- Zanotti-Cavazzoni SL, Pino RM. Self-Assessment in Adult Multiprofessional Critical Care. 7th ed. Mount Prospect: SCCM; 2011.

Important skills to practice while in residency to prepare for fellowship

- Central and arterial line placement, intubation, tube thoracostomy, thoracentesis, paracentesis, emergency airway, thoracotomy
- Ultrasound — FAST, transthoracic and transesophageal echocardiography, lung, vascular access, deep vein thrombosis assessment
- Bronchoscopy, fiberoptic intubation
- Conscious sedation
- Wound management — complex dressings and vacuum-assisted closure devices

Tips on how to succeed as a fellow

Work hard, but eat and sleep when you can. Continue to read and stay up to date on current literature and guidelines. Learn from your colleagues (particularly those who trained through different specialties). Get to know your patients and their families; participate in as many family meetings as you can. Identify mentors and role models. Respect and learn from the nurses, respiratory therapists, and ancillary staff. Teach someone something new every day. Don't be afraid to get your hands dirty, and don't be afraid to ask for help. Try something new (procedure, management style, etc.) every week. Keep in touch with your loved ones.

CONCLUSION

Additional resources

Journals

New England Journal of Medicine
JAMA
The Lancet
Chest
Critical Care Medicine
Critical Care
Intensive Care Medicine
Journal of Trauma and Acute Care Surgery
JAMA Surgery
Journal of the American College of Surgeons
Resuscitation

Podcasts

[EMCrit](#)
[iCritical Care podcast by SCCM](#)
[Intensive Care Network](#)
[Medscape Critical Care podcast](#)
[Critical Care Perspectives in EM](#)
[The RAGE podcast](#)
[ICU Rounds](#)
[ED ECMO](#)
[ALiEM](#)

Blogs

[LearnICU](#)
[Intensive Care Network](#)
[Maryland CC Project](#)
[Penn CC Project](#)
[NIH CC Project](#)
[Critical Care Reviews](#)
[Life in the Fast Lane](#)
[PulmCCM](#)
[The Bottom Line](#)
[Resuscitation Medicine Education](#)
[Thoracic Anesthesia](#)
[5 Minute Sono](#)
[Ultrasound of the Week](#)
[Resuscitative TEE Project](#)
[Virtual Transesophageal Echocardiography](#)

Articles

Napolitano LM, Rajasee V, Gunnerson KJ, Maile MD, Quasney M, Hyzy RC. Physician Training in Critical Care in the United States: Update 2018. *J Trauma Acute Care Surg.* 2018 Feb 17.

Tisherman SA, Alam HB, Chiu WC, Emlet LL, Grossman MD, Luchette FA, Marcolini EG, Mayglothling JA. Surgical critical care training for emergency physicians: Curriculum recommendations. *J Amer Coll Surg*. 2013;217:954-959.

National organizations

Critical Care Sections of ACEP, SAEM, and EMRA
Society of Critical Care Medicine
American Association for the Surgery of Trauma
Eastern Association for the Surgery of Trauma
Western Trauma Association
Shock Society
American Heart Association

Conferences

ACEP, SAEM, and EMRA critical care section meetings
SCCM EM section meeting
AAST
EAST
WTA
AHA Resuscitation Science Symposium
Social Media and Critical Care Conference (SMACC)

How to find a mentor

Ways to network and find a mentor include: [EMRA Critical Care Virtual Mentorship](#), critical care section meetings, social media, and alumni network.

Disaster Medicine Fellowship

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INTRODUCTION

Description of the specialty

The specialty of disaster medicine represents an exciting and fast-growing opportunity for emergency physicians. In the 1980s, the slowly escalating presence of disaster needs caught the attention of various domains and specialties. Disaster medicine emerged as a combination of acute care medicine, public health, and emergency management (formerly known as disaster management).¹ This resulted in a specialty that incorporates principles from different disciplines, including emergency medicine and its associated acute care specialties, public health, emergency management, humanitarian services, non-medical genres, and prehospital emergency medical services (EMS).

Disaster medicine provides care for the victims of natural and man-made disasters with specific consideration given to timeliness and availability of resources. This often means expanding scopes of practice to allow dynamic operations with partners from other jurisdictions. The role of a disaster medicine-specialized physician is not limited to responding to the disaster; it should also be integrated into the full disaster cycle, including the areas of preparedness, recovery, and mitigation.

History of the specialty/fellowship pathway

It is difficult to track a linear chronological progress for the development of disaster medicine as a specialty. It evolved to fulfill the need for an organized management structure for health and human issues arising from disasters around the world. By 1990, the first core textbook for disaster medicine training was written.² Since then, the paradigm of the domain of disaster response has slowly and heterogeneously moved toward more formal, interoperable, and consensus-based training.

Events such as the 1993 World Trade Center bombing, the 1995 Oklahoma City bombing, the September 11 attacks of 2001, the 2004 Indian Ocean earthquake and tsunami, Hurricane Katrina in 2005, the Haiti earthquake of 2010, and the rise of domestic and international terrorist attacks have shaped the specialty. In 1976, the American College of Emergency Physicians developed a policy statement describing the role of emergency physicians during disasters. The University Association of Emergency Medicine (now the Society of Academic Emergency Medicine) called for the establishment of fellowship training in disaster medicine. In 2005, after decades of asynchronous growth, the American Board of Physician Specialties (ABPS) determined that a new board of certification in disaster medicine should exist as a unique part of the national disaster preparedness strategy. In response, the American Board of Disaster Medicine (ABODM) was created as the first medical board certification in disaster medicine in the U.S. (<http://www.abpsus.org/disaster-medicine>).

Why residents choose to follow this career path

Residents choose this career path when they desire to be disaster medicine specialists engaged in leadership roles in disaster management through the whole spectrum of the disaster cycle.

How do I know if this path is right for me?

If you are the kind of person who wants to break from routine and go beyond traditional boundaries to save lives during disasters, then this is the perfect specialty for you. Envision yourself in the role of a leader: sorting causalities, managing hyper-acute injuries, and leading domestic field and hospital operations or deploying with medical teams overseas. You should also imagine yourself in meetings, sitting around a table surrounded by leaders from different disciplines, discussing matters that affect your hospital, region or state, nation, and the international community. You may find yourself in another part of the world, helping people recover from a recent disaster. However, if the idea of frequent meetings, committee brainstorming sessions, and hours-long discussions of non-clinical issues doesn't appeal to you, reconsider such a fellowship.

Career options after fellowship

Many exciting opportunities await the disaster medicine specialist. Burnout leads many emergency physicians to look for an area of interest outside the doors of emergency departments. Whether you want to spend most of your time in the ED, disaster administration, or

both, all options are available. Many factors can affect your career pathway. This includes the hospital's view of and demand for emergency management, as well as your qualifications and intentions. Many hospitals are in need of someone who can help them prepare for and sail through the waves of disasters toward safer shores after a crisis. You may need to gather more information about the disaster management system before applying for a job and see what suits your goals the most. It is not only hospitals that employ disaster specialists. There are many non-hospital opportunities, including the military, city, state, and federal government, public health departments including the Centers for Disease Control and Prevention (CDC), academic research centers and universities, and private small and international agencies. Humanitarian disaster relief work is another great opportunity for those who are interested in being in the field, and career paths can lead you to work with various non-governmental organizations (NGOs), the World Health Organization (WHO) or foreign governments. If you prefer domestic operations, you can also join a DMAT (Disaster Medical Assistance Team) in your region to be part of a federally sponsored deployment team or (create) a hospital system or university-based disaster medical team. Mentors in the field are available for you to seek advice and to make suggestions that will help satisfy your career goals. It is projected that every large, tertiary, and private academic center will need a DM specialist on staff. Another projection among disaster faculty is aligned with moderate size cities.

Splitting time between departments

The graduate of a disaster medicine fellowship is expected to participate actively in hospital emergency management. Splitting time between the ED and your hospital's emergency management team is not uncommon. Some graduates will pursue a full-time job in emergency management but splitting the time with ED shifts is more common. Taking the responsibility of hospital disaster management is not an easy job as it requires a lot of time and effort. The best way to figure out what is expected from you is to discuss it with your hiring institution. Ask about their expectations from you and working hours for both (ED and disaster management). The same approach applies if you want to work for institutions other than hospitals, whether local, federal or international. Fortunately, the flexible nature of ED shift work will help you to save time for other duties. In the end, it is up to you to plan how to manage your time and to maintain balance in your life, income and career.

Academic vs. community positions

The earlier you plan for your future, the greater the chance you will get the position you seek. Think about lifestyle, family and income bracket when planning. It is important to decide early if you want an academic or community position. If you are passionate about teaching, research, and academic titles, then you may want to pursue an academic position. Positions are available for disaster medicine fellows in many universities and university-affiliated hospitals. Many faculty members of fellowships hold academic titles in well-known academic institutions, not only in the United States, but all over the world. Working in a community hospital will most likely lead to more involvement in emergency management with less teaching and research opportunities. Disaster medicine is a relatively new and rapidly growing specialty. As such, the demand for more research and education is high. This fellowship can help you build bridges to connect with many academic staff from different disciplines, which may help you in your future career.

IN-DEPTH FELLOWSHIP INFORMATION

Number of programs

Currently there are at least 17 programs that address disaster medicine, although some combine it with an EMS fellowship. Programs include:

- [Albert Einstein Medical Center \(with EMS\)](#)
- Brown University/Rhode Island Hospital (Government and International focus)
- [Carolinas Medical Center](#) (Disaster and Operational Medicine)
- George Washington University (Disaster And Operational Med with EMS fundamentals)
- Harvard Medical School/Beth Israel Deaconess Medical Center (International, Research, Operations, and Academics focus)
- Indiana University (Disaster Medicine)
- Johns Hopkins University (Disaster, Operational and Global Medicine with Research)
- [Newark Beth Israel Medical Center](#) (EMS with added Disaster over the EMS requirement)
- Stanford University (EMS dominant add 2nd year for Disaster Medicine with advanced degree time allotment)
- SUNY Health Sciences Center at Brooklyn (Strong DM and PH with 2 yrs. option MPH, 16-20 hr/wk NYHHC-HEPP)
- University of Massachusetts Medical School (DM and Emergency Management with flexibility:

International Med, EMS and MPH expanded to 2 years or more)

- University of California Irvine School of Medicine (Disaster and Operational Medicine, EMDM in development, MPH with 2 yrs.)
- University of California San Diego Medical Center (EMS dominant with added Disaster over the EMS requirement)
- University of New Mexico (Disaster in context of EMS Response Service: no DM faculty but MPH available)
- University of Texas: look at individual sites: [Houston](#); [San Antonio](#) (Global Health with a Master's in Tropical Medicine), and [Dallas](#) (MPH option)
- Wake Forest University School of Medicine (EMS dominant with participation in Disaster Medicine including large mobile hospital)

Differences between programs

Most have the same core content. Some programs are older than others, and better established. Some are fast-growing, while others are almost in a steady state. Programs may have a particular emphasis on a specific aspect of disaster medicine and management. Many programs still combine EMS and/or International Medicine with disaster medicine which may bridge some of the need to work ED shifts for income. The location of some programs may be advantageous. For example, a few programs are concentrated in distinct geographical areas, which allow them to share resources and experiences together in an enriching environment. The intensity of the curriculum and the level of hands-on training provided can vary between programs. The strength of research activities is also variable between programs.

Length of time required to complete fellowship

Disaster medicine fellowships are generally 1-2 years in length. Some programs may be combined with another subspecialty and/or an MPH degree for a total of 3 years.

Skills acquired during fellowship

As a disaster medicine fellow, you are expected to grasp the principles of operations and disaster management and to gain the skills to manage disasters both clinically and administratively. Through didactic sessions and clinical training, the fellow will learn to triage, manage, and evaluate a multitude of disaster-related injuries, including blast injuries, hazardous material casualties, mass casualty incidents (MCI), and more. Fellows will develop the requisite administrative skills needed for success, including planning, allocating

resources, utilizing data, maximizing surge capacity, conducting drills, and improving research. You will gain experience in prehospital disaster-related operations, Hospital Incident Command System (HICS), and the development of hospital disaster-related protocols. You will also learn about field disaster response on the domestic level using Incident Command and on the international level, including coordinating with the UN, WHO, and basic deployment field skills and principles.

Typical rotations/curriculum

Most fellowships have a common core content, which includes mandatory and elective rotations. Usually, the curriculum is a mixture of didactics, meetings, clinical sessions, courses (both online and in person), field experience, and research activities. Core content will include things like Federal Emergency Management Agency Incident Command System (ICS) courses, mass casualty incident (MCI) triage, and management of CBRNE (Chemical-Biological-Radiological-Nuclear and Hazardous Materials) events.

There is a large variety of available elective rotations, some of which can entail a second year. Examples of elective rotations include EMS (if not already integrated in the program), tactical medicine, visits to federal agencies, CDC, international emergency medicine, disaster relief/humanitarian aid, and disaster simulation. Those who want to do a 2-year fellowship often have the opportunity to obtain advanced degrees related to disaster medicine. For instance, fellows may be able to obtain a Master's of Public Health (MPH), Health Care Emergency Management (HEM), or the European Master of Disaster Medicine (EMDM).

Board certification afterwards?

The ABODM provides medical board certification in disaster medicine.

Average salary during fellowship

Salary will vary, but it is usually based on that of a PGY-4/5 trainee but in some cases may be commensurate to that of a junior faculty/attending.

PREPARING TO APPLY

How competitive is the fellowship application process?

Competition is variable between centers. Some may have difficulty filling slots due to proximity to other similar fellowships. As the number of fellowship programs increases, so does the number of candidates.

Requirements to apply

Applicants must be board-certified (or eligible) emergency physicians.

Research requirements

It is always advantageous to have prior experience in research, but it is not mandatory. Having a research project in mind before starting the fellowship is a good idea, since you will be asked to conduct research during fellowship. The more research experience you have during residency, the stronger your application will be from an academic point of view. Ideally it is related to disaster medicine, and specifically your area of interest. If possible, present your work as an oral or poster presentation at a conference if you cannot publish it before applying.

Suggested elective rotations to take during residency

Disaster medicine education during residency training is usually quite limited but may be growing as experts raise awareness of the need for education. However, some related content will be covered during the usual required residency rotations in the ED, EMS, intensive care units, and trauma care. Take advantage of elective training in disaster medicine. Look for opportunities to work with and learn from emergency management personnel at your hospital.

Suggestions on how to excel during these elective rotations

Start with a disaster medicine textbook or National Disaster Life Support (NDLS®) courses. Share your interest with those who can help you early in residency. Actively participating in hospital emergency management is a strong indicator of your interest. This includes involvement in meetings, table-top exercises, planning processes, and disaster drills.

Should I complete an away rotation?

An away rotation is not mandatory, but it can be significantly beneficial. Also, deploy whenever possible for a disaster, whether local or international. Disaster relief work will be a strong point in your application. Deploy with a professional organization to get the maximum benefit. International emergency medicine is a subspecialty of emergency medicine, with a significant overlap with disaster medicine. Participation in international activities will help you in your fellowship and your career after the fellowship. It is reasonable to look for such experience in your local area (whether your city or state) before traveling far away to get a similar experience.

What can I do to stand out from the crowd?

Demonstrate a strong desire toward disaster medicine in your application. Your education, research, and training should display that interest. Focus early on disaster medicine-related activities to strengthen your application. You should also show the administrative skills needed to manage critical operations during disasters. Your reputation during your work in the ED is very important; excel in your primary job as an emergency physician from the beginning. Obtain a mentor with sound experience in disaster medicine.

Should I join a hospital committee?

Yes! Active participation, ideally in your institution's emergency management group, includes attending meetings, participating in drill development, and showing up on time. Try to leave a positive impact on any committee in which you participate. If possible, participate in committees on larger scales, such as on a city or state level. These can potentially expose you to leaders in disaster medicine within your region.

Publications other than research

There are plenty of opportunities for writing other than research that include, but are not limited to, book chapters, blogs, magazine articles, and scientific material for disaster courses.

How many recommendations should I get? Who should write these recommendations?

Most programs will ask for three letters of recommendation, with at least one from either your program director or chair of the emergency department. You will likely need two additional letters, and it is recommended that both of these are from physicians who work in the field of disaster medicine and emergency management. Getting the letters from hospital emergency management and a disaster medicine fellowship director is ideal. These letter writers should have worked with you on a project, in the field, or in the ED, as the letters should be strong, well-written, and specific to you.

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

You can still be competitive after working as an attending, but you will need to show your dedication to learning disaster medicine. Most of the things aforementioned apply here, like joining the emergency management committee at your hospital and being actively involved. Being involved completely in another subspecialty of emergency medicine may make others question your interest in disaster medicine as a

future career path. However, working as an attending by itself will enhance your clinical, administrative, communication and leadership skills. Make sure you have a disaster medicine mentor who will help ensure that you make this time productive and demonstrate your interest in disaster medicine.

What if I'm a DO applicant?

In general, there has been an increase in the number of fellowships that accept graduates of DO residencies. Contact each fellowship to see if they accept DO candidates and what additional requirements for ACGME certification they have. In most situations, though, inclusiveness is the rule.

What if I am an international applicant?

In general, the requirements are almost the same, but you need to know if passing USMLE exams is mandated by the program or not. You need to work on your application even earlier, at least 6 months ahead. Allot time for your visa application. It would be best to ask programs about this prior to applying.

APPLICATION PROCESS

How many applications should I submit?

There are many factors to consider. Which programs offer guidance and educational programs in the specific areas of disaster medicine you are interested in? Are there certain geographic areas of the country you want or more importantly don't want to be? Do you want to be in a program close to your family or friends? Do you have an idea of what you want to do post-fellowship, and will a particular program or a program in a particular area help you achieve those goals? Is university affiliation important to you, or are you going to be happy in any program as long as you obtain a fellowship position? Whether coming straight out of residency or taking a short hiatus from the clinical duties in an already established professional practice, the important factors in choosing the right program are going to be different for everybody. Apply to all the programs fit your criteria.

How do I pick the right program for me?

The most common mistake people make when applying is assuming all programs have the same curriculum. Disaster medicine is not, as of yet, an ACGME-accredited specialty. This has advantages and disadvantages; While you are given considerable latitude and flexibility in designing an educational experience that fits your specific interests, there is no standardized core curriculum, so understanding

opportunities at specific programs is critical. Nearly all disaster fellowship programs have websites explaining their mission, the programs they offer, the specialties and interests of their faculty and what their graduates are doing post-fellowship. You're going to be overwhelmed by all the amazing and cool opportunities out there, and you will probably change your mind about what interests you in disaster medicine several times during this process.

Common mistakes during the application process

The biggest mistake one could make during the application process is not doing enough research about the different programs and faculty. This is critical in designing an attractive CV as well as planning for the interview — the two most important pieces of the application process. Exaggeration or embellishment of experience, previous positions, or professional roles on the CV or during the interview is a significant mistake an applicant can make. Your integrity matters. Have confidence in your experiences and sell yourself truthfully.

Application deadlines

Fellowship schedules typically follow the academic year (July - June) so the best time to apply, particularly for senior residents, is the summer at the beginning of your final residency year. Interviews will typically take place October-November, and fellowship acceptance notifications will be sent out in November. Most programs accept applications on a rolling basis, but each program is different. Contact the programs you are interested in early to get application materials and guidance regarding deadlines.

Tips for writing your personal statement

Keep it simple. Depending on the fellowship program, you may be asked to write a full 1- to 2-page statement or just a single paragraph, placed at the top of your CV. In either case, you want to be succinct and hit a few important points:

- Identify your personal career goals and what experiences have led you to identify those particular goals.
- Explain why you think a fellowship in disaster medicine will help you reach those goals.
- Explain both why the program is the right fit for you and why you are the right fit for the program.

Is this a match process?

No.

What happens if I don't obtain a fellowship position?

Contact the programs who have not contacted you and see if there are any openings. If all of your desired positions have been filled, secure a clinical position for the following year, and then re-evaluate a fellowship. The greatest benefits of a disaster medicine fellowship are the networking potential with others in the field and the opportunity to learn about the various aspects of the specialty in an environment where the education is paramount and clinical duties are important, but secondary. While these benefits offer certain advantages when developing your career in the specialty, completing a disaster medicine fellowship is not a requirement. There are many resources available for self-learning, or you may take an entirely different structured academic approach to the field by seeking a master's in emergency management or public health. If you still strongly believe that fellowship is your path and you are willing to wait the extra year (or two, depending on your clinical responsibilities), take the time to strengthen your application. Participate in your hospital's emergency management committee, take online and in-person courses offered by the Federal Emergency Management Agency and other disaster-associated organizations, or join your local medical reserve corps. There are many opportunities if you are willing to do the research and find them.

INTERVIEW PROCESS

How do I stand out from the crowd?

There are many tips on good interviewing practices, but the most critical thing to do is be yourself. Play up your strengths, but do not stretch or exaggerate the truth to make yourself look better, and NEVER lie on your CV. You would not have been asked to interview if the program did not see something special in your application, so be confident in yourself and your accomplishments.

Disaster medicine programs may have an extensive network of faculty, but the core faculty that will be interviewing you is a small group. Know each program's strengths, the opportunities that they provide and the research interests of the faculty, particularly the core faculty. These will give you talking points throughout the interview to bring up and show that you are truly interested.

This interview may be different from others. While it is still very important to sell yourself, your previous accomplishments, and the experience you have garnered over the years leading to this point in your life, remember that you are interviewing the program at the

same time they are interviewing you. For the sake of your own future career, you want to do your fellowship at the program that best fits your needs and interests, so come prepared to ask a lot of questions.

What types of questions are typically asked?

Why do you want to go into disaster medicine?

What aspects of the specialty interest you?

What are your goals for future?

Why do you want to attend our program?

Do you see yourself in academic or community medicine?

**These interviews tend to be pretty informal compared to residency interviews. Most programs are just trying to get a sense of what you want to accomplish so they know if you would be a good fit.*

How many interviews should I go on?

Revisit the advice from the application section. If you chose to apply only to positions that met the criteria for programs that would allow you to achieve your goals, accept every interview you are offered. The more interviews you go on, the better you will become at them — and the better your ability will be to discern key differences between programs.

PREPARING FOR FELLOWSHIP

Textbooks to consider reading

- Antosia RE, Cahill JD. Handbook of bioterrorism and disaster medicine. New York, NY: Springer; 2006.
- Ciotto GR. Disaster medicine. 2nd ed. Philadelphia, PA: Elsevier; 2016.
- Koenig KL, Schultz CH. Koenig and Schultz's Disaster Medicine: comprehensive principles and practices. Cambridge, MA: Cambridge University Press; 2010.
- Partridge RA. Oxford American handbook of disaster medicine. Oxford: Oxford University Press; 2012.
- Schwartz RB, McManus JG, Swienton RE. Tactical emergency medicine. Philadelphia, PA, and London: Wolters Kluwer/Lippincott Williams & Wilkins; 2012.

Beyond the textbooks, there is a wealth of disaster-related research literature available.

Important skills to practice while in residency to prepare for fellowship

Try to expand your disaster medicine knowledge base as much as possible prior to starting fellowship. Take advantage of the opportunities provided by your residency program in the various areas that disaster medicine encompasses. Get involved with opportunities for global health (whether that be humanitarian aid missions with your hospital group or formal international rotations through your residency). Volunteer at the main medical tent for large city marathons or Ironman events. Go on EMS and air medical ride-alongs or spend some time with local EMS medical directors and agencies.

Tips on how to succeed as a fellow

When the fellowship year starts, you want to do all in your power to make it as worthwhile as possible. Do your reading. Complete as much of the available online and classroom training as you are able up front. Participate in your hospital's emergency management meetings. Take every available opportunity to meet key people in the field by going to conferences and joining the ACEP Disaster Medicine Section group and the SAEM Disaster Medicine Interest Group. Some medical schools are encouraging their students to become involved in disaster medicine training so seek out opportunities to teach when available. Become active in your local Medical Reserve Corp and participate in disaster simulation exercises in your area. Wherever you end up, opportunities will be numerous. Be flexible with your schedule and get involved with as many as you can. You will have some of the foremost experts in the field at your disposal so use their guidance, but you should also take an active role in developing your own self-directed educational experience.

CONCLUSION

Additional resources

Online and classroom training

<https://delvalle.bphc.org/>
<http://www.ready.gov/>
<https://training.fema.gov/>
<https://www.disasterready.org/courses>
<https://sis.nlm.nih.gov/dimrc/trainingresources.html>
<http://register.ndlsf.org/>
<https://mrc.hhs.gov/HomePage>
<https://lagunita.stanford.edu/courses/course-v1:Medicine+SEMPER+selfpaced/about>

Journals

[Disaster Medicine and Public Health Preparedness](#)

[American Journal of Disaster Medicine](#)

[International Journal of Disaster Medicine](#)

[Journal of Emergency & Disaster Medicine](#)

[Annals of Emergency Medicine](#)

[Free Medical Journals: Disaster medicine, military medicine](#)

Clinical Resources/Websites/Blogs

[SAEM Fellowship Search](#)

[Western Journal of Emergency Medicine article](#)

[BIDMC Fellowship in Disaster Medicine](#)

[Carolinas HealthCare System Disaster and Emergency Preparedness](#)

Cooper University Health Care EMS/Disaster Medicine Division

GW Disaster and Operational Medicine

[SUNY Downstate Disaster Medicine Fellowship](#)

[UMass Medical School Disaster Medicine and Emergency Management Fellowship](#)

[UC Irvine Disaster Medicine Fellowship](#)

[Medical College of Wisconsin Section of Emergency Medical Services and Disaster Medicine](#)

[UTHealth McGovern Medical School EMS and Disaster Medicine Fellowship](#)

[Indiana University Disaster Medicine Fellowship](#)

National organizations

EMRA Prehospital & Disaster Medicine Division

ACEP Disaster Medicine Section

SAEM Disaster Medicine Interest Group

World Association of Disaster and Emergency Medicine

Society of Disaster Medicine and Public Health

Conferences

[EMSSA and WADEM Conference](#)

[WADEM](#)

[Medical Disaster Response](#)

[World Extreme Medicine](#)

How to find a mentor

Reach out to any faculty in your residency who may have an interest in disaster medicine or emergency management. Physicians who sit on the emergency management committee have already identified themselves as someone interested in the field and will be able to network you with other physicians on a hospital, city and state level. Reach out to local EMS agencies as they are also often linked in with people who work in disaster medicine on a larger scale and can help find you mentors in your area of interest. Do not be afraid to use email as a way to find mentors. It never hurts to ask, as most senior members in the field are eager to help interested newcomers find their way.

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Emergency Medical Services (EMS) Fellowship

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INTRODUCTION

Description of the specialty

Emergency medical services (EMS) is the administration, coordination, and delivery of medical care outside of a hospital or medical facility (also known as “prehospital care” or “out-of-hospital care”).

History of the specialty/fellowship pathway

Emergency medicine and EMS share a common ancestry, as both evolved from the core purpose of taking care of patients with time-sensitive conditions at their moment of injury/illness. Although EMS has been practiced for hundreds of years, EMS medicine recently became a board-certified subspecialty of emergency medicine in 2013 (2006 by the AOA). EMS fellowships are uniquely positioned to give emergency physicians (and physicians from other specialties) the knowledge and experience to provide, oversee, and improve pre-hospital care.

Historically, EMS fellowships have varied widely in terms of the experiences for individual fellows. However, with the arrival of subspecialty certification and ACGME accreditation, there is now a standard core curriculum for EMS fellowships. Fellowships include field response, where the fellow rides on EMS vehicles and responds to emergency calls. Some programs have a dedicated vehicle for physician response. Many fellowships are attached to a flight program as well, which provides the opportunity to serve as a physician on aircraft for inter-facility transfers and emergency requests.

In addition to clinical prehospital care, EMS fellowships train physicians in the medical oversight of EMS systems. Fellows are intimately involved in many aspects of EMS education, as well as continuous quality

improvement activities. EMS policies are constantly in flux due to changing research and guidelines, and fellows learn how to create, implement, and evaluate policies and protocols. Fellowships also offer opportunities in scientific research, as well as disaster planning and response.

Why residents choose to follow this career path

This field attracts physicians who are interested in becoming involved in the EMS field, such as clinical providers, researchers, educators, and/or medical directors.

EMS board certification may translate into increased funding, whether directly through a monetary payment from a medical direction contract or via funds to offset clinical time in the emergency department for EMS related activities. EMS agencies and municipalities are increasingly recognizing the value of EMS board certified physicians and seeking out those with the training to fill their positions. Many physicians who are interested in EMS complete a fellowship to gain experience and engage in the field of their interest. Board certification also has the added benefit of allowing for more diversified work, and may decrease long term burning by allowing you to have other work activities outside of emergency department shifts. Additional training may also increase competitiveness for obtaining academic emergency medicine positions that prefer fellowship trained faculty.

How do I know if this path is right for me?

A career path in EMS may not be right for all physicians. Being involved in EMS requires significant time dedicated to the furthering of the EMS organization. This involves collaboration with multiple committees and working groups, meeting with members of the community, public safety agencies, and governmental bodies. EMS work requires skills in interpersonal communication, outreach, diplomacy, and politics. Serving as an EMS medical director requires some knowledge of finance, administration/management, and policymaking.

Career options after fellowship

There are local, state, federal, and private positions that are opportunities for physicians interested in EMS. Many states and larger EMS systems have a dedicated full-time medical director. Some larger organizations require multiple physicians. Tactical teams and

local law enforcement, large event organizations, sporting arenas, and international medical groups may employ the services of an EMS medical director or physician. The medical director position in larger EMS organizations is typically filled by a physician with a background in emergency medicine and prior EMS experience or training. However, there are many EMS agencies who still do not have medical directors with EMS experience or training. Completing an EMS fellowship will greatly help your chances of obtaining a job as an EMS physician or medical director. Some EMS physicians build upon their administrative and management experience in the pre-hospital setting and take on positions in the emergency department and hospital setting as well.

Splitting time between departments

Depending on the specific position and organization in which you are employed, an EMS medical director position may include working clinically within an emergency department, or it may not include any clinical work. Some EMS positions may require a full-time administrative commitment, which would mean the individual has to make his/her own arrangements for clinical work separately. Other smaller agencies only have funding to hire a medical director for a few hours per week and thus some EMS physicians will combine contracts from several EMS agencies. There are also still many departments where time may be uncompensated and done as a community service. The largest challenge for a physician involved in EMS is often balancing the time spent between EMS and non-EMS work, as well as clinical, educational, academic, and administrative work within EMS.

Academic vs. community positions

There are both academic and community based positions in EMS. An EMS agency may be university-based, hospital-based, fire-department based, municipal, or a private organization. They may be associated with a medical school or academic department, or may have no affiliation. All of these variables can affect the working environment and responsibilities requested of a medical director/physician.

IN-DEPTH FELLOWSHIP INFORMATION

Number of programs

There are currently 52 ACGME accredited fellowships, with more in the accreditation queue. Lists and links to current programs can be found on the [ACGME website](#), the [National Association of EMS Physicians website](#), and [EMRA Match](#).

Differences between programs

With the implementation of ACGME accreditation of EMS fellowships in 2013, all fellowships are required to provide their fellows with a foundational level of knowledge regarding the basic tenants of EMS, however the programs differ significantly in their focus and flavor.

The joint ABEM and ACGME “[EMS Milestone Project](#)” provides a framework for assessment of the development of the fellow in key dimensions of the elements of physician competency in EMS. They reside in the domains of patient care, medical knowledge, system-based practice, practice based learning and improvement, professionalism, and communication skills. [The Core Content of Emergency Medical Services Medicine](#), published by ABEM, lists the skills that should be acquired during an accredited fellowship. This is also the content on which the board exam is based. The ACGME has established a specific set of program requirements for any EMS fellowship. Many of these requirements are similar to other specialty residency and fellowship programs. These requirements can be found in the [ACGME Program Requirements for Graduate Medical Education in Emergency Medical Services](#).

The execution of these requirements is left to the individual program, with significant variability. Programs generally focus on one or more aspects of prehospital care including operations, administration and research, and offer different and unique prehospital opportunities.

Operational experience may range from ride-alongs with various EMS units to a vehicle that allows the fellow more flexibility to respond to incidents as they occur. This may be a shared vehicle or a dedicated take-home vehicle. Similarly, aeromedical exposure may vary from occasional shifts as an observer to weekly scheduled shifts as part of a crew. Most programs will have different opportunities to be involved in the planning and execution of special event and mass gathering medicine. Fellowships may also have operational opportunities in disaster medicine, wilderness medicine, tactical medicine, and/or rural EMS.

Administrative duties may include appointment as an assistant or associate medical director for an EMS agency with scheduled continuous quality improvement activities, regular meetings, conducting investigations, rewriting clinical policies and planning. It may also involve different levels of governmental involvement. Clinical oversight and supervision may range from on-scene medical direction to online medical command provided by phone or radio to EMS providers. Fellows will also likely have an opportunity to review and revise written EMS protocols. Many programs offer opportunities to teach both clinical and didactic material to EMS providers.

All fellowships require the completion of a scholarly activity. However, this varies widely between programs, as it can range from a popular media publication or quality improvement project, to retrospective or prospective trials and peer-reviewed publication.

With the ACGME accreditation of EMS fellowships, other pre-hospital fellowships in disaster medicine or tactical medicine fellowships have been merged into EMS fellowships. Generally, they all offer training in ground and air medical services in such areas as patient care, communications systems, system design, quality assurance, education/training, and disaster medicine, among others.

Length of time required to complete fellowship

ACGME-accredited fellowships are 1 year; however, some fellowships offer an additional year for an advanced degree (MPH, MHA, MBA) or other endeavors.

Skills acquired during fellowship

As mentioned, all accredited fellowships are required to provide their fellows with a foundational level of knowledge regarding the basic tenants of EMS. [The Core Content of Emergency Medical Services Medicine](#) and “[EMS Milestone Project](#)” described the knowledge and skills graduates of accredited programs are expected to have mastered.

Typical rotations/curriculum during fellowship

EMS fellowships differ on the specific structure/schedule they use to deliver the curriculum. Most intersperse various areas and topics throughout the year. Some fellowships have set rotation schedules where the fellow spends a specified period of time in one area/topic, and then rotates to another. Additional areas that may be covered during fellowship are mass gathering medicine, disaster medicine, tactical medicine, wilderness medicine, medical education.

Board certification afterwards?

Beginning in 2013, EMS subspecialty board certification is available through a written certification exam administered every 2 years by ABEM. Subspecialty certification is open to any primary specialty, provided they meet the requirements for EMS certification. Fellows who complete an ACGME-accredited fellowship may take the board exam at the next offering after completing their fellowship.

Currently a practice pathway (“grandfathering” pathway) exists for those who either completed a non-accredited fellowship or who have been practicing actively in EMS without any fellowship training, both pathways are set to close in 2019, after which the only way to be eligible for board certification is to complete an accredited fellowship.

Average salary during fellowship

Most programs offer a PGY salary equivalent to your level of training, at minimum. For some programs, this is the sole source of salary. However, others offer a varying stipend for clinical shifts worked during fellowship (which may or may not be considered “moonlighting”). This stipend will vary in amount by institution, and must follow ACGME work hour restrictions. Some fellowships may come with clinical instructor or other academic appointments as well. In addition to the salary, fellowships may offer CME (Continuing Medical Education) budgets, retirement plans, or other additional compensation.

PREPARING TO APPLY

How competitive is the fellowship application process?

Although there are still more positions available than applicants, the fellowship application process may become more competitive over the next several years. The designation of EMS board certification has led to a surge in interest in fellowship training. EMS is also a field rapidly growing in physician involvement and research.

Requirements to apply

EMS fellowships are open to any board-eligible or board-certified physicians, however the vast majority of applicants come from emergency medicine.

Suggested elective rotations to take during residency

Your EMS rotation during residency will be an important area of focus. Fellowship programs are looking to train people who will be committed to improving EMS care. Different programs have different requirements and

opportunities, but any involvement in EMS is a good way to demonstrate dedication and to obtain some experience in the topic. Getting involved with EMS provider education and training during residency is a great way to get involved. Completing ride-alongs, with ground or air-based EMS, especially if done outside of your mandatory rotation, will further solidify your commitment.

Suggestions on how to excel during these elective rotations

The best way to excel during these rotations is by displaying strong clinical skills, teamwork capabilities, and enthusiasm for pre-hospital medicine.

Should I complete an away rotation?

Away rotations for EMS are relatively rare, though may be a consideration if your residency program does not have a strong EMS component and you wish to bolster your experience. Away rotations may increase your competitiveness if you have a strong desire to match to a particular program.

What can I do to stand out from the crowd?

To stand out from the crowd, fill your CV with activities that display a strong interest in EMS and leadership skills. Participating in or creating an EMS track in your residency program is another way to gain EMS exposure and demonstrate commitment. Prior EMS experience also strengthens your CV.

Should I join a hospital committee?

Hospital review committees involving EMS, such as STEMI, stroke care, and trauma care, provide administrative experiences that will help to solidify your candidacy.

Research requirements

As with many subspecialties, prior research experience is helpful when applying to an EMS fellowship. There has been an increasing drive towards evidence-based medicine in EMS, and having research experience demonstrates commitment in this area of importance. Certain EMS fellowships are known for their research focus, in which case such experience is extremely important.

Publications other than research

Non-research publications are also helpful for your application. As a resident, there are many opportunities for publication, such as *EM Resident*, the magazine published by EMRA, or one of the many newsletters, such as *ACEP Now*. There are also EMS specific publications including *JEMS* and *EMS1*.

**How many recommendations should I get?
Who should write these recommendations?**

Most programs require 3 letters of recommendation, with one being from your department chair or residency program director. A recommendation from your local EMS director, or any EMS faculty in your department, is very helpful and recommended. However, like with all fellowship and job applications, having a good recommendation from your department chair and/or residency program director are equally as important, as they demonstrate your overall ability as physician as well as your personal character.

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

Almost all EMS fellowships will accept physicians who have been practicing as an attending before applying. The key is to ensure that you stay involved with EMS as part of your practice. Again, fellowship programs are looking to train people who will remain committed to EMS. However, it is important to note that many people find it hard to “switch back” to a trainee rank, salary, and lifestyle after being an attending. Most fellows come directly out of residency.

What if I’m a DO applicant?

Most EMS fellowships do not differentiate between MD and DO applicants.

What if I am an international (IMG/FMG) applicant?

Most EMS fellowships are more concerned with where you completed residency than where you attend medical school.

What if I am an international residency applicant?

ACGME-accredited fellowship programs, by regulation, can only accept board-eligible or board-certified physicians. Plus, most EMS fellowships help to offset the costs of training a fellow by having a fellow cover clinical shifts in the emergency department. Both of these factors mean the individual has to be licensed to practice medicine and have completed an ACGME/AOA accredited residency. However, some EMS fellowship programs have an international track designed for physicians who are not trained/licensed in the United States. These tracks would not be eligible for board certification. Also, usually, the individual would have to pay tuition to cover the costs of training.

APPLICATION PROCESS**How many applications should I submit?**

This is highly subjective, depending on your qualifications, geographical restrictions, and family considerations, among many others. Numerically, there are more EMS fellowship positions than applicants, so barring any personal preferences, there is likely to be a position available. Even if you have your mind set on a single program, it is a good idea to apply to or visit several programs to provide some perspective.

How do I pick the right program for me?

The right program is also a very subjective question. Most fellowships have a website you can visit for highlights about their program. Additionally, the EMS community remains a relatively tight-knit subspecialty, so EMS faculty in your department are often able to provide insight into other programs. The application and interview process also is very revealing, and the impression you get from meeting the fellowship director and core faculty can have a huge impact on picking the right program. In addition to the program elements, many applicants have their own family, geographical, or other requirements that may shape their decision of picking the right program. In the end, as with choosing any job, trust your gut.

Common mistakes during the application process

It cannot be stated enough that the EMS community remains a small and tightly knit one. Always be professional and honest throughout the application process.

Application deadlines

In the past, there was a lack of a true formal process for fellowship applications, and dates were highly variable. Applications are typically accepted as early as July with interviews occurring in September and October.

Beginning in 2018 for programs starting July 2019, EMS fellowships will be in the NRMP Fellowship Match.

The dates for the 2018 Emergency Medicine Fellowship Match for 2019 appointments are:

- August 22, 2018 Match Opens
- September 26, 2018 Rank Order List Entry Opens
- October 31, 2018 Rank Order List Certification Deadline
- November 14, 2018 Match Day

Tips for writing your personal statement

Your personal statement can serve to both emphasize points on your CV as well as delve into those intangible things that don't fit on a CV. For instance, it is your opportunity to show the reader why you decided to go into EMS medicine. Be honest and concise. Writing individual letters to each program emphasizing why you would be a good match for them and demonstrating that you have done some research into their program is a good idea as well. Having a faculty member review your draft statement can often be valuable. The American Medical Association, EMRA, and many other organizations offer personal statement advice you can review as well.

Is this a match process?

Beginning in 2018 for programs starting July 2019, EMS fellowships will be in the NRMP Fellowship Match.

What happens if I don't obtain a fellowship position?

If you do not obtain a fellowship position, you have several options. As stated before, there are usually more positions than applicants, so if you have no restrictions you have a good chance to place somewhere. Another option can include applying during the next cycle.

INTERVIEW PROCESS

How do I stand out from the crowd?

During any interview process, it is always of benefit to you and the program to be yourself. There is no advice specific for EMS fellowship interviews. Program directors (like any supervisor) are looking for energetic candidates with a commitment to learn about EMS and take that knowledge to improve the field.

What types of questions are typically asked?

Questions may range from EMS specific to generalizations. For example, questions regarding the aspects of EMS that you feel are important, the latest science of EMS, or opinions about specific issues are all valid questions. Be knowledgeable about the latest controversies, scientific breakthroughs, and news in the area of out-of-hospital medicine. Most importantly, be prepared to explain why you want to complete an EMS fellowship and your career goals.

How many interviews should I go on?

There is no "magic number" of interviews. You should interview at an adequate number of programs depending on your competitiveness. If you feel you are not a strong candidate, you should interview at more programs to increase the likelihood of obtaining a position. Remember there are still more positions than there are applicants, so the odds are with you. However, with the increasing interest in EMS fellowships, this may change over the next several years, so you may want to apply to more than you feel is necessary.

PREPARING FOR FELLOWSHIP

Textbooks to consider reading

There are no required texts to read prior to fellowship. Some considerations include the seminal texts and papers in EMS that may offer some background on the specialty. One of those foundational papers is the [EMS Agenda for the Future](#). The NHTSA website contains links to many others. The NAEMSP publishes what is considered the core textbook for EMS medicine: Cone's (2015) *Emergency Medical Services: Clinical Practice and Systems Oversight*. NAEMSP also advocates for some [additional reading materials](#) that may be used as references. Certainly, you should be familiar with all of these materials by the end of fellowship and before taking the board exam. Thus, it doesn't hurt to start reading them before beginning your fellowship.

Important skills to practice while in residency to prepare for fellowship

Getting solid emergency medicine training should be your focus during your residency. You have to know how to practice medicine in the hospital before you can adapt it outside the hospital. Showing EMS interest through research, involvement in medical direction, or other avenues is encouraged during residency.

Tips on how to succeed as a fellow

Fellowship should be a fun experience. Everyone entering this field has a desire to work in the prehospital setting. Work hard, enjoy your time there, soak up the mentorship from your peers, network with others, and never forget your roots in emergency medicine.

CONCLUSION

Additional resources

There are further resources for EMS for those who are interested. The National Association of EMS Physicians (NAEMSP) has a [wealth of resources available](#) on their website at www.naemsp.org, as well as a podcast that interviews authors of major articles. Prehospital Emergency Care (or PEC), published by NAEMSP, is considered one of the most influential journals for EMS medicine.

National organizations

NAEMSP is one of the most important organizations for EMS physicians. NAEMSP provides resources for new and established EMS physicians, publishes position papers on important topics, and promotes opportunities for research and networking. NAEMSP also publishes the journal Prehospital Emergency Care quarterly. NAEMSP offers a medical director's course annually, which is an excellent three-day course that helps prepare you for becoming an EMS director. NAEMSP welcomes resident and fellow members.

Conferences

NAEMSP hosts an annual conference in January that is highly recommended for those interested in EMS.

How to find a mentor

Finding a mentor is an important part of the journey to become an EMS physician. EMRA offers a fellowship mentor program where you can apply to be paired with a mentor or to work as a mentor, if interested. Ideally, a mentor should be located at your site of practice/residency and they can be a valuable resource to assist with your involvement in EMS and making the decision if an EMS fellowship is right for you. SAEM and ACEP both have EMS sections that can provide a forum to seek advice and make connections.

Forensic Emergency Medicine

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INTRODUCTION

Description of the specialty

Emergency physicians care for patients with forensically relevant chief complaints nearly every shift. Victims of trauma including gunshots, stab wounds, motor vehicle crashes, and sexual assault pass through the ED daily. Emergency physicians are in the ideal position to identify victims of domestic violence, elder mistreatment, child abuse, and human trafficking. In all of these cases, they may be required to collect and preserve evidence, provide detailed documentation, provide court testimony, and refer to the appropriate agencies. Thus, it is important for EM physicians to be appropriately trained and have access to the necessary resources to care for this unique population of patients.

History of the specialty/pathway

In recent decades, violent crime, abuse, assault, and neglect have risen to arguably epidemic levels. EM physicians are frequently involved in the identification, evaluation, and treatment of these patients. In response, the Department of Emergency Medicine at the University of Louisville established the first forensic medicine fellowship in the U.S. in 1991. By 2006, ACEP established the Forensic Medicine Section. Very few residencies include clinical forensic medicine in their training curricula, but ACEP's Model of Emergency Medicine does require proficiency in sexual assault training. Fellowships within this field have also been slow to develop. There are forensic preceptorships available, but they are often under the auspices of other specialty organizations, such as the Child Abuse Preceptorship offered by the Pennsylvania Chapter of the American Academy of Pediatrics.

Why residents choose this career path

Residents follow this career path when they have a strong interest in utilizing the forensic education and skill set to assist victims of crime, injury and violence. Physicians in this field may have a leading role in violence prevention and in the care of victims of trauma and violent and sexual crime.

How do I know if this path is right for me?

Do you find yourself interested in becoming better at forensic medical evaluation, injury documentation, and photography? Do you want to become a champion for victims and an expert at testifying for these patients? Are you interested in helping with the forensic training and education of health care providers? Do you desire to become an expert and leader in this field within your hospital system? If you answered yes to any of these questions, you should strongly consider a career in clinical forensic medicine.

Career options after residency

Some options to consider when designing a career with a focus on forensic emergency medicine include:

- Employment with a Sexual Assault Response Center
- Employment with a Child Advocacy Center (CAC)
- Director of Forensics within departments of emergency medicine
- Researcher in forensic relevant topics
- Forensics educator of residents, nurses, and other providers
- Local and national speaking engagements

Splitting time between departments

Most clinicians interested in emergency forensics will develop this niche within their own EDs and will not split time. Some physicians may be double board certified in another specialty or perhaps have a second career, such as police officer, etc., and then will split time between departments. Others may consider working in an ED and a CAC or Sexual Assault Response Center. The key is to avoid “double-booking” and difficult transitions, such as going from an overnight ED shift directly into a day shift working at a CAC. This will need to be carefully negotiated in your initial contract. You will also need to negotiate vacations and holidays. Finally, don’t forget to negotiate your involvement in activities such as departmental meetings, hospital committees, etc. Ideally, you would have fewer hospital commitments to accommodate your forensic involvement.

Academic vs. community positions

Those interested in teaching and/or research often gravitate towards academia or community-based academic positions. However, those with an interest in pediatric forensics may find academic positions challenging, as large centers often separate their adult and pediatric patients into separate emergency departments. Another consideration is whether the hospital is a designated center for sexual assault forensic examination (SAFE). It is not uncommon for an entire county to bring all sexual assault cases to one designated hospital. Finally, one should consider the department’s current involvement in forensic emergency medicine and their openness to hiring someone (you) to specialize in this niche.

IN-DEPTH SPECIALTY INFORMATION

Number of programs

There are currently no ACGME-accredited forensic fellowship programs. There are academic emergency medicine programs that house forensic departments. Currently the training and track are more of a “niche” within emergency medicine. Therefore, it is important to contact program directors to discuss the scope of their program’s forensic training and department resources.

PREPARING FOR A CAREER IN FORENSICS

Research requirements

There is no research requirement to become involved in this field. Because clinical forensic medicine is a young field, research opportunities abound, and it can illustrate your interest in the niche.

Suggested rotations to take during residency

Rotations to consider: violence prevention programs, coroner’s office, forensic toxicology service, Child Advocacy Centers, child abuse service (offered within pediatrics in some academic institutions), medical examiner’s office, detention center clinic, and hospital-based forensic examiner teams.

Suggestions on how to excel during these elective rotations

Demonstrate your dedication, interest, and knowledge base. Read every day about relevant topics. It is always a good idea to arrive early and stay late if needed, especially to ensure all patient care has been completed. Be courteous to everyone you encounter.

Should I complete an away rotation?

If your department does not provide you with a rotation and/or exposure to a particular patient population that you desire (example: child abuse cases, elder abuse, sexual assault, etc.) then we highly encourage you to seek away elective opportunities. We encourage you to seek out programs that have forensic departments within their department (such as Drexel University College of Medicine) or at least EDs that are the designated center for assault/abuse, etc., cases in their regions.

How can I make my CV stand out from the crowd?

Your resume should clearly display your interest in forensics by listing multiple supporting activities. Strive for leadership positions where you have meaningful involvement. It might be helpful to narrow your niche even more within forensics (such as child abuse, for example). Seek training through conferences, workshops and online training modules to better educate yourself and then subsequently educate others about your niche. Online training modules on multiple forensic topics are available through ACEP's online continuing medical education repository. Seek training through conferences, workshops and online training modules to better educate yourself and then subsequently educate others about your niche. Learn the administrative skills that are needed to design and manage a forensic examiner team.

Should I join a hospital committee?

Many hospitals have a committee that reviews child abuse and neglect reports, elder abuse reports, sexual assault cases, domestic violence cases, etc. It would be wise to inquire about such committees and to join if possible. Ideally your involvement in this committee would be meaningful and active.

Publications other than research

This is highly encouraged! There are many opportunities for submitting articles in medical newsletters, magazines, journals, and blogs. You could also consider working on a podcast. This is an excellent opportunity to expand your own and the

audience's knowledge base on a particular topic and also to bolster your writing skills. Perhaps the best way to accomplish this is to reach out to your targeted publisher. You will be surprised by how many doors open simply by asking!

Textbooks to consider reading

- Curry, Merlin. Rosen's Emergency Medicine: Concepts and Clinical Practice, 9th ed, Elsevier, 2018
- Olshaker J, Jackson M, Smock W. Forensic Emergency Medicine. Philadelphia, PA: Wolters Kluwer; 2006.
- Layne-James. Simpson's Forensic Medicine, 13th ed. Taylor & Francis Group, 2014
- Riviello RJ. (Ed). Manual of Forensic Emergency Medicine: A Guide for Clinicians. India: Jones & Bartlett; 2009.
- American Academy of Pediatrics. Visual Diagnosis of Child Abuse on CD-ROM. American Academy of Pediatrics, 2003.

Important skills to practice during residency to prepare for a career in Forensics

- Broaden your knowledge base in forensics:
 - Learn the different burn and fracture patterns associated with child abuse.
 - Understand how to appropriately document and photograph child abuse findings.
 - Learn the verbal and physical clues that will alert you to elder abuse, domestic violence, and human trafficking victims.
 - Understand the concept of chain of custody and preservation of evidence.
 - Become proficient at the sexual assault exam.
- Develop leadership and administrative skills to run forensic medicine sections of an emergency department.
- Develop effective educational skills to teach others about forensic medicine.
- Expand your knowledge about the legal system and learn about court testimony.
- Understand the protocols to appropriately identify and assist potential human trafficking victims.
- Recognize the specific detail and documentation necessary for the admissibility of chart entries in legal proceedings.

CREATING A CAREER IN FORENSICS: CONVINCING YOUR EMPLOYER

How do I stand out from the crowd in the interview/hiring process?

Your goal during the interview is to be engaging, confident, and personable. Be courteous to everyone you meet, and treat every event/interaction as part of the interview. Make sure your application is complete and you fulfill all requirements in a timely manner. Communicate a clear vision about how your future career will include forensics.

What types of questions are typically asked?

- What are your 5- and 10-year career plans?
- What specifically was your forensic training during residency?
- How do you plan to expand our department's involvement and education in forensic medicine?
- What are your strengths and weaknesses?
- Tell me more about [fill-in-the-blank] leadership opportunity that you list here on your resume.
- Why do you seek employment at our institution?

How many recommendations should I get? Who should write these recommendations?

Each potential future employer will have its own policies regarding the number of recommendations required. Seek letters from physicians who know you well and will advocate strongly for you. Letters from program directors and/or department chairs would be favorable. If you have a mentor within the niche of forensics, a letter from him or her would be ideal. Letters that display your knowledge of and competence in forensic emergency medicine will help support your cause for a career that allows you to continue to build and expand upon your forensic training.

CONCLUSION

Additional resources

Journals

- Journal of Forensic Sciences
- Journal of Forensic and Legal Medicine
- The American Journal of Forensic Medicine and Pathology
- Journal of Forensic Medicine
- Global Journal of Nursing & Forensic Studies
- Medical Toxicology and Clinical Forensic Medicine Journal
- Journal of Forensic Toxicology and Pharmacology

Journal articles

- Ryan M. Clinical Forensic Medicine. *Ann Emerg Med.* 2000;36(3):271-273.
- Finn R. Tips for Conducting a Child Sexual Abuse Exam. *ACEP Now.* June 2010.
- Riviello R. EPs Should Continue to Improve Forensics Skills. *ACEP Now.* November 2013.
- Forensic Emergency Medicine: Practitioners Must Consider Roles as Investigators, Reporters. AHC Media, ED Legal Letter, 1 May 2002.

Webinars

- [The Faculty of Forensic and Legal Medicine of the Royal College of Physicians](#)

Websites

- [Physicians for Human Rights](#)
- [California Clinical Forensic Medicine Training Center](#)
- [National Sexual Violence Resource Center](#)
- [Health, Education, Advocacy, Linkage](#)
- [Massachusetts General Hospital: Division of Global Health and Human Rights](#)

Blog

- <http://clinicalgate.com/forensic-emergency-medicine/>

National organizations

- [American Academy of Forensic Sciences](#)
- [ACEP Forensic Medicine Section](#)

Conferences

- American Academy of Forensic Sciences Annual Scientific Assembly
- Annual International Conference on Traffic and Transport Psychology
- [International Symposium on Child Abuse](#)
- [International Conference](#) by End Violence Against Women International

Coursework to consider completing

- [Medical Training Academy for Child Physical and Sexual Abuse](#)
- (This is a self-paced online course)
- [Master of Science in Forensic Science](#)
- Drexel University

Geriatric Emergency Medicine (GEM)

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INTRODUCTION

Description of the specialty

An overall increase in life expectancy and the demographic bubble of the baby boomers is reflected in increasing numbers of older patients (65 and over) presenting for emergency care. The field of geriatric emergency medicine evolved to fill the needs of this group of people in times of serious illness or injuries. Older patients are generally more complex than younger patients, with physiologic, pharmacologic, and pathologic differences, as well as social needs that may differ from younger patients. In addition, there are specific geriatric syndromes that often go unrecognized in emergency departments. As a result of this growing patient population, fellowship training is an important component of the emerging subspecialty of geriatric EM.

History of the specialty/fellowship pathway

The American Board of Internal Medicine and the American Board of Family Medicine offer ACGME accredited fellowships with a match process and board exam. These programs generally do not offer training to emergency medicine applicants.

Therefore, geriatric EM fellowships were created to provide fellowship-level geriatric knowledge and training to EM residency-trained physicians. They are a relatively new fellowship pathway within emergency medicine; the first geriatric emergency medicine fellowship started at Beaumont in Michigan, with the second at New York Presbyterian in 2005. Most of the GEM fellowships combine attending-level EM clinical care with the patient care and coursework of an existing geriatric medicine fellowship. Additionally, in April 2017, the Geriatric Emergency Department Accreditation (GEDA) program was formed by the American College of Emergency Physicians (ACEP). This program is an ACEP-governed national accreditation program that is designed

to improve the care of geriatric patients presenting to the emergency department. This program offers three levels of accreditation, which is based on the emergency department's commitment to senior-specific care.

Why residents choose to follow this career path

EM residents choose this career path when they are interested in furthering their clinical proficiency in the acute care of the older patient. It may also be a choice for those interested in research topics relevant to the development of health care for the emergency geriatric population.

How do I know if this path is right for me?

Are you interested in improving care for the elderly who seek medical attention in the emergency department? Are you interested in participating in research related to the field of geriatric emergency medicine, or leading hospital committees that address elderly issues? Would you like to create an emergency department geriatric service? How about participating in and leading hospital committees that address elderly issues? Do you like working in multidisciplinary teams? If so, then this may be the fellowship for you.

Career options after fellowship

A diversity of career options exist such as geriatric emergency medicine program director/assistant program director, GEM medical director, involvement in multidisciplinary geriatric initiatives, GEM research, GEM education for emergency medicine residents and faculty, as well as medical students.

Geriatric emergency departments have developed in community based EDs across the country. Many of the community health systems with geriatric EDs are actively seeking GEM expertise, providing opportunities for GEM-trained physicians to practice lead after graduation.

Splitting time between departments

Your specific schedule depends on final appointment, local opportunities, hospital culture, and individual circumstances. Geriatric EM-trained physicians have worked in community settings, skilled nursing facilities, and other split positions.

Academic vs. community positions

Geriatric emergency medicine can be practiced at both community and academic institutions. The choice of academic vs. community is usually dependent on the applicant's desire for education or research opportunities, as larger academic institutions tend to

have better access to funding, research staff, research facilities, and students, residents, and fellows.

Many community geriatric EDs exist across North America, and community geriatric emergency practice offers the opportunity to affect the lives of thousands of patients.

IN-DEPTH FELLOWSHIP INFORMATION

Number of programs

The current programs, in order of establishment, are:

- [Beaumont](#)
- [New York Presbyterian](#)
- [UNC](#)
- [UC Davis](#)
- [Mount Sinai Hospital, University of Toronto](#)

Research fellowship with options for a geriatric focus:

The [University of Arizona](#)

Differences between programs

With the exception of the University of Arizona, which is purely a research program, these fellowships are similar in their diverse geriatric multidisciplinary clinical training. They vary in the types of research and advanced degree opportunities available. Please refer to individual program websites for additional details.

Length of time required to complete fellowship

1-2 years. The 2-year program should have an advanced degree, such as a master's-level program.

Skills acquired during fellowship

Geriatric emergency medicine fellows receive interdisciplinary training regarding the care of the geriatric patient across multiple in- and outpatient settings. Fellows are provided with an opportunity to become more competent in categories such as knowledge of the field, communication skills, and patient care/procedures. For further details, please refer to the individual GEM Fellowship programs' websites.

Typical rotations/curriculum

Clinical, research, administrative, and clinical educator rotations and curriculum are the foundation of these fellowships. Most programs offer opportunities for obtaining an advanced degree and/or mentored research projects.

Board certification afterwards?

Currently, GEM fellowships are non-ACGME-accredited. However, beginning in 2014, SAEM has approved several of these non-ACGME-accredited GEM Fellowships. While obtaining a certification may not be necessary, it is highly encouraged as it provides an opportunity to become a more qualified and experienced candidate.

Average salary during fellowship

Because this is not an ACGME-approved fellowship for EM physicians, the fellowship salary is typically much more competitive as compared to the typical PGY-4/5 salary.

PREPARING TO APPLY

How competitive is the fellowship application process?

Because this is not an ACGME fellowship, it is hard to gauge how competitive this fellowship is. There are limited fellowship programs available but the application pool is typically small.

Requirements to apply

Applicants must be either in their final year of EM residency, EM board eligible or EM board certified physicians. Applicants must also be able to obtain a medical license in the state in which the fellowship is based.

Research requirements

Research is not required but may certainly strengthen your application, especially if you perform research in topics relevant to the field.

Suggested elective rotations to take during residency

Some examples of elective rotations to consider include geriatric outpatient clinics, inpatient consult services that specialize in geriatrics, palliative care services, geriatric psychiatry units, and/or outpatient geriatric clinics.

Suggestions on how to excel during these elective rotations

The best way to excel during these rotations is to work hard, come in early and stay late, read every day and expand your knowledge base, be courteous to all, remain enthusiastic throughout the entire rotation, be mindful of ethical situations, and be a team player.

Should I complete an away rotation?

An away rotation at one of the institutions listed that sponsor this fellowship may be a good idea to help you “try out” the program and let the program get to know you. Assuming you do well during this rotation, it could be a nice way to help you stand out from other applicants.

What can I do to stand out from the crowd?

The best way to stand out from the crowd is to develop a CV that through various activities clearly demonstrates your interest in GEM and also demonstrates your leadership ability. Anything showing interest early on in GEM is a great way to be remembered.

Should I join a hospital committee?

Yes, assuming you are able to hold a leadership position and be an integral part to the committee.

Publications other than research

Publications other than research, such as blog posts, *EM Resident* articles, podcasts, etc., are strongly encouraged especially in topics related to the GEM field. These are excellent opportunities to educate yourself and fellow EM physicians while also helping to increase your visibility to the small but vibrant GEM community.

How many recommendations should I get? Who should write these recommendations?

Traditionally you should obtain 3 letters of recommendations, 1 of which should be from your past or current residency program director.

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

Absolutely. The key is to continue your involvement in this field and continue to develop your CV. The more involvement, the more it shows interest and will aid your chances for the fellowship.

What if I'm a DO applicant?

There are no known barriers to DO applicants.

What if I am an international applicant?

International applicants are strongly encouraged to contact each program individually. International applicants will at minimum need to have the appropriate visa, medical licensure, complete a core residency-training program, and have passed all 3 USMLE steps.

If you are applying to a program accredited by ACGME, you must also meet all ACGME requirements. Of note, there is a Canadian program listed above that is open to American candidates and the license process for a training position is relatively straightforward.

Also of note for international candidates, the Global Emergency Medicine Literature Review Task Force developed a definition of Global EM with the goal of this definition to: a) clarify the role and importance of GEM within the wider field global health, b) delineate opportunities for GEM research and funding, c) advance knowledge dissemination and implementation of GEM advancements worldwide, d) standardize training of providers specialized in GEM, and e) promote professionalization of GEM. While this obviously doesn't pertain to U.S.-based GEM fellowships, it does speak to the opportunities that are newly developing worldwide (Canada and Australia, for example).

APPLICATION PROCESS

How many applications should I submit?

Apply to all programs you would seriously consider attending if offered a fellowship position.

How do I pick the right program for me?

The fellowship program you choose should provide the resources to help you obtain your career goals and aspirations. It should also be in a location where you and your family will feel comfortable spending the next 1-2 years. Finally, during your interview, you should feel comfortable and see yourself fitting in.

Common mistakes during the application process

- Missing application deadlines.
- Choosing letter of recommendation writers who do not know you well or are not strongly supportive of your aspirations in geriatric emergency medicine.
- Grammatical errors in your application and/or personal statement.
- Having a CV that does not clearly show your interest in GEM.
- Having a CV that does not have any activities that display your leadership capabilities.

Application deadlines

Please contact each program individually regarding their application process and application deadlines. It is best to inquire approximately 1 year (July) prior to your intended fellowship start date.

Tips for writing your personal statement

Do not fall into the trap of repeating your CV in your personal statement. Instead, use this avenue to explain why you are interested in a geriatric emergency medicine fellowship and how you plan to use this training for your future career. The best personal statements read as a story. Thus, if there is a particular patient who sparked your interest in the field, now is the time to talk about it. Let your personality shine through in your statement, and use this as an opportunity to positively separate yourself from the other the applicants.

Is this a match process?

No.

What happens if I don't obtain a fellowship position?

If you do not obtain a fellowship position, take a hard look at your application to identify areas of weaknesses. It may be helpful to have your residency program director look over your application with you to help identify these areas. You may also consider asking the GEM programs that you applied to for advice on how to make your application stronger. Spend the next year addressing these weaknesses and apply again. Worst-case scenario, you can build a niche within this field with research and other publications as well as a clinical educator.

INTERVIEW PROCESS

How do I stand out from the crowd?

The best way to stand out from the crowd is by letting your personality shine through. Don't be overly talkative, but also do not be the shy candidate who is hard to engage in conversation. Come prepared with questions about the program that are not easily answered by looking at the program's website. Have a clear vision about your reasoning for wanting to complete this fellowship and regarding your future career goals.

What types of questions are typically asked?

Why are you interested in geriatric emergency medicine?

Why are you interested in GEM at our specific institution?

What are your 5- and 10-year career goals?

What can we expect from you in your first 90 days?

Tell me more about [blank] that you list here on your CV.

How many interviews should I go on?

It is recommended to attend all interviews that are offered. Remember that missing an interview can be seen as both irresponsible and unprofessional.

PREPARING FOR FELLOWSHIP

Textbooks to consider reading

- Kahn J, Magauran Jr BG, Olshaker JS. Geriatric Emergency Medicine. New York, NY: Cambridge University Press; 2014.
- Murdoch I, Turpin S, Turpin B, MacLulich A, Losman E. Geriatric Emergencies. India: Wiley-Blackwell; 2015.
- Mattu A, Grossman S, Rosen P. Geriatric Emergencies: A Discussion Based Review Book. Wiley-Blackwell.

Important skills to practice while in residency to prepare for fellowship

Skills to practice to prepare for fellowship include proficiency in clinical care of elderly patients, administrative and leadership skills, research skills, interpersonal and communication skills, and clinical educator skills.

Tips on how to succeed as a fellow

Fellowship is a unique time to continue expanding your clinical skills under the guidance of a faculty mentors as you transition from being a resident to an attending. Take advantage of all opportunities offered. Work hard and become an expert in this field all while maintaining a balance with your personal life.

CONCLUSION

Additional resources

Academic Life in Emergency Medicine (ALiEM) has had some great GEM-themed articles.

GEM physicians active on Twitter: @ACEPgeriatricsection, @geri_EM, @gemcast, @clshenvi, @katren_tyler, @kbiese, @SMDresdenMD, @ulahwang.

Journal article

<http://www.acepnow.com/geriatric-emergency-medicine-fellowships/>

Podcast

<https://gempodcast.com>

Blog post

<http://www.jhartfound.org/blog/geriatric-emergency-medicine-the-time-to-act-is-now/>

Blog and podcast post

<http://emergencymedicinecases.com/episode-34-geriatric-emergency-medicine/>

Why GEM blog post

<http://www.foamem.com/2015/03/31/geriatric-emergency-medicine-for-students-residents-and-physicians/>

Listing of Geriatric Medicine Journals

<http://www.ccgp.org/content/geriatric-journals>

National organizations

Academy of Geriatric Emergency Medicine (AGEM) —
Academy of Society for Academic Emergency Medicine
GEMS — Geriatric Emergency Medicine Section (ACEP)
The American Geriatrics Society

Conferences

ACEP and GEMS sections
SAEM and AGEM section (especially great networking dinner)
American Geriatric Society meeting
Geriatric Emergency Medicine Conference (held in the U.K.): <http://em3.org.uk/gemcon/#gemcon16>
Local geriatrics conferences, including Maine Geriatrics Conference and UCLA Intensive Course in Geriatrics

How to find a mentor

FOAMed resources are a great way to get in touch, and residents should reach out to fellowships. We encourage residents to seek out geriatric EM clinician mentors within their own institutions, during away electives, and/or at conferences, especially at ACEP (Geriatric Emergency Medicine Section) and SAEM (Academy of Geriatric Emergency Medicine).

Health Policy Fellowship

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INTRODUCTION

Description of the specialty

The healthy policy fellowship is designed to educate/train future physician leaders who will work to effect change within the health care system and advocate for the practice of emergency medicine to ultimately shape the future health care landscape on both local and national levels. One way to accomplish this is through the development and refinement of academic, clinical, and professional skillsets. The firsthand experience of providing care to patients from all walks of life as well as the increasing role of primary care uniquely qualifies emergency medicine physicians to serve in this capacity.

History of the specialty/fellowship pathway

The history and current landscape of U.S. health care has been shaped by a complex relationship between the federal government and private industry. This large, expensive system has resulted in escalating medical bills for both the average individual American consumer as well as the government. Consequently, both struggle to cover extraordinary costs. It comes as no surprise that discussions of health care reforms have gained significant interest and attention within both local and federal government agencies. This led to the passage of the Patient Protection and Affordable Care Act, colloquially named "Obamacare" in 2010. In the time since, potential repeal of all or part of Obamacare and the role of Medicaid expansion dominates the conversation. Emergency physicians are distinctively suited as advocates in such debates due to the wide spectrum of patients that they provide care to. As a result, health policy fellowships designed specifically for the emergency physician have evolved over the course of time.

Why residents choose to follow this career path

Residents may choose this path for a number of reasons, including but not limited to: (1) to advocate for patients and emergency medicine providers, (2) to promote health policies that improve emergency care in the United States, and (3) to develop leadership and administrative skills.

How do I know if this path is right for me?

This path tends to draw those who have a strong desire to be involved in the health care system beyond their clinical roles: those who desire to impact health care policy formulation and refinement, those who are passionate about public health, and those interested in health care based leadership roles for the benefit of both the specialty and the patients. Most people drawn to this path have a vision and an aim to make a significant impact on a larger scale.

Career options after fellowship

The career options following a fellowship in health policy are broad and allow graduates to create a unique career path that best suits their policy interests. The level of involvement can vary ranging from health care policy or advocacy involvement at the community level to the national or international level (organizations like the WHO, UNICEF etc.). Many choose combined career paths that allow them to utilize their clinical skills and public policy expertise. After graduating from fellowship, one may choose to pursue work as an academic emergency physician focusing on health policy research or perhaps as a community physician representative on hospital or health care organization's executive committees. Other opportunities include serving in an advocacy or government position (such as policy advisors for Congress, executive positions in ACEP or your state ACEP chapter), becoming a liaison to governmental organizations (such as HHS, CDC, or CMS). Graduates may assist as media or legislative representatives on health policy issues or consult for insurance or pharmaceutical companies.

Academic vs. community positions

While some health policy fellowships or grants for health policy career development allow one to pursue educational and experiential opportunities while working at any desired institution, the overwhelming majority of fellowships in health policy are located at academic institutions. Health policy fellowships are located widely across the United States, with most programs concentrated on the East Coast. Depending on the program, the clinical sites may vary in terms of number and length of shifts, patient types, and acuity.

IN-DEPTH FELLOWSHIP INFORMATION

Number of programs

There are currently 9 active programs that offer health policy fellowships. There are further areas of specialization within health policy fellowships, such as social emergency medicine, administration, advocacy, safety and quality, research, or general health policy.

see chart on next page

Other programs have positions available for emergency physicians, but may also extend invitation to applicants from all specialties. These include:

[The National Clinician Scholars Program](#)

[The Commonwealth Fund](#)

[The Robert Wood Johnson Foundation Health Policy Fellowship](#)

[The APHA Public Health Fellowship](#)

Differences between programs

Fellowships offer a wide spectrum of options from those with a primary focus on advocacy, to translational or experiential training, to predominantly research in health policy. While almost all programs offer elements of each, fellowships vary in emphasis on these categories. The health policy fellowships that emphasize research aim to develop the necessary skills to conduct translational research in health policy. Those that have a more experiential emphasis tend to offer a larger variety of practicum placements, allowing fellows to rotate through different public policy experiences such as city, state, and national government organizations, advocacy groups, nonprofit organizations, or research centers. Most fellowships require the completion of a research, MPH, and/or capstone project.

Length of time required to complete fellowships

Fellowships are usually 1-2 years in length but most are flexible depending on whether an applicant already has a master's degree or graduate certificate in public health or a related field.

Skills acquired during fellowship

Depending on the institution, a graduate certificate or a degree may be an option or a requirement. Particular knowledge and skills acquired during fellowship include, but certainly aren't limited to, basic understanding of American policy and procedures, understanding of how policy impacts health care, practice of medicine, public

EMRA FELLOWSHIP GUIDE

Program	Length in Years	Positions per Year	Advanced Degree	Focus Area	Clinical Work
Baylor College of Medicine, Houston, TX	1* or 2	1	MPH, MHA or Master's in Health Leadership	Health Policy and Advocacy	20 hr/week
Brigham and Women's Hospital, Boston, MA	2	1	MPH at Harvard School of Public Health	Health Policy Research and Translation	Variable
Georgetown University, Washington, DC	1* or 2	1	Certificate in Health Policy	Health Policy	8 shifts/month at affiliated sites, moonlighting
George Washington University, Washington, DC	1* or 2	Up to 3	MPH or Graduate Certificate in Health Policy	Health Policy	20hr/week at affiliated sites, moonlighting
NYU Langone School of Medicine, New York, NY	1*	1	MPA in Health Policy and Management	(1)Health care Leadership and Operations; (2)ED Safety and Quality	Average of 20 hr/week at affiliated sites
Oregon Health and Science University, Portland, OR	2	Unknown	MPH or Human Investigations Program Certificate	Research	Variable
Stanford School of Medicine, Stanford, CA	2-3	Unknown	MPH or MS in Health Services Research	Social Emergency Medicine and Population Health	Variable
University of California (UCLA), Los Angeles, CA	2	1-2	MPH or equivalent	International and Domestic Health Equity (IDHEAL)	Variable
University of Colorado, Aurora, CO	1*	Unknown	Unknown	Climate and Health Science Policy	Unknown
University of Pennsylvania, Philadelphia, PA	2	1	MS in Health Policy Research	Emergency Care Policy and Research	Variable
University of California, (UC Davis, Sacramento, CA	2	Unknown	MPH or Masters in Clinical Epidemiology	Health Policy	Variable
University of Maryland, Baltimore, MD	2	1-2	MPH in Public Health Practice and Policy	Health Policy and Research	10-20 hr/week at affiliated sites
University of Texas Southwestern, Dallas, TX	2	1-2	MHA	Practice Management and Health Policy	7 shifts/month or Average of 20 hr/week

• *A 1-year fellowship option is available for individuals who already possess an advanced degree in public health or public policy.

*Moonlighting or assigned shifts in ED

health, leadership development, and policy research. Furthermore, there is ample exposure to policy systems through involvement with advocacy groups, think tanks, city, and various levels of governmental organizations and legislative bodies.

Typical rotations/curriculum

For fellowships specifically for emergency medicine physicians, clinical shifts are offered at one or more emergency departments. Most health policy fellows work part-time, approximately 5-8 clinical shifts per month, which varies from month to month depending on the fellowship demands.

Educational activities include:

- Graduate courses (degree/certificate) focusing on public health, health policy, research methods, statistics, and ethics
- City, state, or national government practicum to gain experience in public policy making, formulation and implementation
- Advocacy, nonprofit, or think tank practicum
- Research project focusing on health policy topic
- Leadership development and coaching

Board certification afterwards?

No. There is currently no certification agency for a health policy fellowship. Programs are variable in the nature of being accredited by the ACGME. The Master's degree or certificate awarded as part of almost all fellowships and related coursework along with the examination requirements towards these are considered sufficient.

Average salary during fellowship

Salary during fellowship varies depending on the structure of a particular program. Compensation may be based on the Graduate Medical Education pay scale, based on employment as a part time attending, or a combination of base salary and supplemental income from moonlighting opportunities. Not all health policy fellowships allow moonlighting, but those that do usually recommend not working more than a total of eight to ten clinical shifts per month so that you can fulfill the other requirements of the fellowship. Some programs may include tuition for advanced degrees as part of the fellowship, but this can vary among programs.

PREPARING TO APPLY

How competitive is the fellowship application process?

There are only a few programs (13 currently), each of which accept 1-2 fellows per year, which inherently makes it competitive.

Requirements to apply

Completion of an accredited emergency medicine residency program is necessary to matriculate into a health policy fellowship. Other requirements, such as prior research, policy, or public health experience will vary amongst the programs.

Research requirements

The amount of research required to apply for a health policy fellowship depends on the emphasis placed on research throughout the fellowship at an institution. However, research experience, particularly related to a health policy topic is likely to improve one's application. Please note there are health policy grants available from the Emergency Medicine Foundation, ACEP, and other public and private institutions devoted to health policy research and advocacy that you may be able to utilize during both residency and fellowship.

Suggested elective rotations to take during residency

EMRA offers a [4-week health policy elective](#) for medical students and a [4-week mini-fellowship](#) for residents.

Suggestions on how to excel during these elective rotations

During your elective rotations, be enthusiastic, reliable, hardworking, and friendly to everyone. Arrive early and offer to stay late. Read every day and expand your knowledge base on topics such as lobbying, policy, legislation, regulation, etc.

Should I complete an away rotation?

Away rotations are neither widely available nor required to apply for health policy fellowships. However, if an away rotation is available, it may be useful to preview a particular program of interest and further explore your interest in health policy.

What can I do to stand out from the crowd?

Opportunities individuals can take to set themselves apart include:

- Active involvement in state EM organizations, EMRA, and/or ACEP, or AMA for advocacy and health policy education
- Special rotations or mini-fellowships in health policy
- Conducting health policy research
- Meaningful activities within hospital committees and administration
- Publishing reviews, articles, and book chapters relevant to policy

Should I join a hospital committee?

Hospital committees are excellent leadership opportunities as long as your involvement allows for meaningful contribution commensurate with your level of training.

Publications other than research

Publications such as blog posts, magazine articles, book chapters, case reports, etc., can certainly strengthen your application.

How many recommendations should I get? Who should write these recommendations?

Typically 3 letters of recommendation are required, usually from your program director, department chair and someone who has worked with you clinically. Additionally, any eligible professional/mentor (attending with health policy specialization, local chairperson of a city or state public policy committee) who can vouch for your involvement in health policy formulation and implementation and/or advocacy can also write a letter of recommendation.

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

Some programs do limit applications to those who have graduated from residency within the last 2 years. For the most part, aside from personal logistics, there are no specific limitations to working as an attending prior to fellowship. Be mindful to remain involved in the health policy field and continue to build your CV after residency. Please note that some programs do limit applications to those who have been graduated from residency for less than 2 years.

What if I'm a DO applicant?

No barriers currently exist for DO applicants.

What if I am an international applicant?

International applicants are encouraged to contact each program individually to inquire about whether or not they accept visa applicants.

APPLICATION PROCESS

How many applications should I submit?

The answer to this question is dependent on the individual. Due to the small number of programs available, each with a varied focus, a lot of the determination will be on the basis of geographic location, offered graduate degree(s), and specific interest within the health policy realm. Apply to all programs that you have a strong interest in.

How do I pick the right program for me?

Reaching out to current fellows and speaking with them is instrumental in the process. It is important to get an idea of their experiences, how they feel the training has helped them and maybe most importantly, what they would change about their program. Speaking with the current fellows of different programs offers invaluable insight into the programs structure, fellows' quality of life and opportunities that are available. Communicating with fellowship directors is another way to obtain perspectives and goals for the fellowship.

Common mistakes during the application process

- Missing application deadlines and applying late in the year.
- Choosing letter writers who provide weak letters of recommendations.
- Poorly written personal statements.
- Limited health policy knowledge.

Application deadlines

Application deadlines for each program are different. As with any application process, submitting materials earlier is always better. Spend the early part of your final year updating your CV, choosing which fellowship programs to apply to and picking your letter writers. Most programs interview in the early fall of the year prior to matriculation and make acceptance offers by November.

Tips for writing your personal statement

Personal statements are meant to demonstrate not only your interest, but also how you stand out, your commitment and qualifications for the program to which you are applying. All personal statements should reflect the author's interest and intent for pursuing a health policy fellowship. It may be useful to include a story about what encouraged you to pursue health policy, your specific areas of interest and/or research, prior experience in health policy and ultimate career goals. Many programs will also ask you to include a paragraph specifically describing your reasons for applying to their program.

Is this a match process?

No.

What happens if I don't obtain a fellowship position?

Options for future directions for those who apply and are not granted admission to a health policy program depend upon each applicant. An individual may choose to pursue a clinical emergency medicine career, work towards improving their fellowship application, reapply, or pursue health policy education through alternative experiences (mini-fellowships, graduate school, volunteer work, etc.).

INTERVIEW PROCESS

How do I stand out from the crowd?

As with any interview, applicants should dress professionally in a business suit or professional skirt or dress. Be prepared by having additional copies of your CV and writing samples. Let your personality and enthusiasm for the field shine during your interview.

What types of questions are typically asked?

Interview questions, as with most academic and professional interviews, focus on the applicant's interest in health policy, research, their interest in the specific program at which they are interviewing, long term career goals, and occasionally personal opinions on well-known health policy subjects. Spend time familiarizing yourself with the latest developments in health policy before your interview. Considering asking a friend to help with a mock interview so that your answers are polished.

How many interviews should I go on?

It is recommended that you attend all interviews offered by programs that you would strongly consider attending if offered a fellowship position.

PREPARING FOR FELLOWSHIP

Textbooks to consider reading

- Bohenheimer T, Grumbach K. Understanding Health Policy: A Clinical Approach. 6th ed. New York, NY: McGraw-Hill Professional Publishing; 2012.
- Schlicher NR, Alison Haddock A. Emergency Medicine Advocacy Handbook. 4th ed. Dallas, TX: EMRA; 2016.

Important skills to practice while in residency to prepare for fellowship

Since health policy is often focused on addressing important current public health issues and events, it is important to follow current events. That said, the best advice for moving towards a fellowship, is to simply stay informed, active, and maintain the passion for policy issues that drive you toward making this a prospective career choice. Active involvement in organizations, governmental affairs, or policy research can be important in honing the essential skills such as public speaking, leadership, and gaining the important policy knowledge that will serve the potential fellow well throughout their career.

Tips on how to succeed as a fellow

Fellowship is a unique time to expand your knowledge and skills under the guidance of a mentor. Take advantage of all opportunities such as research, course work and advanced degrees, international opportunities etc. Strive to develop your professional network and contacts in health policy. Work hard to become an exceptional leader, clinician, educator, and advocate.

CONCLUSION

Additional Resources

Blogs

[PolicyRx](#)

[ACEP 911 Network](#)

<http://www.govtrack.org/>

Social media apps such as Twitter can be helpful in organizing the healthy policy information flow.

National organizations

ACEP/EMRA Healthy Policy sections

SAEM

AAMC

AMA

State EM organizations (state or local chapters)

Conferences

ACEP hosts a yearly leadership and advocacy conference, usually in May, which is an excellent opportunity for all EM providers to learn, network, hone leadership skills, and discuss topics directly with legislators. There are also tracks for residents to help expand their knowledge and launch their involvement in health policy. AMA also hosts an annual conference usually in October-November which one should consider attending should they have specific interest in health policy fellowships.

How to find a mentor

Reaching out to program directors and other faculty at your home institution can be very helpful. Also, speak with current and past fellows, and attend conferences, as these can be a fantastic opportunity to network with others who have interests in health policy. Active involvement in ACEP/EMRA can help you find a mentor based on your specific requirements and career interests through the mentorship matching program.

Finally.....never give up. Good luck!

Informatics Fellowship

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INTRODUCTION

Description of the specialty

The Accrediting Council for Graduate Medical Education (ACGME) defines this fellowship as “the subspecialty of all medical specialties that transforms health care by analyzing, designing, implementing, and evaluating information and communication systems to improve patient care, enhance access to care, advance individual and population health outcomes, and strengthen the clinician-patient relationship.”

History of the specialty/fellowship pathway

In 2007, the American Medical Informatics Association launched an investigation to define the core content and training process for proposed informatics fellowship. In 2008, they sent proposals to multiple different medical specialty boards, and in 2009 the American Board of Preventive Medicine (ABPM) agreed to sponsor the fellowship. In 2010, the formal application was submitted, and in 2011 the ABPM committee officially accepted it. Starting in 2013, the newly created board certification exam became available to physicians already working in the field of informatics to become certified through the “Practice Pathway.” There are 2 options to be considered eligible for the practice pathway:

- Obtaining a 24-month master’s or doctoral program in Biomedical, Health Sciences, or Clinical Informatics
- 3 years of 25% FTE work in Clinical Informatics (10 hours per week minimum) within the past 5 years, which may include time spent completing a non-ACGME fellowship.

Eligibility for practice pathway will not be available after 2022, and thereafter only graduates of Clinical Informatics Fellowships will be eligible for board certification.

Why residents choose to follow this career path

This training path is for those physicians who are interested in the application of information technology and protocols to promote efficient patient care, improve access to data, and help prevent disease.

How do I know if this path is right for me?

Are you interested in the use of technology to help facilitate care for patients and assist with patient safety? Do you wish to design an interface between health care systems and providers that is more user-friendly? Are you interested in creating a strategy, budget, and team to introduce new technology to a health care system? If the answer is yes, this may be the fellowship for you.

Career options after fellowship

Career options include: chief information officer (CIO), chief medical information officer (CMIO), physician champion for patient safety, quality improvement project leader, and risk management director.

Splitting time between departments

After being certified in informatics, physicians traditionally use their information training as part of their administrative duties while still maintaining clinical duties.

Academic vs. community positions

Due to the introduction of electronic health records, it is certainly possible to use your informatics training at a community or academic institution. Some informatics physicians may prefer employment at a low volume community hospital, where as others may prefer employment at a large research focused academic institution.

IN-DEPTH FELLOWSHIP INFORMATION

Number of programs

Clinical Informatics Fellowships are sponsored by a wide variety of specialties; however, most are willing to accept residency graduates from any primary specialty. As of April 2018, there are 31 ACGME-accredited fellowships:

- Anesthesia
 - Vanderbilt
- Emergency Medicine
 - [Indiana University \(Regenstein Institute\)](#)
 - [University of California - Irvine](#)
 - [University of California - San Diego](#)
 - [Yale-New Haven Medical Center](#)
- Family Medicine
 - [Madigan Healthcare System \(Tacoma, WA\)](#)
 - [University of Washington \(Seattle\)](#)
- Internal Medicine
 - [Beth Israel Deaconess](#)
 - [Case Western Reserve University \(MetroHealth\)](#)
 - [Duke University](#)
 - [Geisinger Health System](#)
 - [Icahn School of Medicine at Mount Sinai](#)
 - [New York Presbyterian Hospital \(Columbia Campus\)](#)
 - [Ohio State University](#)
 - [Oregon Health & Science University](#)
 - [UCLA David Geffen School of Medicine](#)
 - [University of Arizona](#)
 - [University of California - San Francisco](#)
 - [University of Chicago](#)
 - [University of New Mexico](#)
- Pathology
 - [Massachusetts General Hospital](#)
 - [Mayo Clinic](#)
 - [Methodist Hospital \(Houston\)](#)
 - [University at Buffalo](#)
 - [University of California - Davis](#)
 - [University of Illinois College of Medicine \(Chicago\)](#)
- Pediatrics
 - [Children's Hospital of Philadelphia](#)
 - [Children's Hospital/Boston Medical Center](#)
 - [Stanford](#)
 - [University of Virginia](#)
 - [Washington University in St. Louis](#)

Emergency medicine applicants open to a non-ACGME fellowship, may also be interested in applying to the “Administration, Quality, Informatics, and Policy Fellowship” co-sponsored by the American College of Emergency Physicians (ACEP) and Integrated Emergency Services (IES) based in the Dallas/Fort Worth, Texas area. The first year of fellowship will provide a mentored experience in four 3-month blocks related to administration, quality, informatics, and policy. The second year of training will allow the fellow to focus on one of the four domains explored during the first year. And a third year of training is option for applicants who wish to complete an MBA or MPH. At ACEP, fellows will have the opportunity to work with ACEP’s Clinical Emergency Department Registry (CEDR), develop national quality measures, and/or develop national policies for the field emergency medicine. At IES, fellows will be involved in departmental quality projects and administrative issues across the network of hospitals staffed by IES. Time spent in this program can be applied toward board-eligibility in Clinical Informatics via the practice pathway. Interested applicants should contact Pawan Goyal, MD at pgoyal@acep.org.

Differences between programs

As demonstrated by the growing list of ACGME-accredited Clinical Informatics fellowships, programs can be sponsored by departments of anesthesia, emergency medicine, family medicine, internal medicine, pathology, and pediatrics. Applicants should definitely consider programs sponsored by their primary specialty, but emergency medicine residency graduates should not limit themselves to only the four fellowships sponsored by departments of emergency medicine. Applicants should ask if programs sponsored by other specialties have had emergency medicine fellows before, and if so what types of projects they have worked on to ensure that they will gain experience specific to emergency medicine, rather than being limited to inpatient or outpatient informatics projects. Also, given the breadth of clinical informatics, applicants should learn which areas the institution has the most expertise in.

Length of time required to complete fellowship

The ACGME requires a 2-year fellowship.

Skills acquired during fellowship

During fellowship, you will receive training in each of the four core content categories that serve as the blueprint for the Clinical Informatics board-certification examination:

1. Fundamentals
 - a. Clinical Informatics
 - b. The Health System
2. Clinical Decision Making and Care Process Improvement
 - a. Clinical Decision Support
 - b. Evidence-based Patient Care
 - c. Clinical Workflow Analytics, Process Redesign, and Quality Improvement
3. Health Information Systems
 - a. Information Technology Systems
 - b. Human Factors Engineering
 - c. Health Information Systems and Applications
 - d. Clinical Data Standards
 - e. Information System Lifecycle
4. Leading and Managing Change
 - a. Leadership Models, Processes, and Practices
 - b. Effective Interdisciplinary Teams
 - c. Effective Communications
 - d. Project Management
 - e. Strategic and Financial Planning for Clinical Information Systems
 - f. Change Management

Typical rotations/curriculum

Example of rotations include the following: clinical informatics experience managing an electronic health record; reporting and analytics; quality improvement training and project involvement; research; and electives such as interoperability with your local or regional health information exchange (HIE) organization. Additionally, most fellowships provide fellows with protected time to practice in their primary specialty to maintain their clinical skills (aka must maintain primary specialty skills/certification by working in that respective department).

Board certification afterwards?

Yes. This exam is conducted by the American Board of Preventive Medicine.

Average salary during fellowship

Because this is an ACGME fellowship, salary is based on the appropriate PGY level.

PREPARING TO APPLY

How competitive is the fellowship application process?

Currently there are 31 ACGME-accredited programs (4 based in departments of emergency medicine) with each typically taking 1-2 fellows per year.

Requirements to apply

You must be board eligible or board certified in any ABMS approved specialty to apply.

Research requirements

Research is not required but is highly recommended, especially if the research is completed on a topic relevant to informatics. Make sure you have your research projects near completion when you apply. It is better to have one completed research project than three projects in the data collection phase.

Suggested elective rotations to take during residency

Consider using your elective time to take an administrative or research elective. Some programs specifically have an informatics rotation, which would be an ideal rotation. Residents at hospitals or health systems using Epic might also consider asking their institution to register them to attend “Physician Builder” courses at the Epic Intergalactic Headquarters in Verona, Wisconsin.

Suggestions on how to excel during these elective rotations

Your elective months can potentially connect you with attending physicians who may be your future letter of recommendation writers. Thus, it is imperative to treat every day on elective as an interview day. Treat everyone with respect and go the extra mile. It is always looked at positively when you arrive early and stay late to help. Be innovative. Strive to be both a team player and a leader. Read every night, and increase your knowledge base about informatics.

Should I complete an away rotation?

It may be worth considering an away rotation at a program that has an informatics fellowship. This may be a prime way to help “get your foot in the door” and display your interest and clinical skills.

What can I do to stand out from the crowd?

The best way to stand out from the crowd is to build a CV that displays clear leadership ability and an apparent interest in the field of informatics. One example to consider is to develop a quality improvement project

during residency that focuses on improving the electronic health records system at your institution.

Should I join a hospital committee?

Absolutely. Try to join a committee that is focused on informatics topics and allows you to make a meaningful contribution and/or allows for a leadership role. The Houstaff Patient Safety and Quality Improvement Committee is a good example.

Publications other than research

Writing case reports, blog posts, magazine articles, and so forth, is an excellent learning opportunity and a great way to get your name out into the informatics community.

How many recommendations should I get? Who should write these recommendations?

It is generally recommended to obtain 3 letters of recommendation. One of these letters must be from your residency program or department director. The remaining recommendations should be from faculty who know you well, strongly support you, and can speak to your interest and skills in informatics. For example, physicians with whom you have worked on quality improvement projects, research projects, or on hospital committees may be a useful resource for these letters.

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

You can absolutely still be competitive if you work as an attending before applying to fellowship. Some programs look forward to having applicants with prior independent clinical experience, as they could potentially provide a unique perspective. The key is to remain involved in informatics. You do not want the activities on your CV to stop when residency ends. Also, be prepared to explain during your fellowship interviews why you made the decision to practice before applying for fellowship.

What if I am a DO applicant?

There are no barriers for DO applicants.

What if I am an international applicant?

Please contact individual programs regarding whether they accept international applicants (some programs receive funding that prevents them from taking international applicants). In general, international applicants are usually required to be certified by the Educational Commission for Foreign Medical Graduates (ECFMG). You also must have a visa (traditionally a J-1).

APPLICATION PROCESS

How many applications should I submit?

You should apply to all programs you would seriously consider attending if offered a fellowship position.

How do I pick the right program for me?

Pick a program that makes you happy in regards to career and personal life. Do not ignore your inner voice; if you feel uncomfortable, that program is not for you. Choose the program that believes in you and is supportive of your career goals. Finally, do not forget location. If you are unhappy when you go home after work, this sentiment will infiltrate your fellowship experience, and you won't be nearly as happy or as productive as you otherwise would have been.

Common mistakes during the application process

Common mistakes include submitting an application past the deadline, submitting an incomplete application, choosing letter writers who are not 100% supportive of you, or having a CV that does not display an interest in informatics.

Application deadlines

Applications traditionally open in July and positions are filled by January. Most programs are participating in the ERAS and will accept application through the ERAS portal only. Clinical Informatics fellowship programs are listed under a wide variety of primary specialty, however, most programs accept applications from graduates of any ACGME-accredited residency specialty type. Applicants should contact each program regarding specific application timelines.

Tips for writing your personal statement

Your personal statement should not be a regurgitation of your CV but rather should show your personality and explain why you are interested in informatics. Is there a specific patient-technology interaction that first sparked your interest in the field? Perhaps your involvement in a hospital committee or maybe a mentor was pivotal in introducing you to the field? The best statements read as a story that engages the reader from the very first sentence. Consider ending your personal statement with your thoughts about your career goals after completing an informatics fellowship.

Is this a match process?

Yes. However, applicants do not need to submit a rank-list. Instead, the directors of ACGME-accredited Clinical Informatics programs will pick a date and time, likely in mid-December, where they will simultaneously offer positions to their most desired candidate(s) by phone

or email which will be active for one hour, after which time the offer will be automatically withdrawn. After an applicant declines a position (or accepts a position at another program or is automatically withdrawn due to expiration of their one hour offer window), fellowship programs with unfilled positions are then free to make offers to other applicants.

What happens if I don't obtain a fellowship position?

Not all programs will fill their positions during the match. If you decide to pursue Clinical Informatics late into the application season, or are interested in applying to programs which gained ACGME-accreditation or funding for a previously approved fellowship position later in the year, you may be able to individually reach out to programs that you are interested in to see if you can obtain a position outside of the match.

If you still do not obtain a fellowship, we recommend that you take a hard look at your application and interview process to identify weaknesses that you need to change. It may be worth gently asking the programs that did not offer you a position if they have any advice to help you to improve. More important, we recommend that you find a trusted physician (such as your EM residency program director) to look at your application with a critical eye to find the gaps. Spend the next year addressing these gaps and apply again. Worst-case scenario, it is possible to create a niche within the field of informatics as an attending physician without completing an ACGME fellowship.

Applicants who are able to complete a 24-month Master's or PhD in Biomedical, Health Sciences, or Clinical Informatics; or are able to spend at least 10 hours per week doing Clinical Informatics work by the year 2022 may be eligible to become board certified in Clinical Informatics via the "Practice Pathway." The National Library of Medicine also sponsors sixteen "University-based Biomedical Informatics and Data Science Research Training Programs" which may help physicians gain the skills they need to be successful informaticians.

INTERVIEW PROCESS

How do I stand out from the crowd?

The best way to stand out from the crowd during an interview is simply by being yourself. Let your personality shine through. Come prepared to ask questions about the fellowship program. Make sure these are thoughtful questions that cannot be easily answered by looking at their website. Finally, know your application well and be prepared to answer anything from it.

What types of questions are typically asked?

- Why are you interested in informatics?
- Why are you interested in informatics at our institution?
- What are your 5- and 10-year career goals?
- Tell me about “blank” activity that you list on your CV.
- What are your strengths and weaknesses?

How many interviews should I go on?

Attend every interview that is offered to you by programs that you would seriously consider attending.

PREPARING FOR FELLOWSHIP

Textbooks to consider reading

- Englehardt SP, Nelson R. Health Care Informatics: An Interdisciplinary Approach. St. Louis, MO: Mosby; 2002.
- Shortliffe EH, Cimino JJ. Biomedical Informatics: Computer Applications in Health Care and Biomedicine. New York, NY: Springer; 2006.
- Coiera E. Guide to Health Informatics. 3rd ed. Boca Raton, FL: CRC Press; 2015.
- Strauss RW, Mayer TA. Strauss & Mayer’s Emergency Department Management. New York: McGraw-Hill Education, 2014.

Important skills to practice while in residency to prepare for fellowship

Practice your leadership, research, and negotiation skills. Above all else strive to be a fantastic physician first and foremost. Work on your understanding of electronic medical records, such as order sets, note templates, and decision support tools. Work on your understanding of the sociotechnical aspects of health care. Become knowledgeable on how to create and implement quality improvement projects.

Tips on how to succeed as a fellow

The best fellows are the ones who are passionate and dedicated to their careers. Fellowship is a unique opportunity to learn about informatics under the guidance of many physician mentors. Take advantage of all that fellowship has to offer. Read every day, come into work early and stay late, and be amicable to everyone. Also, remember to stay balanced and take care of yourself and your family.

CONCLUSION

Additional Resources

Journals

- International Journal of Medical Informatics
- Journal of American Medical Informatics Association (JAMIA)
- ACI — Applied Clinical Informatics Journal

Blogs

- [College of Medicine Phoenix](#)
- [Top 50 informatics blogs](#)
- [Clinfowiki](#)
- [Informatics Professor](#)

Podcast

- [Healthcare Informatics](#)
- [AMIA Clinical Informatics Fellows Go Live](#)

National organizations

[American College of Emergency Physicians \(ACEP\)](#)

- [Clinical Emergency Data Registry \(CEDR\) Committee](#)
- [Emergency Medicine Informatics Section](#)
- [Emergency Telemedicine Section](#)
- [Quality and Patient Safety Committee](#)
- [Quality Improvement and Patient Safety \(QIPS\) Section](#)

[American Medical Informatics Association \(AMIA\)](#)

[Emergency Medicine Residents’ Association \(EMRA\)](#)

- [Informatics Committee](#)

[Healthcare Information and Management Systems Society \(HIMSS\)](#)

[Society for Academic Emergency Medicine \(SAEM\)](#)

- [Academic Informatics Interest Group](#)
- Telehealth Interest Group

Conferences

- AMIA iHealth clinical informatics annual conference
- International conference on healthcare informatics
- Medical Informatics World Conference
- Healthcare Information and Management Systems Society (HIMSS)

How to find a mentor

A great way to find mentors is by reaching out the CMO and physician informaticists within your institute. Alternatively, by joining the [ACEP Emergency Medicine Informatics Section](#), you can connect with emergency physicians who share the same passion and could potentially serve as a mentor.

Injury Control Fellowship

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INTRODUCTION

Description of the specialty

This fellowship trains physicians to become injury prevention experts, educators, researchers, and eventually leaders in their field.

History of the specialty/fellowship pathway

In 1964, Haddon et al. published *Accident Research: Methods and Approaches*, a groundbreaking piece for the development of injury control research. For the first time, basic principles of research for the injury field were established. Soon after, the National Highway Traffic Safety Administration was formed, which established funding for scientific research in automobile safety. By 1985, injury research was recognized as a distinct field and the Centers for Disease Control and Prevention's National Center for Injury Prevention and Control was established. Injury research and funding has accelerated since this time both locally and globally. It is largely due to this research that disability and mortality caused by injury has declined over the past century. As providers of care for injured adult and pediatric patients, emergency physicians are ideally situated and have the ability to affect the health of the public by being leaders in injury prevention and control.

Why residents choose to follow this career path

Residents choose to follow this career path if they are interested in developing and disseminating evidence-based strategies for injury prevention with resultant decreased morbidity and mortality.

How do I know if this path is right for me?

This fellowship may be for you if you are interested in any of the following:

- Using research to prevent injuries from motor vehicle crashes (MVCs), sports injuries, household injuries, assault, or abuse.
- Becoming an expert, public educator, and physician educator in injury prevention.
- Coordinating outreach programs or becoming part of the team at an injury prevention center.

Career options after fellowship

Career options to consider after fellowship include becoming an injury prevention research faculty member/investigator or advocate for intentional or unintentional injury.

Splitting time between departments

Traditionally, physicians hold the rank of staff physician or faculty member in the emergency department, and their injury prevention work falls under administrative and/or research effort.

Academic vs. community positions

It is common for physicians after this fellowship to work in academic positions to pursue available funding and research opportunities. In addition, a variety of injury control positions are available in the community, government, and private sectors.

IN-DEPTH FELLOWSHIP INFORMATION

Number of programs

There are currently three fellowships for physicians:

- [Alpert Medical School of Brown University](#) (Rhode Island Hospital/Hasbro Children's Hospital)
- [Harborview Injury Prevention & Research Center](#) (University of Washington)
- [Drexel Center for Nonviolence and Social Justice](#) (Drexel University College of Medicine Department of Emergency Medicine)

Other opportunities include internships and grants that are not necessarily geared toward physicians:

- [Certificate in Injury and Violence Prevention](#)
- [Indian Health Services Injury Prevention Fellowship](#)
- [Injury and Violence Prevention Internship](#)
- [Occupational Injury Prevention Research Training](#) (PhD), University of Minnesota

- [Occupational Injury Prevention Research Training](#) (PhD), University of Utah
- [Emory Injury and Violence Prevention Certificate Program](#) (MPH or PhD)

Differences between programs

The fellowships at Brown and Harborview require 2 years to complete. The fellowship at Drexel, while also a 2-year program, may be completed in 1 year if the fellow already has a Master's degree or PhD and a background in research. These programs are all primarily research-based and are associated with injury prevention centers. Harborview specifically focuses on injury prevention in children and adolescents. Drexel emphasizes emergency medicine and permits fellows to focus on a particular area of interest, such as research, policy and advocacy, or program management.

Length of time required to complete fellowship

This is usually a 2-year fellowship.

Skills acquired during fellowship

The Brown Alpert Injury Control Fellowship at Brown includes a Master's of Public Health or Master of Science in Clinical and Translational Research and is also a well-established research program with a long track record of funding.

The Pediatric Injury Research Training Program at Harborview is funded through a T-32 grant and offers a Master's of Public Health or Master of Science as part of the training program.

The Fellowship in Injury and Public Health at Drexel allows fellows to take courses through the Dornsife School of Public Health at Drexel University and obtain a Master's of Public Health.

Typical rotations/curriculum

Fellows traditionally continue to work a small percentage of time in the emergency department, while the remainder is protected time for research educational work, some of which may be as part of a public health curriculum. Fellows are involved in mentored research and also in public health course/advanced degree coursework.

Board certification afterwards?

There is no board certification available; this is not an ACGME-accredited fellowship.

Average salary during fellowship

Because this is not an accredited fellowship, your salary is similar to that of a part-time EM attending.

PREPARING TO APPLY

How competitive is the fellowship application process?

While there is a small applicant pool for this fellowship, there are only 3 fellowship programs. Because of the small number of programs and very limited number of fellow positions, this is a more competitive fellowship.

Requirements to apply

You must be at minimum in your last year of emergency medicine residency to apply for this fellowship.

Research requirements

Research completed during residency is very strongly encouraged. Performing research with ties to injury control would be particularly favorable on your application. It would be very difficult to obtain a spot in this fellowship without having some sort of research project on your CV.

Suggested elective rotations to take during residency

Consider using your elective time as research months. If your institution has an injury prevention center, it may be worth seeking out a rotation or administration month working with this center.

Suggestions on how to excel during your elective rotations

To excel on your elective rotations, it is important that you display your passion and enthusiasm. Arrive early and stay late, read daily, and take advantage of opportunities to expand your knowledge base. If you are on a research elective, strive to get as much done as possible during the month with the goal of (at minimum) having an abstract to submit by the beginning of your senior year and submitting your research for publication by the end of your residency.

Should I complete an away rotation?

It may be worth completing an away rotation at Drexel, University of Washington, or Brown as a way both for you to check out their program and for the program to “audition” you.

What can I do to stand out?

Ensure that your application displays a strong interest in research and target both your research and other activities toward injury control. Having activities on your CV that display your leadership capabilities is also helpful.

Should I join a hospital committee?

If the opportunity to participate in a hospital committee arises that interests you and allows you to have meaningful contribution, then this is strongly recommended.

Publications other than research

Case reports, blog posts, and magazine articles are highly encouraged as well. This is a great way to educate both yourself and others and to start getting your name out in this academic space. Especially consider publishing about topics within the injury control field.

How many recommendations should I get? Who should write these recommendations?

Applicants traditionally submit 3-4 letters of recommendation. One of these letters must be from either your residency program director or department chair. You may also consider asking your residency research mentor to write a letter. Make sure that you choose faculty who know you well and are willing to write you a strong letter of support.

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

Absolutely. The key is to keep working on research and other projects, especially those related to the injury prevention field. Ensure that the list of activities on your CV does not stop after you graduate from residency. Also, be ready to explain your decision to practice as an attending prior to applying for fellowship.

What if I am a DO applicant?

There are no known barriers to DO applicants.

What if I am an international applicant?

Contact each program to inquire whether they accept international applicants. Make sure you have completed your USMLE steps, have your ECFMG (education commission for foreign medical school graduates), and have acquired a visa to work clinically in the U.S. Of note, Harborview only accepts applications from U.S. citizens and permanent residents.

APPLICATION PROCESS

How many applications should I submit?

Applicants should apply to all programs s/he would consider attending.

How do I pick the right program for me?

Pick a program that matches your educational and career goals. You should feel comfortable at the program and you should be surrounded by mentors and a leadership team dedicated to helping you succeed. Finally, ensure that a program is in a geographic location where you and your significant other will be comfortable and happy.

Common mistakes during the application process

- CV does not demonstrate an interest in injury control.
- No involvement in research.
- Impersonal or unfocused personal statement.
- Having letter writers who are not completely supportive of the applicant.
- Missing application deadlines as set by the program.
- Submitting an incomplete application.

Application deadlines

Please contact each program regarding their application deadlines. Traditionally, applicants begin to apply in July the year before they plan on starting fellowship.

Tips for writing your personal statement

The best personal statements read more as a story that explains your interest in the field of injury prevention and discusses your career goals. Do not simply repeat what can be found in your CV. This is your chance to show your personality and also your dedication to the field. Consider describing a patient and/or perhaps a research mentor who sparked your interest in the field. Ask multiple people whom you trust to review and critically edit your personal statement. Make sure there are no grammatical mistakes.

Is this a match process?

No.

What happens if I do not obtain a fellowship position?

If you do not obtain a fellowship position, take a step back and critically review your application. Consider asking your residency program director to critically review your application with you to identify ways to improve it. You may also consider gently asking the programs that did not offer you a position if they have any suggestions for improvement. Spend the next year addressing these areas of weakness and apply again. You can also consider getting a master's degree (such as an MPH) after fellowship or perhaps investigating a traditional research fellowship instead. It is also possible to build your niche in the field without completing a fellowship. Seek mentors and look for a career that allows you to spend time working in an injury prevention center.

INTERVIEW PROCESS

How do I stand out from the crowd?

The best way to stand out from the crowd during your interview is simply by being yourself. Make sure you are able to articulate your interests and passions but avoid being overbearing. Also, be prepared to ask questions about the fellowship that are insightful and cannot be easily found on their website.

What types of questions are typically asked?

Why are you interested in an injury control fellowship?

Why are you interested in attending our fellowship program?

Please tell me more about [fill in the blank] on your CV.

What are your 5- and 10-year career goals?

How many interviews should I go on?

It is recommended that you attend any interview offered by a program that you would seriously consider attending if offered a fellowship position.

PREPARING FOR FELLOWSHIP

Textbooks to consider reading

- Rivara F, et al. Injury Control: A Guide to Research and Program Evaluation. Cambridge University Press: Cambridge; 2010.
- Doll L, et al. Handbook of Injury and Violence Prevention. New York, NY: Springer; 2008.
- Gielen AC, Sleet DA, DiClemente RJ. Injury and Violence Prevention: Behavioral Science Theories, Methods and Applications. San Francisco, CA: Jossey-Bass; 2006.
- Hemenway D. While We Were Sleeping: Success stories in injury and violence prevention. Berkeley, CA: University of California Press; 2009.

Important skills to practice while in residency to prepare for fellowship

Practice your research, leadership, and educator skills during residency. But above all else, make sure you leave residency as a strong, confident, and capable emergency medicine physician.

Tips on how to succeed as a fellow

Take advantage of all opportunities offered to you during fellowship. Use your protected educational time to complete coursework such as a MPH or other Master's degree. Your research mentor is a wealth of information for you to learn from and to help you complete a research project during fellowship. Work hard during these two years and develop your skills as a leader and as an educator. Make sure that you stay balanced and spend time with your family, which will help protect you against burnout.

CONCLUSION

Additional Resources

Journals

[Injury Prevention](#)

Blogs

[Children's Hospital of Philadelphia Center for Injury Research and Prevention Research in Action Blog](#)

Podcasts

[Injury and Violence Prevention Podcasts by the CDC](#)

[BMJ talk medicine](#)

National organizations

[Society for Advancement of Violence and Injury Research](#) (SAVIR)

Conferences

SAVIR annual conference:

- Comprehensive Children's Injury Center (Cincinnati, OH) — April 15-17, 2019
- Penn Injury Science Center (Philadelphia, PA) — Spring 2020

World Conference on Injury Prevention and Safety
IOC World Conference on Prevention of Injury and Illness in Sport

How to find a mentor

[SAVIR offers a mentor program](#) to match you with an appropriate mentor.

International Emergency Medicine/Global Emergency Medicine Fellowship

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INTRODUCTION

Description of the specialty

International emergency medicine (IEM) is a subspecialty of emergency medicine (EM) that focuses on the development of EM capacity across national borders.¹ Some IEM practitioners prefer the term global health, which refers to the systematic quest for health equity around the world, and they have adopted the term global emergency medicine (GEM). In most countries of the world, emergency medicine is a young specialty or has not yet been established. There is a great need for EM physicians to build and equip emergency departments, establish training and research programs, mentor colleagues, and provide patient care across borders. There are currently more than 40 GEM fellowship programs, with more being added every year. GEM fellowships are widely variable in goals, work balance, training, and target population. Fellowship tracks are as varied as the programs that offer them, thus a fellowship in GEM can generally be tailored to your specialty interests and needs.

History of the specialty/fellowship pathway

Emergency medicine is a relatively young specialty that has become well-established in only a small number of countries. The United States was the first to recognize the specialty. The first EM practice was established in 1961 by Dr. James Mills Jr. and three other colleagues in Alexandria, Virginia, and it wasn't until 1979 that the American Board of Emergency Medicine (ABEM) was established.

Between 1980 and 1986, Canada, Australia, Hong Kong, Singapore, and the U.K. followed suit and formalized specialties in EM along the lines of the American model. Simultaneously, continental Europe developed a competing model, termed the Franco-German model. In this model, physicians in the field triaged patients to specialty inpatient units; therefore, there was little need for an ED with generalist physicians

and undifferentiated patients. With time, the American model has been adopted in most countries that have incorporated EM into their health system design.

With the development of EM in these countries, a number of EM trained physicians in the early 1990s turned their attention to developing the specialty in other regions. Arnold et al. described 3 stages of EM development: underdeveloped, developing, and mature. In underdeveloped systems, EM is not recognized as its own field, and specialty systems for patient care do not exist. In developing systems, emergency medicine is recognized as a specialty, residency training is usually underway, and a national EM society often exists. In mature systems, academic EM, subspecialty fellowships, national databases, and peer reviewed journals are well established.

With increasing interest and demand for international assistance and a desire to develop mature EM systems globally, GEM was born. GEM was first composed of medical relief organizations. One of the first organizations, Doctors Without Borders, delivers emergency medical care when war, civil strife, epidemics, or natural disasters occur. It was founded in 1971 by 13 French doctors and was known as Médecins Sans Frontières (MSF). Their first mission was in Managua, the capital of Nicaragua, where an earthquake in 1972 had destroyed most of the city and killed between 10,000 and 30,000 people. MSF now has offices in 28 countries, employs more than 30,000 people, and has treated more than 100 million patients—with 8.25 million outpatient consultations being carried out in 2014 alone.

World Association for Disaster and Emergency Medicine (WADEM) was one of the first EM development organizations, founded in 1976 to “promote the worldwide development and improvement of emergency and disaster medicine.” WADEM focuses on the development of disaster management systems and sponsors the biennial World Congress for Disaster and Emergency Medicine. This organization also publishes the journal *Prehospital and Disaster Medicine*.

In 1989, ACEP was among 4 international organizations to found the International Federation for EM (IFEM), which is now the most broad-based international organization dealing with GEM development issues. In 1998, the ACEP International Section was founded, which quickly became one of the largest sections in ACEP, and currently has more than 1,000 members.

The Society for Academic Emergency Medicine (SAEM) had an international committee from 1991-1996, which then changed to the GEM Interest Group. SAEM’s international arm is now known as the Global

EM Academy (GEMA), which provides an academic framework for GEM activities and provides guidance for individuals and organizations seeking to guide the development of EM in other countries.

The first GEM fellowship program was established in 1994 at Loma Linda University, and now there are more than 40 GEM fellowships in the United States alone. In more recent years, academic institutions have become more involved in GEM by sponsoring medical missions, physician-exchange programs, and long-term development projects. Currently, GEMA is working to establish curriculum standards for these fellowships. Funding continues to be a challenge in resource-limited settings, and fellowships rely on a combination of US-based clinical work, teaching, research grants, government programs and non-governmental organization (NGO) sponsorship to cover GEM fellow salaries.

In the past 50 years, the medical care in underdeveloped countries has continued to grow, making GEM a rapidly growing field in medicine. The future for GEM is a bright one as an increasing number of countries seek to improve their health care systems and young physicians continue to push the boundaries of medicine, especially in the developing world.

Why residents choose to follow this career path

Embarking on a 1- to 2-year post-residency fellowship is a big decision. Though GEM fellowships have varied goals, there are a few things that a fellowship can offer you: mentorship, skills development, networking opportunities, research opportunities, and opportunities for obtaining advanced training, such as a Diploma in Tropical Medicine and Hygiene (DTM&H) or a Master of Public Health (MPH) degree. International EM is a small community. The personal relationships and networking opportunities you develop while in fellowship can set the stage for your GEM career for the rest of your life. First-hand education from those who have experience is priceless. During fellowship you will be focused on developing international medicine skills, which usually translates into scheduling flexibility with reduced shift load to accommodate possible graduate work and international travel.

How do I know if this path is right for me?

Some residents may choose a fellowship if they have a special interest in academics and may want to continue their global EM career in an academic setting. Many physicians in GEM pursue academic careers because of more available time for travel, international projects, and teaching. Participating in a GEM fellowship may be a great way to get your feet wet and discover your niche in GEM.

Career options after fellowship

International EM is broad, so the career options afterwards are nearly unlimited. Before choosing to do a fellowship, it is important to undertake a personal inventory of your goals, career aspirations, and lifestyle. Some career paradigms include:

- **Overseas work:** Some graduates pursue full-time international positions. NGOs and other international organizations (such as Doctors without Borders, MSF) employ physicians and offers volunteer opportunities. Another strategy is to apply to a specific hospital or clinic and work as an international physician in a clinical setting.
 - **Research:** Some graduates devote themselves solely to international research. Though most people balance this with a clinical career, governmental or non-governmental organizations (such as the World Health Organization (WHO) or the United Nations (UN)) offer positions for clinical researchers interested in global health.²
 - **Domestic Practice and Education:** Graduates of international EM fellowships do not have to settle on a life abroad. Many graduates use the lessons they learned from their international work to inform their practice in the United States, becoming more versatile providers in rural and low-resource settings. Others use their experience to teach in residencies or to serve remotely as a mentor to international programs. Whether you decide to pursue a fellowship or not, one of the first career decisions you will make related to working in a community or academic site for your subsequent job. If you choose to work overseas for an NGO or other international organization this decision may not apply to you immediately, but if you choose to return to domestic work, you will have to figure out how to find a job that allows you to best pursue your career interests. One of the initial decisions most resident and fellows make is related to choosing an academic or community-based practice.
- **Academics:** Working in an academic medical center with a specialty interest in global health is one strategy for those who are passionate about teaching or research. One advantage of pursuing an academic career is that some institutions may reduce clinical service and provide scheduling flexibility to allow you to divide time between international and

domestic work. An academic affiliation may help open doors when collaborating with certain organizations who may be looking for an academic or institutionally-backed partner.

- **Community work:** A strategy is to work in a community setting and negotiate time off to pursue international work. As many community jobs base pay on clinical productivity, it may be easier to reduce clinical service requirements, but your paycheck may reflect the time you spend doing other non-clinical activities. The advantage to this route is flexibility and the ability to have full control over what activities you participate in.

Academic vs. Community positions

Community jobs typically pay more than academics, and this can be used to fund time and work overseas, instead of relying on grants or departmental funding, although recognize that if you are working less shifts, your paycheck will reflect the decrease. It may be more difficult to negotiate longer periods of time off (greater than two weeks), but often community groups will be supportive if your intents and goals are clearly stated and discussed with leadership at the beginning of your employment. In addition, much of the work of developing EM in low and middle-income countries is not necessarily done onsite, and much can be accomplished while in your home country. The overall advantage to this route is flexibility and the ability to have full control over what activities you participate in.

It is important to realize that most substantive global EM opportunities will have the involvement of a university or academic center, and it is difficult, and likely problematic to pursue projects either individually or with a small group. Therefore, involvement with academic centers with global EM projects is likely essential, so maintain and develop relationships with centers you have worked with as a resident. Global health conferences also provide opportunity to find collaborative partners.

While working internationally, it is imperative to have a thorough understanding of the guiding principles and common pitfalls of global medicine. If this route is pursued outside of a fellowship, it requires some level of additional formal or self-directed education. The principle of “good intentions are not enough” definitely applies.

IN-DEPTH FELLOWSHIP INFORMATION

Number of programs

The International Emergency Medicine Fellowships Consortium (IEMFC) is the primary administrative body for GEM Fellowships and lists many fellowships at iemfellowships.com/programs (43 programs in 2018). Additionally, there are many great fellowships that are available but not yet advertised or part of the IEMFC. If you are applying to a fellowship that is not a member of IEMFC, you may want to ask why their fellowship is not included. There are many reasons for non-affiliation, but it is worth a conversation to understand the program's specific reasons and to ensure they would be a good fit for you.

SAEM also maintains a directory of GEM fellowships and additionally accredits programs. As of 2018, 7 programs were SAEM-accredited.

Differences between programs

Most GEM fellowships encompass three components; clinical work, educational experiences, and operational functions.

- **Clinical work:** Most fellows work clinically in the ED with a reduced shift load. This varies by program. It is important to strike a balance between clinical work and GEM projects.
- **Personal Education:** Some time will be allocated for your personal educational goals, such as an advanced degree or continuing education. The most popular degrees are detailed below.
 - Master of Public Health (MPH): The MPH was long considered the foundational credential of a global health practitioner due to its broad coverage of skills for building public health infrastructure for the development of emergency medicine. More recently, MPH programs have sought to distinguish themselves by offering specialized concentrations in disaster relief, tropical medicine, management, and other topics.
 - Diploma in Tropical Medicine and Hygiene (DTM&H): The DTM&H is a two to three month clinical course in diagnosis and treatment of tropical disease. Most DTM&H students are infectious disease fellows, but a growing number of GEM fellows take the course. The most well-known DTM&H courses include the Gorgas Course, taught in Peru by the University of Alabama-Birmingham and Cayetano Heredia University; the London School of Hygiene and Tropical Medicine; and the Liverpool School of Tropical Medicine.

- Master of Science in Global Health (MSc-GH): This is a specialized research degree offered by a few universities.
- Master of Business Administration (MBA), Master of Education (MEd), Master of Science in Emergency Medicine (MSc-EM): Many of these degrees can be tailored to build skills relevant to GEM.

- **Operational:** Much of GEM fellowship is spent participating in field work. This component may vary based on goals of the fellowship, but it could include global health research, field work, clinical time abroad, etc. Most fellowships include projects focused in one of these four areas:
 - Emergency medicine specialty development (Residency building, EM skills training)
 - Public health/capacity building (EMS/ Emergency services)
 - Disaster Relief/Humanitarian Aid
 - Academic research

Length of time required to complete fellowship

Most GEM fellowships last 1-2 years. Some programs will allow you to finish in 1 year if you already have an advanced degree, and there are a few programs that are 1 year but offer no advanced degree.

Skills acquired during fellowship

The skills required for GEM are extensive and can be different from what you learned during residency. Only you can determine what skills you want and what skills you think will benefit your career. Here are a few to consider:

- **Public Health Skills/Epidemiology:** An MPH degree teaches you about health on a large scale. This skill can be valuable in international medicine where it is often public health interventions rather than brilliant diagnostic skills that make the greatest impact.
- **Research Skills:** How do you set up a formal focused needs assessment? How do you ensure a quality homogenous chart review? How do you talk to the IRB in India? These are skills that will benefit you.
- **Education Skills:** How do you teach an internal medicine physician in Kenya about ATLS? How do you educate residents in Cambodia?
- **Program development skills/Health systems:** What does it take to set up an EMS system in Panama? Can you design a program for combating maternal mortality in Slovakia? What do you do to help out with the earthquake in Nepal?

- **Clinical Skills:** How do you treat typhoid? What do you do about sepsis when you have only limited antibiotics and no IV fluids?

Typical rotations/curriculum

One of the most important aspects of a fellowship is the type of curriculum it offers. Programs have either a structured or flexible program. Structured programs have a set curriculum that all fellows follow, because it is believed that there are core concepts that all fellows need to learn regardless of specific interests. More flexible programs allow the fellow to determine what they want to learn. Some applicants prefer the structure because it can help them develop their skills with more guidance from experts in their area of interest, but some prefer more flexibility to allow them to determine how much time they travel, what they learn, or how they'll develop their skills further. Most programs have a mixture of both styles of learning, so be sure to match your program with your career goals and your style of learning.

During fellowship you typically spend 2-7 months per year working on projects abroad. The rest of the time is spent working clinical shifts in the ED, preparing didactics, working on research, and fulfilling administrative responsibilities.

Board certification afterwards?

ACGME does not accredit GEM fellowships. There are multiple programs that offer the opportunity to get certifications from other schools or their own (such as the Certificate in Tropical Medicine (CTropMed) or advanced degrees). SAEM accredits GEM fellowships, and a few have achieved this accreditation.

Average salary during fellowship

Many fellowships offer salaries between \$60,000 and \$100,000, although the most accurate information is available by contacting potential fellowship programs. Additional things to consider in your fellowship search could include fees that are paid for by the program (ie, do they pay for certifications or for a public health degree, travel stipends, benefits, and/or allow moonlighting).² One should consider the cost of living since this will vary widely.

Splitting time between departments

International emergency medicine work typically falls as part of your EM appointment within your home institution. However, the key points to a negotiation will be regarding how much international time you are given versus how much time you spend practicing medicine within your home institution, as well as how this time will be compensated.

PREPARING TO APPLY

How competitive is the fellowship application process?

Several spots go unfilled most years. The IEMFC posts a list of unfilled positions after the application process each year (mid-November). As with many other fellowships, there are specific programs that are much more competitive. In general, competition for GEM spots at well-known institutions has grown in recent years and will likely continue to grow.

Requirements to apply

Global emergency medicine fellowships are available to graduates of all accredited EM residency programs.

Research requirements

Research requirements vary by program. Grant writing and research skills will likely be an advantage, but there are some programs that are more research-oriented and will favor candidates with research experience.

Suggested elective rotations to take during residency

Consider completing an international away elective sometime prior to submitting your fellowship application.

Suggestions on how to excel during these elective rotations

As with anything else in residency, you will excel at things you are passionate about. If you choose an experience that you are excited about and have clear goals for your time, you will likely excel and learn a great deal.

Should I complete an international rotation?

Though an international rotation is not required, it would be helpful to increase your breadth of experience. Participating in an international rotation during residency is not always possible due to time and financial constraints, but most applicants have had experience abroad in the past. If you get the chance for an elective, try to use it to engage in something that you are passionate about. You will not have much time in residency, so use your time to do something that will reinvigorate you and serve as a reminder for why you went into emergency medicine. While many people will try to get clinical experience abroad, you may want to serve in an educational activity and teach abroad or take a course at the CDC to learn more about epidemiology. Whatever you choose, if you get something out of the experience it will add depth to your application and your ability to talk about why you want to be a GEM fellow.

What can I do to stand out from the crowd?

The best thing you can do is to research the programs you are most interested in and start building the skill set that those programs expect. Does your dream program focus on a particular country? Visit and/or research that country in depth. Does your dream program require an MPH? Most distance learning MPH programs allow you to start taking classes for credit online before formally enrolling. Joining a hospital committee, teaching courses for medical students, going to international conferences, volunteering abroad, or contributing to an international research project may help you in your GEM career endeavors. Most importantly, the quality of involvement is much more important than the quantity — a CV filled with small one-day projects is less impressive than a CV with 1 or 2 longitudinal projects showing a sustained record of engagement and service.

Should I join a hospital committee?

Hospital committees may help you build a targeted skill set but are not required for GEM fellowship application.

Publications other than research

As mentioned earlier, it is more important to be involved with experiences that you are passionate about and that have in some way contributed to your education or career. Everyone understands that you have little free time in residency. As a general rule, program directors understand that you are busy and have a lot of clinical and educational time constraints. You have too little free time to be participating in activities that you do not enjoy, so choose your experiences wisely. Writing for EM related journals or magazines is a way to get more publications and experience writing without detracting from residency. These are not required but can be a helpful experience and accomplishment to have on your resume.

The most important approach to residency activities for the GEM fellowship applicant is to limit the breadth of your work to 1 or 2 high-quality projects. Choose a project and do it very well and you will stand out from the crowd. Even if your interests change, your reputation for high-quality work will be valuable.

How many recommendations should I get? Who should write these recommendations?

Most fellowships require 3 letters of recommendation, with one being from your residency director or chair. We recommend that the other 2 letters be from someone who can speak to your versatility, attitude,

and skill set. As with all letters of recommendations, it is important that they are heartfelt and are from someone who really knows you. Most programs are looking for fellows who can operate in very diverse and challenging situations, and for fellows who can maintain a positive attitude and work with a team. Additionally, the most successful applicants are people who are competent and passionate about their work, so make sure you choose mentors who can speak to this. Ideally, choose someone who has worked with you on specific projects or shared experiences with you that showcase how remarkable you are and why you would be a great GEM fellow.

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

Absolutely. Taking some time to work can help you solidify your clinical skills, allow you to really clarify your career goals, and give you time to gain more experience in educational and clinical roles. It may be more professionally and financially difficult to return to an academic environment if you have been working in the community, but many fellows have previously made this transition.

Several residents interested in GEM are able to customize a GEM fellowship-like experience by taking a part-time attending job and connecting directly with a mentor and project in the field, bypassing the fellowship route altogether. If you have a specific project in mind, you may find this “build your own experience” approach to be much more rewarding than fellowship. Salaries are typically higher and the commitment is much more flexible. However, this strategy does make it harder to enter some academic roles. Additionally, a lot of flexibility requires an equal amount of self-discipline and the ability to network and find mentoring independently, which can be difficult.

What if I'm a DO applicant?

Programs do not have specific requirements for DO or MD candidates. However, some countries do not recognize the DO degree, and thus DO applicants may be excluded from fellowships that have projects in those countries.

What if I am an international applicant?

Applicants to most fellowships must be ABEM board-certified or eligible by the July 1 fellowship start date and be eligible to live and work in the US.

APPLICATION PROCESS

How many applications should I submit?

Apply to all programs that you may want to attend. Choosing a fellowship is an intimate process since you are not only choosing a curriculum, but you are also choosing your colleagues and mentors. Most applicants apply to 5-10 programs.

How does an applicant pick the right program for them?

The most important part in choosing a fellowship is first figuring out your own goals and priorities. You have 1-2 years in fellowship and want to make the most of your experience, in programs that are incredibly heterogeneous. Consider your particular interests, type of curriculum, degree of autonomy you are seeking, mentorship and personality of your program and colleagues, any advanced degrees or certificates you are looking for, proportion of time spent abroad, length of program, program affiliations, and benefits/salary. We have already touched on many of these previously but here is a brief rundown on each topic:

- **Location of Interest:** Most fellowships are based at a single sponsoring North American institution and have one or two international partner institutions. Your first consideration should be the site where you want to work or the type of project you want to be involved with, as your fellowship may have limited capacity to add additional sites.
- **Particular Areas of Interest:** Most programs focus on one of several areas of interest including EM development, public health/capacity building, research, or humanitarian disaster relief.
- **Degree of Autonomy:** Fellowships offer a variety of structured and flexible curricula. It is important to conduct an assessment of your personal learning style and goals to find a program that will best serve your needs.
- **Mentorship:** Your future fellowship program mentors are one of the strongest reasons to do a fellowship. Find a mentor with the same goals and objectives as you who can offer the degree of mentorship that you desire. This is particularly relevant in international EM, because mentors may spend a significant portion of each year out of the country. Choosing a mentor with similar interests may be helpful, but it is most important to find someone who will be supportive of you and has a vested interest in your education.
- **Advanced degrees:** Pay close attention to the degree(s) offered by your fellowship program. In general, academic degrees are no substitute for field experience if you primarily seek

clinical expertise. Commonly an MPH program is included, and many fellowship directors recommend fellows complete a diploma or certificate. If you are not sure about committing to a full degree, consider participating in certificate programs, which often are shorter and can still offer a valuable and tangible experience. Online degrees offer more flexibility and may allow you the time to become a stronger GEM practitioner. As this is not a board certified specialty, a degree or certificate give you something tangible to show for your time in fellowship.

- **Length of program:** Most programs are 1-2 years. Two year programs include an extended year to allow for you to complete an advanced degree.
- **Program Affiliations:** These can be incredibly helpful to provide networking and career opportunities after fellowship. Fellowships generally fall into 3 categories: those that serve in a global research or advisory role at several sites, those that affiliate with one or two partner academic institutions, and those that affiliate with an NGO such as MSF, IMC or Partners in Health. The first category is most useful for fellows seeking a specific academic area of expertise. Fellowships that partner with other institutions are useful ways to establish connections with a particular part of the world. NGO affiliations provide a stable long-term link to populations in greatest need. Consider your goals and be sure to ask about program relationships when you interview.
- **Benefits/Salary:** Assess the salary, as well as the cost of living, amount of clinical time you are expected to work, and other expenses covered by the program to get a real sense of your true benefits package.

Common mistakes during the application process

- **Applying to only “the best” fellowships:** Just because a fellowship is associated with a prestigious institution does not mean that it is the best for you. Most fellowships only focus on one or two regions of the world or topics within GEM.
- **Over-emphasizing research or practice:** When applying, don't try to fit yourself into the mold that you think the fellowship wants out of you or you may be disappointed during your fellowship years. Be yourself and you will find the fellowship with the right blend of work experience.
- **Not showing enough interest:** When you find the right program, reach out to the faculty in that division. Start planning your fellowship projects as an applicant and you will stand out as the best match.

- **Applying too late:** Programs start accepting applications at various times. For most programs, this is from early April to early June. Submit your application early.
- **Not applying to degree programs in time:** Ask if you need to start your application to MPH or DTM&H programs simultaneously, or immediately after you matriculate at a fellowship program.
- **Not having minimum credentialing requirements:** This is more often an issue after you have accepted a position, so don't sweat it too much up front. Make sure your ACLS, BLS, and PALS are up to date. Ask if the institution requires a Difficult Airway certification. Ask about the institution's ultrasound credentialing requirements, as most institutions require documentation of at least 25 scans of each type (FAST, echo, bladder, etc.). Make sure you have copies of your immunization documents and citizenship documents, just like during residency credentialing.

Application deadlines

For applications submitted via the [International Emergency Medicine Fellowships website](#), please review the site for specific details. Applicants are accepted April through October. Programs offer acceptances on the second Monday of November, and applicants are given 24 hours to make a decision regarding the fellowship. For non-IFEM fellowships, contact the institution directly, as their deadlines and requirements may vary.

Tips for writing your personal statement

Fellowship personal statements may be more prosaic than residency personal statements. Show why GEM is important to you. Reflect on your experiences thus far. Most importantly, show a vision for your career plans 5-10 years down the road.

Is this a match process?

No.

What happens if I don't obtain a fellowship position?

If you are not offered a fellowship, you can call other programs you were interested in to see if they have an unfilled spot, or you can consider spending your time working with an international organization. There is not a backup application process for GEM, but with many programs unfilled each year, there should be positions available for you if you are well prepared.

INTERVIEW PROCESS

How do I stand out from the crowd?

Show that you have an understanding of the breadth of GEM and your place within it. Show that you have thought out your long-term career plans personally, academically, and financially (are you really going to go volunteer with that NGO forever?). Show that you are passionate and you will stand out.

What types of questions are typically asked?

Fellowship interviews are focused and typically not intimidating. You will typically interview with the fellowship director, the emergency medicine department chair, a teaching faculty member, and additional global health faculty. Example questions include:

- What skills have you focused on developing during residency inside and outside the ED?
- What motivates you to be involved in global health? Do you find special personal, philosophical, spiritual, cultural, or academic experience in the field?
- Do you mind living in austere conditions? Are you comfortable using an outhouse, taking cold showers, eating rice and beans every day? How do you take care of your personal safety? Programs should not ask directly about your relationship status or family situation, but they may touch on these topics indirectly as many field sites may be dangerous for families.
- What are your long-term career plans?
- What research have you performed? What research interests you? Why did you choose it? What challenges did you encounter?
- How well do you understand the state of GEM globally? International organizations? EM capacity in various countries?
- What is your clinical style as an academic EM attending?
- What is your approach to teaching residents?
- Why did you choose your particular residency program?
- What experience do you have working or visiting a region we focus on?

If you feel intimidated at a fellowship interview, then that institution is probably not the right place for you.

How many interviews should I go on?

In general, most applicants interview at fewer than 10 programs. GEM fellowships are vastly different from each other and fellowship applications are less competitive than residency applications. Applying to too many programs suggests you have not established your specific fellowship goals.

PREPARING FOR FELLOWSHIP

Textbooks to consider reading

Focus on clinical excellence during the residency years. Work hard to do well on the national board exams. Your greatest asset in GEM is your clinical credentials. Do not worry about reading a GEM textbook during residency. If you need a guide while on rotation, consider the [EMRA GEM guide](#).

Important skills to practice while in residency to prepare for fellowship

Practice placing IVs without ultrasound guidance. Practice as much bedside ultrasound-based diagnosis as possible. Make sure to work on language skills if relevant to your region of interest.

Tips on how to succeed as a fellow

Establish a good balance of clinical care and project involvement.

CONCLUSION

Additional Resources

Literature

The [Global EM Literature Review](#) summarizes the best GEM literature each year

The Nuts and Bolts of Global Emergency Medicine
John Roberts, Janet Lin, Scott Weiner

Podcasts

- The [MSF YouTube channel](#) summarizes the greatest under-reported humanitarian challenges weekly.
- [EM:RAP](#) offers editions tailored to several parts of the world in several languages.

National organizations

EMRA International Division
ACEP International Section
SAEM Global Emergency Medicine Academy
AMA
Global Academy of Emergency Medicine

Conferences

ACEP Scientific Assembly
SAEM Annual Meeting
ICEM — International Conference on Emergency Medicine
CUGH — Consortium of Universities for Global Health
There are many other [International Medicine conferences abroad](#).

How to find a mentor

Check out www.globalem.net, a website run by GEMA that allows you to connect with a mentor in a social network-style format. If you have a specific institution or project in mind, reach out to someone who has similar interests in you.

Citations

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Medical Education Fellowship

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INTRODUCTION

Description of the specialty

Medical education fellowships within emergency medicine cover a broad skillset related to the education of medical students, residents, and faculty. This typically includes topics such as curriculum design, learner assessment, program evaluation, education research, education and adult learning theory, simulation and immersive learning, pedagogy, as well as faculty development and continuing medical education (CME). While content typically focuses on undergraduate and graduate medical education in emergency medicine, skills developed are readily transferable to other domains of medical education and leadership.

History of the specialty/fellowship pathways

Emergency medicine physicians have been involved in medical student and resident leadership and education for decades. Therefore, medical education fellowships were originally developed to address the need for advanced training to assist education champions tasked with training the next generation of physicians. Historically, medical education fellowships were institution-wide, and focused on early to mid-career faculty in order to hone their skills in pedagogy.

The number of fellowships began to sporadically grow in the early 2000's; in recent years, however, the number of fellowship programs have proliferated exponentially. Programs range from 1-2 years in length, and usually depend on whether or not a certificate or a master's degree is offered as part of the fellowship. Online hybrid courses with partial required in-person sessions are also options to pursue advanced degrees in medical education.

Why residents choose to follow this career path

Commonly, residents follow a career path in medical education to further refine their skills in education as they begin their respective careers in academic emergency medicine. A subset of this cohort, however, also enter fellowship to pursue more specialized areas (ie, education research, residency program leadership, or clerkship leadership). The skills developed during medical education fellowship also provide prospective fellows with the foundation for careers in institutional education leadership (i.e., assistant/associate deans, vice-chairs, or simulation center leadership).

How do I know if this path is right for me?

If you enjoy teaching medical students and being involved in resident/student education, then fellowship training in medical education may be an intuitive career decision. Alternatively, if you want to gain experience in educational research, curriculum development, assessment design, or other areas of medical education, fellowship would provide these skills. Refined training in educational theory and curricular methods can provide you with ample opportunities for your career development, particularly if you see yourself pursuing a position as a medical student clerkship director, associate program director, or even program director.

Career options after fellowship

Career options after fellowship are endless! Some fellowship graduates choose to focus on academics, and publish research in medical education that pertains to both undergraduate and medical education audiences; others seek out opportunities in residency program leadership (i.e., residency program director or associate/assistant residency program director). Other future career options often include positions as assistant or associate deans of a medical school (i.e., in faculty development, graduate medical education (GME), student affairs, curriculum); or a designated institutional officer (DIO) for GME at your institution. There are also positions available in national education organizations, such as the Agency for Healthcare Research and Quality (AHRQ).²

Splitting time between departments

Your time will likely be split between administrative/educational duties and clinical shifts. It is up to you and your prospective chair to determine how much time is split between these activities.

Academic vs. community positions

Some fellowship graduates choose to work part-time in the community or primarily at a community-academic affiliate in order to maintain their independent practice, while others work solely in academic institutions with medical students and residents full-time.

IN-DEPTH FELLOWSHIP INFORMATION

Number of programs

The number of education fellowships has rapidly increased due to its popularity, with more than 30 programs (and growing). Please reference the [EMRA Match](#) website for the most up-to-date list. If you are interested in medical education fellowships, it would be useful to discuss this with your program director or a mentor in the field, who is typically the first to know of new programs via the CORD email listserv; he or she can forward these opportunities to you as they arise.

Additional searches for online or distance-learning programs can be undertaken yearly (as an alternative to completing a fellowship, or in conjunction with fellowship) as new programs appear each year.

Some of the most well-known online learning programs include the University of New England Master's in Medical Education, Johns Hopkins Master's of Education in the Health Professions (MEHP), University of Southern California's Masters in Academic Medicine (MACM), and the Masters of Education Program (MHPE) through the University of Illinois (UIC); however, there are many others.

Differences between programs

Generally, all programs are designed to develop leaders in resident and medical student education, curriculum development, and educational research. The facilities and methods in achieving these goals may differ from program to program. As an example, some programs provide opportunities to get involved in podcasts, while others allow teaching the United States Navy procedures on cadaveric models. Some programs even provide training for some of the major sports teams in their respective cities! While most programs have a wealth of information on their website, newer programs may not have such detailed information available; for this reason, it is encouraged that you contact the fellowship director(s) directly with any questions.

Typically, for academic emergency departments, the strengths of that respective department will be well represented in the fellowship's training opportunities.

Therefore, if there is an emergency department known for its innovative contributions to emergency medicine, it is highly likely that the respective fellowship will afford the fellow the chance to immerse himself/herself in this area during training.

Length of time required to complete fellowship

Program length varies from 1 to 2 years. Most 2-year fellowships encourage, and often help fund, an advanced degree in education and/or research at an affiliated academic institution.

Skills acquired during fellowship

A medical education fellowship generally provides a foundation for a career in academic medicine. Each program should be able to provide you with mentorship in many, if not all, of the following areas: undergraduate and graduate medical education; understanding of academic medicine and credentialing bodies; competency-based medical education and the Accreditation Council for Graduate Medical Education (ACGME) milestones; curriculum development; education research; adult learning theory; assessment; program evaluation; healthcare simulation; continuing medical education; mentorship; and faculty development. Many programs will have projects already in progress that you can join. If you have a specific area of interest, however, there are often opportunities to develop new projects. Because the community is small, immersion in a medical education fellowship opens the door a wide-variety of networking opportunities with like-minded educators and academicians across the country.

Typical rotations/curriculum

There are no formal rotations that take part in a medical education fellowship. Most fellowships have a shift-load requirement of 7-10 shifts per month, where the fellow functions as an attending physician in either an academic environment or a community affiliate. There is typically an informal curriculum used to teach the aforementioned skills. There may be a formal curriculum in place, or the fellow may pursue an advanced degree that will cover educational core content in more depth. Completion of projects related to new curriculum development, learner assessment, or educational research are usually required components of these fellowships.

Board certification afterwards?

No. As mentioned previously, some programs will include an advanced degree (i.e., certificate or Master's in Medical Education).

Average salary during fellowship

The average salary varies by institution, given that medical education is not an ACGME-accredited fellowship. The lowest salary is that of a PGY-4 or PGY-5 trainee, while the highest can range upward of \$120,000 per year if hired as a junior clinical faculty member. Institutions with lower salaries may incorporate the fellow into the bonus structure of the department, which will significantly increase the fellow's earning potential. Many programs will also allow some external moonlighting during the fellowship to supplement income, so long as it does not interfere with training and fellowship responsibilities.

Many programs set aside funds for the fellow to subsidize training opportunities outside of the department, such as the American College of Emergency Physician (ACEP) Teaching Fellowship or the Academic Life in Emergency Medicine (ALiEM) Faculty Incubator. While these funds could be part of the fellow's salary, having the option of pre-tax funds available may appeal to fellows who will choose to pursue an advanced degree or certificate, or may choose to attend more conferences throughout the fellowship year.

PREPARING TO APPLY

How competitive is the fellowship application process?

The application process for medical education fellowships is fairly competitive. There are generally anywhere from 4-12 applicants per fellowship position. Be aware that some fellowships are created for internal institutional needs and vary on number of external applicants considered (because departments invest time and money in these fellowships, the goal for some is to groom and retain these fellows as academic faculty members).

Requirements to apply

Requirements include board eligibility or board certification in emergency medicine; a personal statement or letter of intent; and generally 2-3 letters of recommendation, including one letter from your program director. Some fellowship programs require acceptance to a Master's degree program in order to be accepted into the fellowship program.

Research requirements

There are no definitive research requirements, although previous research in medical education that results in a national presentation or publication is always a plus.

Suggested elective rotations to take during residency

If you have elective time, you should seek opportunities to spend this time teaching and building your education portfolio. Multiple templates are available for you to start populating your educational portfolio; chances are your institution already has a template that you can start using. Many programs allow residents to spend time teaching one-on-one with medical students while on a shift. You could also develop conference content, teach advanced cardiovascular life support (ACLS) or advanced trauma life support (ATLS) certification courses, or assist with writing, running, and debriefing simulation cases. You can also seek mentorship from faculty and develop curricula for medical students and residents. It is strongly advised that you take the time to write-up your educational activities for publication in education-focused journals, including educational scholarship opportunities (i.e., the AAMC's MedEdPORTAL or the Journal of Education and Teaching Emergency Medicine, JETem).

Suggestions on how to excel during these elective rotations

As with anything, be enthusiastic, professional, and organized. Seek mentorship from the clerkship and/or residency leadership on how to develop bedside teaching skills. Think about the educators that helped you the most during your training and what teaching styles they modeled.

Should I complete an away rotation?

It is not necessary to complete an away rotation in order to secure a fellowship position in medical education; however, if there is a particular institution where you would like to match, you may choose to do so.

If you have time available during the last year of residency, consider taking the ACEP Resident Teaching Fellowship. Spots may be limited, so inquire early; but this experience will serve as a good primer as to what will await you as a prospective medical education fellow. Be sure to [apply for the EMF-ACEP Teaching Fellowship Award](#), which will help cover the cost of the course! Additionally, you may pursue this course as a fellow or junior faculty member with continued benefit.

What can I do to stand out from the crowd?

The best way to stand out from the crowd is by developing a CV that strongly demonstrates your interest in medical education through meaningful activities. This can include research, curriculum development, publications, blog posts, leadership activities (i.e., chief resident, EMRA involvement), and involvement in medical student education.

Additionally, if you are able to attend the CORD Academic Assembly, this is a great opportunity for national exposure, whether it's just meeting educators from across the country, presenting an abstract, a presentation, or even joining a committee.

Should I join a hospital committee?

For medical education fellowships, try to get involved in your residency program and with the medical student clerkship in ways that are pertinent to applying for fellowship. For example, you can get involved with teaching shifts where you work one-on-one with medical students, you can work with your clerkship director to learn how to write standardized letters of evaluation (SLOEs), or you can work on core content delivery for students through simulation, lectures, or podcasts. With regard to resident education, you can get involved with hospital graduate medical education (GME) committees, monthly resident simulation, conference content, or creation of podcasts.

Publications other than research

If you have the opportunity to develop a curriculum or specific educational content, you should attempt to publish it! There are several journals, both within emergency medicine and within medical education as a whole, that accept educational innovations. Another great avenue to get your hard work noticed is MedEdPORTAL, JETem, and the Technical Report in the Cureus Journal of Medical Science, which are all peer-reviewed.

How many recommendations should I get? Who should write these recommendations?

You should have at least 2-3 letters of recommendation when applying to medical education fellowships. One must be from your program director. The other 1-2 should be from faculty members who know you well, both in regards to your clinical work and educational involvement.

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

Absolutely! You would still be competitive, especially if you decided to take a faculty position at an academic institution prior to completing a fellowship, and develop an interest in medical education during that process and wish to pursue further training.

What if I'm a DO applicant?

If you are a DO applicant who has completed or will complete a residency in emergency medicine in the United States and become board-certified or board-eligible by the time of entering a medical education fellowship, you will certainly be considered.

What if I'm an international applicant?

If you are an international applicant that has completed or will complete a residency in emergency medicine in the United States and become board-certified or board-eligible by the time of entering a Medical Education fellowship, you will be considered. You must have a valid visa at the time of application and at the time of entering the fellowship. It is advised that you check with a program's policies and procedures for international applicants, as these will vary from institution to institution.

APPLICATION PROCESS

How many applications should I submit?

As always, where you are going to spend the next 1-2 years of your life is a very personal decision. Make sure wherever you end up is somewhere you could move with your loved ones. That being said, as programs become more competitive you may want to apply broadly to give yourself the best chance of success.

How do I pick the right program for me?

This one will be hard to know until after interviews. As most programs are accommodating for interviews, we recommend going on all interviews at institutions you are seriously considering. Education requires a team-based approach, and as such, finding the right "fit" is very important. As of now, there is not a large discrepancy in history or prestige, so pick the place you believe that would give you the support in order to thrive as a future academician.

Common mistakes during the application process

We believe that one of the biggest mistakes would be not being true to yourself or to the program that is interviewing you. Make sure you are serious about applying somewhere before going on an interview. If you do not have a serious interest in attending a specific program, then it is advised that you do not interview at that program. If you are seen as dishonest during this process, that view may stick with you longer than you would like. Remember, this is an increasingly small professional world, so treat everyone as you would like to be treated.

Application deadlines

All variable, but as a general rule of thumb, you should start applying in the late summer as interview season generally starts in the Fall.

Tips for writing your personal statement

Being honest and true to yourself and your experiences will paint a picture that you would want to convey. As a general rule of thumb, a good story about education is better than a generic experience. Be yourself, and you shouldn't have any issues.

Is there a match process?

No. In fact, many applicants are frustrated by the lack of consistency with the timing of offers for fellowships. For example, one program may offer a position and need confirmation of an applicant's decision before the applicant has had a chance to hear back from other programs. Because of this lack of a standardized process, it is important to be honest and open with fellowship directors. Communication is key. If you find yourself in this situation, simply let the fellowship director know.

What happens if I do not secure a fellowship position?

There are many alternative ways to contribute to the education process other than a dedicated medical education fellowship. Any academic position will lend you the opportunity to contribute to the education of current and future doctors, though they may focus less on the educational theory. Fortunately, EM is a specialty that rewards the motivated. If you keep at it and make it a productive year, you will increase your chances for securing a fellowship position the following year!

INTERVIEW PROCESS

How do I stand out from the crowd?

You have managed to impress your prospective program director on paper with your academic achievements and clinical experience. Now it is time to show them in person how you are different from other applicants. It is very important you package and present yourself by identifying your qualities and strengths, and aligning them with the program's objectives to display compatibility. Researching the program's website will give the interview dialogue a two-way feel, and you will come across as a well-informed candidate. Rehearse and decide what message you want to convey to the interviewer, showing how the connection between your achievements and the fellowship's opportunities will help you reach your goals.

What types of questions are typically asked?

Predicting questions and preparing answers ahead of time can certainly make you come across as a strong candidate. Interviewers want to know about your past and current educational activities to gauge how much of a fit you are to their respective program. This is your time to shine and demonstrate your strengths. Be prepared to talk about your educational and administrative activities (i.e., publications in magazines/journals, medical student and resident teaching activities, presentations, lectures, resident recruitment). Express to them what you are eager to teach and how you would teach it.

You may also be asked about your educational philosophy, or in other words, what your personal worldview on teaching and learning is. Are you a proponent of self-directed learning, and want to increase this skill in your residents? Or do you value experiential learning, and want to immerse your trainees in multiple experiences to enhance their learning? Chances are you have already developed your philosophy. Being mindful of this philosophy, and talking about it during your interview is a sign of educator maturity.

How many interviews should I go on?

Go to every interview that you are offered. Medical education fellowships are competitive, and there are still not many programs. As long as you think you'd be happy there, you should go on the interview.

PREPARING FOR FELLOWSHIP

Textbooks to consider reading

Your potential fellowship will likely recommend some textbooks on educational theory. Kern's Curriculum Development for medical education is a classic. Academic Life in Emergency Medicine's Faculty Incubator have also published eBooks on the basics of medical education theory; these can be found at www.aliem.com. We also encourage podcasts/Ted Talks on leadership and education, and would recommend browsing titles at your leisure.

Important skills to practice while in residency to prepare for fellowship

Take any teaching opportunity you can: medical students, residents, mid-level providers, nurses, volunteers. An equally important aspect for you will also be to start understanding educational theory. Pay attention when your curriculum changes, and ask questions about the reasoning behind it.

Tips on how to succeed as a fellow

Motivation and hard work trump book knowledge. Really try to immerse yourself as a member of the program, especially if you are not staying at your home program.

CONCLUSION

Additional resources

www.ALiEM.com

National organizations

It is recommended you maintain membership in ACEP and EMRA, if possible.

Strongly consider joining the Council of Emergency Medicine Residency Directors (CORD), an educational organization striving to improve resident education. There are many committees that will accept residents as members.

You can consider joining the Society for Simulation in Healthcare (SSH) to develop simulation ideas and network with others interested in simulation. They have committees you can consider joining as well.

Conferences

The yearly CORD academic assembly is where all the big names in emergency medical education gather. Some fellowship programs emphasize simulation, and subsequently recommend attending the annual International Meeting on Simulation in Healthcare (IMSH) provided by the SSH.

How to find a mentor

You can attempt to find a mentor within your own program or reach out to a desired program for a faculty advisor from the Medical Education Fellowship program there.

EMRA has an [Academic Career Mentorship Program](#) where you can electronically request a mentor.

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Neurovascular/Stroke Fellowships

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INTRODUCTION

Description of the specialty

Neurovascular fellowships have long been a pathway that board certified physicians in neurology complete in pursuit of continuing their careers in acute stroke care. More recently, emergency medicine physicians have undertaken this non-ACGME accredited fellowship in hopes of becoming experts in this niche area.

History of the specialty/fellowship pathway

While this is a fairly new area of fellowship and there are only a few programs accepting emergency medicine (EM) trained physicians, it is an expanding field since EM physicians are the first to evaluate these patients and activate neurovascular emergency protocols. In fact, as EM trained physicians have historically not pursued this type of fellowship, they are often coveted for these programs. Several new career paths and opportunities for the EM physician have arisen secondary to this fellowship in both the academic and community setting. While programs do not offer ACGME accreditation at this point, in the future we may see board certifiable positions being offered.

Why residents choose to follow this career path

Residents choose to follow this career to increase their familiarity and expertise with acute neurovascular emergencies. In addition, those interested in directing stroke care and developing protocols for neurovascular emergencies at either an academic or community institution find this fellowship attractive. Those looking to advance the pre-hospital evaluation of neurovascular emergencies are also drawn to this path. Finally, residents looking to function as both clinicians and researchers undertake this fellowship with specific predilection for clinical or basic science research in acute stroke care.

How do I know if this path is right for me?

If you have a specific interest in the care of neurovascular emergencies but are not sure if you want to pursue any fellowship, it may be best to plan rotations on a stroke service with your respective neurology colleagues. Alternatively, pursuing basic science or clinical research may help you gain a greater perspective. Generally, good candidates for this path include residents with a strong interest in being a leader in directing stroke/neurovascular care at either primary or comprehensive stroke centers or those pursuing an academic career with a focus on stroke/neurovascular emergency research and care.

Career options after fellowship

Career options vary depending on the particular program, as there is some variety between what each fellowship offers. Regardless, the idea is that after completion of this fellowship, you will be an expert in neurovascular emergencies forming a unique niche within whichever practice environment you choose to pursue. If any doubt exists on where to take your career after completion of the fellowship, the best idea is to find someone who has taken a similar path and ask for his or her guidance. There are not many EM trained clinicians who have gone down this route, so seeking out faculty mentors is crucial.

After completion of this fellowship, though you will not be board certified in the specialty, you will possess a unique skill set- whether that be an immense research background in acute neurovascular emergencies or that you are the leading expert in acute stroke care at your hospital. At primary or comprehensive stroke centers, you may be the most qualified to head committees or serve as directors of acute stroke care. Some examples are:

Primarily research/clinician

- Clinical research focusing on acute stroke care, biomarkers of ischemia/TIA, novel antithrombotic agents
- Basic science research focusing on intra-cerebral hemorrhage in rodents or other neurovascular emergencies

Primarily clinician/administrative

- Teaching positions/clinical educators in medical school or residency programs regarding neurovascular emergencies
- Directors of stroke at academic or community settings, either at primary or comprehensive stroke centers

- Serve as members of stroke/neurovascular emergency committees, implementing new protocols in pre-hospital and early hospital care/administrative work

Splitting time between departments

Splitting time between the ED and Stroke, Neurology, and Neuro-ICU services is very possible, if not encouraged. In fact, several programs fund the fellowship through shift work in the ED. As an EM-trained fellow, this is a great way to not only fund your fellowship, but also to stay involved in the acute initial management of neurovascular emergencies from the moment the patient hits the door. In addition, for those applicants interested in staying in the clinical spectrum after fellowship, it allows you to keep your emergency medicine knowledge fresh.

Academic vs. community positions

Most positions after fellowship are at academic institutions, though some graduates go on to become stroke/neurovascular directors at local community hospitals that are either comprehensive or primary stroke centers. The path you choose is entirely dependent on what you desire after graduation. It is important to keep this in mind throughout your training and when choosing a program that is right for you. You want to maximize exposure and tailor your CV to what best suits your interests. It is important to know that some programs have more of a predilection for academics or research.

IN-DEPTH FELLOWSHIP INFORMATION

Number of programs

There are fewer than 10 well-cited fellowship programs, but as these are non-ACGME accredited, some institutions may be open to having a research fellow in neurovascular emergencies if funding can be attained.

- [Henry Ford Hospital](#)
- [Massachusetts General Hospital](#)
- [Medical University of South Carolina](#)
- [UCLA](#)
- [University of Cincinnati](#)
- [University of Michigan](#)
- [University of Pennsylvania](#)

Differences between programs

While there are slight differences between any fellowship program, most offer similar curriculums, combining both research and clinical duties. Some programs are more research based than others, devoting more time to basic or clinical research. Rotations are similar amongst the programs. As mentioned previously, these programs are not used to having EM trained candidates, so do not be surprised if you are the first- you offer a unique perspective on these disease processes and their immediate treatment and management protocols.

Length of time required to complete fellowship

Most programs vary between 1-2 years in length. This distinction is often made based on either the interests of the candidate or the specific program itself. Candidates strongly interested in research generally take an additional year to complete this. Fellows looking to be primarily clinical can complete programs in 1 year.

Skills acquired during fellowship

Depending on the program, you will gain experience with either clinical or basic neurovascular research, largely depending on your interest and the program you choose. Additionally, you will spend time on the Stroke Service, in the Neuro Intensive Care Unit and with Neuroradiology, honing your clinical skills as a diagnostician as well as your ability to interpret various forms of imaging in neurovascular emergencies. Some programs additionally offer the ability to serve on stroke committees and implement or augment existing policies.

Typical rotations/curriculum

This is dependent on the fellowship program. Fellowships usually offer the following: Stroke Service (inpatient and outpatient), Neuroradiology, PM&R, Neuro-ICU, Research.

Board certification afterwards?

Fellowships are not ACGME accredited for EM physicians and thus do not grant board certification afterwards. However, as highlighted above, this does not mean that they do not afford a wide variety of career opportunities after completion.

Average salary during fellowship

Salary will be that of a PGY-4, 5, 6, and comparable to other residents/fellows in your geographic area.

PREPARING TO APPLY

How competitive is the fellowship application process?

Most programs take a maximum of 1-2 fellows per year, and these spots are shared with neurology and vascular residents. These spots are limited; however, historically there are few EM candidates interested in these positions, and programs are typically looking for more EM trained candidates. The best way to be competitive is to have strong academics and supportive letters of recommendation. As these are non-ACGME accredited for EM residents, the rate-limiting step may be funding. In this case, grants, moonlighting or other shift work may fund the curriculum and an additional fellow spot.

Requirements to apply

The only strict requirement is that applicants complete an accredited residency in EM.

Research requirements

Though some require it, generally there are no strict research requirements; however, most departments are involved in research and may even be participating in national trials. Thus, it is likely that you will have exposure to or be involved in some form of research throughout your rotations. Most programs encourage additional research if you have an interest in specific ongoing trials.

Suggested elective rotations to take during residency

If possible, the following rotations may be beneficial to the interested applicant, but are not required: Stroke Call, Neurology Elective Month (both inpatient or outpatient), and/or Neuroradiology.

Should I complete an away rotation?

There are no specific requirements for applicants to complete away rotations. However, if you are interested or want to get a better feel of a program and how neurovascular emergencies are run at that particular hospital, an away rotation may help.

What can I do to stand out from the crowd?

There are few EM trained candidates applying for these fellowship positions, so you already stand out from the crowd! Other things to consider are, of course, completing research specifically in neurovascular emergencies or serving on stroke committees. In the end, you already are an exception to the rule, and the best thing you can do is get strong recommendation letters and build your CV to showcase a distinct interest in this area.

**How many recommendations should I get?
Who should write these recommendations?**

Get 2-3 recommendation letters from core EM or Neurology faculty and/or faculty from your away rotations and elective months. Core faculty includes core EM faculty or those responsible for neurology away rotations. The most important thing is that these faculty know you well.

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

Yes, definitely! Most applicants are encouraged/required to continue clinical work in the ED at least several shifts per month at the institution. They are encouraged to work at outside hospitals during fellowship as well. Any additional experience is generally a good thing.

What if I'm a DO applicant?

DO applicants are accepted to some, but not all, neurovascular fellowships. In some institutions they are not eligible to do shift work in the ED and may be limited to the research aspect of the fellowship.

Requirements are generally the same; these applicants need to complete an EM residency to qualify for fellowship. Research and away rotations may be more beneficial to this type of applicant.

What if I am an international applicant?

Some international candidates may be accepted but may not be allowed to perform clinical shift work in the ED of that institution.

APPLICATION PROCESS**How many applications should I submit?**

In terms of number of programs applied to, interviews to go on or typical questions asked, there is no great consensus. As stated previously, neurovascular fellowships are largely non-accredited, and historically EM candidates have not pursued these positions. There are only a few programs throughout the country, so applicants would probably do best by applying to all of them.

Generally speaking, applicants contact the appropriate program director expressing interest in the fellowship along with a CV and 2 letters of recommendation. If the applicant is deemed eligible, an interview would follow and then positions are offered. There is no strict application process for most of these programs as they operate outside of the match process.

How do I pick the right program for me?

It seems that positions are largely filled based on how well the applicant and program fit together and the similarity in academic interests. The best way to pick the “right” program is to pick one that will serve as a foundation for the type of career you want (research, academics, clinical education or as stroke directors at community hospitals). It is important to take into account the collaboration between neurology, neurosurgery, and radiology, but in the end a program should be chosen based on what best suits your desires.

Application deadlines

This fellowship operates outside of the match. Contact program directors with your CV and letters of recommendation by January before the start of the fellowship.

Tips for writing your personal statement

Personal statements are not officially required: only a CV and letters of recommendation are required. An “interest letter” or email to the respective program director should go along with the above but is not necessarily a personal statement. As this fellowship is based on fit between you and the program it is less formal than fellowships that operate within ERAS or the match.

Is this a match process?

No.

What happens if I don't obtain a fellowship position?

Unfunded positions may be available at specific institutions that can be funded through outside clinical work/moonlighting. Research opportunities may still be available in neurovascular/stroke at the desired program for 1 year, with re-application the following cycle.

INTERVIEW PROCESS**How do I stand out from the crowd?**

Be yourself! This is your time to let your personality shine and show that you would be a great fit in their program. Make sure you know your application well and research the program prior to your interview. Try and practice a mock interview prior to the real interview so that you can make sure you present your best self. Finally, make sure you are able to clearly vocalize why you are interested in this fellowship and your tentative career goals post-fellowship.

What types of questions are typically asked?

There is no real consensus on the types of questions typically asked on these interviews. Program directors will have genuine conversations with you regarding your interests in neurovascular emergencies and inquire as to why you have chosen this particular type of fellowship, what are you looking to gain from this program, and what particular skills do you hope to leave with? They most likely will want to know what direction you want to take your career whether that be strictly research, clinical education, stroke director, etc.

How many interviews should I go on?

It is recommended that you attend as many as are offered, as there are not that many eligible programs in the country.

PREPARING FOR FELLOWSHIP

Textbooks to consider reading

There are no real tips on textbooks to read prior to fellowship. It is useful to keep up on the latest in neurovascular care, however, via journal articles, etc.

Important skills to practice while in residency to prepare for fellowship

The competitive applicant should try to broaden his or her knowledge of neurovascular emergencies, making sure to include both acute and chronic management of these disease processes. Unlike general emergency medicine residency, during fellowship you will likely be focused on the inpatient or clinic care of these patients, and it is important to keep that in mind during residency if you desire this type of fellowship. Patient care will not end with diagnosis and acute stabilization. Most EM trained residents are fairly skilled in basic neuroradiology, but any additional training, exposure or expertise would be a great skill to acquire, especially since some of your colleagues will be neurology trained with expertise in advanced imaging.

Tips on how to succeed as a fellow

Fellowship is a unique time to expand your skill set under the guidance of mentors. Take advantage of any opportunity to further your education during fellowship not just as an EM physician, but also an expert in acute neurovascular care. Also make sure to stay balanced, making time do things that you enjoy outside of work and to spend time with your family and friends to help prevent burnout.

CONCLUSION

Additional resources

Because EM trained applicants generally have not followed this path, there are few additional resources. National organizations affiliated with neurovascular study are geared toward neurology and vascular surgery residents and would probably not prove very useful. The best resource you have is other clinicians who have taken a similar path and word of mouth. This is a very small network where connections go a long way so all the better to start forming them now.

Journals

- Journal of Stroke and Cerebrovascular Diseases
Stroke

Podcasts

- [International Journal of Stroke: Podcast Series](#)

National organizations

- No consensus opinion exists on recommended national organizations.

Conferences

No consensus opinion exists on conferences to consider attending. Consider attending the lectures at ACEP that are on neurovascular and stroke topics as these are not only educational but can be potential networking opportunities as well.

How to find a mentor

The best way to find a mentor is to try to find someone within your institution that has gone down the path that you intend on pursuing. This may prove difficult in the sense that there are few EM-trained physicians who have completed neurovascular fellowships. However, if there are faculty that are clinical educators in neurovascular emergencies, serve on stroke committees, or have strong connections with the stroke protocol teams, it may be useful to have their opinions or guidance. Remember, this opportunity wouldn't exist if there weren't EM physicians around the country that have also pursued this path. So find them, and reach out to them! Most emergency medicine physicians are passionate about their fields and happy to help future generations; this is no exception to that tenet.

Observation Medicine

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INTRODUCTION

Description of the specialty

The specialty of observation medicine focuses on training emergency physicians to be leaders in education, research, administration, and clinical care in the context of acute care beyond the ED setting. Physicians trained in this specialty have a broad knowledge base regarding clinical operations, quality improvement, patient safety, observation patient selection, and patient flow, such that they are capable of developing and running an observation unit. As such, physicians in this specialty often engage in quality improvement and/or research projects.

History of the specialty/fellowship pathway

With the rapidly aging population, increased emergency department and hospital crowding, and increased ED boarding, the focus on patient flow has intensified. One of the solutions to both hospital and ED overcrowding has been the development of short stay/observation units. These units offer an alternative to inpatient admission by providing efficient and effective time-limited health care. Patients who are treated in these units are those whose expected care will be completed within 24 hours and who have limited severity of illness or intensity of service needs. These units started with protocols for cardiovascular emergency patients, but now serve a variety of patients with medical and trauma-related emergencies. While in some hospital systems the care of these patients falls to the internal medicine service, in many others care remains the responsibility of the emergency physician. As a result, fellowships have arisen to help train and prepare emergency physicians both clinically and administratively to lead an observation unit.

Why residents choose to follow this career path

This is a growing specialty designed for physicians who aspire to be leaders in developing, managing and working clinically in observation units. As a training environment, the observation unit is excellent entry-level training for ED administration, and many former observation unit directors have gone on to become ED medical directors.

How do I know if this path is right for me?

Are you interested in addressing patient flow? Are you interested in developing protocols to help observation units run more efficiently? Would you like to develop an observation unit at your institution? If the answer to any of these questions is yes, this may be the fellowship for you.

Career options after fellowship

Completing this fellowship provides you with the skills to be a leader in observation medicine. Not only will you specialize in the care of these patients, but you will also have the administrative skills to develop and run an observation unit. Many graduates move into careers in ED operations and administration. Some also become involved in resident or advance practitioner education and expanding their acute care knowledge base. Others find their niche in research and/or quality improvement projects.

Splitting time between departments

Those who complete fellowships do not typically split time between departments because affiliated observation units are often staffed and managed by emergency medicine physicians. However, most observation medicine specialists will work more shifts in the observation unit than their colleagues. Also, you will likely need to factor in time for research and/or administrative work in addition to your clinical shifts. Finally, some hospitals have two observation units: one within the ED and one staffed by hospitalists. A strong ED observation unit director would be well-trained to oversee both, which would involve interface with the Department of Medicine hospitalists.

Academic vs. community positions

Deciding between an academic or community practice environment is a very personal choice. Both academic and community programs across the country have developed observation units and offer administrative/leadership positions. Those with strong interest in research tend to gravitate toward careers in academia.

Those with education interests also gravitate toward academia or community-academics. There are health systems that employ observation medicine directors to oversee all observation services within multiple hospitals.

IN-DEPTH FELLOWSHIP INFORMATION

Number of programs

[Emory University School of Medicine](#)

[Johns Hopkins Medicine](#)

[Thomas Jefferson University](#)

[Progressive Emergency Physicians](#)

Differences between programs

All three available fellowship programs are very similar:

Program	ACGME Accredited	Duration	Option for Advanced Degree? (+1 year)	Available Positions	Clinical Shifts
Emory	No	1 year	Yes	1	64/mo
Johns Hopkins	No	1 year	Yes	TBD	800/yr
Thomas Jefferson	No	1 year	Yes	1-2	64/mo

Length of time required to complete fellowship

This is a 1-year fellowship, unless you earn an advanced degree (such as an MBA, MPH, or MHA) during fellowship, which would take 2 years.

Skills acquired during fellowship

You will acquire administrative and leadership skills, research skills, and continue to expand upon your knowledge base and clinical skills within the observation medicine field.

Typical rotations/curriculum

Johns Hopkins: 800 clinical hours as an emergency attending physician is expected over a one-year time frame. Research and administrative curriculum are also completed under the guidance of intensive mentorship. Coursework and degree opportunities are additionally available.

Emory: 64 clinical hours per month as an emergency medicine attending physician, with clinical coverage of observation unit as a part of clinical shifts. Much of this time will be spent in an observation unit, but there will be time within the regular emergency department as well.

Thomas Jefferson: 16 clinical hours per week over a one-year time frame (unless pursuing an advanced degree). *"We offer electives with nationally recognized EM experts in fields of research, transitions in care, health policy, and telehealth. We are a new fellowship program looking for fresh talent and we offer many opportunities for career growth during and after the fellowship."* — Dr. Maria Aina, Director of Observation Medicine Fellowship at Thomas Jefferson University Hospital.

Board certification afterwards?

There is no board certification in this field. However, all three fellowships offer the opportunity for advanced coursework/certificate/degree work if so desired.

Average salary during fellowship

Because this is not an ACGME accredited fellowship, you will likely be offered a competitive salary.

PREPARING TO APPLY

How competitive is the fellowship application process?

This is a small field with limited fellowship opportunities. However, there are also a small number of applicants per year.

Requirements to apply

You must be graduating from an emergency medicine residency or be an EM graduate who is board-eligible or board-certified.

Research requirements

Completing research prior to fellowship is strongly encouraged, particularly in research that pertains to observational medicine.

Suggested elective rotations to take during residency

It would be wise to spend a dedicated rotation to work in your department's observational unit. Other elective rotations to consider include research, cardiology/stress testing, neurology, neuroradiology, and ED administrative months.

Suggestions on how to excel during these elective rotations

Be enthusiastic, engaging, and easy to work with. Arrive early and stay late. Read every day and continue to expand your knowledge base. Treat every day as an interview day, and be courteous to all. Aggressively seek out mentors and future letter-writers.

Should I complete an away rotation?

If your home institution does not have a separate observation unit within your department, then it would be worth considering an away rotation.

What can I do to stand out from the crowd?

The best way to stand out from the crowd is to demonstrate a strong interest in observational medicine with your CV, personal statement, and interview. Have a clear vision for your career after fellowship. Be clear, concise, and friendly during your interview. Have ideas to share with your interviewer about how the fellowship training might be used in your future career aspirations. It would be ideal to have a research project near completion by the time of your interview. Being chief resident will help your application but is not required. Assume meaningful leadership roles. Finally, ensure that you meet all deadlines, have strong letters of recommendations, and practice your interview skills, ideally with faculty familiar with observation medicine.

Should I join a hospital committee?

If your hospital has a committee that interests you and on which you can have meaningful contribution, then this experience may strengthen your application. Anything that shows a resident's ability to engage and play a leadership role, even on small committees or projects, would be helpful. The ability to build relationships with others, and other departments, is important.

Publications other than research

Publications other than research - such as blog posts, newsletter articles, clinical case publications, etc. - are encouraged, especially in observation sections at national levels (i.e. ACEP).

How many recommendations should I get? Who should write these recommendations?

Try to get 3 letters of recommendation (minimum of 2), one of which should be from your program director and/or department chair. If possible, a strong letter from a physician who is known within the observation medicine community or spends time working within an observation unit would be useful as well.

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

Yes, you can still be competitive. The key is to continue to be involved in leadership and/or research opportunities and to continue to gear your resume toward observational medicine. If you can, seek out

shifts in observation units. Attend conferences about observational medicine, and consider publishing educational articles. Consider joining a relevant hospital committee.

What if I'm a DO applicant?

There are no barriers for DO applicants.

What if I am an international applicant?

International applicants are encouraged to contact the programs early to see if your visa is accepted. English competency is also required.

APPLICATION PROCESS

How many applications should I submit?

Apply only to the programs you would consider attending.

How do I pick the right program for me?

Look for the one that best aligns with your future career interests. You should be excited about the program. You should feel like you enjoy the staff and clinical environment and would be happy there for the duration of your fellowship. Do not ignore your inner voice if it is telling you a particular program is not the right fit. The program should also be in a location where you can see yourself happily living for 1-2 years.

Common mistakes during the application process

- Grammatical errors in your personal statement.
- Missing application submission deadlines.
- Submitting an incomplete application.
- Having a CV that does not display an interest in observation medicine.
- Choosing letter writers that are not strongly supportive of you.
- Being rude to ancillary staff/program coordinators.
- Asking questions about the program during an interview that could easily be found on the program's website.
- Not knowing your CV well and thus being unable to answer questions about it during your interview.
- Falsifying parts of your CV.

Application deadlines

All three fellowships accept rolling applications, and fellows start their program on July 1. Johns Hopkins and Thomas Jefferson will consider mid-year candidates as well.

Tips for writing your personal statement

Try to use your personal statement to show your personality and character traits that suit you well for a career in observation medicine. Avoid repeating your CV on your personal statement. This is your time to show your personality and share your passion for the field. Readers are interested in understanding why you want to pursue observation medicine and how it fits in your future career goals. The best personal statement reads as a story and captures the reader's attention. Is there a particular patient, mentor, or clinical scenario that led to your interest in observation medicine? If so, let this story be the focus of your statement, and end the statement with your career goals and aspirations after completing a fellowship.

Is this a match process?

No.

What happens if I don't obtain a fellowship position?

If you are not selected for a fellowship position, discussing your application with the fellowship program director can provide insight into how you can strengthen your application for the future. Asking a trusted mentor to critically review your application (preferably a physician in a leadership role) can also identify areas of weakness. Practice your interview skills, and apply again for fellowship. Consider also applying to related fellowships (such as administrative fellowships). Attend national conferences, and continue to seek opportunities to show your interest and become involved in the field. Another option is to work with your employer to develop your niche within observation medicine within your institution.

INTERVIEW PROCESS

How do I stand out from the crowd?

Practice your interview skills prior to your actual interview to place your best foot forward. You want to come off as confident, engaging, and interested in their program. You want to show them you would be a great fit. Don't be the applicant who talks too much, and don't be the one who doesn't talk at all. Do not be vague or uncertain about your decision to pursue this fellowship opportunity. You also don't want to come off as arrogant or shy. Search the program's website and make sure the questions you ask during your interview are not easily answered on their website. Know your application well, and be prepared to answer any questions about it (such as about your personal statement, activities on your CV, etc.)

What types of questions are typically asked?

Why are you interested in completing an observational medicine fellowship?

Why are you interested in completing this fellowship at our institution in particular?

What are your 5- and 10-year career goals?

Tell me more about your research interests.

What has been your clinical experience working in observation units? How much exposure have you had?

Tell me more about your CV.

What are your strengths and weaknesses?

How many interviews should I go on?

Because there are limited fellowship positions, it is recommended that you attend all offered interviews.

PREPARING FOR FELLOWSHIP

Textbooks to consider reading

- Graff LG. Observation units: Implementation & Management Strategies. Dallas, TX: American College of Emergency Physicians; 1998.
- Ross M, Graff L, Bohan S. Operations: Flow — The Role of Observation Units, RTUs, in the Emergency Department. In Strauss R, Mayer T, Salluzzo R, Kaplan J, Weintraub B. Emergency Department Leadership: Principles and Applications. New York, NY: McGraw-Hill; 2013.
- Ross MA, Graff LG. Principles of Observation Medicine. *Emerg Med Clin North Am*. 2001;19(1): 1-17.
- Ross MA, Wheatley M, Leach G, O'Malley R, Osborne A. Clinical Decision Unit Manual. Electronic media, Macintosh i-Book. 2012.

Important skills to practice while in residency to prepare for fellowship

Work on your clinical skills and knowledge base, especially as they relate to observation medicine; research skills; administrative and leadership skills.

Tips on how to succeed as a fellow

Fellows who are most successful are those who are passionate about their fellowship and develop their niche within it. Show up early and stay late for your shifts. Read every day to expand your knowledge base. Find a project that interests you and do it well. Become involved in hospital committees and in research projects. Stay balanced to protect yourself from burnout. Take every opportunity your training program offers, and make the most of your time as a fellow.

CONCLUSION

Additional Resources

Journal articles

- Mace S, Shah J. Observation Medicine in Emergency Medicine Residency Programs. *Acad Emerg Med*. 2002;9(2):169-171.
- Wheatley M, Baugh C, Osborne A, Clark C, Shayne P, Ross M. A Model Longitudinal Observation Medicine Curriculum for an Emergency Medicine Residency. *Acad Emerg Med*. 2016;23(4):482-492.
- Huffman A. Use of Observation Units Growing. *Ann Emerg Med*. 2013;61(2):A21-A23.

Blogs

<http://www.physicianspractice.com/blog/understanding-observation-codes>

National organizations

[ACEP Observation Medicine Section](#)

[Society of Cardiovascular Patient Care](#)

Conferences

Observation Care — Held annually

Society of Cardiovascular Patient Care Congress, held annually in May

Michigan College of Emergency Physicians, Observation Medicine — Science and Solutions in September

The World Congress's annual Observation Management Summit

Observation Patient Management Congress by Global Media Dynamics

How to find a mentor

There is no current centralized service that pairs interested physicians with mentors in the field. We recommend finding physicians currently holding leadership roles in observation units to help introduce you to this field. Certain medical societies, such as ACEP, have observation sections you can join and get more information. Your program director is another good source of mentorship. Finally, you can consider emailing either of the observation medicine fellowship programs and asking their leaders for advice/mentorship.

Occupational and Environmental Health Fellowship

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INTRODUCTION

Description of the specialty

Occupational and Environmental Medicine (OEM) is a specialty in which physicians focus on the evaluation, treatment, and prevention of diseases related to workplace and environmental exposures. They work closely with and advise governmental and state agencies, organizations, and regulatory bodies.

History of the specialty/fellowship pathway

Occupational medicine first began in the 1700s, when Bernardino Ramazzini published about the diseases resulting from noxious gas and dust in the workplace and from improper posture of the body. The industrial revolution gave rise to medical inspectors in factories and physicians dedicated to taking care of patients harmed by industry. In 1914, focus on the importance of environmental and occupational exposure led to the creation of the Office of Industrial Hygiene and Sanitation. In the 1920s, Dr. Alice Hamilton pioneered the specialty as a division within public health and preventive medicine. By 1970, the National Institute for Occupational Safety and Health (NIOSH) and Occupational Safety and Health Administration (OSHA) were created. As a result, there are funds allocated for both the training and employment of physicians within OEM, resulting in numerous residencies and fellowships for this specialty across the country.

Why residents choose to follow this career path

Residents choose to follow this career path when they have an interest in caring for those affected by occupational and environmental hazards. This fellowship provides the resident with the tools to prevent these hazards from affecting the health of the population, the ability to treat those who suffered from exposure to such hazards, the investigative

knowledge needed to identify the source of disease resulting from occupation and environment, the leadership skills to promote policy changes within the government, the educational skills to teach other physicians about the field, and the research skills to help improve the health of individuals and communities.

How do I know if this path is right for me?

Are you interested in treating patients with environmental exposure-related diseases? Are you interested in recognizing and finding solutions for both workplace and environmental hazards? Would you like to be involved in creating workplace and environmental health policy? Does research within OEM interest you? If so, this fellowship may be a good fit for you.

Career options after fellowship

After completing this fellowship, physicians may work in private practice, industry, government, military, community, or academia. They are typically engaged in clinical, leadership/administrative, research, and/or education roles.

Splitting time between departments

It would be unusual for a physician in OEM to split time between the Emergency Department and the Office of OEM specialist. However, if you have completed both an emergency medicine residency and this fellowship, you will find yourself a more suitable applicant for a job that allows you to practice in both fields. Fulfilling positions in these two, often separate, positions may be difficult; you will have to convince two different departments to hire you and decide on the split that you work in each, such as 50% in each, or 75% in one or the other. Be careful that you protect yourself from a circumstance such as back-to-back shifts overnight into the next day. You will also need to negotiate things such as vacation time, conference time, days off, benefits, etc. Having two certifications in two unique specialties makes you a valuable commodity for an institution. Remember this and make sure to confidently sell your skills/training during your contract negotiation.

Academic vs. community positions

The decision between community, academic, or government positions depends on your individual career aspirations. Those who enjoy research and education tend to gravitate towards academia. Some people enjoy health policy and tend towards government careers. Others seek out jobs working for industry or private sectors.

IN-DEPTH FELLOWSHIP INFORMATION

Number of programs

Many organizations curate lists of OEM residency opportunities. The [American College of Occupational and Environmental Medicine](#) and [Association of Occupational and Environmental Clinics](#) offer up-to-date lists of opportunities and residency programs as they become available. Presently there are many programs, notably:

[Duke University Division of Occupational & Environmental Medicine](#)

[Harvard T.H. Chan School of Public Health Occupational & Environmental Medicine](#)

[Icahn School of Medicine at Mount Sinai Occupational and Environmental Medicine](#)

[Johns Hopkins Occupational and Environmental Medicine](#)

[Rutgers Occupational and Environmental Medicine](#)

[University of California Irvine Occupational Medicine](#)

[University of California, San Francisco, Occupational & Environmental Medicine](#)

[University of Cincinnati Occupational Medicine](#)

[University of Illinois at Chicago Occupational Medicine](#)

[University of Iowa Occupational Medicine](#)

[University of Kentucky Occupational Medicine](#)

[University of South Florida Occupational Medicine](#)

[University of Texas Health Science Center at Houston: Occupational and Environmental Medicine](#)

[University of Utah Occupational Medicine](#)

[University of Washington Occupational and Environmental Medicine](#)

[UT Health Northeast Occupational Medicine](#)

[West Virginia University Occupational Medicine](#)

[Yale School of Medicine Occupational and Environmental Medicine](#)

Differences between programs

You will notice that some of these programs are listed as residencies. This is because you do not need to complete a residency within emergency medicine to apply. You only need one year of residency to complete an OEM training program. Some of these programs

specifically list on their website that they offer positions to those trained in emergency medicine, whereas others do not. Some programs also preferentially or only consider physicians who have completed a residency training program, whereas the majority of programs only require the completion of a PGY-1 year. Also, the focus and expectation to be involved in research during fellowship will vary per program.

Length of time required to complete fellowship
2 years

Skills acquired during fellowship

After fellowship, you will be prepared to participate in a multi-disciplinary approach to planning, implementing, managing, and evaluating programs and services for environmental health and worker health and safety. You will develop a broad clinical knowledge of the spectrum of disease that affects these patients. Finally, you will gain leadership, educator, and research training.

Typical rotations/curriculum

During most OEM fellowships you will be required to complete a Master's in Public Health (MPH) or similar program, which typically takes 1 year to finish. The second year is usually 12 months of clinical time focused on public health-oriented administrative rotations. Example clinical rotations include large industries, occupational and subspecialty clinics, poison control centers, and public health agencies. You will likely participate in site visits to locations with occupational and/or environmentally suspected diseases. Research opportunities are offered by most institutions.

Board certification afterwards?

Those who complete this training are eligible to obtain certification in occupational medicine as provided by the American Board of Preventive Medicine.

Average salary during fellowship

The average salary provided varies between institutions but will typically be based on the appropriate PGY level salary.

PREPARING TO APPLY

How competitive is the fellowship application process?

This is a moderately competitive residency/fellowship.

Requirements to apply

Minimum 1 year of residency in an ACGME accredited program with a minimum of 11 months of direct patient care.

Research requirements

Research is not required but is highly suggested. If you do engage in research, it is much better to focus on one project and follow it to completion than to start but not finish many projects.

Suggested elective rotations to take during residency

Elective rotations to consider include poison control, toxicology service with focus on environmental toxins, "Work First" and other occupational health clinics, research months with focus on OEM topics, and public health agencies.

Suggestions on how to excel during these elective rotations

It goes without saying that you should arrive early and stay late during your rotations. Show your enthusiasm in the subject matter and motivation to learn by being as involved as possible. Continue to read and expand your knowledge base. Be a team player and look for physician mentors in OEM (and potentially future letter of recommendation writers) during these rotations. Treat every day as if it was an interview day and remain as professional as you can be.

Should I complete an away rotation?

If your program does not offer an away rotation within the realm of OEM then it would be worth considering an away elective. Arranging a rotation at an institution where you are considering a fellowship may be helpful as well.

What can I do to stand out from the crowd?

The ideal applicant is one whose application clearly displays commitment to the field of occupational and environmental health. Becoming chief resident can certainly help your application. Ideally, you should have some sort of activity in which you have a meaningful leadership role.

Should I join a hospital committee?

If your hospital offers a committee that is within the field of occupational and environmental medicine, then we highly recommend joining it. Actively pursue leadership positions within these committees.

Publications other than research

Publications other than research are also encouraged. Examples of such publications include blog posts, newsletter articles, magazine articles, and patient case publications. Creating a podcast episode is another consideration. Such publications are a great way to educate both yourself and the physician community about topics relevant to OEM.

How many recommendations should I get? Who should write these recommendations?

Most programs require a minimum of 3 letters of recommendations (and some programs may require 4). One of these must be either from your program director or your ED director. The others should be from physicians who know you well and can speak to your strengths as a fellowship candidate. Be sure to ask for a *strong* LOR from all your letter-writers; if they cannot provide a strong LOR, consider choosing a different letter-writer. LORs from physicians involved in the occupational and environmental health field are most ideal.

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

You can absolutely still be competitive when applying after being an attending. The key is to use your time as an attending to continue to show your involvement and interest in occupational and environmental health and build your resume. Actively pursue leadership opportunities within your hospital system, and if possible, local OEM organizations. If you have no involvement in the field and then decide to apply after years of practice, it will be hard to convince a program that you are serious about this fellowship.

What if I'm a DO applicant?

Please note that most programs request USMLE scores in their application process.

What if I am an international applicant?

International applicants must have completed an ACGME accredited PGY-1 year and also must have a visa that is accepted by the institution. Please contact individual institutions for more details.

APPLICATION PROCESS

How many applications should I submit?

Apply to all programs you would seriously consider attending if offered a fellowship position.

How do I pick the right program for me?

Choose a program that will help you achieve your career goals. You want a program that believes strongly in you as an individual. Do you feel like you fit in at their program? Do the residents/fellows/faculty seem happy? Also, make sure the program is in a location where you wouldn't mind living for 2 years. Finally, do not discount the opinions of your family that will be traveling with you, especially in terms of program location.

Common mistakes during the application process

Common mistakes include the following: not submitting your application on the first day of application acceptance, not submitting a complete application, having LORs from physicians who do not know you well or do not 100% support you, or having an application that does not display a strong interest in OEM.

Application deadlines

Please note that some programs use ERAS and others have their own separate application process. Please refer to each program's website for more information. Of note, for many programs you have to apply to both their fellowship and MPH program.

Oct. 15 appears to be the most common application submission deadline, but again, please refer to each individual program for additional information.

Tips for writing your personal statement

The best personal statements read like a story that focuses on your interest in the field. The worst personal statements are ones that simply repeat your CV without providing the reader with any insight about your personality or your career goals. Is there a particular mentor or patient who sparked your interest in occupational and environmental medicine? If so, write about this. The reader should understand why you are passionate about this field, how your experiences have expanded that passion, and why they would benefit from giving you the position. What goals do you want to accomplish during fellowship, and in the years soon thereafter? It may be worth including your 5- and/or 10-year career goals.

Is this a match process?

No.

What happens if I don't obtain a fellowship position?

If you do not match into a fellowship position, take a critical look at your application and find the deficits that need to be corrected before you apply again. Consider asking one of the programs for specific feedback about why they did not choose you. You can also ask your program director or assistant program director to look over your application for deficiencies as well. Practice your interview skills and continue to seek out opportunities for involvement in this field to help strengthen your application. Consider applying only for a MPH and applying for the fellowship later. If all else fails, you may be able to build your niche within this field despite not completing a fellowship by attending conferences, additional coursework, and research.

INTERVIEW PROCESS

How do I stand out from the crowd?

During the interview, your goal is to be confident, pleasant, and engaging, with a clear vision about your future career in OEM. Be confident without sounding arrogant. Be courteous to everyone, and send thank-you notes to those who interviewed you.

What types of questions are typically asked?

Why are you interested in completing an OEM fellowship?

Why are you interested in completing this fellowship here?

What are your 5- and 10-year career goals?

Please elaborate on [an activity or accomplishment] listed your CV.

What are your strengths and weaknesses?

How many interviews should I go on?

You should attend as many interviews as are offered (assuming that you only applied to places that you would seriously consider attending if offered a position).

PREPARING FOR FELLOWSHIP

Textbooks to consider reading

- Rom W, Markowitz S. Environmental and Occupational Medicine. 4th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2006.
- LaDou J, Harrison R. Lange Series: Current Diagnosis and Treatment Occupational and Environmental Medicine. New York, NY: McGraw-Hill Education; 2007.
- Tarlo S, Cullinan P, Nemery B. Occupational and Environmental Lung Diseases. Online: John Wiley & Sons; 2010.

Important skills to practice while in residency to prepare for fellowship

Research skills, knowledge of core areas of preventive medicine, administrative and leadership skills, patient care of those suffering from occupational and environmental exposures, clinical educator tasks, and knowledge of epidemiology and biostatistics.

Tips on how to succeed as a fellow

Success during fellowship starts with choosing a program that best suits you and is in a location that suits both you and your spouse. The happier you are

with your program and your life outside the hospital, the more productive you will be during fellowship. Read daily and continually expand your knowledge base. Be reliable, take great care of patients, and be a team player. Take advantage of every opportunity fellowship offers, and consider the legacy that you would like to leave behind.

CONCLUSION

Additional resources

Journals

Journal of Public Health

The Annals of Occupational Hygiene

Occupational Medicine

Journal of Occupational and Environmental Medicine

Electronic resources

[Occupation Medicine Podcast](#)

[Webinar](#)

[Online lectures](#)

National organizations

[American Academy of Environmental Medicine](#)

[American College of Occupational and Environmental Medicine](#)

[The Society of Occupational Medicine](#)

American Board of Preventive Medicine

American Osteopathic Board of Preventive Medicine

Conferences

American Occupational Health Conference

Western Occupational and Environmental Medical Association Annual conference

American College of Occupational and Environmental Medicine Annual Conference

How to find a mentor

Currently we are unaware of a website or organization that helps pair interested residents with faculty in the field. However, we encourage you to use elective time to rotate through relevant operations and environment medicine rotations and strive to make connections with future mentors. The OSHA website may also be a valuable resource to help connect with local clinicians and leaders in this field.

Pain Medicine Fellowship

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INTRODUCTION

Description of the specialty

A pain medicine physician treats all pain disorders, ranging from pain as a symptom of a disease to pain as a primary disease. A specialist in this field utilizes various levels of care such as evaluating complex pain problems, prescribing and managing pain relieving medications, acting as an integral component in a multidisciplinary team, and dispatching skills to perform interventional procedures such as nerve blocks and spinal injections.

According to the first prospective broad based multicenter evaluation of ED patient pain experience by Todd et al in 2007, pain has been designated as the most common reason for seeking healthcare, representing 78% of visits. Despite representing a majority of the patients in the emergency department, 74% of patients were discharged in moderate to severe pain with 60% receiving analgesia. A potential barrier to improving pain outcomes in the emergency department is the shortage of pain medicine specialists.

History of the specialty/fellowship pathway

The history of the specialty spans decades as it was originally part of anesthesiology and, later expanded to all specialties. The origins of the specialty can be derived from the International Association for the Study of Pain (IASP). Founded in 1973, it is the largest multidisciplinary international association in the field of pain founded in 1973. The goals of this body are to foster and encourage research on pain and to improve the management of patients. In 1977, the American Pain Society (APS) was founded due to a need for a national organization of pain professionals. The first credentialing of pain clinics came from the Commission on Accreditation of Rehabilitation Facilities (CARF), though it did not accredit pain clinicians. Thus, the need for a standardization

in evaluating the competency of pain physicians was apparent and, in 1983, the American Academy of Algology, later named the American Academy of Pain Medicine, was formed. Emergency medicine's involvement in pain medicine, however, is a recent trend. On April 24, 2014, the Board of Directors of the American Board of Medical Specialties (ABMS) approved the American Board of Emergency Medicine (ABEM) to join along the various other boards in offering certification in pain medicine.

Why residents choose to follow this career path

There are many reasons why one would choose this career path. The field allows continuity of care and established relationships with patients, offers training in procedures and medication management, and provides a predictable work schedule with minimal nights or weekends.

How do I know if this path is right for me?

Knowing whether the path to pain medicine is right for you is both a personal and professional decision. To determine if it is the correct path, one should engage in activities related to pain medicine, such as rotations and research.

Career options after fellowship?

Being dual board certified in Pain Management and Emergency Medicine is a relatively new pathway that allows for a variety of clinical practice. Some graduates may practice both Emergency Medicine and Pain Management, while other may choose individual practice in either specialty.

Academic or community positions are available after fellowship completion. For those in academic settings, research in pain medicine is integral to the specialty. From a previous study on graduates in the specialty, large portions either engage in academic or community practice with a small minority engaging in additional fellowships. In addition to the recent federal government declaration of the opioid epidemic as a public health emergency, pain medicine specialists are especially needed to help set mindful and effective policies that can help direct future government policies.

Splitting time between different departments

Splitting time between two departments is program and funding dependent. One could theoretically work within the same institution or per-diem in an Emergency Department and part-time in a community pain clinic.

Academic vs. community positions

Having niche EM training is attractive to both academic institutions as well as community practices and hospitals looking to participate in research and/or develop pain management guidelines.

IN-DEPTH FELLOWSHIP INFORMATION

Number of programs

As of 2018, there are 100 programs per the ERAS directory, with 91 participating in the match. These programs participate in the December application cycle, accepting anywhere from 1-9 fellows per year.

Differences between programs

Most fellowships provide a mix of training in procedures and medication management, with some heavier on procedures and vice versa. While most fellowships are multidisciplinary, the extent to which they integrate psychiatry, integrative medicine, physical therapy and other teams into their clinical practice significantly varies. In addition, there are variations within the rotations of each program with some including rotations at the VA and others in more community or rural settings.

Length of time required to complete fellowship

The current length of time required to complete a fellowship in pain medicine is 12 months. There are optional 24 month long programs that have 12 months of clinical work and 12 months of research.

Skills acquired during fellowship

Pain medicine fellows gain an understanding of evaluating, diagnosing, and treating pain disorders with various modalities that includes management of medications, coordination with multi-disciplinary teams, and deploying interventional management techniques.

Types of rotations/curriculum

According to the Accreditation Council for Graduate Medical Education (ACGME) Program Requirements for Graduate Medical Education in Pain Medicine, the fellowship curriculum is organized as follows: outpatient (continuity clinic), inpatient chronic pain, interventional, acute pain inpatient, cancer pain, palliative care, and pediatric pain management. It is important to note that programs are not required to offer all interventional techniques to their trainees at a minimum through didactics. 60 procedures are to be recorded and

include the following: at least 25 image-guided spinal intervention, 10 trigger point injection, 10 neuro-ablative procedures, 5 joint and bursa injections, at least 5 neuromodulation, and at least 5 nerve blocks.

Board certification afterwards?

Because pain medicine is recognized as an interdisciplinary specialty, the American Board of Physical Medicine and Rehabilitation co-sponsors subspecialty certification in pain medicine along with the American Board of Anesthesiology and the American Board of Psychiatry and Neurology. As of 2014, the American Board of Emergency Medicine can also confer subspecialty certification in pain medicine.

Average salary during fellowship

Salary varies depending on the program and would be considered either PGY4 or PGY5 status depending on whether a 3 or 4-year program was completed for residency. Some programs may allow moonlighting.

PREPARING TO APPLY

How competitive is the fellowship application process?

Although pain medicine is officially a subspecialty of anesthesiology, PM&R, neurology, and psychiatry, it is important to note that no specialty is barred from applying and participating in an ACGME accredited pain medicine fellowship. Pain medicine is quite competitive, as evident by match data for the previous few years. In the most recent match, 98.8% of positions were filled with 331 applicants from a pool of 438. In 2018, approximately 75% of the applicants matched.

Requirements to apply

According to the ACGME, entry into an ACGME accredited fellowship program requires completion of a residency program accredited by the ACGME, The Royal College of Physicians and Surgeons of Canada (RCPSC), or The College of Family Physicians Canada (CFPC). After this, one applies through the Electronic Residency Application Service (ERAS). Most programs require the following: Curriculum Vitae (CV), personal statement, photo, medical school transcript, United States Medical Licensing Examination (USMLE) scores, In-service Training Exam (ITE) score, and letter of recommendation. It is important to note that some programs do not participate in ERAS. Lastly, there are some program specific requirements that will be listed on their websites.

Research requirements

This is dependent on the type of applicant you want to portray yourself as and the type of program you are applying to. Research is always a positive addition to one's CV, especially when it is related to pain medicine. In addition, applying with research to programs that have more focus on research or that offer a 2-year fellowship tract can be an additional bonus to the application.

Suggested elective rotations to take during residency

It is absolutely recommended to undertake pain medicine elective rotations during residency, more preferably with programs that can produce a letter of recommendation by someone affiliated with a fellowship program. It is recommended to complete rotations before applications are submitted (mid PGY2 for 3 year programs and mid PGY3 for 4 year programs). These elective rotations help bridge the gap between emergency medicine residents and other specialties in terms of interventional skill and pain medicine exposure.

Suggestions on how to excel during these rotations

Absolutely acquire material on the field to have adequate knowledge and preparation. Reference the "Textbooks to consider" section for which texts books are effective at this. As with all rotations, be prompt, courteous, and an effective team member. Ask for evaluations to assess your own progress in order to make adjustments.

Should I complete an away rotation?

This is dependent on your personal preferences and the capacity of your residency program. If your program has a pain medicine fellowship in house, you could either do a rotation there or conduct an away. If your program does not have the capabilities of providing a pain medicine rotation, it would be beneficial to complete an away rotation.

What can I do to stand out from the crowd?

Your background in EM already sets you apart. Having applied work in pain medicine related research, policy, or clinical exposure would strengthen an application. In addition, attending the fellowship director/resident meet-and-greet hosted by the American Society of Regional Anesthesia (ASRA) allows residents and program directors to informally meet ahead of the application deadline.

Should I join a hospital committee?

Committee work to help set policy related to pain medicine is a great indication of one's commitment to the field. Thus, joining a hospital committee can be highly beneficial.

Publications other than research

Publications can be outside of traditional clinical medicine journals that relate to pain medicine. These include publications in textbooks, policy journals, etc.

How many recommendations should I get?**Who should write these recommendations?**

An assessment of programs reveals that a minimum of 3 letters of recommendation is needed with many of these programs asking for at least 1 of the letters to be from a pain specialist.

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

This is a personal preference. The difficulty with a 3-year emergency medicine residency is completion of adequate pain medicine rotations in time for applications. Many 3-year programs have at least 2 elective rotation months throughout the 3 years, often one in PGY2 and one in PGY3. If this is the case and modifications cannot be made, it might be helpful to complete these rotations and then apply, allowing time to work as an attending.

What if I am a DO applicant?

DO applicants are eligible for board certification after the completion of an ACGME accredited residency. The most recent match does not break down the number of osteopathic applicants that matched.

What if I am an international applicant?

International applicants are allowed to complete ACGME accredited fellowships with program discretion and approval. Referring to the requirements to apply, there are additional criteria allowing eligibility exceptions. Per the ACGME Program requirements guideline, a program may accept an exceptionally qualified applicant who does not satisfy the requirements in terms of eligibility but meets additional conditions. Exceptionally qualified is defined as someone who completed a non-ACGME accredited residency program in the core specialty and demonstrates clinical excellence. Additional evidence of exceptional qualifications include satisfaction in at least one of the following areas: participation in research in the specialty or subspecialty, demonstrated scholarship in the specialty or subspecialty,

demonstrated leadership during or after residency training, and/or completion of an ACGME-international accredited residency program. Accepted exceptionally qualified candidates must demonstrate satisfactory completion of the USMLE Steps 1, 2, and (if the applicant is eligible) Step 3, and have complete fellowship milestones evaluation conducted by the program within 6 weeks of matriculation. Again, check with programs individually to see if they accept international applicants.

APPLICATION PROCESS**How many applications should I submit?**

Applying broadly will yield a higher chance of matching. We recommend reaching out to a local mentor who is familiar with the application process. Avoid applying to programs which you do not plan to attend.

How do I pick the right program for me?

The decision is personal and is dependent on whether you prefer to join an academic or private practice. Look for fellowships that will not only provide exceptional training but also create opportunities that support your long-term goals.

Common mistakes during the application process

The application process is similar to the process that you underwent during residency applications. Make sure to apply on time and contact program directors early to determine whether or not you are eligible for their program. Do not forget about the programs that do not participate in the match; they typically require a separate application.

Application deadlines

Typically, applications are accepted from December 1st through varying dates in the spring (usually between March — May) with Interviews beginning as early as February. Deadlines vary from program to program.

Tips for writing your personal statement

Ensure that your personal statement tells the story of why you are interested in pain medicine and what you can bring to the specialty. Make your application flow and relate the personal statement to your application.

Is this a match process?

Yes, the majority of the ACGME accredited fellowship programs participate in the NRMP Match. The programs that do not participate in the match will usually offer positions ahead of match day.

What happens if I don't obtain a fellowship position?

You can repeat the application process the following year. In the meantime, there are many ways to get involved. Reach out to mentors, program directors, and physicians in the pain medicine field to find potential opportunities. There are also non-ACGME accredited pain fellowships to consider.

INTERVIEW PROCESS

How do I stand out from the crowd?

Always be unique. Your background in EM already sets you apart, but be ready to defend why this is a benefit to the field of pain medicine. What makes you the best candidate for the program?

What types of questions are typically asked?

Why do you want to do a pain management fellowship? What makes you unique? Why this program? Why this location? What are you going to do after fellowship? Where do you see yourself in ten years?

How many interviews should I accept?

Pain management fellowships are competitive. It is hard to predict how emergency medicine applicants will fare when compared to anesthesia and PM&R. We recommend meeting with an advisor who can help gauge how many interviews you should attend.

PREPARING FOR FELLOWSHIP

Textbooks to consider reading

There are a considerable amount of textbooks available to Pain Medicine physicians, but some of the more recommended ones include the following:

- Clinical Text:
 - Benzon H, Rathmell J, Wu C et al. *Raj's Practical Management of Pain*, 4e. Chicago, IL: Mosby; 2008.
- Procedural Texts:
 - Waldman S and Winnie A. *Interventional Pain Management*, 1e. W B Saunders Co; 1996.
 - Rathmell J. *Atlas of Image-guided Intervention in Regional Anesthesia and Pain Medicine*, 2e. LWW; 2011.

Important skills to practice while in residency to prepare for fellowship

Practice injections with ultrasound guidance (lumbar punctures, nerve blocks, joint injections, IVs, etc) to develop tactile feedback and spatial awareness.

Tips on how to succeed as a fellow

Learn to empathize and understand your patients. Pain is frequently multifactorial, and procedures, as well as medications, are just one avenue to treat pain.

Be receptive and seek feedback from your attendings and mentors. If your opinions differ, try to understand why.

Read and be proactive with your learning. Stay up-to-date with the literature and new interventions.

CONCLUSION

Additional resources

There are numerous resources available for residents interested in pain medicine. ACEP recently added a pain medicine section. There are journals with pain medicine related research such as the *Pain Medicine Journal* and *Regional Anesthesia and Pain Medicine*. The pain national organizations also have an abundance of **educational resources**.

National Organizations

The following are organizations that relate to pain medicine: American Society of Regional Anesthesia and Pain Medicine (ASRA), American Academy of Pain Medicine (AAPM), and American Pain Society (APS).

Conferences

Most of these organizations/societies hold annual meetings that consist of lectures, workshops, and networking opportunities.

How to find a mentor

Due to the nature of emergency medicine physicians being relatively new to pain medicine, it may be difficult to find a mentor with a background in emergency medicine. However, attending conferences or joining pain medicine societies can help foster mentor-mentee relationships.

Palliative Care Fellowship

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INTRODUCTION

Description of the specialty

Palliative care (PC) is patient-centered specialized care for those with a serious or chronic life-limiting illness. PC aims to improve patients' quality of life by providing pain and symptom relief as well as spiritual and psychosocial support. Palliative care has been shown to improve quality of life, reduce hospital length of stay, reduce number of repeat emergency department (ED) visits, improve patient and family satisfaction, lessen utilization of intensive care units, and provide overall cost savings to hospitals.^{1,2}

Hospice is a type of health care for patients in the last months of their lives when curative treatments are either not available or no longer desired by patients. Hospice enrollment enables patients to receive comprehensive medical care outside the hospital, including nursing visits, medications, medical equipment, social work, and spiritual support in the comfort of their home or at a hospice facility. Although palliative care can overlap with hospice and the terms are often used interchangeably, palliative care and hospice are not the same. Palliative care may be provided along with curative treatment over an extended period of time. Hospice care, on the other hand, is appropriate for patients with life expectancy less than 6 months. Hospice also supports patient's families beyond the death of patient.

History of the specialty/fellowship pathway

Emergency departments are increasingly treating patients with advanced chronic illnesses and those who are seriously ill and dying. Ideally, integration of palliative care should be done by patients' primary care providers or by dedicated palliative care providers who work alongside patients' regular providers. However, with the health care system serving an increasing aging population, and considering primary

care provider shortages as well as fragmented specialty care, the introduction and implementation of palliative care does not always happen before the patient visits the ED. ED providers are therefore increasingly engaging, developing and incorporating palliative care in the ED for their seriously ill patients.

In 2006 Hospice and Palliative Medicine (HPM) became an officially recognized subspecialty where ten specialties including emergency medicine can obtain HPM certification. The American Board of Emergency Medicine (ABEM) offers a pathway for emergency medicine (EM) trained physicians who complete a Hospice & Palliative medicine fellowship to sit for the HPM board certification. Thus, the EM physician who completes fellowship and passes the boards will become dual board certified in both emergency as well as hospice and palliative medicine. Currently, there are about 115 dual board certified physicians (EM and HPM) and emergency medicine is 6th out of 10 specialties in such dual certified physicians.³

The integrated emergency and palliative medicine discipline in general has shown tremendous growth and garnered increased interest in the last decade. American College of Emergency Physicians (ACEP) has a very active Palliative Medicine section with growing membership each year, in addition to the Society for Academic Emergency Medicine (SAEM) Palliative Medicine interest group. Also, due to increased physician demand, the American Academy of Hospice & Palliative Medicine (AAHPM) has recently established an emergency medicine special interest group. In addition, due to the increasing number of palliative care —emergency medicine research papers, the ACEP Annual Research Forum created a separate submission section for palliative and hospice medicine to be alongside ultrasound, critical care, and other long-standing core content in Emergency Medicine research in 2015. ACEP Now magazine has dedicated pain and palliative care section showing the increasing call to incorporate palliative care into emergency medicine education and practice. It's a new and exciting place to be!

Why residents choose to follow this career path

Residents choose to follow this career path when they desire to practice emergency medicine as well as hospice and palliative medicine jointly or they may transition to practice as a full-time palliative medicine physician.

How do I know if this path is right for me?

If you are the type of resident who can step back during a clinical shift and put a patient's ED visit into the context of "the big picture," this specialty may be for you. If you have a strong interest in improving the care of those who are very seriously ill and/or dying, then this specialty provides the key skills to improve end-of-life care. If you're an excellent advocate for your patients and actively inquire about their wishes, then you're already on the path to becoming an amazing HPM physician. Additional avenues of interest include bio-ethics of medicine, symptom management in patients with complex chronic illness where the goal of treatment is focused on relief of symptoms . (Symptom management can include but not limited to pain management, and often includes dyspnea, GI symptoms, agitation, etc.) This fellowship will teach you to become a skilled communicator and you will become the "go-to" person in your department for treating and educating others about caring for the sickest of the chronically sick. In addition, you will help to identify the patient's 'goals of care' and shine a light on the treatment pathways desired by the patient early in their course, which may help to avoid unnecessary admissions and procedures.

If this interests you, then a palliative medicine fellowship will give you a niche for your future academic career. Having a niche by training in palliative medicine may allow for a varied perspective and an opportunity to balance clinical work with education and research in a less chaotic, less procedure intense, or time-constrained setting. Some physicians want to have these options in their careers so later they can adjust their work-life balance and transition to clinical care in a care setting other than working ED shifts.

Career options after fellowship

HPM fellowship is meant to train you as an independent HPM physician who can run an inpatient unit, palliative care consult service, or become an outpatient palliative care or hospice provider after fellowship.

Splitting time between departments

After fellowship, some physicians prefer dividing their time between the two departments often with rotating time blocks of ED shifts and inpatient palliative care consult service. Other physicians may want to practice HPM medicine only in the ED. Most EM-HPM physicians are contracted for majority of their time in the emergency department due to the salary difference, in that emergency medicine physicians make more annually. HPM physician's salaries are more similar to sub-specialists in internal medicine such as nephrology or endocrinology.

Most EM-HPM dual-trained physicians work in major academic institutions where they teach palliative care and/or do research. These physicians are generally consulted in the care of seriously, chronically ill patients and specialize in alternative treatment pathways other than aggressive resuscitation. Some physicians sit on ethics committees in conjunction to their clinical practice. Others take on the role as hospice medical director.

Being an EM-HPM pioneer, you may need to pave your own way, setting up your schedule/time split and negotiating between the two departments. The best way to do this is to figure out your own personal career goals and compare them with what the institution's expectations are in terms of clinical hours, salary, teaching, and research requirements for full-time physicians within each department. Past hospitals have hired EM-HPM physicians and allowed them to split their time between two departments; however, other hospitals might not be familiar with EM-HPM providers and will need guidance to how this works. Similar to other subspecialties, you may need to look at the two departments to find the right fit, or have the flexibility for two different institutions.

Academic vs. community positions

Most EM-HPM trained physicians work in major academic institutions that are more comfortable or familiar with providers certified in multiple specialties. As an EM-HPM physician, you most likely will be the point person in your emergency department for faculty teaching or medical education and the collaborating physician for ED based palliative care-oriented projects. If EM-HPM medical education and/or research is concurrent with your future career goals, then choosing an academic environment may be more conducive.

Remember, after fellowship you are an asset, bringing a unique perspective and skill set that is vital to the hospital, so don't forget this when negotiating! You will lead your emergency department to gain specialized skills and knowledge in hospice and palliative medicine. If there is a program you're interested in working at after fellowship, send out your CV and take the time to call the director, as some places will not always advertise their job openings. Before accepting, make your goals—such as medical education or research—are clear to both to you and your employer in order to thrive as a supported faculty member that achieves their professional goals.

IN-DEPTH FELLOWSHIP INFORMATION

Number of programs

Currently the ACGME lists [137 hospice & palliative medicine programs](#).

Differences between programs

Because hospice and palliative medicine involve nearly every specialty, HPM fellowships can be sponsored via different disciplines and departments. Most fellowships span both inpatient and outpatient settings and are sponsored by general internal medicine or family medicine; although, others can be housed within the geriatric, oncology, or anesthesiology departments. Emergency medicine and surgery departments however currently do not sponsor a fellowship program.

Fellowship directors may hold primary certifications from a variety of disciplines. An example: Emory Palliative Care Center, which is headed by an emergency medicine physician, versus the director of UCSF-Fresno, who is trained in both internal medicine and psychiatry. Be sure to check whether a fellowship's faculty composition is primarily from the same background or if there is a variety of specialties represented. This can tell you if the faculty have similar interests and goals in research, administration, or education to which you seek.

Older, more established programs tend to have larger faculty, more fellows, and fixed schedule blocks that provide more structure. Smaller, newer programs may offer less structure, but can provide greater flexibility if you want to focus on a particular area, design your own electives, or wish to moonlight in an ED throughout fellowship. Despite some variations, all fellowships regardless of size or departments, require the same basic rotation requirements.

Length of time required to complete fellowship

HPM fellowships are 1 year. Some programs offer additional tracks in research, geriatrics, bioethics, or public health which may require a longer time commitment.

Skills acquired during fellowship

As an HPM physician, during rotations you will specialize in acute symptom management, running family meetings, and helping to optimize the care of a patient with their loved ones by attending to their medical, spiritual, and psychosocial needs. Patient and family interactions can be intense and time-consuming, but are also very rewarding as you work to honor patients' wishes while improving their quality of life. This

specialty requires patience and good communication skills in order to balance all aspects of care across multiple services (oncology, neurology, surgery, etc.) and settings (such as hospital, home, long-term care etc.) HPM providers are often looked upon as the masters of communication and conflict resolution; adept at resolving difficult clinical decision-making conflicts and solving ethical dilemmas, as well as providing good end-of-life care.

- **Symptom control**

This includes pain control and alleviation of other bothersome and/or difficult to control symptoms experienced by patients with serious illnesses, such as chronic malignancy related pain, dyspnea, nausea/vomiting, fatigue, neuropathic symptoms, etc. Guidance and management of symptoms of the actively dying patient in both inpatient and outpatient settings, such as: delirium, anxiety, dyspnea, etc.

- **Communication skills**

These are critical for conflict resolution and goals of care discussions. You will learn how to do this while simultaneously giving caregiver (surrogates) support. Palliative medicine is an interdisciplinary team sport, including social work, medical chaplaincy, nursing, and advanced practice providers. Communication and leveraging team care is fundamental to palliative medicine.

- **Goals of care**

In addition to being a master of symptom management, it is necessary to be adept at building a realistic view of a patient's disease trajectory and using this to provide advice regarding the non-initiation or stopping of interventions that are not consistent with a patient's goals, as well as insuring that the plan of care is clearly communicated, understood, and agreed upon by the patient and their support system.

- **Clinical recognition skills**

Fellows recognize chronic illness or dying trajectories of terminal illness, organ failure, frailty, and sudden illness to help prognostication. They can identify the imminently dying patient, complications of cancer, and cultural and ethical issues surrounding end-of-life and death.

- **Ethical/legal understanding**

Gain knowledge of advanced directives and multidisciplinary team/support systems for chronically ill and dying patients.

Typical rotations/curriculum

Your fellowship will likely be divided into blocks (usually 1 month in length) of inpatient consults or working with patients in a palliative care unit, hospice outpatient visits — typically within a patient's home, inpatient hospice both acute and long-term care, and electives in pediatrics, geriatrics or interventional pain.

Inpatient experience will span at least 4 months in duration or roughly 100 hours monthly, although most fellowships do more. Most fellows achieve this experience by working in a palliative care inpatient unit or by participating on a palliative care consultation team or both. ACGME requires fellows to see 100 new patients and follow at least 10 patients longitudinally across settings by the end of fellowship.

Patient homes and long-term facilities: Fellows conduct home hospice or home palliative care visits with members of the interdisciplinary team which often include nurses, chaplains, social workers, etc. and attend any interdisciplinary case conferences for their patients. This can be completed as a separate clinical block or spread out over several months, i.e. every Thursday you do home visits with the team. Fellows must have 25 minimum hospice home visits. Fellows' long-term care experience should comprise a minimum of one month or total 100 hours and provide access to meaningful care of patients on either a consultation team or a hospice or palliative care unit.

Ambulatory practice setting: This is usually outpatient palliative medicine clinic that runs weekly although it varies from institution to institution. You must attend clinic for at least 6 months during fellowship.

Elective: Fellows must spend at least 1 month or equivalent of elective time in a clinically relevant field. Electives may include ethics consultations, geriatric medicine, interventional pain management, medical psychiatry, pediatrics, HIV clinic, medical oncology, radiation oncology, pulmonary, cardiology, neurology clinics, or other experiences determined to be appropriate by the program director.

Fellowship scholarly activity: This must be completed during fellowship and can be a research project or quality improvement project involving hospice & palliative medicine

For more information, consider reviewing [ACGME requirements](#).

Board certification afterwards?

Yes. The written boards are offered every other year and there is no HPM oral exam component. Recertification is every 10 years. In 2016, the pass rate for the first-time takers was 92%.

Average salary during fellowship

Most fellows receive a PGY-4 or 5 level salary.

PREPARING TO APPLY

How competitive is the fellowship application process?

The application process is currently evolving as both the awareness and popularity of the specialty are growing. The fellowship was available through the NRMP Match in 2015 for the first time. Match data is now available through the NRMP: <http://www.nrmp.org/wp-content/uploads/2018/02/Program-Results-2014-2018.pdf>. Some geographic locations or larger metropolitan areas tend to be more competitive.

Requirements to apply

Candidates should be allopathic or osteopathic physicians in good standing and anticipated to graduate from one of the approved disciplines previously described-this includes emergency medicine.

Research requirements

There are no strict criteria regarding research. However, it is encouraged and there are an abundance of research opportunities within the field.

Suggested rotations to take during residency

It is generally recommended that applicants rotate with the palliative medicine service within their institution or participate in an elective in HPM if available. This shows prior exposure to the clinical scenarios relevant to the practice of HPM and demonstrates interest.

Suggestions on how to excel during these rotations

- Access the literature and introductory texts before and during the rotation to foster a greater depth of understanding for the evidence guiding palliative care in clinical settings.

Demonstrate dedication to becoming an adept communicator. Fundamental communication skills lead to success when discussing goals of care and during family meetings; however, they take time to develop. It is clear when a resident is making an effort to practice these skills. Consider [reviewing VitalTalk](#) at for useful tips.

Be a team player. This skill set is important in all areas of medicine and just like it is part of being a successful emergency physician, this will help you learn how to garner the best care for the patient while including all members of the team such as: social work, chaplaincy, case management, pharmacists, and other learners.

Should I complete an away rotation?

Away rotations are particularly useful if you are hoping to match at a specific program. A stellar job will certainly help you stand out when rank lists are made later in the year. This will also allow you to experience a program firsthand that you may be interested in to try them out, too!

What can I do to stand out from the crowd?

As mentioned above, a positive rotation will go a long way towards standing out. Since there is so much opportunity for exploration of research and education in HPM, participating in projects that align with your interests can be worthwhile. It will also show a longitudinal interest in the topics surrounding HPM (whether this is through publications, volunteerism, committee work, or involvement in education) and a longstanding commitment to the field.

Should I join a hospital committee?

There are many opportunities for overlap between the goals of a hospital committee and HPM. The important element is finding one that you're passionate about and would like to continue to explore. This is not necessarily a requirement as much as a suggestion since it will show a dedication to the field. Some suggestions include the ethics or pain management committee.

Publications other than research

Since there is so much opportunity for integrative medicine and possibility for the use of medical humanities within HPM, most clinicians have an appreciation for other forms of publication. For example: creative writing, poems, play-writing, and medical narratives. However, this is again what feels true to your own personal interest. The important aspect is building a link between these and your interest in HPM.

How many recommendations should I get? Who should write these recommendations?

In general, at least three letters of recommendation are preferred with at least 1-2 letters from within the field (although this is not a requirement, per se). As always, a letter from the residency Program Director is encouraged, as well as from faculty whom you have worked with extensively. Additional letters may be from mentors/supervisors of research or special interest

projects. If an elective or away rotation was done in HPM, a letter from HPM faculty is highly recommended. Overall, the key is to choose people who can translate your unique skill set to HPM.

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

Yes, the key is to demonstrate interest and a ‘trail of breadcrumbs’ that led you to this new path. In these cases, it is beneficial if clinical experience can be directly tied to HPM exposure. If this is challenging it may be wise to look for alternative avenues, such as gaining permission to shadow the in-house HPM consult team, that may provide clinical exposure.

What if I’m a DO applicant?

The AAHPM and NRMP websites both state that DO physicians are considered candidates for the match in HPM.

What if I am an international applicant?

Refer to the NRMP website as far as application procedures apply.

There may also be some institutional variation, and therefore one may want to contact programs of interest prior to applying in order to find out their procedures and practices.

APPLICATION PROCESS

How many applications should I submit?

This is largely dependent on the applicant’s geographic area of interest, confidence in their candidacy, and number of programs that feel like a good fit. Because the HPM fellowship has only gone to the Match relatively recently, there is not a lot of real data to work with. It may be most beneficial to discuss the exact number with an advisor based on your performance-to-date and geographic area of interest. In general, more is better than less to provide you with an adequate pool to choose from and make-up for possible programs that may not offer you an interview.

How do I pick the right program for me?

It is important to consider future next steps when choosing a program as geographic location may determine your next career move. In addition, if a specific institution would be your dream job, it may be useful to train there. Geographic location and accessibility to your support system may be a consideration given the financial constraints many trainees have graduating from residency and still

earning a salary commensurate with a PGY-4 as well as the stressors involved with starting a new training program.

Get to know the people in the program! Are fellows happy? Do the faculty seem supportive? Are there opportunities for exploring your interests? Many of the same rules apply as when you interviewed for residency.

Explore if there are opportunities available specifically for EM trained graduates. Inquire about moonlighting if you want to keep your skills fresh while in training. Many programs are looking to expand their presence in the ED and inquiring about consult numbers from the ED will give insight into the type of exposure HPM staff have to ED patients.

Common mistakes during the application process

- Assuming all programs are alike especially in palliative care. Every program will have a slightly different range of experiences that they have to offer. It is important to identify what your career goals are and to check to see if the places you have interviewed align well with them. It also will insure your ultimate happiness at the place you match with.
- Not asking enough questions!
- Make the programs work for a spot on your rank list! Write a list of your top priorities in a program and check to see if the program meets your standards. You are interviewing them as much as they are interviewing you. Remember: this is the launching pad for the next stage of your career.

Application deadlines

HPM participates in the [NRMP Medical Specialties Matching Program](#). Check the [timeline for your specific fellowship route](#) and review the [NRMP Fellowship Applicant Checklist](#).

Tips for writing your personal statement

A strong personal statement will describe the journey you took in deciding to pursue an HPM fellowship, highlight your personal qualities that make you an ideal candidate, and does not serve as a carbon copy of your CV. As with all personal statements, it is important to have a good hook as your personal statement will be one of many that a person may read and you want to stand-out. If possible describe personal experiences, research, and key cases that contributed to your decision.

The conclusion is also important. Put it all together for the reader and connect how all of these pieces fit to make you an ideal candidate.

Is this a match process?

Yes. HPM uses the NRMP MSMP. Designing a rank order list is a similar process to the one used for residency.

What happens if I don't obtain a fellowship position?

Open slots are posted on the AAHPM JobMart for candidates to review. It is also beneficial to review the procedures on NRMP regarding applying for unfilled slots. Most importantly, you should review your application with the HPM program director or elective director available at your institution and assess what needs to be improved upon for future application cycles. You also may want to consider further exposure to HPM through electives or mentoring that is available within your institution.

INTERVIEW PROCESS

How do I stand out from the crowd?

Be yourself.

Practice: Try to rehearse with a faculty member in HPM to help yourself prepare for typical interview questions (see below for examples) and polish your answers. This will help your responses sound natural and come easily to you, so you won't freeze on interview day. The program generally wants to get to know you and already knows your credentials. They are looking for a good fit.

Don't be afraid to highlight your achievements. Your goal is to show that you will be an asset to the program and to insure the program will be supportive of your interests. It is helpful to demonstrate this connection for the interviewer and help them see what you will bring to the program and why you're unique.

Show you are truly interested in their program. If you're making the investment of interviewing at the program, then it should be a place you're seriously considering. Take the time to read about what makes their fellowship unique and use these facts to highlight your interest.

What types of questions are typically asked?

- Why are you interested in a hospice and palliative medicine fellowship after completing a residency in EM? Provide an example of a case you participated in that influenced your career path.

- Describe how your personal skills will help you navigate challenges in palliative care (i.e. difficult family meetings, challenging interactions with the primary team for the patient, etc).
- What do you hope to be doing in 5 years?
- Why are you interested in our program; what brought you here today?

How many interviews should I go on?

As previously mentioned, this is difficult to approximate given the Match process has only been used for a couple of years. Since some programs are more 'Emergency Medicine friendly' it would be beneficial to investigate in advance how many prior graduates are from EM and if they are seeking EM candidates (this also obviously is beneficial when you select programs to apply to). Also, it would be wise to add an EM-friendly program in for every program you're not sure of. In general, assess the strength of your application, your goal geographic area, and consider your comfort level both financially and for insuring a spot. It is never considered wise to apply to a single program.

PREPARING FOR FELLOWSHIP

Textbooks to consider reading

- Quill TE, et al. AAHPM's Primer of Palliative Care. 6th ed. Chicago, IL: AAHPM; 2014.
- McPherson, ML. Demystifying Opioid Conversion Calculations. Bethesda, MD: ASHP; 2009.
- DeSandre PL, Quest TE. Palliative Aspects of Emergency Care. Oxford University Press, Oxford, UK. 2013

Important skills to practice while in residency to prepare for fellowship

- Run a family meeting with a fellow or attending present for back-up.
- Consider practicing goals of care discussions when appropriate. Remember, palliative care is part of the *Choosing Wisely* campaign for EM.
- Try opioid conversion practice problems using some of the texts listed above and while supervised by an attending if you're able to do an HPM elective.

Tips on how to succeed as a fellow

Be a self-directed learner. This absolutely will serve you well regardless of what specialty becomes your ultimate career. Recognize gaps in knowledge or questions represent opportunities for learning. Don't accept the answer, "We do this because this is the way it has always been done," and look for supportive literature to

show the evidence that supports our practice patterns. Learn from your attendings and ask them to explain their thought process. This may be your last chance to work in an environment where your education is a top priority! Take advantage of it and try and pick-up pearls from a variety of sources along the way. Consider including local EM leadership in adding support for HPM within the hospital and take the lead on consults coming from the ICU and ED. Show off the amazing skill set that you have developed through an EM residency. Be a team-player. HPM is a team sport like EM with many moving parts. It is important to always recognize and value the skill sets offered by case managers, social workers, chaplains, nursing, and other specialties that are an essential part of the palliative team.

CONCLUSION

Additional resources

Podcasts

[EMCrit Podcast](#) (Episode 25 — End of Life and Palliative Care in the ED)

[Emergency Medicine Cases](#) (Episode 70 End-of-Life Care in EM)

[EM:RAP](#) (especially Episode 149)

Journals

Journal of Pain and Symptom Management

Annals of Emergency Medicine

Academic Emergency Medicine

JAMA Oncology, especially January 2015

Journal of Palliative Medicine

Journal of Emergency Medicine

Western Journal of Emergency Medicine

Clinical Resources/Websites/Blogs

[Palliative Care Network of Wisconsin](#) (my PC now)- Their Fast Facts and Concepts are a great resource under this website with easy to understand clinical summaries. They have an Emergency medicine section.

Academic Life in Emergency Medicine: [Palliative Care PV Card](#)

[ACEP Now](#): Pain and Palliative content

National organizations

ACEP: Palliative care section

American Academy of Hospice & Palliative Medicine (AAHPM): Emergency Medicine Special Interest Group (SIG)

Society of Academic Emergency Medicine

Center to Advance Palliative Care

Palliative Care Network of Wisconsin

Conferences

ACEP Scientific Assembly

AAHPM Annual Meeting

Education in Palliative & End-of-Life Care (EPEC)

EMTalk, powered by VitalTalk

Center to Advance Palliative Care (CAPC) National Meetings and Webinars

How to find a mentor

Establish a mentor early and connect with him/her often to ask questions and receive feedback. Mentors to consider include your program director, palliative care director, or other palliative care physicians at your institution. The ACEP Palliative Care Section has begun a mentoring program and has an EMRA representative that facilitates EM-PC networking and mentoring.

Remember, at this time there's a limited number of dual-certified EM-PC physicians in this young sub-specialty who are able to advise and mentor. It is important that you seek out mentors from both outside and within your institution in order to start the search process and begin networking early.

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3. American Academy of Hospice, Cosponsoring boards. "Number of Certified Hospice and Palliative Medicine Physicians by Cosponsoring Specialty Board." Certified HPM Physicians | AAHPM, 15 Dec. 2015, aahpm.org/hpm/number-certified.

Pediatric Emergency Medicine Fellowship

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INTRODUCTION

Description of the specialty

Pediatric emergency medicine (PEM) is an ACGME-accredited clinical subspecialty that focuses on caring for the acutely ill and injured pediatric patient in the emergency department. Subspecialty training is available to graduates of either pediatrics or emergency medicine residencies, and completion of PEM training and examination results in board certification in pediatric emergency medicine.

History of the specialty/fellowship pathway

In 1990, the American Board of Emergency Medicine (ABEM) and the American Board of Pediatrics (ABP) applied for approval to offer subspecialty certification in pediatric emergency medicine. Once approved, the first board examination for PEM was offered in 1992, and it has been offered biennially since that time. The longest running PEM fellowship was established in 1980 at Children's Hospital of Philadelphia, and since that time, more than 70 fellowships have been developed in the United States.

Why residents choose to follow this career path

PEM combines principles of emergency medicine with general pediatrics and pediatric critical care. This subspecialty allows the emergency physician to expand his/her knowledge of pediatrics in the acute care setting. In addition to advanced clinical training, pediatric emergency medicine fellows develop skills in pediatric emergency care protocol and guideline development, pediatric emergency care infrastructure, pediatric emergency medicine education, practice in a pediatric emergency setting, and advancing emergency medicine research in the pediatric population.

How do I know if this path is right for me?

This fellowship is ideal for those who love the emergency department setting and also have an interest in pediatric care. By taking the pathway of emergency medicine to PEM fellowship, you have already developed strong resuscitation and acute care skills in residency and will expand your skills with diagnostics and management of pediatric patients in fellowship.

Career options after fellowship

PEM fellowship will expand your employment options and practice settings. Those boarded in emergency medicine and pediatric emergency medicine are qualified to work in any emergency department (pediatric or adult) in the country. Some physicians choose to practice exclusively in the pediatric emergency department; however, many either practice in a combined emergency department (pediatric and adult patients seen in the same care setting) or dual pediatric/adult emergency department (pediatric and adult patients seen in parallel departments in the same hospital) or in multiple care settings (adult and pediatric hospitals). Additionally, those who practice in general emergency departments often become the pediatric care coordinator, or “pediatric champion,” for the department and establish protocols and quality improvement practices for the care of pediatric patients.

Splitting time between departments

Given variability in practice settings, some EM/PEM physicians split time between the general adult emergency department and pediatric emergency department or practice in a combined pediatric and adult emergency department. Many institutions will help with setting up your contract and establishing the division of labor between these two departments. This split of your time will be highly variable. Positions may entail a relatively even split between time seeing adult and pediatric patients, or they may be constructed so that you see predominantly children or adults. Some institutions will have one department chair for both departments, which will make contract negotiation easier, whereas others have two separate department chairs whom must both agree to hire you. It is not uncommon that when two separate department chairs are involved, one chair will take the lead for contract negotiations.

Academic vs. community positions

There are both academic and community positions for the EM/PEM physician, depending on the type of practice environment you seek. The majority of pediatric hospitals are academic centers, therefore

practicing exclusively in the pediatric emergency department setting will often have a teaching/supervisory component. Furthermore, pediatric academic hospitals often utilize residents, nurse practitioners and physician assistants, leading to a different practice environment than many emergency physicians have encountered in residency. These settings offer rich experiences in teaching and mentoring, but may lead to less direct patient care or use of one’s own procedural skills.

IN-DEPTH FELLOWSHIP INFORMATION

Number of programs

To date, there are more than 70 PEM fellowship opportunities. Programs are added to the [EMRA Match database](#) and the [AMA Residency & Fellowship Database](#) as they become available.

Differences between programs

PEM fellowships vary widely in departmental structure. The majority are situated within tertiary care pediatric hospitals, while some function within combined adult and pediatric centers. As with emergency medicine, there is a spectrum from highly academic to more community-oriented fellowships. The fellow role varies between programs, with many having the fellow as an intermediary role between the resident and attending, while others have the fellows see patients in an attending capacity primarily with supervision. There is also variability in curriculum with regards to the incorporation of graduate classes, research, and elective opportunities.

Length of time required to complete fellowship

To be eligible to sit for the PEM subspecialty boards, emergency medicine physicians must complete an accredited 2-year fellowship. However, given that pediatricians must complete a 3-year fellowship, there are both 2- and 3-year programs. For some programs, the third year is strongly recommended of all EM-trained fellows. It is best to find out by contacting them directly. However, this year may include additional certifications or graduate educational opportunities.

Skills acquired during fellowship

All programs will train you in trauma and medical resuscitation of the critically ill pediatric patient. You will also gain skills and knowledge in dealing with pediatric specific complaints and pediatric subspecialty areas such as neonatal and infant care, genetic syndromes and metabolic disorders, congenital heart disease,

endocrinopathies, transplant medicine, and neurologic disorders. Some programs will offer various rotations in specialties not often encountered in traditional EM training but pertinent to a career in PEM such as Child Abuse/Child Protective Services. EM graduates are required to have training experiences in primary care, as well as pediatric and neonatal critical care.

Typical rotations/curriculum

Because this is a clinical fellowship, the majority of your time will be spent in the pediatric emergency department with direct patient care. Curriculum varies between programs; however, exposure to the pediatric intensive care unit, pediatric anesthesia and specific pediatric subspecialties are typically included. Many programs include rotations in child abuse, sports medicine/orthopedics, transport medicine, neonatal ICU, burn/trauma, and pediatric primary care. Many programs include opportunities for obtaining advanced degrees in research, public health or medical education, among others.

Board certification afterwards?

Yes, you will be board-eligible in pediatric emergency medicine after the completion of an ACGME accredited pediatric emergency medicine fellowship. Similar to EM residency, you will take in training examinations (ITEs) for PEM boards once a year. These ITEs, similar to EM training, are geared to help you prepare for PEM boards and guide your studying.

Average salary during fellowship

The majority of programs have a salary consistent with that of a PGY-4,5,6, which will vary by location. Some programs will offer or allow moonlighting opportunities. It is important to note if your intent is to return to adult practice following fellowship, moonlighting (in a mostly adult ED) should be a strong consideration to maintain your adult skills. Inquire regarding moonlighting opportunities during your interview. Once matched, reach out to your program once again regarding moonlighting, as the credentialing process can be lengthy, even taking up to six months in some cases.

PREPARING TO APPLY

How competitive is the fellowship application process?

The application process is strongly competitive for fellowship applicants. Given the multiple paths to this fellowship and the variable training years, some programs are more open to emergency medicine applicants than others; however, as the specialty matures this gap is closing.

Requirements to apply

The only requirement for application is completion or projected completion of an emergency medicine or pediatric residency.

Research requirements

Research, while not a requirement for applications, is strongly encouraged, as is experience in quality improvement. While pediatric emergency medicine-related research is encouraged, fellowship programs are seeking applicants who show a track record of success in research and an applicant who will be able to “see a project through”, even if prior research is not related to the pediatric population.

Suggested elective rotations to take during residency

Given the unique educational environment of the PEM fellowship, it is important to obtain letters of recommendation from PEM faculty, as well as some experience in a pediatric emergency department prior to your application. Depending on the program in which you are training, you may not have access to a pediatric emergency department beyond the minimum rotation requirement. In this case, we recommend completing an away rotation at a site where you are interested in applying. Additional rotations you may find helpful in preparation for applying to fellowship include the pediatric intensive care unit, the neonatal intensive care unit, transport medicine, sports medicine, and pediatric anesthesia.

Suggestions on how to excel during these elective rotations

Read the pediatric chapters of whichever emergency medicine textbook you use in residency prior to a pediatric rotation. Many pediatric emergency departments have developed treatment protocols for common complaints such as asthma, bronchiolitis,

neonatal fever, button battery ingestions, and appendicitis diagnosis. Contact the department in advance to find out if you can access them online so you will be familiar with their treatment algorithms prior to your arrival. Remember that pediatric emergency departments have a structure and flow model that is often different from general emergency departments, so go into these rotations with an open mind. Finally, skim through some of the pediatric blogs, podcasts, and online review articles such as Evidence-Based Medicine and Pediatric Emergency Medicine to get a sense of current topics in pediatric care.

Should I complete an away rotation?

If your home institution does not have a dedicated pediatric emergency department either on-site or closely affiliated with the residency, then you should strongly consider an away rotation for letters of recommendation and exposure to the practice of pediatric emergency medicine during your elective time.

What can I do to stand out from the crowd?

Show that you are interested in pediatrics! Look for and participate in pediatric emergency medicine opportunities offered by pediatric organizations. Join a pediatrics based quality improvement committee at your institution, write a pediatrics article for *EM Resident* or another emergency medicine magazine, join the EMRA Pediatric Division, the ACEP Pediatric Section or the American Academy of Pediatrics Section on Emergency Medicine and get involved. With regard to research, PEM fellowship includes a research requirement. Thus, being involved in research will put you a step ahead of other applicants. Consider submitting a case report or interesting clinical image during residency in addition to your research.

Should I join a hospital committee?

If your hospital provides pediatric care, then consider joining a committee or quality improvement project relating to pediatrics. Many emergency departments have a committee dedicated to pediatric care protocols, which would be an excellent learning opportunity and way to be involved.

Publications other than research

Any publication that you can include in your CV relating to pediatric care will bolster your application. You may consider working on a book chapter or writing an article for an emergency medicine magazine. You may also consider writing an article for *EM Resident* or the ACEP Pediatric Section Blog.

How many recommendations should I get? Who should write these recommendations?

You should provide 3 letters of recommendation, 1 from your program director and 1-2 from PEM attendings who have worked with you. If you need a third letter, consider a research or QI mentor who can speak to your non-clinical leadership qualities.

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

Yes! Just as in any fellowship application, you will need to explain your decision to work as an attending prior to applying for fellowship, but this is not uncommon among PEM fellowship applicants. You will strengthen your application if you demonstrate an ongoing commitment to PEM (e.g., PEM research, participation on PEM-related committees) during your time as an attending.

What if I'm a DO applicant?

If you have completed a residency in emergency medicine and are eligible to sit for the AOBEM/ABEM boards, then you may apply for PEM fellowship.

What if I am an international applicant?

The same requirements are necessary for PEM fellowship as prior for an ACGME residency. If you are a U.S. citizen applying as an international medical school graduate, and you have completed a residency in pediatrics or emergency medicine making you eligible for ABP or ABEM, then you may apply for PEM fellowship. Many programs are able to support a visa, but international applicants are less common. Thus we recommend that you contact individual programs prior to applying.

APPLICATION PROCESS

How many applications should I submit?

There is no firm guideline for the number of places to apply for fellowship. A general recommendation is to send applications to 10 programs; however, this should be tailored to your desired location, program qualities, and the strength of your application.

How do I pick the right program for me?

When selecting a program, look at the number of EM trained fellows they have taken in the past, as EM applicants start fellowship with a different skill set than their pediatric peers. It is helpful to have a program that understands that the educational goals of an EM

trained fellow are different from those of a pediatric trained fellow. Assess the clinical experience you will get in each program. Also, look at opportunities for fellows including research, electives, supervisory roles, graduate school, and international rotations. Finally, look at where the program's fellows go after they complete fellowship: academic vs. community, local vs. national, and combined vs. pediatric specific sites, and consider whether this mirrors your anticipated career path.

Common mistakes during the application process

ERAS opens for PEM in the late spring, so send in your application as early as possible. Approach your letter writers early so they have enough time to write your letters of recommendation and upload them for your application. When writing your personal statement, explain your interest in PEM and then use your application and CV to support this. Be honest in your application, remember to spell-check, and have a colleague review and proofread it.

Application deadlines

The application season opens in June, and programs are able to start viewing applications in July, until the end of August. Interviews are from September to November, and the match occurs in December. The application timeline can be found on the [ERAS site](#).

Tips for writing your personal statement

Your personal statement should discuss the reasons you are interested in PEM, and any specific examples you might have to support this. If there is anything unique about your application, or anything important about you that is not conveyed in other parts of your application, the personal statement is the chance to include it. The [EMRA Pediatric EM Committee page](#) contains an applicant toolkit and sample personal statements for EM residents applying into PEM fellowship.

Is this a match process?

Yes. There is an [NRMP match for PEM fellowships](#).

What happens if I don't obtain a fellowship position?

If you do not match, remember you are still a trained emergency medicine physician who can see both adults and children in practice. Consider if you would like to re-apply, which is not uncommon for pediatric trained applicants in PEM. Review your application with a mentor, your program director, and possibly your letter writers. Reach out to programs you applied to and ask them how you could strengthen your application. Look for deficiencies in your applications and work towards improving those areas in your application the next year.

INTERVIEW PROCESS

How do I stand out from the crowd?

As with all interviews, your goal is to present yourself as competent, professional, respectful, and enthusiastic about the pediatric emergency medicine fellowship. Review the program and faculty on their website prior to your interview so you may ask insightful and appropriate questions. Know your reasons for applying to fellowship and your goals for what you would like to learn and achieve in fellowship. Be prepared to highlight how your EM training will bring a fresh perspective to a program.

What types of questions are typically asked?

Programs will typically ask about your reasons for applying to PEM fellowship, especially because few emergency medicine residents apply for PEM fellowship. You will likely be asked to describe your residency training experience, especially when interviewing with programs that are not as familiar with your specific residency. You may be asked about your research and prior publications, thus consider anything on your CV a potential topic of conversation. Finally, remember that the PEM fellowship interviews are an opportunity for the program to get to know you as a person, so you may be asked about your interests, etc.

How many interviews should I accept?

There is no standard number of interviews, but a general rule would be to go to any interview you are offered.

PREPARING FOR FELLOWSHIP

Textbooks to consider reading

- Shaw K, Bachur R. Fleisher & Ludwig's Textbook of Pediatric Emergency Medicine, 7th ed. St. Louis, MO: Wolters Kluwer; 2016.

Important skills to practice while in residency to prepare for fellowship

- Resuscitation leadership
- Ultrasound — you may be the expert in fellowship
- Procedural skills including ultrasound guided IV placement, intraosseous placement, intubation, procedural sedation, laceration repair techniques, splinting and casting
- Child life — practice communicating with pediatric patients at their developmental levels and providing coping mechanisms during exams and procedures
- Emergency department flow

Tips on how to succeed as a fellow

- Keep an open mind
- Be aware that institutions have differing protocols based on local resources
- Work hard on shift and seek feedback from faculty
- Get involved in projects within your department
- Understand that your training background will be different than many of your co-fellows and your learning needs will be different; learn from each other

CONCLUSION

Additional resources

[ACEP Pediatric Emergency Medicine Section](#)
[AAP Section on Emergency Medicine](#)
[EMRA Pediatric EM Committee](#)

Blogs/Podcasts

[PEM Network](#)
[Pediatric EM Morsels](#)
[PEM Academy](#)
[PEM Database](#)
[PEM ED Podcast](#)
[HIPPO Education — Pediatrics](#)
[Pediatric Emergency Playbook](#)
[PEM Guide 2.0](#)

National organizations

EMRA Pediatric EM Committee
ACEP Pediatric Emergency Medicine Section
PEM Database — email listserv
AAP Section on Emergency Medicine

Conferences

ACEP *Scientific Assembly*
ACEP Advanced Pediatric Emergency Medicine Assembly
Pediatric Academic Societies Meeting (PAS)
AAP National Conference
SAEM Annual Meeting

How to find a mentor

Look within your home institution for PEM faculty to guide you in your consideration of fellowship. Outside of your program, consider applying for a mentor through the EMRA Mentor Match program on the EMRA PEM Division website or through the EMRA Medical Student Council, which will match you with a PEM faculty member nationally.

Population Health and Social Emergency Medicine Fellowship

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INTRODUCTION

Description of the specialty

Population health has been defined by the *American Journal of Public Health and Milbank Quarterly* as “the health outcomes of a group of individuals, including the distribution of such outcomes within the group.” The goal of this specialty is to reduce and potentially eliminate health disparities stemming from social determinants of health (such as cultural, economic, environmental, etc.) Social emergency medicine narrows the field of population health by focusing on the emergency department acting as the local population’s health and social “safety net.” By analyzing the interplay between the social forces of the local community and its interaction with the emergency system, this specialty strives to impact these social forces with the goal of improving the individual and thus community health and well-being.

History of the specialty/fellowship pathway

Population health as a specialty did not become prominent in the United States until the late 1990s and early 2000s. It is still a young specialty, with only a few fellowships available.

Why residents choose to follow this career path

Residents choose this career path when they are interested in impacting population health and policy through community outreach, research, health policy, clinical services, and education.

How do I know if this path is right for me?

Are you interested in the social origins of health and disease? Do you find yourself dedicated to examining the interactions between emergency medicine and the social forces that affect population health?

and well-being of our communities? Are you interested in working on collaborative interventions where you design, implement, and evaluate these new strategies? If so, this fellowship may be for you.

Career options after fellowship

Career options after fellowship beyond the traditional appointment as an emergency medicine faculty include (but are not limited to) the following: government positions for the Department of Health Services, assisting in the formation of health policies, developing quality improvement initiatives, developing local programs such as HIV testing or infant mortality prevention, employment with nonprofit agencies, working in academia with a focus on research or teaching students enrolled in a public health-related degree program, or consulting and assisting in private companies such as insurance and pharmaceutical agencies.

Splitting time between departments

Traditionally, EM physicians who complete this fellowship do not necessarily split time between departments. Rather, their primary appointment falls under emergency medicine, and their population health commitments fall under protected administrative time.

Academic vs. community positions

The decision between academic and community positions depends on the physician's desire for research; academic programs traditionally have increased access to funding as compared to community programs. Other factors to help make this decision include desired location for employment and the hospital's current and/or willingness for future involvement in programs that focus on improving population health.

IN-DEPTH FELLOWSHIP INFORMATION

Number of programs

Some are combined population health and social emergency medicine fellowships whereas others are either population health or social emergency medicine fellowships.

Combined Population and Social EM:

- [Stanford Social EM and Population Health](#)
- [University of California, Los Angeles \(UCLA\): IDHEAL Fellowship — Population Health](#)

EM Population Health (Research based):

- [New York University \(NYU\) — Population Health](#)
- [St. Barnabas Health \(SBH\) — Social EM](#)

Population Health (Research and Advanced Degree Opportunities):

- [Wisconsin Population Health Service](#)

Non-Fellowship Opportunities (Resident Research Opportunities):

- [Levitt Center](#)

Differences between programs

UCLA has a heavy clinical focus in their program, which is different from the other opportunities, all of which are all primarily research based. The University of Wisconsin requires a master's or doctoral degree in public health or an allied discipline at the time of appointment. This program does not specifically target emergency medicine physicians. UCI, NYU, and SBH however all target emergency medicine physicians for their respective programs. UC Irvine in particular offers a Research Fellowship in Population Health that prepares Emergency Physicians for a role in Research Directorship. Because of such, this program allows dedicated time for the participant to pursue an MPH or MS degree in research methodology. Stanford offers an additional year for advanced degree obtainment and also offers opportunities for curriculum development for undergraduate students. The Levitt Center is a research institute dedicated to advance the knowledge base regarding the interplay of social forces that influence emergency medicine.

Length of time required to complete fellowship

Stanford is 1-2 years, depending on whether the fellow chooses to complete a master's degree and/or research project. The University of Wisconsin is a two-year service and training fellowship. St. Barnabas offers a program that is one year in length. The Population Health fellowship at UC Irvine, NYU, and UCLA are all two-year programs.

Skills acquired during fellowship

During fellowship, you will obtain skills in scientific research, health policy formation, community health advocacy, team communication, program administration, academia, and mentorship.

Typical rotations/curriculum

Curriculum usually includes research, involvement in curriculum development and health policy formation, involvement in community outreach programs/ community health, and course work in public health.

Board certification afterwards?

There is no board certification after fellowship. The Stanford fellowship offers a master's degree in public health or health services research. At NYU, a Master of Science Degree in Clinical Investigation (MSCI) is given to fellows who have completed the program requirements.

Average salary during fellowship

Salary during fellowship is typically comparable to that of a part-time ED attending.

PREPARING TO APPLY

How competitive is the fellowship application process?

Although there are typically a low number of applicants to these fellowships, because there are limited fellowships with limited spots, this is considered a reasonably competitive fellowship.

Requirements to apply

Stanford requires candidates to be either in their last year of residency or have completed an ACGME-approved residency program in emergency medicine to apply. They must also be licensed to practice in California prior to applying to this program. University of Wisconsin requires a master's or doctoral degree in public health or an allied discipline. St. Barnabas requires a CV, a letter of interest, and three letters of reference. Applicants must have completed an ACGME-approved program in Emergency Medicine. Applicants to the Population Health Fellowship at UC Irvine must have a California Medical License and must be board-certified or board-eligible emergency physicians. Applicants must also have three letters of recommendation, a CV, and a letter of intent. Candidacy for the NYU Healthcare Leadership and Operations Program requires a candidate to submit a CV, letters of recommendation, clinical references, cover letter from school of medicine, transcript, two essays, and completed Wagner application. The ideal candidate will have demonstrated a dedication to public service, passion for leadership, and interest in ED operations. NYU requires their candidates to be board certified and have an active license to practice in New York.

UCLA's IDHEAL program requires applicants to have completed an ACGME-accredited residency and be board-certified or board-eligible in emergency medicine. Applicants of a four-year residency programs can apply directly whereas applicants of three-year programs must have one year of post-residency experience or one year or more of fellowship experience. In addition, applicants must be eligible to practice in the state of California.

Research requirements

Completing research during residency is highly recommended for applicants considering this fellowship, especially research with ties to population health. It is better to have one completed research project than to have three incomplete projects at the end of your residency.

Suggested elective rotations to take during residency

Suggested elective rotations to consider (but not limited to) include research, administrative, community health clinics, state or local public health office, and substance abuse clinics.

Suggestions on how to excel during your elective rotations

On your elective rotations, strive to be the hardworking resident who is known to come in early and stay late. Be enthusiastic, helpful, and friendly. Be a team player. Continue to read every night and expand your knowledge base about population health topics.

Should I complete an away rotation?

If you are interested in any of the above programs, it may be worth considering an away rotation at their institution. Be aware that this rotation will be a way not only for you to get to know the program, but also for the program to get to know you. Be on your best behavior during this rotation and treat every day as an interview day.

What can I do to stand out from the crowd?

The best way to stand out from the crowd is by building a solid CV that displays leadership, educational, and research activities that clearly display your interest in population health.

Should I join a hospital committee?

If there is a hospital committee in which you are interested and could have a meaningful role, then you should definitely participate. Hospital programs with community outreach involvement would be ideal to help prepare for fellowship.

Publications other than research

Publications other than research, such as blog posts, magazine articles, podcasts, etc., are recommended and highly encouraged. These are great ways to educate yourself and the community especially about topics regarding population health. Do not forget to list such opportunities on your CV.

**How many recommendations should I get?
Who should write these recommendations?**

Most programs require three letters of recommendation. Stanford specifically requests that one of these letters be from either your program director or department chair. The other two letters should be from physicians and/or researchers who know you well and are willing to write you a strong letter. Having a letter writer within the field of public health would be very beneficial.

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

Yes, you can still be competitive. Be prepared to answer questions during your interview about this gap in your application. Also, make sure you continue to build your CV during your time as an attending. For example, continue your involvement in research projects, community or hospital-based leadership roles, etc.

What if I'm a DO applicant?

There are no known barriers to DO applicants.

What if I am an international applicant?

We recommend for international applicants to contact each program individually. University of Wisconsin requires foreign nationals to have U.S. permanent citizen status.

APPLICATION PROCESS

How many applications should I submit?

Apply to all programs where you would strongly consider accepting a fellowship position if offered.

How do I pick the right program for me?

Pick the program that strongly aligns with your career goals. Choose a program in an area where you will be comfortable living for two years.

Common mistakes during the application process

- Missing application submission deadlines.
- Choosing authors for your letters of recommendation who do not know you well.
- Grammatical mistakes in your application.
- Failure to have activities on your CV that display leadership.

- Failure to have activities on your CV that display your interest in population health.
- Unfocused or inconsistent personal statement.

Application deadlines

Stanford has an application due date of mid-November (with a July 1 start date in the following year). University of Wisconsin lists a deadline of mid-December. St. Barnabas has a rolling admission deadline. For UC Irvine's Population Health fellowship admission deadline, call 714-456-5239. NYU has a rolling admission date starting in July. Two-year cycle is from July-June. The application deadline for UCLA's IDHEAL fellowship is October 15th.

Tips for writing your personal statement

Your personal statement is a place to let your personality shine through and to set yourself apart from the other applicants. Be careful not to simply repeat your CV, but rather explain why you are interested in population health and how this fellowship will help you achieve your career aspirations. The best personal statements are cohesive and immediately grab the reader from the beginning.

Is this a match process?

No.

What happens if I do not obtain a fellowship position?

If you do not achieve a fellowship position, the best thing is to take a step back and analyze your application looking for areas of weakness. It may be worth gently asking the programs where you applied if they have suggestions for improvement. It is also worth considering asking someone in a leadership position, such as your EM program director, to look over your application for weakness as well. Spend the next year addressing the deficiencies on your application and apply again. It is also possible to find a career in population medicine without completing a fellowship. Alternatives to a fellowship can include pursuing a Master's Degree in Public Health, Public Administration or Public Policy.

INTERVIEW PROCESS

How do I stand out from the crowd?

The best way to stand out from the crowd is by displaying a strong, clear interest in population health and articulating your plans for a career after fellowship. Be friendly and pleasant with everyone you meet. Practice your interview skills with someone in a leadership position at your current residency program prior to your fellowship interview.

What types of questions are typically asked?

Why are you interested in a population health fellowship?

Why are you interested in a population health fellowship at our program specifically?

Tell me more about “blank” that you list here on your CV.

What are your 5- and 10-year career goals?

How many interviews should I go on?

You should attend all interviews offered (assuming you applied only to programs you are serious about attending if offered a fellowship position).

PREPARING FOR FELLOWSHIP

Textbooks to consider reading

- Nash D, et al. Population Health. Burlington, MA: Jones & Bartlett Publishers; 2016.
- Lueddeke G. Global Population Health and Well-Being in the 21st Century. New York, NY: Springer Publishing Company; 2015.
- Levy B, Sidel V. Social Injustice and Public Health. 2nd ed. Oxford University Press; 2013.
- Shi L, Stevens G. Vulnerable Populations in the United States. Hoboken, NJ: John Wiley & Sons; 2004.

Important skills to practice while in residency to prepare for fellowship

It is important that you first and foremost strive to become a strong emergency physician during your residency. Other skills to focus on include developing your skills as a researcher, educator, and advocate for vulnerable patient populations.

Tips on how to succeed as a fellow

Take advantage of everything your fellowship has to offer. Fellowship is a unique time to develop your skills with the close guidance of mentors who have been in the field for years. Come in early for your required rotations and responsibilities, stay late, and make sure you continue to build your knowledge base by reading daily. Seek out feedback and strive to improve your skills daily. The existing fellowships offer opportunities to earn an advanced degree; strongly consider pursuing this opportunity. Finally, use this training to develop a community program or health policy initiative that improves local and/or global population health.

CONCLUSION

Additional resources

Journals and Journal Articles

[Population Health](#)

Anderson ES, Hsieh D, Alter HJ. [Social Emergency Medicine: Embracing the Dual Role of the Emergency Department in Acute Care and Population Health](#). *Ann Emerg Med*. 2016; 68 (1): 21-25.

Kindig D, Stoddart G. [What is Population Health?](#) *Am J Public Health*. 2003;93(3):380-383.

Klauer, Kevin. “Can Social Emergency Medicine Give a Different Perspective on Community Health?” *ACEP Now*, 8 July 2016, www.acepnow.com/can-social-emergency-medicine-give-different-perspective-community-health/.

Blogs/Podcasts

[Improving Population Health](#)

[Robert Wood Johnson Foundation’s Culture of Health blog](#)

[Population Health for Clinicians](#)

[Levitt Center Blog](#)

National organizations

[World Health Organization](#)

Conferences

[PopHealth Summit](#)

[Population Health Colloquium](#)

[SEM Consensus Conference review](#)

How to find a mentor

There is no central website that links interested physicians with mentors within the field of population health. Consider reaching out to individual programs to find networking opportunities or mentors within that program or hospital system.

Research Fellowship

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Special thanks to our 1st edition writing team

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INTRODUCTION

Description of the specialty

Emergency medicine research fellowships provide a non-ACGME-accredited post-graduate training opportunity for emergency medicine (EM) residency graduates interested in pursuing a career in basic and clinical research. The Society for Academic Emergency Medicine (SAEM) has approved a subset of eligible research fellowships that have met a number of milestones based on predetermined guidelines. Fellows who complete a research fellowship at a SAEM-approved site receive a certificate of approval upon completion. Emergency medicine is a dynamic specialty that relies heavily on evidence-based medicine to guide everyday practice. EM is an ideal specialty for studying acute emergencies with a broad mix of patients and conditions. The proportion of academic faculty involved in research and the proportion of studies published in emergency medicine journals that have research funding has been climbing. Emergency medicine research is growing quickly, and fellowship training has been one successful pathway to increase EM research success.

History of the specialty/fellowship pathway

The Josiah Macy Jr. Foundation sponsored a conference in 1994 titled “The Role of Emergency Medicine in the Future of American Medical Care,” which recommended that medical schools develop and enhance academic departments of emergency medicine. The conference also recommended that the American College of Emergency Physicians (ACEP) and SAEM should convene a conference to develop an agenda for research in EM and to define strategic options for implementing that agenda. The Research Directions Conference in 1995 presented 5 recommendations of their own in response to the Macy conference in order to develop and enhance research support both outside and within

departments of EM. These recommendations included: support for basic, clinical, and health services research pertinent to EM practice; promoting collaborative and interdisciplinary research within and across traditional institutional boundaries; development of new systems to manage clinical information; development of new methods to assess the outcomes of emergency care; and to seek and develop increased funding sources for EM research. The Future of Emergency Medicine Research Conference in 1997 issued a call for more EM physicians to pursue fellowship training within and outside the traditional EM settings, to seek advanced degrees, and to develop focused research mentorships. The conference also recommended that academic institutions draft a strategic plan to develop or improve research capabilities for EM, protect time for productive researchers, support promising interdisciplinary collaborations, and provide statistical and study design support within their departments. The Emergency Medicine Foundation, SAEM, and ACEP have been tasked with advancing these various goals and to act as a clearing house of advanced research training opportunities pertinent to EM and to facilitate the advancement of promising individuals into research fellowship training.

Why residents choose to follow this career path

Residents who desire to incorporate the conduct of research into their career while working at an academic institution choose to follow this career path. Several studies have demonstrated that residency and fellowship training with a focus on research is associated with increased career satisfaction, as well as success in obtaining increased grant funding, academic promotion, and an increased number of publications.

How do I know if this path is right for me?

If your goal is to become a leader in the field of emergency medicine research, then this is the right path for you. Individuals who pursue a research fellowship have a passion for discovery in health services and clinical research, research methodology, and/or biostatistics. A career in research also includes a fair amount of writing in the form of manuscripts and grant proposals. Consequently, an aptitude for writing, while not a necessity, is definitely an advantage. Individuals who go into academic emergency medicine in general are enthusiastic about teaching and enjoy collaborating with an interdisciplinary team.

Career options after fellowship

Most research fellows remain in academic medicine after fellowship. Some fellows accept an attending position at the institution where they completed their

fellowship, giving them the opportunity to continue their research. Others accept faculty positions at other academic institutions as members of a research division. There are also positions available in health policy if you opt to do a health services research fellowship. Where you end up really depends on what your research focus was during fellowship. It is important to find a program that will allow you to develop your clinical skills as a faculty member at an institution that has the resources available to fund your research.

Academic vs. community positions

Nearly all EM researchers practice at an academic institution. However, there are a limited number research opportunities within the community setting, including the Clinical Research in Emergency Services and Treatments (CREST) network within the Kaiser Permanente health system, and other regional institutions. It is important to determine what funding revenue streams are available and the scope of research being performed at each institution when considering a career in research in either setting after your fellowship.

IN-DEPTH FELLOWSHIP INFORMATION

Number of programs

There are currently 40 non-SAEM approved sites and 13 SAEM approved sites in the United States and Canada.

Differences between programs

All of the programs will aim to train you to be an excellent researcher in emergency medicine or a multitude of other disciplines. SAEM created a list of fellowships in order to promote standardization of training for fellows, though many excellent programs do not participate in the SAEM review process. There are a number of milestones that institutions must address in curricular elements, faculty support recommendations, and career development opportunities in order to be considered an SAEM-approved site. Fellows will receive a certificate of approval upon completion of a SAEM-approved site. Many programs offer opportunities to obtain an advanced degree including a Master's of Public Health (MPH) or a Master's of Science in Clinical Research (MSCR). Research fellowship programs are often dedicated to a specific area of research while others provide research opportunities in a number of different areas specific to emergency medicine. It is important to visit each institution's web site to determine if there is a specific research focus.

Length of time required to complete fellowship

Research fellowships are 2-3 years in length.

Skills acquired during fellowship

All programs will train fellows to conduct high quality research. In general, research fellowships will include the following components: course work in methodology, biostatistics and content area expertise; direct mentoring from senior research faculty; and practical experience in the form of a fellowship research project. SAEM-approved fellowship programs are required to specifically address instruction in areas including hypothesis generation, research design, data collection methods, data monitoring and interim data analysis, data analysis, presentation of research, project management, ethical aspects of medical research, regulatory requirements, informatics, teaching skills, manuscript submission, and grant submission. Fellows are expected to submit at least one study to the IRB during training. Fellows are also expected to author at least 2 full-length manuscripts and submit a competitive grant application to the NIH or another major national organization for at least \$100,000. It is recommended that clinical hours be restricted to 8 hours per week, and it is required that clinical hours be restricted to a maximum of 12 hours per week. All fellows are required to pursue their research training for 40 hours per week, and programs must guarantee that trainees will have at least 75 percent nonclinical time for at least 2 years.

Typical rotations/curriculum during fellowship

The curriculum is institution-dependent, especially with non-SAEM-approved sites. Generally, the first-year concentrates on didactic coursework working towards a MPH or MSCR, and conducting preliminary work on a research project. The second year focuses on continuing master's coursework and preparing a grant for submission to a federal agency. Fellows also have clinical duties and teaching during their two years. A minimum amount of protected time is set aside for research related academic activities, which is dependent upon each program. Other activities can include fellow seminars, which involve grant proposal discussions and work-in-progress presentations.

Board certification afterwards?

There is currently no board certification for research fellowships, although there is an SAEM-approved fellowship certificate of approval.

Average salary during fellowship

Salary is variable, ranging from a low range approximately equivalent to that of a PGY-4 to a higher range similar to other clinical instructors. Practically this range is between \$55,000 to \$95,000 per year. Most of this variation is driven by the clinical work differences between fellowships. Benefits, tuition, and travel funds vary based on institution.

PREPARING TO APPLY**How competitive is the fellowship application process?**

Research fellowships are not generally thought of as highly competitive. Most applicants who apply end up finding a position but applicants for research fellowships tend to be very accomplished. Fellowships vary in terms of mentorship and structure. It is important to find a research fellowship with good mentors and one that has a structured plan to gain skills in data analysis, manuscript preparation, and grant writing.

Requirements to apply

The only requirement is that applicants are board-prepared or board certified in emergency medicine. Since this is a research fellowship, a demonstrated interest in health services or clinical research, and a commitment to a career in academic emergency medicine is a must. There are no set guidelines in terms of how many publications an applicant needs to be considered competitive, however, it is recommended that the applicant complete at least one research project during residency. Ideally the applicant should have at least one publication in a peer-reviewed journal and at least one poster presentation of their research at a national conference.

Suggested elective rotations to take during residency

The research fellowship is unique because there are no specific rotations to take during residency. It is important to start looking for a research project early in your training, especially if you are coming from a three-year residency. Starting a project on your own and finding a mentor that will work with you may not be time effective given the time it takes to plan, execute, and publish a research project. The best way to mitigate the time constraint of residency is by joining an active project that is already underway within your department. One way to get involved early is by attending research

meetings within your department's research division and finding out what projects are currently active or in the planning process. Another way to get involved is by contacting a mentor within your department that is involved in a research project that may interest you. Joining an ongoing project may have a number of advantages. It enables you to contribute to a project early on in your residency with the potential for your name on a publication and provides an opportunity for you to present your research at a national conference. Working on an existing project can also lead to your involvement in other group projects or allow you to develop a project of your own with a member of your team. Most residencies allow time for research electives in 2-4-week blocks as long you demonstrate that your time off will be spent on a meaningful research project with a mentor.

Suggestions on how to excel during these elective rotations

The research elective is unique compared to other rotations because most of your time is spent alone working on your research project with a mentor. It is important not to fall into the trap of using this time as a second vacation. You should have a clear plan of what you would like to accomplish during your elective and an agenda for each day. Make sure that the faculty member that you will be working with has the time to work with you during your elective and that they understand the goals of your elective as well. This is the time during residency when you can dedicate all of your energy to your research project. However, don't expect to finish your project during this limited time period. Rather, you should use this time on aspects of your project that might require more of your attention. You could also use this time on reporting your research, including writing an article, preparing a poster for an upcoming conference, or completing a manuscript.

Should I complete an away rotation?

Rather than an away rotation, consider a remote collaboration with an experienced researcher involved in an area of emergency medicine research that does not exist at your institution. This is a viable option, particularly if the research does not involve direct patient interaction. Working with a faculty member from another institution can also provide opportunities for future collaborations.

What can I do to stand out from the crowd?

Your application should reflect meaningful involvement in a research project. Performing meaningful research on one or two related projects during your residency rather than on multiple unrelated projects at a cursory level will have more of an impact on your fellowship application and your professional development as a researcher. Meaningful research includes working on the design and implementation of the project, assisting with the Institutional Review Board (IRB) and grant application, presenting a poster at a national conference, and primary or secondary authorship on a peer-reviewed manuscript. Involvement in educational and administrative activities at your institution in addition to your research activities would demonstrate your commitment to a career in academics. Taking on a leadership role within your institution's research track or on the national level with a research committee can reflect positively on your application and show reviewers your potential as a leader in the emergency medicine community. Being a chief resident is not a requirement.

The other thing you may consider is applying for an Emergency Medicine Foundation (EMF) resident research grant to fund your project during residency. Although the funding is modest, this level of commitment and organization demonstrates a skill set that is valuable for future trainees in a research fellowship.

Should I join a hospital committee?

Consider joining a hospital committee if it relates to your research in some capacity. Being on a committee may expose you to faculty members from other specialties that may have similar research interests and provide for future collaborations.

Publications other than research

There are a number of opportunities in emergency medicine to publish including blog posts, book chapters, magazine articles, and podcasts. Contact faculty members in your department who are active in Free Open Access Medical Education (FOAM) to see if there are any opportunities for you to publish articles pertaining to your area of interest. Publishing a case report in a journal or blogpost that relates to your research is also a quick and easy way to add to your resume.

How many recommendations should I get? Who should write these recommendations?

All programs require a letter from either your program director or chair of the emergency department. You should also submit a letter of recommendation from the faculty member with whom you worked the most closely on your research project.

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

Yes, it is possible to return to academics after working as an attending for a couple of years, but it is not easy. Most research fellowships are offered informally, which is easier to obtain when you are in residency when you have daily contact with academicians in the field. Also, it may be hard to go back to a trainee salary once you start making a faculty or community physician salary. If you do opt to work as an attending for a couple of years prior to fellowship, make sure that you stay up-to-date on the latest literature in your field of interest, maintain contact with academicians, and continue to be involved in research to be prepared for returning to academic research and practice.

What if I'm a DO applicant?

There are no restrictions for applicants from a DO residency to apply to a research fellowship in an allopathic program. Ensure that you take all 3 USMLE Step exams before applying.

What if I am an international applicant?

International residents are welcome to apply to research fellowships as long as all program requirements are met and you have passed all 3 USMLE exams. Make sure the programs that you are applying to support your visa prior to applying.

APPLICATION PROCESS

How many applications should I submit?

Only apply to institutions that you are serious about attending. You should start contacting research faculty toward the end of your residency to find out if they are accepting fellows for the coming year. Some programs have a specific research focus that may or may not interest you while others allow for a broad range of potential research topics. It is important to find out what the research focus is at your institution of interest prior to applying and to see if it matches your research interests. There is no specific number of programs to apply to, but having multiple offers to choose from is better than none at all.

How do I pick the right program for me?

You need to find a research fellowship that has a robust research program that matches your interests and goals. Some programs have a specific research focus while others allow for a diverse range of research topics. It is up to you to find out which program represents your research interest and to make sure that they have the money available to fund your research

for the next 2 years. Find out who has graduated from that program in the past, and find out if they are still actively involved in research to get an idea of what you can expect after graduating from the program. This is probably the single most important variable to consider — are past graduates of this program in academic positions? Are they continuing to conduct scientific research? Have they been promoted? Are they funded? Try and get a feel for the faculty, nursing staff, and other fellows in the program during your interview to see if your personality and goals are in-line with theirs. Geography also plays a role in your education, especially if you are planning on relocating your family for the next two years. Make sure you visit the area with your family, if applicable, before committing to any program.

Common mistakes during the application process

Reach out to faculty members who you are interested in working with early in the application process. Make sure you are continuously updating your CV during the course of your residency, and make sure that your CV is complete and accurate. Be honest about your level of involvement on each project that you list on your CV. Make sure to send your CV, letter of interest, and letters of recommendation well before the November 1 deadline. Give faculty writing letters of recommendation on your behalf plenty of time to complete your letters of recommendation.

Application deadlines

The deadline for most programs is November 1 of each year.

Tips for writing your personal statement

Your letter of intent should address why you are interested in a career in research and academic emergency medicine. Use the letter of intent as an opportunity to describe your research in more detail and how you hope to contribute to the practice of emergency medicine on a larger scale. Don't make the mistake of just reciting what is on your CV. Describe how your research has impacted patient care in the emergency department by providing an anecdote that ties your research and patient care together. Your letter should be a mature reflection of what it means to you to work in academic emergency medicine. Do not forget that research is just one aspect of your fellowship training in addition to resident mentoring, which you should acknowledge in your letter as well. Make sure you send your letter to multiple people in addition to your research mentor prior to submission. Consider sending your letter to people outside of medicine as well (Let's face it: Doctors don't always make the best editors).

Is this a match process?

No.

What happens if I don't obtain a fellowship position?

Contact your mentor to review your application to find any deficiencies that might have compromised your admission to a research fellowship the first time around. Talk to your program about staying on for another year in a less competitive fellowship. One year is not enough time to start a new research project, but you might be able to join an existing project with the potential to publish. Use this time to enhance your application and to strengthen your contacts in the research field. This would also be a good time to pursue other interests in EM that you were hesitant to pursue before.

INTERVIEW PROCESS

How do I stand out from the crowd?

The most important thing to remember in an interview is to be yourself. Most interviewers have years of experience interviewing candidates and are quite adept at recognizing insincerity. Try to highlight your strengths as a researcher without appearing too arrogant or self-absorbed. It is important to articulate how the program can help you achieve your goal of becoming a successful researcher while also describing what you can bring to the program. Be realistic in your goals for the next 2 years and discuss what you would like to achieve as a fellow in the research division. Find out as much as you can about the program you are applying to by asking other faculty members in emergency medicine and visiting their website prior to your interview. Find out which faculty are active in the research division and read up on a couple of recent publications in addition to any landmark publications the department might have produced in the past. Be clear about your research goals and talk about which faculty you would be interested in working with to achieve those goals. Go on a couple of mock interviews (with faculty members at your institution) prior to your actual interview with faculty members who have had experience with the fellowship interview process.

What types of questions are typically asked?

Be prepared to explain your research in detail from planning to execution depending on your level of involvement. This shouldn't be problem as long as you were honest in your application about your involvement on a specific research project. You should appear enthusiastic about your projects and the program

where you are interviewing. Make sure you read up on recent developments and publications within your specific research field of interest. You should have a good understanding of what will be expected of you as a faculty member in addition to research. Prepare a list of thoughtful questions that you have about the program that cannot be easily found on their website.

How many interviews should I go on?

There is no specific number of interviews that you should attend when applying for a research fellowship. Only attend interviews at programs that you are really serious about. It is waste of your time and disrespectful to the program interviewing you if are not earnestly considering them to begin with. You should really only be interviewing at programs where you could realistically see yourself staying after fellowship as a faculty member.

PREPARING FOR FELLOWSHIP

Literature to consider reading

- Geyer BC, Goldberg E. Emergency Medicine Research Handbook for Residents and Medical Students. Dallas, TX: EMRA; 2012.
- Bebarta VS, Cairns CB. [Emergency Care Research: A Primer.](#)
- Highleyman L. [A Guide to Clinical Trials.](#)
- Inouye SK, Fiellin DA. An evidence-based guide to writing grant proposals for clinical research. *Ann Int Med.* 2005;142(4):274–282.
- Neill US. (December 2007). [How to write a scientific masterpiece.](#)
- Benos DJ, Kirk KL, Hall JE. (June 2007). [How to review a paper.](#)

Important skills to practice while in residency to prepare for fellowship

Planning for designing a research presentation, presenting research, and writing.

Tips on how to succeed as a fellow

The overall key to a successful research fellow is being able to develop a program that addresses their professional goals in emergency care research, mastering research methodology through didactic study and individual mentorship, becoming proficient in project management, grant writing and submission, and developing an understanding and appreciation for the career track of an academic emergency medicine physician. Start applying for funding as early

as possible before your fellowship starts. Applying early will give you time to reapply if you are rejected on your first attempt. Make sure that your research interests align with your mentor. Formulate a clear plan for postdoctoral funding as you transition from research and fellowship (T & F series) grants to career development grants (R & K series). Join a grant committee through one of the national organizations in order to develop contacts with researchers from other institutions. Finally, participate in a faculty development course which is available through a number of organizations.

CONCLUSION

Additional resources

Journals

This really depends on your specific area of research. We would recommend starting with some of the more common journals in emergency medicine to find out what is “hot” right now in the field of emergency medicine research. General recommendations are:

- NEJM Journal Watch for Emergency Medicine
- JAMA
- Annals of Emergency Medicine
- Academic Emergency Medicine

Clinical Resources/Websites/Blogs

[EMRA Research Committee](#)

[ACEP Emergency Medicine Research Section](#)

[SAEM Research Committee](#)

[Emergency Medicine Foundation](#)

National organizations

Consider joining EMRA’s resident and fellow-run research committee. There are many ways to get involved with the committee, and it’s a great way to connect with other residents interested in EM research. SAEM also offers great mentorship and collaboration for emergency medicine researchers, including trainees.

Conferences

Consider attending the national conferences including ACEP and SAEM. SAEM also has a number of regional conferences that you might consider attending to find out what is going on in your region, present your research, and to make new contacts.

How to find a mentor

The best way to find a mentor is at your home institution early in your residency. Find out which faculty members are active in research either by word of mouth or on your residency program’s website. Contact them to see if they would be willing to have you join an existing project they are working on or assist you in starting a project of your own. If they don’t have anything going on at the moment they might be able to direct you to a faculty member that does. You can also reach out to mentors at other institutions if they are involved in research that you are really passionate about. Make sure to come prepared with questions for your mentor and schedule regular meetings.

Resuscitation Fellowship

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INTRODUCTION

Description of the specialty

A resuscitation fellowship is the perfect opportunity for an emergency medicine physician to gain additional training in critical care without the inpatient responsibilities (and rounding!) that come with a critical care fellowship and working in an intensive care unit (ICU). These fellowships allow for focused clinical and scholarly training to care for the critically-ill patient in the emergency department. Some of the fellowships are research-oriented and offer mentorship and advanced degrees in order to develop fellows as clinician-scholars. Other programs have a stronger focus on building clinical resuscitation skills, especially those skills needed to work in an ED-based ICU. Resuscitation fellowships are best suited to EM physicians who want to maintain a clinical practice solely in the ED with an academic or research emphasis in resuscitation and/or ED-based critical care. The commitment varies from 1 to 2+ years depending on interest in pursuing advanced degrees. This fellowship is non-ACGME board eligible at this time.

History of the specialty/fellowship pathway

The fellowship has evolved from a need for emergency-based resuscitative care. Many EDs have long boarding times for ICU patients, and additional training is desirable to ensure that high-quality “upstairs” ICU care is available “downstairs” in the ED. The ED is also a prime location to enroll patients for resuscitation and critical care research, especially for early treatment of sepsis, cardiac arrest, and trauma. EM clinician-scholars with additional training through a resuscitation fellowship are well-suited to these research opportunities. More recently, some EDs have constructed short-term ICUs based within the department (e.g. the University of Michigan’s Emergency Critical Care Center) to care for critically-ill patients who are anticipated to have rapid

improvement in their clinical status. These patients have a length of stay too long for a traditional ED visit, but can likely be “turned around” fast enough to avoid an inpatient ICU admission, with alternative disposition to the floor or even home. This fellowship provides the additional training that EM physicians need to ensure ICU-level care for these patients.

Why residents choose to follow this career path

Residents choose to follow this career path when they desire to become a resuscitation and critical care specialist within the ED rather than working in the inpatient setting. This pathway is geared toward training to treat high-acuity patients in their initial phase of presentation, before the patient is transferred to the ICU. This is also an opportunity for mentored research focusing on critical care and resuscitation in the ED.

How do I know if this path is right for me?

If your goal is to become better at resuscitation as an EM physician, without the option of working in an ICU, or to become a leader in resuscitation research, then this is the fellowship for you!

Career options after fellowship

Graduates of resuscitation fellowships tend to remain primarily academic and research-oriented. Clinically, graduates work in the ED and in ED-based ICUs. Some graduates take on research positions within the ED and some have administrative roles. Again, as there is no critical care board certification available after fellowship, graduates do not have opportunities to work in inpatient ICUs.

Academic vs. community positions

There is always the option of a community position, but historically this fellowship has appealed more to residents seeking academic positions. This fellowship also has the potential for hybrid careers, such as consulting and administration.

IN-DEPTH FELLOWSHIP INFORMATION

Number of programs

There are a limited number of fellowship programs, but the field is continuing to grow. Current programs are:

Research focus

[University of Pennsylvania](#)

[Virginia Commonwealth University](#)

[Beth Israel Deaconess Medical Center](#)

[University of Illinois at Chicago](#)

Clinical focus

[Stony Brook University Hospital](#)

Differences between programs

As noted above, programs generally have either a research or a clinical focus. Each program has crossover, though, and some have more than others. All programs will train you to be an excellent resuscitation clinician and scholar. There is variation in clinical curriculum among the programs in terms of the number and types of electives offered, ICU experiences available, and ED clinical shifts required. Location of the fellowship program inevitably results in some variation of patient disease processes encountered; emphasis placed on research (or particular research areas) and administrative activities will differ as well.

Length of time required to complete fellowship

Resuscitation fellowships are 1-2+ years in length. The duration often depends on whether or not the fellow pursues an advanced degree in research.

Skills acquired during fellowship

Programs with a clinical focus will train you to provide high-quality care to critically-ill patients in the ED. Fellows become masters of resuscitation, capable of providing advanced life support from a patient's initial presentation until transfer to the ICU. Through didactic sessions and clinical training, fellows obtain in-depth knowledge about the pathophysiology, clinical presentation, and treatment of disease states that lead to life-threatening illnesses. Technical skills obtained during residency are refined, and fellows learn new procedures and undergo advanced ventilator training. For those programs with research training, fellows have specialized mentoring, protected time for scholarly work, and the opportunity to pursue advanced degrees in research. Each program's emphasis on research vs. clinical training is different, and it is important to contact each program to know where the emphasis lies in their fellowship curriculum.

Typical rotations/curriculum during fellowship

Rotations and curriculum vary by program. Programs focused on research have less clinical training, but they may offer advanced physiology/basic science or biostatistics/research methods courses. Programs focused on clinical resuscitation training have rotations in the ED and ICUs.

Board certification afterwards?

No.

Average salary during fellowship

Salary varies across programs. Some programs pay PGY-4, 5, and 6 salaries, and some pay adjusted attending-level salaries that are tied to ED clinical hours and responsibilities during the fellowship.

PREPARING TO APPLY

How competitive is the fellowship application process?

There is not a lot of information available about acceptance rates for specific programs or the fellowship in general. Applications are made directly to the programs themselves and there is no formal match process governing applications, thereby limiting data availability. Given the limited number of programs, the process may be fairly competitive. Theoretically, however, competition may also have dropped in recent years as increased opportunities for EM physicians to pursue critical care fellowships have likely divided the applicant pool.

Requirements to apply

The only requirement to apply is that applicants must complete an EM residency. Most programs request a letter of interest and curriculum vitae via email to initiate the conversation with the fellowship program director. Letters from or contact information for references will likely be requested at some point in the application process as well.

Research requirements

Research experience, especially that pertaining to critical care in the ED, is highly recommended to increase competitiveness of an application. This is especially the case for fellowships with a research focus, as prior interest, presentations, and publications are seen as predictors for future success in fellowship.

Suggested elective rotations to take during residency

There are not any specific requirements, but critical care rotations in the medical, cardiac, surgical, or neurological/neurosurgical ICUs would be very beneficial prior to starting this fellowship. Rotations with the trauma and burn surgery services are also likely to be useful.

Suggestions on how to excel during these elective rotations

Make sure that you are well-read about the fundamentals of critical care and are also up to date on the latest research in the field. You should plan to arrive early, stay late, and be a dependable team member. Make it a point to know all the patients on the service well, including their primary disease process and current critical care issues. During rounds, your presentations should be polished, thorough, and medically sound. Rather than just reporting information, your presentations should also include your interpretation of data and recommended management plan. You should update families without being asked and adeptly coordinate care for the patients with other specialties as indicated. Make it a point to lead the team during resuscitations in the ED and ICU, and be proficient with your procedural skills.

Should I complete an away rotation?

It may be possible to rotate at a program that has a resuscitation fellowship in order to see what the fellows do, but this is not necessary and could be logistically difficult to arrange. A discussion with current fellows (or recent graduates) via phone, email, or in person at a conference would likely be just as useful if you are considering an application to the program.

What can I do to stand out from the crowd?

Your application should demonstrate meaningful activities in resuscitation and critical care. It is better to have a couple projects that you have significant involvement in rather than multiple projects where your role is superficial. A common theme among your activities, such as administrative, educational, or research, is recommended instead of having a smattering of projects. Show evidence of leadership and a self-starter mentality. Create strong relationships with mentors who will be able to write you robust letters of recommendation. A strong performance in residency, where you are seen as a hard and enthusiastic worker, will set you up for success as a fellow.

Should I join a hospital committee?

If your hospital has committees that are focused on critical care, joining one is worth considering. The goal would be to have meaningful involvement in the committee with resulting positive impact on patient care, such as through a quality improvement project. These committees can potentially expose you to leaders in critical care within your hospital, and may lead you to your future letter writers. Examples of relevant committees that many hospitals have are: resuscitation, trauma, and critical care quality improvement committees.

Publications other than research

Other opportunities include, but are not limited to, book chapters, blog posts, magazine articles, and podcasts. Remember that there are avenues for publication through other disciplines beyond EM, as critical care can involve physicians from internal medicine, surgery, neurology, neurosurgery, or anesthesia, and each of these specialties has their own publications.

How many recommendations should I get? Who should write these recommendations?

Like applications for most fellowship programs, you will need the support of your residency program director. Applications are individualized by fellowship program, however, so the application process is largely self-directed. Contact programs early to learn more about their specific application requirements and to allow for sufficient time for letter writers.

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

Yes, but you need to make this time after residency valuable. Get involved in writing and research in critical care and resuscitation. Join a critical care committee at your hospital. Become involved in national critical care organizations. Make sure you have a critical care mentor who will help ensure that you make this time productive and demonstrate your interest in critical care.

What if I'm a DO applicant?

There are no special requirements for DO applicants.

What if I am an international applicant?

You will need to demonstrate the same requirements and interest as other applicants, including taking USMLE. The biggest challenge will be getting programs to support your visa. It would be best to ask programs about this prior to applying to see if accommodations could be made.

APPLICATION PROCESS

How many applications should I submit?

There are limited programs available, but you should only apply to those places where you would honestly consider working as a fellow.

How do I pick the right program for me?

Your goal is to find a program that has access to a critically-ill patient population, exposure to different critical care environments in which you can apply your resuscitation skills, a curriculum that matches your needs, and mentorship that suits your academic interests and goals. For research-focused programs, access to mentors in your area of interest, availability of sustained funding, and opportunities for advanced degrees are also important.

Common mistakes during the application process

Start early! This application process is self-directed, and you will need to contact program directors and fellowship leadership to facilitate further interest. Also, be clear with yourself and with the programs about why you are seeking to do this fellowship and how you see it adding to your residency training and benefitting your future career.

Application deadlines

As there is no match, there is no universal application deadline. However, starting in the latter half of your second-to-last year of residency will give you ample time to contact programs, develop relationships, and gather all application materials on time.

Tips for writing your personal statement

Your personal statement should address why you are interested in resuscitation and research. The best personal statements tell a story and have something unique/interesting that sets you apart from the pack. Keep a list of interesting critical care cases during your residency, as these can serve as inspiration for your personal statement. Do not regurgitate what is already listed on your CV; rather, your personal statement should be a mature reflection on what it means to you to become a resuscitator. Let your personality show through, and display yourself as thoughtful, intelligent, and insightful. Remember to send your personal statement to multiple people to help edit and fine-tune your masterpiece.

Is this a match process?

No.

What happens if I don't obtain a fellowship position?

You will need to evaluate your application, preferably with someone who is either involved in or has recently graduated from such a fellowship, to look for deficiencies. Spend the next year addressing those deficiencies and practicing your interview skills. Do not be afraid to re-apply. Consider pursuing other fellowship opportunities, such as medical education or research, which would strengthen your overall application.

INTERVIEW PROCESS

How do I stand out from the crowd?

Your goal in the interview process is to come off as a strong candidate. You want to highlight your strengths and things you can add to the program without being too pompous, aggressive, or self-absorbed. Supply good reasons about why you want to attend that specific program. The more you know about the program, the better the impression you will make. Find out as much about the program as you can, and treat it as if it is your top choice. Articulate not only how that program can help you achieve your career goals, but also what you can bring to the program. Hold a mock interview prior to the actual interviews to ensure that you present your best self. The goal is to be yourself and let your personality shine. Show your passion for resuscitation and critical care medicine, and demonstrate what you can bring to the program of interest. Remember, these are small programs; you will need to impress upon leadership that you are a good team player who will contribute to the group.

What types of questions are typically asked?

Be prepared to discuss your interest in critical care and resuscitation within the pre-hospital setting and ED, as well as your career goals. You will likely be asked to recount specific experiences during your residency training. You will also be expected to demonstrate that you have good clinical knowledge and understanding about the field. Know some of the "hot topics" within the field, such as therapeutic hypothermia and sepsis. Additionally, know your application inside and out because questions about your leadership experience, publications, and research projects are all fair game. Be prepared to discuss your research projects as if

you were presenting an oral poster presentation. Not knowing your research makes it seem as though you played a superficial role. You should be enthusiastic about your projects, critical care, and the program where you are interviewing. Have an idea about what type of position you are aiming for after fellowship (e.g. funded independent researcher or clinical resuscitation expert in an academic ED). Be prepared with a list of questions to ask about the program. These questions should be thoughtful and not something easily answered by the institution's website.

How many interviews should I go on?

There is no recommended number of interviews that you should attend. Because of the competitive nature of this fellowship, the general advice is that the more interviews you attend, the more likely you are to obtain a position. Ideally, you should attend any interview offered at programs where you would seriously consider accepting a fellowship position.

PREPARING FOR FELLOWSHIP

Textbooks to consider reading

- Vincent JL, Abraham E, Kochanek P, Moore FA, Fink MP. Textbook of Critical Care. 6th ed. Philadelphia, PA: Saunders; 2011.
- Gabrielli A, Layon AJ, Yu M. Civetta, Taylor and Kirby's Critical Care. 4th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2008.
- Marino PL. The ICU Book. 4th ed. Philadelphia, PA: Wolters Kluwer Health/Lippincott Williams & Wilkins; 2014.
- Yealy DM, Callaway C. Emergency Department Critical Care (Pittsburgh Critical Care Medicine). New York, NY: Oxford University Press; 2013.
- Tobin MJ. Principles and Practice of Mechanical Ventilation. 2nd ed. New York, NY: McGraw-Hill; 2006.
- Levitov A, May PH, and Slonim AD. Critical Care Ultrasonography. 2nd ed. New York, NY: McGraw-Hill; 2014.
- Deutschman CS and Neligan PJ. Evidence-Based Practice of Critical Care. 2nd ed. Philadelphia, PA: Elsevier; 2016.

Important skills to practice while in residency to prepare for fellowship

- Procedural skills including (but not limited to) central line insertion, arterial line placement, intubation, thoracentesis, and paracentesis

- Ultrasound skills, especially echocardiograms and lung exams
- Leading a team and managing multiple sick patients
- Leading medical and trauma resuscitations, including codes
- Ventilator management
- Management of non-invasive positive pressure ventilation
- Application of targeted temperature management and sepsis protocols

Tips on how to succeed as a fellow

Read to gain understanding of fundamental critical care topics as they apply to care in the ED, as well as landmark and recent articles in high-impact journals that focus on resuscitation and critical care. Work hard during your clinical shifts, and strive to be the best physician that you can possibly be. Try to build relationships with physicians and other staff members (e.g. advanced practice providers, pharmacists, and respiratory therapists) in the ED and the ICUs in order to create opportunities for mentorship and collaboration, as well as promote teamwork between disciplines.

CONCLUSION

Additional resources

Journals

Circulation
Resuscitation
NEJM
Chest
Journal of Trauma
Anesthesiology
Critical Care
Critical Care Medicine
Intensive Care Medicine
JAMA
Lancet
American Journal of Respiratory and Critical Care Medicine
Annals of Emergency Medicine
Academic Emergency Medicine
Shock
Therapeutic Hypothermia and Temperature Management

Podcasts

[EMCrit](#)
[iCritical Care podcast by SCCM](#)
[Intensive Care Network](#)
[Medscape Critical Care podcast](#)
[Critical Care Perspectives in EM](#)
[RAGE podcast](#)
[ICU Rounds](#)
[Crit IQ](#)
[ED ECMO](#)

Clinical Resources/Websites/Blogs

[SCCM Learn ICU](#)
[Thinking Critical Care](#)
[Intensive Care Network](#)
[Maryland Critical Care Project](#)
[Critical Care Reviews](#)
[Life in the Fast Lane](#)
[Pulm CCM](#)
[The Bottom Line](#)
[Deranged Physiology](#)
[Resus.me](#)
[R.E.B.E.L. EM Critical Care](#)
[ATS](#)

National organizations

EMRA has a Critical Care Division that is a great resource, is resident- and fellow-based, and offers multiple opportunities for involvement. ACEP also has a Critical Care Section that connects EM physicians who are interested and/or trained in critical care medicine. SAEM has a growing Critical Care Interest Group as well.

Other organizations to consider:

- American Heart Association (3CPR Council)
- ACCP
- ATS
- EAST
- SCCM (has an EM Section)
- European Resuscitation Council (ERC)

Many of these organizations offer discounted membership rates for residents and fellows. Often, residents and fellows are also desirable members of committees.

Conferences

The EMRA Critical Care Division has biannual meetings at ACEP and CORD. The Critical Care Section of ACEP has annual meetings during the scientific assembly. SCCM has annual meetings in the winter. There are multiple other meetings, including the following:

- Resuscitation Science Symposium (ReSS) at the American Heart Association Scientific Sessions
- SMACC Conference
- University of Maryland Medical Center Critical Care Conference
- Weil/UC San Diego Symposium on Critical Care and Emergency Medicine
- Northern New England Critical Care Conference
- Rocky Mountain Regional Critical Care Conference
- Chest Annual Meeting (American College of Chest Physicians)
- American Thoracic Society Conference
- Extracorporeal Life Support Organization Conference. Training courses and workshops also offered.

How to find a mentor

Within your home institution, your program director will likely be able to guide you towards both local and national mentors. Establishing good relationships with the intensivists on your critical care and trauma rotations may also help facilitate introductions. Attending organized medicine conferences, such as SAEM and ACEP, and meeting people presenting resuscitation research will further help with networking. Additionally, there are young investigator events at the American Heart Association Resuscitation Science Symposium and other conferences. The Critical Care Section of ACEP and the EMRA Critical Care Division also have programs to link you with mentors in critical care. Joining relevant committees within national organizations or attending section meetings at national conferences are also opportunities to network. You should establish a mentor early during residency and do your part to foster this relationship by bringing questions and scheduling regular meetings. Search out feedback from your mentor and apply it. Given that there are few resuscitation fellowship programs, each of which only accepts 1-2 fellows annually, this is a small community. Try to reach out to program leadership or graduates of the programs to inquire about mentorship in resuscitation care and research.

Simulation Fellowship

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INTRODUCTION

Description of the specialty

Medical simulation is an educational technique that can bridge gaps within traditional education and training approaches through the safe, structured fostering of medical knowledge, decision-making, procedural skills, teamwork, and communication.¹ Health care simulation as a specialty is guided by 4 main purposes: education, assessment, research, and patient safety.² Simulation can be as extensive as virtual reality surgical simulators for fine technical skills, computer-based avatars and virtual patients for decision-making skills, or as straightforward as using actors with standardized patients for communication skills. A key component of this method of teaching is to promote safe learning environments where technical and non-technical clinical skills can be taught, assessed, and reviewed with participants in order for them to apply the lessons learned and skills acquired to real patient care.²

Currently, simulation is formally used in most core health care fields (e.g., emergency medicine,⁶ internal medicine,¹⁰ OB/GYN,¹¹ surgery, and anesthesiology¹² training programs) and by the full spectrum of medical professionals, including medical and paramedical providers,⁹ nurses and nursing assistants,⁸ physicians, and advanced practice providers,⁷ among others. The broad applications of simulation have led to an increase in the number of simulation centers in the United States, with more than 1,000 as of 2016.¹²

History of the specialty/fellowship pathway

Simulation as a method of training has been documented since the 6th century, but the most direct antecedent of simulation for modern medical education lies in aviation.¹³ U.S. military aviation accidents in the 1930s led to the armed forces' acquisition and deployment of flight

simulation trainers to decrease the frequency of these disasters.¹⁴ In the clinical realm, CPR training mannequin development followed in the 1960s, and the importance of these devices to train people in potentially lifesaving CPR skills was the catalyst for modern medical simulation.¹⁴ Simulation in medical education advanced rapidly after the Institute of Medicine's 1999 report, *To Err is Human*, outlined the value and need for interdisciplinary training to improve patient care and safety. The 1990s saw the rise of simulation-focused conferences,¹⁴ and the 2000s were the starting point for simulation fellowship training programs across the United States and internationally. The Society for Simulation in Healthcare, an international organization supporting the community of interprofessional simulation educators, was formed in 2004.

Why residents choose to follow this career path

Health care simulation is a field for those interested in the intersection of patient care, medical education, systems improvement, and technology.

How do I know if this is right for me?

Someone interested in a career in simulation education should anticipate working with learners at different training/practice levels (e.g., undergraduates, professional students, active clinicians, and experts) from a variety of disciplines across numerous settings (e.g., community practice, hospital-based, medical, and nursing schools).

Someone interested in simulation education should be ready to serve as an educator, as well as an administrator. This can mean involvement with institution-wide committee strategic planning and small-scale operational management (e.g., business plans, cost analysis, and budgeting) to ensure proper functioning and stability of the center.¹⁵

Career options after fellowship

Simulation is a rapidly expanding, new field with many career opportunities. Many new or expanding simulation centers seek faculty for administrative, education, or research positions at junior and senior levels. For this reason, many former fellows from simulation fellowship programs are now simulation center directors across the country. Graduates may be offered academic/educator positions at an established institutional simulation facility or newly established training positions in traditional and/or emerging fields and specialties.

In general, a career in medical simulation will primarily involve direct education and hands-on training of learners, along with curriculum creation and implementation for different disciplines, experience

levels, and needs. Moreover, there are individuals working in private industry (e.g., educational companies, technology companies, and insurance companies) as simulation center directors and health educators.¹⁶

Splitting time between departments

EM-based simulation fellows usually split their time between their simulation work and emergency medicine clinical duties. While some programs require their simulation fellow to work as an emergency physician in an affiliate site, other programs require participation only in simulation education related activities, with optional clinical duties¹⁷; some facilities offer observational fellowship arrangements without clinical duties.

Academic vs. community positions

Depending on the setting, responsibilities, learner cohort, and curricula will vary. Some simulation centers will be more focused on credentialing, task training, and team training, and others will devote a considerable amount of time to graduate medical education, medical student training, and/or research. These distinctions, however, are not based solely on community versus academic training affiliations, as evidenced by the creation of a validated national simulation curriculum by the Veteran's Affairs Health System.¹³

IN-DEPTH FELLOWSHIP INFORMATION

Number of programs

As of early 2016, there were at least 30 U.S. programs offering fellowships in EM-based medical simulation.^{17,18} For details including contact information, visit the [EMRA Simulation](#).

Committee website. Programs include:

[Alpert Medical School/Brown University](#)

[Austen BioInnovation Institute in Akron/Summa Health System](#)

[Center for Medical Simulation/Harvard Med](#)

[Children's Hospital of The King's Daughters/Eastern Virginia Medical School](#)

[Cincinnati Children's Hospital Medical Center \(Pediatric Simulation\)](#)

[Dayton Veterans Affairs Medical Center](#)

[Durham Veterans Affairs Medical Center](#)

[Georgetown University](#)

[Hennepin County Medical Center](#)

[John H. Stronger of Cook County Hospital](#)

[Johns Hopkins](#)

[JUMP Simulation Center/University of Illinois College of Medicine at Peoria](#)

[Mayo Clinic Arizona](#)

[Mayo Clinic Florida](#)

[Mayo Clinic Minnesota](#)

[Mount Sinai Hospital \(STAR Center\)](#)

[New York Presbyterian at Queens](#)

[New York Simulation Center for the Health Sciences \(NYSIM\)](#)

[Northwell Health/North Shore University Hospital](#)

[North Florida/South Georgia Veterans Affairs Medical Center](#)

[North Shore University Health System/University of Chicago](#)

[NYC Health and Hospitals Simulation Center](#)

[OhioHealth](#)

[Penn State Hershey Clinical Simulation Center](#)

[Pittsburgh Veterans Affairs Healthcare System](#)

[Providence Veterans Affairs Healthcare System](#)

[St. Luke's-Roosevelt Hospital](#)

[Stanford School of Medicine](#)

[STRATUS Center for Medical Simulation/Brigham & Women's/Harvard](#)

[SUNY Downstate/Kings County Hospital](#)

[The Children's Hospital of Philadelphia/University of Pennsylvania \(Pediatrics\)](#)

[U.S. Department of Veterans Affairs](#)

[University of Arizona College of Medicine — Tucson](#)

[University of California, Davis](#)

[University of California, Irvine](#)

[University of Illinois at Chicago](#)

[University of Minnesota](#)

[University of Texas at Southwestern](#)

[University of Wisconsin](#)

[Vanderbilt University](#)

[Yale University/New Haven Hospital](#)

Differences between programs

Simulation fellowships vary in their curricula, background and needs of learners, extent of research and administrative opportunities, and options to obtain certification or an advanced degree. Some programs will strongly emphasize research, employ a strict fellowship curriculum, have a specific cohort of learners, and/or offer advanced degree(s) or certification opportunities, etc.

Length of time required to complete fellowship

Fellowships range from 1-2 years, with a typical start date of July 1. Most 2-year programs encourage or require the pursuit of advanced degrees, such as a Master's in Education. Moreover, programs may provide funding for a Certificate of Teaching and Learning with a concentration in health care simulation (eg, through the MGH Institute for Health Professions²⁶ or participation in the ACEP teaching fellowship).

Skills acquired during fellowship

The skills developed during fellowship will vary depending on the focus, requirements, and the exposure provided by the program. The knowledge and skills acquired during fellowship will likely be a combination of curriculum development expertise, technical skills, appropriate task trainer and/or mannequin utilization, moulage application, debriefing techniques, academic research methods, the fundamentals of simulation program administration/operations, etc. Graduating simulation fellows should be able to coordinate and conduct simulation courses, capably operate high-fidelity simulators, perform reliable and meaningful learner assessments, debrief proficiently, and have been reported to do so the majority of the time halfway through fellowship.²⁰

Typical rotations/curriculum

Most simulation fellowship training programs focus on teaching skills, educational theory, curriculum development, simulation center logistics, and research.^{17,26,28}

The majority of education occurs experientially through planning, coordinating, organizing, participating in, leading, and debriefing simulation activities; receiving feedback from faculty members and simulation technicians; and participating in operations meetings. Programs may incorporate *in situ* simulation within their fellowship curricula, which involves coordinating and implementing a simulation inside the hospital or affiliated clinical setting.

Board certification afterwards?

There is no American Board of Medical Specialties (ABMS) board certification process for simulation; however, the Simulation Society in Healthcare (SSH) offers accrediting standards for simulation centers and examinations for simulation educator certification at basic and advanced levels. These certifications are the Certified Healthcare Simulation Educator programs. (<http://www.ssih.org/Certification/CHSE>)

) Additionally, there are multiple fellowships that provide certificates or master's degrees in medical education through a variety of academic affiliated institutions.

Average salary during fellowship

Salaries during fellowship may vary each year, based on applicant post-graduate year and/or fellowship program funding.

PREPARING TO APPLY

How competitive is the fellowship application process?

As there is no universal match process for simulation fellowships, there are limited data regarding their fill rate.¹⁹ A survey of 9 programs revealed that 78% of them had a 100% fill rate for the past 3 years.

Requirements to apply

Although there are no specific or standardized academic requirements, per se, many simulation fellowships may require a description of your teaching and research background and future goals within your cover letter.^{17,18} Additionally, some programs will require acceptance into an advanced degree program prior to application or expect the applicant to enroll in a master's degree program upon acceptance into fellowship.^{19,38}

Research requirements

Research relevant to the application may include ongoing studies, projects undergoing data analysis, or manuscripts in preparation. If you have not performed simulation research, you may be able to reference medical education projects, simulation cases or curricula, or medical teaching experiences.

Suggested elective rotations to take during residency

There is no requirement for simulation rotations prior to fellowship application, but electives at your home institution in simulation or education may help to support your application for a simulation fellowship. Fellowship programs commonly offer a 2- or 4-week elective in their simulation center,²⁶ but these are generally not advertised. One can be arranged by directly contacting the simulation center or fellowship director. Participating in this type of elective increases your exposure to simulation, broadcasts your investment and interest in the educational modality, and introduces you to potential programs of interest.

Suggestions on how to excel during these elective rotations

If you choose to participate in a simulation rotation, you can excel by being enthusiastic and engaged in the rotation, meeting and exceeding elective expectations, proactively engaging in simulation sessions, and participating in the development and implementation of simulation curricula and research programs. Prior to beginning the rotation, discuss with the director his or her expectations: which activities he or she thinks you would benefit from participating in; if they want you to write and/or program a case; with whom they would like you to work. During your elective, you may help run a program from behind the scenes.

Should I complete an away rotation?

Away rotations may familiarize you with potential programs, show your commitment to a geographic area, or provide you with simulation-related methods and experiences that you may not have been previously exposed to.

What can I do to stand out from the crowd?

In a survey among simulation fellowships, directors reported research methodology and scholarly writing as the most desired competencies (57% and 48%, respectively).²⁰

Should I join a hospital committee?

Your home institution may have simulation committees, simulation interest groups, or other educational/training entities that host simulation events, and being active in these venues will provide opportunities to enhance your application. Participating in committees that address CPR, cardiac arrest, credentialing, quality management, and patient safety may be especially helpful in exposing you to the interdisciplinary nature and collaborative efforts associated with institutional simulation efforts.

Publications other than research

In addition to research publications, there are several other ways to generate academic deliverables. You can develop and implement a simulation case at your institution, which can be submitted to the [AAMC's MedEdPORTAL](#).

. You can work with faculty or fellows to develop a simulation-enhanced curriculum (e.g. for toxicology or procedural training). After implementation, consider submitting the project as an abstract to a regional or national conference. If your institution hosts regional or national simulation workshops, volunteer to assist.

How many letters of recommendations should I get? Who should write these recommendations?

Simulation fellowship programs typically request 2-3 letters of recommendations during the application process¹⁸; many programs request one from the applicant's program director.^{18,40} Others specify letters of recommendation from the applicant's clinical department, medical education faculty, and/or simulation professionals.^{18,41}

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

Fellowship programs typically accept board-eligible or board-certified emergency medicine residency graduates. If you have worked as an attending, you are likely eligible for the fellowship. How competitive you are as a candidate will depend on your teaching and assessment background, academic and research work, personal qualities, and letters of recommendation, similar to a pending residency graduate.

What if I'm a DO applicant?

Some programs accept DO candidates only if they have completed an ACGME-accredited emergency medicine residency;^{18,29,56} other programs accept DO candidates without ACGME accredited training. Contact the fellowship program's coordinator or director for clarification.

What if I'm an international applicant?

There are several programs that accept international applicants if no qualified U.S. citizens apply.^{17,18} At a minimum, international applicants are required to demonstrate appropriate English language abilities and be able to obtain a work visa (H-1B or J-1) or have U.S. resident status/citizenship. Non-clinical (observational) simulation fellowships may have alternative arrangements.

APPLICATION PROCESS

How many applications should I submit?

The number of places you should apply to depends on the geographic area you are interested in (and the number of programs within those geographic areas). There has been no standard recommendation published and there is a dearth of data to specify the precise number of fellowship programs to be applied to.

How do I pick the right program for me?

Assess each program with respect to how well it matches your simulation interests, academic and career objectives, and personal goals. Consider the history

of the fellowship, length of the program, simulation and clinical environments, exposure to different types of learners, simulation faculty, fellowship curriculum, research support, work schedule, and other lifestyle factors.

Common mistakes during the application process

It is important to follow each program's specific application requirements. Make sure to read each program's application directions and inquire when specific requirements are not listed or readily accessible. Proofread your CV and cover letter multiple times prior to submitting your application to each program. Address any gaps during residency or time spent after residency prior to fellowship application. Ensure your cover letter is directed to the program to which you are applying and the header lists the correct recipient's name and information. Submit your application before the listed deadline; if the deadline is rolling, consider submitting in September through October to have adequate time for the program to review and potentially extend an offer to interview. The simulation community is small; always speak positively about any other programs or centers that may be mentioned during the interview process. Follow up your interviews with an appreciative email or letter and include any follow-up questions.

Application deadlines

The application timeframe for simulation fellowships varies widely. Some programs begin accepting applications as early as July 1, with deadlines as early as September 1 and as late as May 1. Some programs have fixed application deadlines, with interviews offered only after all applications are received, whereas others accept and offer interviews and positions on a rolling basis.

Tips for writing your personal statement

Many programs would like to know about your professional interests, career goals, what attributes you bring to the program, and why you are interested in their particular program. Be specific; you want to emphasize your unique qualifications that make you a good candidate for their fellowship position. Illustrate your experiences in simulation and how they demonstrate your dedication to the field. Moreover, you want to describe your ultimate goals upon graduating from their simulation fellowship.

Most importantly, you want to keep your cover letter professional and well-written. Use spell-check. You may even want a non-medical person to review the letter for simple grammatical errors. Have a mentor or residency program director review the letter prior to submission.

Is this a match process?

No.

What happens if I don't obtain a fellowship position?

Most fellowship programs offer positions from October through January. If you do not receive a fellowship offer, you should continue to apply for other fellowships or other positions as an emergency physician.

INTERVIEW PROCESS

How do I stand out from the crowd?

Prior to your interview day ensure that you are well-rested. If provided your interview schedule, review the faculty included in your interview day; knowing something about their history or research will give you topics to discuss during the interview. Prepare questions to ask each interviewer. Be knowledgeable and ready to speak of/elaborate on any information listed within your curriculum vitae and cover letter. Avoid asking questions that you can find on their website or previously provided information.

What types of questions are typically asked?

Many interviews will start with, "tell me about yourself." Be ready with a quick spiel introducing yourself to the interviewer. This can include your hometown, medical school, and residency. You can briefly describe your interest in simulation and how you pursued it during residency; the synopsis could be rounded out with a discussion of your specific interests and how they fit into their simulation fellowship program.

How many interviews should I go on?

There is limited information regarding the number of interviews that a medical simulation fellowship applicant should schedule. You should consider the number of positions offered by each fellowship, if there were unmatched fellows in previous years, and the competitiveness of your application. We suggest you attend three to five interviews to increase your likelihood of a fellowship offer.

PREPARING FOR FELLOWSHIP

Textbooks to consider reading

- Levine A, DeMaria Jr. S, Schwartz A, Sim A. The Comprehensive Textbook of Healthcare Simulation. 2nd ed. New York, NY: Springer New York Heidelberg Dordrecht London; 2014.
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Important skills to practice while in residency to prepare for fellowship

The most important and relevant skill to develop for a simulation fellowship during residency is excellence in the clinical setting. Do not underestimate the value the rest of your training will have on your simulation career. For example, the more you know and understand with regard to the performance of clinical procedures, the better you will be able to break down the skills in a meaningful way to effectively help novices learn them and experts master them.

Tips on how to succeed as a fellow

Part of your time in fellowship will most likely be dedicated to a project, with a goal of publication. However, not everyone is able to publish following fellowship, and a potential lack of mentoring combined with limited time in the program can affect this outcome.⁴⁴ Who your mentor is may be more important than the topic of the project.⁴⁵ Keep these in mind as you select a program to ensure that you choose one with a lot of mentorship, as well as one that has experience in completing and publishing fellowship projects.

While there is not yet strong evidence regarding factors associated with a successful simulation fellowship, there are many general advice articles from other medical and surgical fellowships.⁴⁶⁻⁴⁷ These articles recommend choosing programs with areas of focus aligned with your career goals⁴⁶, obtaining formal training in research methods, and ensuring you are the lead researcher and first author on your fellowship research project.⁴⁷ It has also been suggested that fellows develop and pursue research questions that may become more feasible over time, and are vigilant of and apply for funding opportunities within and outside of your department.⁴⁷

Success in fellowship will also be based upon experiences you have had in simulation training. The larger the variety of simulation modalities you experience, and the higher the quality of those experiences, the easier it will be to adopt them into your own simulation scenarios in the future.

CONCLUSION

Additional resources

[ALiEM](#)

[BMJ Careers](#)

[MedEdPORTAL](#)

National organizations

[Society for Simulation in Healthcare](#)

[SAEM Simulation Academy](#)

Conferences

Annual Association for Simulated Practice in Healthcare Conference

Annual Association of Standardized Patient Educators Conference

Australian Simulation Congress

Dutch Society for Simulation in Healthcare

International Meeting on Simulation in Healthcare

International Pediatric Simulation Symposia and Workshops

Meeting of the Society of Europe for Simulation Applied to Medicine

Ontario Simulation Exposition

Simulation Technology and Training Conference

SAEM Annual Meeting

How to find a mentor

The best place to start is at your own institution. Talk to the people who run simulation education sessions for your residency program. If you are at a medical school, you can also talk to the people who run the standardized patient encounters. Look into who runs the Advanced Cardiac Life Support classes or nursing education, as they may know of someone who has done simulation leadership training. Anyone who has gone through a simulation fellowship or who is now in a leadership position in simulation will be a great resource to guide you through the process and to give you opportunities to explore the field and determine if this is right for you.

You can also reach out to the SAEM Simulation Academy, the EM Section of the Society for Simulation in Healthcare (SSH), or the EMRA Simulation Committee. Many of these groups have members who are willing to help mentor residents as they explore this new and exciting field.

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Primary Care Sports Medicine (PCSM) Fellowship

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INTRODUCTION

Description of the specialty

Sports medicine (SM) physicians provide care for injuries sustained both on and off the athletic field. Prior to the creation of this specialty, most musculoskeletal injuries were cared for by orthopedic surgeons; however, most athletic injuries are non-operative and frequently include general medical complaints as well as traumatic brain injuries. Therefore, the medical care of athletes may exceed the knowledge and scope of any one specialist and requires a generalist approach for appropriate care. The Primary Care Sports Medicine (PCSM) subspecialty was designed to meet this need.

History of the specialty/fellowship pathway

The PCSM fellowship is available to family medicine, internal medicine, pediatrics, emergency medicine (EM), and physical medicine and rehabilitation physicians. It was certified by the American Board of Medical Specialties (ABMS) in 1992, and since 1993 a written examination for board certification has been administered by the American Board of Family Medicine. It is one of 9 ABMS accredited fellowships available to EM physicians.¹

Why residents choose to follow this career path

Residents who choose this path often have an interest in athletics and caring for active people of all ages. Like others, the sports medicine fellowship expands your knowledge base in a niche of emergency medicine: diagnosing and managing musculoskeletal complaints. Completion of this fellowships offers a unique opportunity to have a diverse career in both the emergency department and the outpatient setting.

How do I know if this path is right for me?

If you have an interest in sports and athletic events, consider an elective with a sports medicine physician (ideally EM sports medicine physician or fellowship faculty if available) and/or moonlight/volunteer to cover sporting or mass participation events in your area. If you participate in such electives/events and cannot imagine your career without this patient population, then this may be the fellowship for you.

Career options after fellowship

EM sports physicians have a variety of career paths available to them, and there are multiple ways to combine an EM and SM practice whether working in an academic or private practice. Sports medicine is a rewarding niche in emergency medicine with many opportunities for education, research, writing, publications, and participation in regional, national, and international organizations and committees. EM sports physicians have become team doctors for many sports teams at all levels of competition, including high school, collegiate, professional, and Olympic sports, as well as leaders in national sports organizations. They may also participate, organize and lead medical teams at mass participation and endurance events such as marathons.

Splitting time between departments

Emergency sports physicians often combine their clinical practice and are able to spend part of their time working in an emergency department and part of their time in a sports medicine clinic. They are able to manage non-operative musculoskeletal complaints as well as general medical conditions and minor head injuries in athletes. However, while not as common, it is possible to practice either specialty exclusively.

Academic vs. community positions

Both academic and community positions are available to EM sports physicians. This decision usually depends on a physician's desire for research, educating fellows/residents, and location preferences.

IN-DEPTH FELLOWSHIP INFORMATION

Number of programs

There are nearly 200 ACGME accredited programs nationwide, through the [American Board of Family Medicine](#), the [American Board of Physical Medicine and Rehabilitation](#), the [American Board of Pediatrics](#), and the [American Board of Emergency Medicine](#). While most programs do accept EM applicants, it is recommended to check with each program individually, and it is prudent to ask if they have ever interviewed, offered a position to,

or matched any EM applicants in the past. Simply, each applicants can email the respective program directors or coordinators to find out about the program application requirements. Determining which programs are truly EM friendly and have experience with EM fellows can be challenging at times.

Differences between programs

The primary difference for EM residents applying to Primary Care Sports Medicine fellowships is to differentiate if they have an EM track and/or if they have taken EM applicants in the past. It also important to find out how many, if any, EM sports faculties are available at the program. ACGME requires that fellows work a minimum of 4 hours per week in your primary specialty. However, this requirement was determined based upon the primary care, not emergency medicine, environment. Four hours per week is difficult to achieve in an EM setting and may not be ideal for the new EM graduate. Not all family medicine programs understand the needs of EM fellows and/or have systems in place to allow you to work in an emergency department. Many primary care based programs will only allow EM fellows to work in an urgent care, office-based setting. Thus, it is important to clarify the clinical setting in which you will be assigned for your continuity clinic. It is also important to note that some programs have you work in the ED/urgent care as a resident, while others allow you to work as an independent provider. Determining the correct balance and setting will vary among EM PCSM fellows.

Length of time required to complete fellowship

These are primarily 1-year fellowships, with a very few number of programs supporting a 2-year fellowship. Typically, a second year of fellowship would be primarily devoted to research endeavors.

Skills acquired during fellowship

- Advancement in the ability to diagnose, evaluate, and manage musculoskeletal injuries, as well as other sports-related injuries (i.e., concussions, exertional heat illness, etc.).
- Increased experience in musculoskeletal ultrasound, both diagnostic and procedural.
- Procedural ultrasound skills focused on joint injections, calcium deposit aspiration, arthrocentesis, and soft tissue injection.
- Procedures including joint aspirations and injections, splinting/casting, endurance testing, compartment testing, some possible fluoro-guided procedures.
- Training in the ability to follow up acute injuries and manage chronic disease of athletes with continued studying of exercise physiology and athletic injuries.

Typical rotations/curriculum

Example of rotations include rehab clinic, sports medicine clinic, covering of sports events including games, meets and mass events, orthopedic rotations, etc. All fellowships include a certain percentage of time working shifts in the emergency department. You will additionally have scheduled didactic time.

Board certification afterwards?

Yes, a written exam is administered through the American Board of Family Medicine.

Average salary during fellowship

Fellows are typically paid at the PGY4 level (or PGY5 if completing a 4-year residency) according to the GME contract of their academic institution. There is some variability based upon whether you function as a resident or attending during your emergency department shifts.

PREPARING TO APPLY

How competitive is the fellowship application process?

According to [2018 NRMP match statistics for Sports Medicine](#), 181 out of 188 programs filled (92.9%); and 283 out of 292 positions filled (96.9%). One program withdrew from the match. There were 386 applicants with rank and 283 of them matched (75.7%).

Requirements to apply

While there are no formal requirements for application, aside from being board certified or board eligible in your respective specialty, there is a [fellowship preparation track that is recommended by the AMSSM](#):

- Elective in sports medicine
- 1 year of longitudinal team physician experience with local high school team
- Medical coverage in 1 mass participation event
- Presentation during at least 2 sports medicine conferences
- Presentations of 1 journal club article related to sports medicine
- Scholarly project in sports medicine
- Attendance for at least 1 sports medicine conference

Research requirements

Most programs require participation in a research project during fellowship, typically under the direction of faculty, but the requirements and structure varies from program to program. Thus, completing research during residency would be highly beneficial on your application.

Suggested elective rotations to take during residency (and how to excel during these elective rotations)

- **Orthopedics:** Show interest in the non-operative management of MSK injuries. Practice your procedural, splinting and casting skills.
- **Sports Medicine Rotation:** Reach out to mentor/sports medicine physician and let them know you plan to pursue a career in Sports Medicine.
- **Ultrasound:** Show interest in the ultrasound skills that pertain specifically to SM. Practice and improve joint injections and aspirations using ultrasound.

Should I complete an away rotation?

If your home institution does not offer a sports medicine elective, and/or you are interested in a particular program/region, then an away rotation should be completed. If there is the opportunity to complete a sports medicine elective at your home institution, it is highly recommended that you participate in this.

What can I do to stand out from the crowd?

Applicants should complete at least 1 sports medicine rotation. While SM fellowship directors realize you are busy as a resident, it is important to get some exposure to Sports Medicine, not only to show your interest and dedication, but to ensure it is the correct career path for you. Similar to EM programs, it is possible to rotate at programs of interest in order to become familiar with the program and their leadership. Consider a resident research project/QI in sports medicine. Experience in sporting event coverage is common in applicants. Presentations/publications in SM are important to show academic interest in the field. Additionally, membership in national organizations (i.e. AMSSM or AOSSM) is recommended.

Should I join a hospital committee?

This is not necessary; however, participation in other venues in the healthcare landscape outside of your residency program can help strengthen your application.

Publications other than research

Publications such as blog posts, magazine articles, case reports, etc., in sports medicine-relevant topics can help to strengthen your CV.

How many recommendations should I get? Who should write these recommendations?

Traditionally 3 letters of recommendation are preferred. One recommendation should be from your program director. Another letter of recommendation should be written by a sports medicine physician with whom you have worked. Additionally, letters can be written by EM faculty and/or other sports physicians who know you well. Ideally, one letter of recommendation is written by a fellowship director; however, programs do recognize that this is not always possible.

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

Yes, applicants can still be competitive after working as an attending. It is important that you continue to show evidence of interest/experience/dedication to sports medicine.

What if I am a DO applicant?

The process is the same for DO or MD applicants who have completed an ACGME accredited residency program and are board certified or board eligible in emergency medicine. For programs that do not participate in ERAS/NRMP, please contact each specifically regarding this question.

What if I am an international applicant?

Not all programs accept international applicants; please refer to individual program websites.

APPLICATION PROCESS

How many applications should I submit?

There is a wide range of recommendations, with about 10-15 the average number recommended.

How do I pick the right program for me?

A program should have the right fit and feel for you. The program should offer broad exposure to many levels and types of sports. Other considerations include geographic location, family, and how future career goals align with individual program strengths/emphasis. It is strongly recommended to attend a program with a Emergency Medicine-Sports Medicine dual boarded physician on faculty or a program that has at least previously had an EM-SM fellow.

Common mistakes during the application process

Applying too late is the most common mistake. Most programs have a deadline of Oct. 1 to submit completed applications and a December deadline for rank list submission. However, many programs begin offering interviews on a rolling basis as soon as they receive applications, and may have all their interview slots filled before Oct. 1. Another common mistake is not getting a letter of recommendation from a sports medicine physician.

Application deadlines

On July 15 programs can begin reviewing applications. It is recommended to have your application submitted by this date to allow you the best chance at obtaining an interview. Application deadlines vary based upon individual programs. Certification of the rank list is usually due mid-December and the match is in early January. Please refer to ERAS/AAMC website as well as individual program websites for deadlines.

Tips for writing your personal statement.

Highlight important goals/achievements and how this has shaped you and how it relates to becoming a SM physician. Most important, be authentic. Tell your story in a way that is uniquely you, and let your personality shine through.

Is this a match process?

Most programs participate in ERAS-NRMP.

What happens if I don't obtain a fellowship position?

Scramble. There may be at-large positions available after the match. An applicant can re-apply the following year, but it is recommended they meet with their SM faculty mentor to analyze what may have gone wrong and improve their application as necessary. In 2018, there were 9 unfilled programs and 9 unfilled positions.

INTERVIEW PROCESS

How do I stand out from the crowd?

Be on time. Be familiar with the program you are interviewing with. Ask thoughtful questions. Do not be afraid to be enthusiastic.

What types of questions are typically asked?

Questions may include: Why do you think sports medicine is right for you? What are your experiences in sports medicine? How do you envision incorporating your fellowship training into your future career?

How many interviews should I go on?

This varies depending on strength of application, but approximately 10 interviews are recommended.

PREPARING FOR FELLOWSHIP

Textbooks to consider reading

- Madden, Christopher et al. *Netter's Sports Medicine*. Philadelphia, PA: Saunders; 2009.
- Waterbrook A. *Sports Medicine for Emergency Physicians: A Practical Handbook*. Cambridge; 2016.
- Harrast et al. *Sports Medicine, Second Edition: Study Guide and Review for Boards*. Demos Medical; 2016.

Important skills to practice while in residency to prepare for fellowship

It is important to spend the time in residency learning your primary specialty well, as many people choose to practice both after fellowship. It is also recommended to spend time in sports medicine clinics and on the sideline of sporting events. No one expects you to be an expert in sports medicine prior to starting your fellowship, but rather have just some familiarity with practice and principles. Incorporating SM into your EM residency journal clubs, lectures, and presentations will allow you to stay up-to-date on not only the latest EM topics on both fields. .

Tips on how to succeed as a fellow

Start early: Contact current fellows and program director to get advanced advice. Review anatomy and physiology prior to start of fellowship.

Show up early to events, introduce yourself to event staff and athletic trainers as appropriate, and review emergency action plans for events. While it is important to show interest and enthusiasm, it is also important to pay attention to team dynamics: medical care of athletes is a team sport where everyone plays an important role.

Be prepared for journal clubs, lectures, etc.

CONCLUSION

Additional resources

Journals

American Journal of Sports Medicine
Clinical Journal of Sports Medicine
Sports Health

Podcasts

[The American Journal of Sports Medicine Podcast Series](#)

[Brukner & Khan's Clinical Sports Medicine](#)

[The Dr. David Geier Show](#)

[AMSSM Podcasts](#)

National organizations

AMSSM

ACSM

AOASM

Sports Medicine section of ACEP

EMRA Sports Medicine Committee

Sports Medicine interest group of SAEM

Conferences

AMSSM and ACSM both hold annual conferences that are worth attending. If you are attending ACEP or SAEM, make sure to attend the sports medicine section/interest group meetings. EMRA now has a sports medicine division and is actively recruiting members.

How to find a mentor

Ideally, find an Emergency Medicine-Sports Medicine dual-boarded physician, but many areas do not have one. In that case, connect with other SM physicians; many are very open and helpful to residents from any specialty. They may also be able to get you connected with other EM SM dual-boarded physicians either locally, regionally, or nationally. There are several mentor matching services that can be found through EMRA, ACEP Sports Medicine Section, and the AMSSM. The EM-SM fellowship network is small, and physicians are very welcoming and encouraging of interest, as this is a very rewarding EM subspecialty.

Tactical Medicine Fellowship

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INTRODUCTION

Description of the specialty

Tactical medicine is the practice of prehospital emergency care specifically designed for the support of high-risk law enforcement operations. Police tactical teams are responsible for an ever-widening scope of responses to critical law enforcement situations, national security threats, anti-terrorism activity, mass gatherings, and disaster response missions. Accordingly, tactical emergency medical support (TEMS) has gained recognition as an essential element of the modern law enforcement mission.

Tactical medicine augments law enforcement operations by performing medical threat assessments, delivering on-scene emergency medical care, and promoting the safety and health of law enforcement personnel. Tactically trained medical personnel achieve their objectives through mission pre-planning, implementation of clinical practices developed specifically for tactical applications, and provision of a critical interface between law enforcement personnel, conventional EMS, and the existing health care system infrastructure.

The broad goals of tactical medicine are to facilitate the overall success and safety of law enforcement missions during all phases of a tactical operation through the delivery of preventative, urgent, and emergency medical care. The basic approaches utilized by tactical medicine providers were initially developed by the military, and have been adapted to the civilian law enforcement environment. The primary function of tactical medicine during a mission is to provide broad medical support including injury prevention, resource identification, allocation and rapid access to emergency medical care within the operation.

History of the specialty/fellowship pathway

In the late 1980s, leadership within law enforcement, emergency medicine, and emergency medical services (EMS) began to develop consensus on the provision of dedicated medical support for tactical teams. In 1993, the National Tactical Officers Association (NTOA) issued a position statement in support of tactical emergency medical support, emphasizing that “the provision of TEMS has emerged as an important element of tactical law enforcement operations.” The National Association of EMS Physicians (NAEMSP) further described medical support of law enforcement special operations in 2001. In 2004, the American College of Emergency Physicians issued a position paper endorsing TEMS as an essential component of law enforcement teams that “helps maintain a healthy and safer environment for both law enforcement and the public.”

Qualified physician involvement and medical oversight is an essential element of tactical medicine. Professional practice in tactical medicine continues to attain formal recognition and, as an example, basic competency is a newly established sub-requirement of ACGME subspecialty certification in EMS. Dedicated fellowship training in tactical medicine is an emerging concept.

Why residents choose to follow this career path

Physicians working in tactical medicine have a strong interest in prehospital and out-of-hospital emergency care and a special interest in working with law enforcement agencies. Tactical physicians actively deploy in the field with their teams, and formal training greatly enhances mission readiness. Tactical medicine often provides additional niche training opportunities such as executive protection, mass gatherings, and care in austere environments. Physicians seeking to train in tactical medicine often have backgrounds in law enforcement and/or military service, and this practice environment is seen as an opportunity to merge those prior experiences with clinical medicine. This may also serve as a means for residents and physicians to engage in other activities outside the traditional realm of medicine and give back to their communities.

How do I know if this path is right for me?

Tactical physicians have a strong sense of community service and expect to be on-call for emergency responses on a near continuous basis. Working with law enforcement carries some inherent risks, and physicians practicing tactical medicine expect regular exposure to high-threat incidents. Tactical physicians must have excellent understanding of their local and

regional emergency health care infrastructure and possess the interpersonal and communication skills to work effectively within their systems. Occupational health is an essential component of tactical medicine, and physicians must be prepared to spend considerable effort on officer health and safety issues. Finally, law enforcement requires a strict adherence to chain-of-command protocols, so tactical physicians must be adept at such procedures and enjoy working within this framework.

While not required, previous experience in EMS, law enforcement, or military medicine is helpful in gaining an appreciation for the unique challenges of emergency care in the prehospital and out-of-hospital setting. Elective rotations abroad, in EMS, or in wilderness medicine can provide residents with exposure to these elements, though few will specifically involve working with tactical teams. Some local law enforcement groups allow medical students and residents to shadow and learn from tactical scenarios. One such example is the [National Center for Medical Readiness](#) (NCMR), also known as Calamityville in Fairborn, Ohio.

Career options after fellowship

After fellowship most physicians continue their careers as tactical physicians with law enforcement agencies, typically working in these capacities at least part-time. Depending upon geography, such opportunities may already exist, or physicians may work to develop positions within a local department. Military physicians who have completed tactical medicine fellowship training add this qualification when they return to active duty service. Less commonly, fellowship trained physicians may elect to work with search and rescue teams, in disaster and international medicine, or conventional EMS systems.

Academic vs. community positions

Well-established positions in law enforcement tactical medicine are typically based at academic institutions. These centers will often have longstanding programs in place with larger agencies, especially at the state or federal levels. Tactical physicians at academic centers will maintain these positions as part of their academic profiles and administrative roles. Well-qualified physicians employed by a community hospital or in private practice may actively work in the field as tactical physicians with a local department. These responsibilities are more commonly individually negotiated, either with or without compensation, separate from their primary employment.

IN-DEPTH FELLOWSHIP INFORMATION

Number of programs

With the advent of ACGME accreditation for EMS fellowships, some exposure to special operations or tactical medicine is required within all accredited EMS programs. The degree can be quite variable, though, and is highly dependent upon availability of local resources and institutional expertise. EMS fellowship programs that offer significant tactical medicine exposure or experiences include Washington University, University of New Mexico, Boston University, Wright State University, University of Illinois Peoria, Carolinas Medical Center, UT Southwestern, and Medical College of Georgia.

The only dedicated tactical medicine fellowship at this time exists at [Johns Hopkins University through its Center for Law Enforcement Medicine](#). Johns Hopkins maintains this fellowship program separate from, and in addition to, its EMS fellowship program.

Length of time required to complete fellowship

The tactical medicine fellowship program at Johns Hopkins is 2 years in length.

EMS fellowship programs accredited by the ACGME offer some degree of exposure to tactical medicine under the core curriculum heading of special operations. ACGME EMS fellowships are 1 year in duration.

Skills acquired during fellowship

The goal of tactical medicine fellowship training is to prepare academic emergency physicians for leadership, field support, and medical direction of law enforcement special operations and tactical medicine programs. Fellowship in tactical medicine at Johns Hopkins has a significant operational component, providing trainees with key skills needed to safely operate and provide care during high-risk tactical operations, large-scale mass gatherings, and dignitary protection missions.

Typical rotations/curriculum

The main components of the Johns Hopkins tactical medicine fellowship include mentorship in the medical direction of special operations while applying the fundamental tenets of prehospital emergency care, direct experience with local, state, and federal law enforcement, exposure to tactical, protective, special event, international, and remote consultation programs, and escalating medical control responsibilities. Additional areas of focus include the education

and training of law enforcement medical providers, continuous quality improvement of care, involvement in the administrative and developmental aspects of tactical and operational medicine programs, and academic research in the field of law enforcement medicine.

The fellowship program at Johns Hopkins specifically includes both training and field deployment with multiple federal law enforcement and homeland security teams.

Board certification afterwards?

No.

Average salary during fellowship

Salaries during fellowship, whether EMS or tactical medicine, vary widely by institution. Applicants should contact potential fellowship programs directly for specific information. Fellows generally have some limited opportunities for moonlighting during fellowship.

PREPARING TO APPLY

How competitive is the fellowship application process?

Because the field is small and the training opportunities specific to tactical medicine are extremely limited, it is difficult to quantify competitiveness. There is currently 1 fellowship position available per year (up to 2 concurrent fellows per year) at a single program.

Requirements to apply

- Board certified or board-eligible in emergency medicine
- Ability to pass a criminal background check and obtain security clearance(s)
- Ability to function in austere environments
- Demonstrated interest in prehospital emergency care and/or tactical medicine strongly preferred

Previous employment in EMS or law enforcement is not required.

Research requirements

Research is not absolutely required; however, fellows are expected to publish during their fellowship, and previous meaningful research experience is preferred.

Suggested elective rotations to take during residency

Robust in-program EMS rotation/elective or an immersive away elective, preferably at a program with substantive experience and faculty participation in tactical medicine.

Suggestions on how to excel during these elective rotations

Evaluators in prehospital, including tactical, medicine typically want to see a balance between active interest, capabilities, and receptiveness to learning. Because operating in the law enforcement environment has risks, supervisors must ensure that trainees listen well and follow directions precisely. Remember to adhere to chain-of-command protocols and understand the importance of teamwork. Comply with all uniform attire (if provided) requirements and communicate any changes in personal schedule or availability. Ensure your equipment is mission-ready at all times. Always arrive early to any assignment, whether training or operations. Staying late to finish group assignments or tasks will be noteworthy.

Should I complete an away rotation?

If an emergency medicine residency does not provide internal exposure to tactical medicine, away rotation(s) would be helpful to potential applicants, both in demonstrating interest and gaining exposure to determine if tactical medicine is a good fit. Commercial, off-the-shelf tactical medicine courses are generally less preferable than rotations at academic centers.

What can I do to stand out from the crowd?

A quality longitudinal experience in tactical medicine is a welcome attribute in any potential applicant. Despite this, meaningful opportunities vary across residency programs. Field experience in any area of prehospital medicine, including EMS and disaster medicine, can be helpful in gauging a candidate's aptitude for practicing medicine outside of a hospital and his/her understanding of the challenges such work entails. Early rotations and involvement with local law enforcement training scenarios shows significant interest over other candidates. Most residency programs are willing to set up rotations with local law enforcement and first responders to give the resident adequate exposure.

Should I join a hospital committee?

Hospital committees related to tactical medicine are rare, but are a beneficial experience if possible.

Publications other than research

Any publication that you can include in your CV relating to tactical medicine will likely bolster your application.

How many recommendations should I get? Who should write these recommendations?

Obtain 3 letters of recommendation at minimum. At least 1 should be from the residency director, and 1 ideally from a supervisory faculty member with expertise in prehospital or tactical medicine. Supplemental letter(s) from non-physician supervisors with detailed knowledge of the applicant's capabilities in the field are welcome.

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

Work experience as an attending emergency physician is potentially quite helpful to the tactical medicine fellow, because clinical excellence is a hallmark of successful tactical physicians. Law enforcement agencies look for maturity, leadership, and experience in the physicians they choose to support operational teams.

What if I'm a DO applicant?

DO applicants are welcome.

What if I am an international applicant?

Unfortunately, due to medical licensure requirements and the need to obtain security clearance(s), international applicants are generally ineligible. Eligibility should be discussed with each program directly.

APPLICATION PROCESS

How many applications should I submit?

Currently there is only a single dedicated tactical medicine fellowship program.

Applicants with a strong desire to pursue tactical medicine training at the fellowship level should also consider EMS fellowship programs that offer significant tactical medicine content.

Common mistakes during the application process

- Application/CV does not display a clear interest in tactical medicine
- Choosing letter writers who do not know you well
- Grammatical errors in your application
- Weak personal statement

Application deadlines

The common fellowship program start date is July 1 at Johns Hopkins. Applicants are encouraged to apply early, because there is only one position offered each year.

Tips for writing your personal statement

Personal statements for fellowships will be similar to those written for the residency application process or other graduate medical education programs. Applicants should focus on factors that motivated them to pursue a career in tactical medicine and highlight relevant past experiences, including any special qualifications. Statements should clearly identify any potential barriers to working with law enforcement agencies or that might preclude obtaining security clearances.

Is this a match process?

No.

What happens if I don't obtain a fellowship position?

Applicants with a strong desire to pursue tactical medicine training at the fellowship level should also consider EMS fellowship training at a program with significant tactical medicine exposure.

INTERVIEW PROCESS

How do I stand out from the crowd?

The culture of law enforcement emphasizes uniformity, rank, and adherence to chain-of-command. Along these lines, interviewees should dress neatly, professionally, and be well-groomed. Interviewees should address all individuals by title and/or rank. Punctuality and preparedness are essential.

What types of questions are typically asked?

Personal motivation, meaningful experiences, and well-documented involvement in tactical medicine are highly desirable and should be anticipated discussion points. Functional experiences in other pre-hospital settings such as disaster and EMS are also noteworthy.

Tactical physicians must be able to demonstrate strong leadership, clear decision-making, and clinical excellence under challenging and stressful conditions. Some interview questions may seek to determine an applicant's aptitude and suitability for medical operations in complex and austere field environments.

How many interviews should I go on?

If you are invited to interview at the single program in existence, you should go.

PREPARING FOR FELLOWSHIP

Textbooks to consider reading

- Stair RG, Polk W, Shapiro G, Tang N. Law Enforcement Responder: Principles of Emergency Medicine, Rescue, and Force Protection. Burlington, MA: Jones & Bartlett; 2012.
- Campbell JE, Heiskell LE, Smith J, Wipfler EJ. Tactical Medicine Essentials. Burlington, MA: Jones & Bartlett; 2011.
- Schwartz RB, Swienton RE, McManus JG. Tactical Emergency Medicine. Philadelphia, PA: Lippincott Williams & Wilkins; 2007.

Important skills to practice while in residency to prepare for fellowship

Proficiency with core content emergency medicine and procedural skills acquired during residency are crucial and form the competency base for the practicing tactical physician. Rotations in EMS, trauma, urgent care, occupational health, and critical care are particularly germane.

Experience with operational skills in the field environment — including PPE, radio communications, emergency vehicle operations, and understanding of prehospital provider scopes of practice — can be particularly helpful to potential fellows.

Tips on how to succeed as a fellow

Consistent demonstration of enthusiasm, professionalism, strong interpersonal skills, willingness to work hard (both physically and mentally), and adherence to command infrastructure is essential for success as a fellow in tactical medicine.

CONCLUSION

Additional resources

Journals

[Journal of Special Operations Medicine](#)

[Prehospital Emergency Care](#)

National organizations

Tactical Emergency Medicine Section, American

College of Emergency Physicians

Special Operations Medical Association

National Association of EMS Physicians

Conferences

Special Operations Medical Association Scientific
Assembly

NAEMSP Annual Meeting

ACEP Tactical Medicine Section Meeting (held during
ACEP's *Scientific Assembly*)

How to find a mentor

Seek opportunities with residency faculty actively
involved in tactical medicine or other practicing tactical
physician(s) in your area.

Contact the EMS or disaster faculty at your institution to
get involved with prehospital medicine.

Contact fellowship programs with content of interest to
seek potential rotations or electives in EMS or tactical
medicine.

Telemedicine Fellowship

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INTRODUCTION

Description of the specialty

The concept of “connected health” is centered around telehealth and telemedicine. According to the American Telemedicine Association (ATA), telehealth and telemedicine are terms that may be used interchangeably to describe an array of patient care provided using telecommunications technology. This may include services ranging from remote patient monitoring to specialty-based consultations such as telepsychiatry, telestroke, or teleICU either locally or internationally. It is a tool for providers to offer convenient, efficient, and patient-centered care.

History about the specialty/fellowship pathway

Telemedicine first started in the United States in the 1960s when television was utilized for medical education and consultation. One famous example is the live-streaming of Michael DeBakey’s open-heart surgery in Geneva in 1965. Although interest waned during the 1970s-1990s due to concerns about cost and practicality, the progression of technology has opened up new possibilities. Interest in the field was revitalized out of a need for health care delivery to those living in remote places. Corporate industries (eg, military, NASA, off shore oil rigs, Antarctica survey stations, etc.) also began exploring this branch of medicine. By the 1990s, real-time video medical consultation was developed, first used in Norway and later spread worldwide. Many believe that telemedicine can provide greater access to health care and improve the quality of health care services at a lower cost. As this field continues to expand and reimbursement models shift from fee for

service to value based, it is no surprise that emergency medicine physicians are taking note of this field. Recently two fellowship opportunities have developed for emergency physicians seeking to become experts in this field.

Why residents choose to follow this career path.

Residents choose to follow this career path because they are interested in becoming leaders in developing telemedicine education, research, and services.

Through the course, they become experts in bringing together technology and clinical medicine to enhance overall delivery of medical care. Telehealth is considered of emerging importance in new value based payment models and population health and is an expanding field that continues to provide new and innovative ways to improve healthcare worldwide.

How do I know if this path is right for me?

Are you interested in developing new innovative technologies to provide patient care to patients when and where they require it? Would you like to become the director of a telemedicine program? Are you interested in performing research regarding remote biometric monitoring? Are you interested in concierge or direct-to-consumer medicine? Ever considered joining a startup? If your answers to any of the above questions are yes, this may be the fellowship for you.

Career options after fellowship

Options after fellowship include: Chief Medical Information Officer (CMIO), Director of Telemedicine; leader in improving patient access or population health; telemedicine provider; telemedicine researcher; leader of quality improvement teams relevant to telemedicine; program director of telemedicine fellowship, etc.

Splitting time between departments

Physicians typically practice telemedicine under the department of emergency medicine, but other parts of the health system may also be involved, such as internal medicine, speciality services, population health, quality, access, compliance, and accountable care. Thus, physicians do not split time between departments but rather fulfill their telemedicine responsibilities during their administrative time. Organizational leadership opportunities may also exist. The decision about how much administrative time versus clinical time is a personal decision and typically also a negotiation with your employer (example is 25% administrative time and 75% clinical).

Academic vs. community positions

Telemedicine can be practiced in practically any hospital setting. This branch of medicine is typically hospital or system specific and is geared towards those with an interest in developing their current infrastructure for telemedicine. Of note, academic centers and integrated delivery networks (i.e. VA system or Kaiser) may have more funding and support staff for those interested in research as compared to community positions.

IN-DEPTH FELLOWSHIP INFORMATION

Number of programs

This is an emerging subspecialty. Currently there are 2 programs, along with a specialized course at another program:

Fellowships

- [George Washington University](#)
- [Thomas Jefferson University](#)

Courses

- [Alaska Federal Health Care Access Network \(AFHCAN\)](#)
- [University of Arizona](#)
- [UC Davis](#)
- [Thomas Jefferson University](#)

Differences between programs

GWU offers an opportunity to obtain a master's degree (ie, MBA, MPH, or master's degree in systems engineering). Fellows are also required to complete 2 research projects during fellowship. Thomas Jefferson offers fellows the opportunity for a certificate or degree from the Colleges of Population, Public Health, or a certificate in Operational Excellence. Both fellowships have their fellows work clinically as telemedicine providers.

Length of time required to complete fellowship

GWU is a 2-year fellowship, whereas Thomas Jefferson is a 1-year fellowship.

Skills acquired during fellowship

Skills acquired during fellowship include research, academia, leadership, administrative, entrepreneurship, and clinical skills.

Typical rotations/curriculum

Typical rotations/curriculum during fellowship include participation in the department's telemedicine services, opportunity to study advanced coursework, research, clinical emergency medicine shifts, and administrative responsibilities.

Board certification afterwards?

No. However, this fellowship is closely associated with medical informatics. Paths may open in the future that qualify fellows to sit for the Informatics Board by ABPM.

Average salary during fellowship

Since this is not an ACGME-accredited fellowship, salaries are much more competitive than the traditional PGY-4/5 salaries.

PREPARING TO APPLY

How competitive is the fellowship application process?

This is a reasonably competitive fellowship due to only two fellowship programs currently available.

Requirements to apply

You must have completed an ACGME residency to apply for this fellowship.

Research requirements

Research is not required to apply for this fellowship but may certainly help to strengthen your application especially if the research is relevant to telemedicine.

Suggested rotations to take during residency

Suggested rotations to take during your elective time include an administrative month, research month, wilderness medicine, EMS and/or telemedicine rotation, etc.

During elective time, it is worth considering attending conferences, such as those through the American Telemedicine Association. This is a great way to help network and increase your knowledge about the specialty.

Suggestions on how to excel during these elective rotations

During your elective rotation, be careful not to fall into the trap of treating this as a "lighter month" and cruise through the month. Instead, make it a point to work hard, come in early, and stay late. Be courteous to all and seek out opportunities to be part of the care team. Read every day and expand your knowledge base. Find mentors in the field of telemedicine during your elective months if possible.

Should I complete an away rotation?

Since there are only 2 fellowships available, it may be helpful to arrange an away rotation at either GWU or Thomas Jefferson. This would be a good way for both you and the program to get to know each other better. Assuming you perform well, it may give you an advantage when you apply for fellowship.

What can I do to stand out from the crowd?

The best way to stand out from the crowd is by creating an application that through your CV, personal statement, and letters of recommendation clearly demonstrates an interest in telemedicine. Leadership and/or research activities will also help you build a strong application. Becoming chief resident, while not required, can certainly strengthen your application as well.

Should I join a hospital committee?

Joining a hospital committee and/or quality improvement team would be an excellent opportunity to expand your management and leadership skills. Seek out opportunities where you would have meaningful involvement in the committee.

What about publications other than research?

Publications other than research — such as blog posts, podcasts, case reports, magazine articles, etc. — can be a great opportunity for you to educate yourself and the emergency medicine community about telemedicine. Such publications would certainly be supportive on your application about your interest in this field.

How many recommendations should I get? Who should write these recommendations?

Contact each program regarding their requested number of letters of recommendations. Typically, the traditional number is 3 letters, one of which is from your program director or department chair and one of which is ideally from someone within the field of telemedicine.

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

Yes, you can still be competitive if you decide to work as an attending before applying for this fellowship. The key is to continue to be involved in leadership and other academic activities while working as an attending and to list them on your CV. Be prepared to explain your decision to work as an attending when interviewing for fellowship.

What if I'm a DO applicant?

There are no barriers to DO applicants.

What if I am an international applicant?

International applicants are encouraged to contact the fellowship directly. Applicants will at minimum need to have completed their USLME steps as well have obtain the appropriate visas.

APPLICATION PROCESS

How many applications should I submit?

Apply only to those places you would seriously consider attending if offered a fellowship position.

How do I pick the right program for me?

Choose a great fit academically while also in a location that fits your personal and family needs.

Common mistakes during the application process

Common mistakes that applicants make during the process include:

- Missing application deadlines.
- Grammatical errors on personal statement.
- Having a CV that does not demonstrate a clear interest in telemedicine.
- Weakly supportive letters of recommendation.

Application deadlines

Interested applicants are advised to contact each program regarding deadlines.

Tips for writing your personal statement

The best personal statements do not simply repeat what is on your CV, but rather explain your interest in this fellowship and your career goals afterward. This is the time to let your personality shine through and try and set yourself away from the other applicants. If you have a certain life experience that led to your interest in this field, now is the time to write about it. Have multiple people read your statement to make sure it reads well and is without grammatical errors.

Is this a match process?

No.

What happens if I don't obtain a fellowship position?

If you do not obtain a fellowship position, take a look at your application to identify areas of weakness. It may be worth asking the programs that rejected you for tips on how to improve your application. Also, consider having your residency program director reviewing your application. Once you identify these weaknesses, spend the next year addressing them and apply again. Practice your interview skills. Worst-case scenario, there are other avenues to pursue education and practice in the telemedicine field.

INTERVIEW PROCESS

How do I stand out from the crowd?

The best way to stand out from the crowd during your interview is by having a clear vision about why you are interested in this fellowship and how this fellowship will help you achieve your career goals. Be personable and friendly with everyone that you meet. Be careful not to be overly shy nor overly chatty. Make sure you are prepared to ask the program thoughtful questions during your interview that cannot be easily found on their website.

What types of questions are typically asked?

Why are you interested in telemedicine?

Why are you interested in our telemedicine program specifically?

Tell me about "blank" that you list here on your CV.

What are your 5- and 10-year career goals?

How many interviews should I go on?

Since there are limited fellowship opportunities available, it is recommended that you attend all interviews offered.

PREPARING FOR FELLOWSHIP

Textbooks to consider reading

- Understanding Telehealth 1st Edition by Karen Schuller Rheuban and Elizabeth A. Krupinski; McGraw Hill Education 2018.
- Latifi R. Telemedicine for Trauma, Emergencies, and Disaster Management. Norwood, MA: Artech House; 2010.
- Eren H, Webster JG. Telemedicine and Electronic Medicine. Milton Park, UK: CRC Press; 2015.

Important skills to practice while in residency to prepare for fellowship

First and foremost, residents should focus their energy towards becoming the best emergency physician they can possibly be. Other skills to consider developing include administrative, leadership, organizational, educator, and technological skills.

Tips on how to succeed as a fellow

Take advantage of all opportunities that are offered to you during fellowship. The next 1-2 years is a chance for you to develop your niche under the guidance of mentors. Arrive early, stay late, and read every day. Strongly consider completing advanced degree programs if offered. Seek out opportunities to become involved in quality improvement projects, research projects etc.

CONCLUSION

Additional resources

Journals/Journal articles

[Telemedicine and e-health](#)

[Journal of Telemedicine and Telecare](#)

[Journal of Ethics article](#)

Blogs/Podcasts/Websites

[The Arizona Telemedicine Program Blog](#)

[UAMS Center for Distance Health](#)

National organizations

[Center for Connected Health Policy](#)

[American Telemedicine Association](#)

[Society for Education and the Advancement of Research in Connected Health](#)

Conferences

[American Telemedicine Association Conference](#)

[Digital Health World Conference](#)

[International Society for Telemedicine & eHealth](#)

[Telemedicine Leadership Forum](#)

[SEARCH Telehealth Research Symposium](#)

How to find a mentor

Unfortunately, there is no central website that connects interested physicians with mentors within this field. We suggest turning to faculty within your current department, national telemedicine organizations, and/or telemedicine conferences when searching for a mentor.

Toxicology Fellowship

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INTRODUCTION

Description of the specialty

Medical toxicologists are physicians who specialize in the prevention, evaluation, treatment, and monitoring of injury and illness from exposures to drugs, chemicals, biological, and radiological agents. These specialists care for people in clinical, academic, governmental and public health settings, including poison control centers. Important areas of medical toxicology include acute drug poisoning, adverse drug events, substance use disorders and withdrawal, chemicals and hazardous materials, terrorism preparedness, envenomations, and environmental and workplace exposures.

History of the specialty/fellowship pathway

The American Board of Medical Toxicology (ABMT) was established in 1974 by the American Academy of Clinical Toxicology in recognition of the growing responsibilities of physicians who provided a significant portion of their professional activities to medical toxicology. In September 1992, the American Board of Medical Specialties (ABMS) approved medical toxicology as a subspecialty, recognizing the American Board of Emergency Medicine (ABEM), American Board of Pediatrics (ABP), and American Board of Preventative Medicine (ABPM) as sponsoring boards. [ABEM is the administering board](#). The first examination was offered in 1994 and is currently administered every other year.

Why residents choose to follow this career path

Some current medical toxicology fellows were unaware they wanted to pursue a toxicology fellowship before starting an EM residency. Most applicants describe a specific toxicology case encountered (in the ED or the ICU) which sparked their passion for the field. Others, however, developed their interest more gradually. Residents who have the opportunity to work directly with a toxicologist or consulting toxicology service in a hospital setting are more likely to pursue a toxicology fellowship.

Completing a fellowship allows the physician to develop a niche and become an expert in a specialized field. It can also open doors for new career possibilities such as: academia, occupational or industrial medicine, pharmaceuticals, forensics, research, medico-legal work and medical consulting.

How do I know if this path is right for me?

Participating in a medical toxicology rotation is the most valuable way a resident can decide if a fellowship is right for them. This allows the resident to preview and understand the schedule, lifestyle, and career of a medical toxicologist. Spending time in a regional poison center is also another opportunity to become familiar with the field of medical toxicology. However, it may be limited in scope and bedside experience is ideal.

Find mentors in the field to help answer questions and provide guidance. The EMRA Toxicology Division can help you get in touch with attending medical toxicologists and current fellows to help guide you.

Career options after fellowship

- Emergency departments, intensive care units, and other in-patient units in which direct treatment and bedside consultation for acutely poisoned adults and children is provided.
- Outpatient clinics, offices, and industry job sites where assessments from acute and chronic exposure to toxic substances in the workplace, home and general environment are performed.
- National and regional poison control centers providing 24-hour phone consultation to health professionals, first responders, public health officials, corporate safety personnel, and the general public regarding hazard identification, decontamination, emergency management, and detailed clinical care of the poisoned patient.
- Medical schools, universities, residencies, and clinical training sites where medical toxicology is taught and research is performed.

- Governmental agencies which provide medical toxicology expertise to the U.S. Food and Drug Administration, the U.S. Environmental Protection Agency, and state and local health departments as well as non-governmental advocacy organizations, consumer groups, and industrial associations.
- Clinical and forensic laboratories which aid in the design, conduction, and interpretation of diagnostic tests and forensic studies.

Academic vs. community positions

The majority of medical toxicologists divide their clinical time between duties performed in medical toxicology and emergency medicine. In general, academic positions allow a medical toxicologist more protected time (reduction in clinical ED shifts) with increased focus on lecturing, teaching, research, and medical toxicology clinical responsibilities. Community positions tend to have more focus on clinical ED duties. These divisions, however, are completely institution-dependent and will be individualized for the practitioner.

IN-DEPTH FELLOWSHIP INFORMATION

Number of programs

There are currently 27 ACGME accredited medical toxicology fellowship programs for the 2018-2019 academic year. EMRA Match offers an interactive map of toxicology fellowship programs on its website.

Differences between programs

While the core curriculum among fellowship programs is identical, they do differ from one another in a variety of ways, including:

- **EM shifts:** Some programs require fellows to work a designated number of shifts in the ED as a junior attending in order to receive pay during the fellowship. Some programs are “fully-funded” by the ACGME and do not require these shifts. However, regardless of this designation, programs generally allow moonlighting as long it does not interfere with fellowship responsibilities. The choice between these two types of programs is an individual one; however, either type of program provides excellent education and preparation for the board.
- **Number of fellows:** This may range from one to three fellows per year. This will factor into your duties and how your call schedule is arranged.

- **Didactics:** All programs implement didactics and lectures, but the structure and schedule may differ among them.
- **Bedside Teaching/Rounds:** Programs will vary regarding bedside rounds/teaching-at-the-bedside versus phone consultations. Generally, all implement some combination thereof depending on the size and focus on the program.
- **Sub-focus:** Programs may emphasize different aspects of medical toxicology such as medical, occupational, environmental, or forensics.

Length of time required to complete fellowship

All ACGME accredited medical toxicology fellowships are two years in length.

Skills acquired during fellowship

Fellows will acquire the necessary clinical and research skills to allow them to function as an independent medical toxicologist upon completion and, ideally, board-certification.

Typical rotations/curriculum

All programs follow the [ABEM Core Content of Medical Toxicology](#), which serves as the foundation of the [toxicology board exam](#). Most toxicology programs do not have blocks or rotations compared to an EM residency. Typically, programs will have the fellow work during day hours performing clinical duties, research, reading, conferences, and didactics. Call-schedules will vary among programs.

Board certification afterwards?

Fellows completing ACGME accredited programs will be eligible to sit for the [ABEM Medical Toxicology Board Certification Examination](#). The pass rates vary among programs, so be sure to ask during your interview.

Average salary during fellowship

Fellows are traditionally paid at the PGY-4/5 level depending on their years of residency training. Most programs will allow for moonlighting to supplement your income as well.

PREPARING TO APPLY

How competitive is the fellowship application process?

The [2018 NRMP Match Data](#) reveals a total of 41 applicants for 47 open positions with a total match rate of 87.5%. However, certain programs are extremely competitive. As with other fellowships, limiting applications to a singular geographic area or select number of fellowships can increase difficulty matching.

Requirements that must be fulfilled to apply

In general, there are no specific requirements needed to apply aside from completing an ACGME approved EM residency, a CV, and letters of recommendation.

Research requirements

Academic activities which demonstrate an interest in medical toxicology are strongly encouraged. During residency, keep track of interesting medical toxicology cases and actively seek out germane attendings to try and submit them as abstracts to conferences and/or manuscripts for peer-review. Moreover, take the initiative to ask any attending if he or she has an interesting case for you to publish or has a research project in which you can participate. Remember, the onus is on the resident to seek out these academic projects, not the attending.

Suggested elective rotations to take during residency

Participation in a medical toxicology or poison center rotation is certainly advantageous and recommended, whether at your home institution or another facility. Using an elective for an away-rotation at a program you are particularly interested in would be extremely valuable. Most programs would be thrilled to have a visiting resident on their service.

Suggestions on how to excel during these elective rotations

First and foremost, show initiative and interest in the field. Read, ask questions, see as many patients as possible and offer to help author an academic paper or research project if possible.

Should I complete an away rotation?

Use your elective time to pursue a medical toxicology rotation at a different institution in which you may have interest or to simply see alternative programs. Most programs enjoy hosting a visiting resident.

What can I do to stand out from the crowd?

There are several ways as a resident to become involved in the field of medical toxicology. You can join and participate in a national organization such as: EMRA Toxicology Division, ACEP Toxicology Section, American College of Medical Toxicology (ACMT), or American Academy of Clinical Toxicology (AACT). Additionally, as stated previously, actively seeking academic projects are important and demonstrate initiative.

Should I join a hospital committee?

Activities/pursuits/research that show an interest in toxicology are strongly encouraged.

Publications other than research

Activities/pursuits/research that show an interest in toxicology are strongly encouraged.

How many recommendations should I get?

Who should write these recommendations?

Most programs require a minimum of three, one of which is from your residency program director. The other two can be written by any attending with whom time has been spent or academic projects have been performed. A letter from a medical toxicologist is certainly helpful.

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

Yes. Most attending physicians do not want to return as a trainee (and give up their current salary and lifestyle). However, it can and has been done.

What if I'm a DO applicant?

MD and DO applicants are considered equivalent.

What if I am an international applicant?

The issue with most programs is whether the applicant can eventually sit for the ACGME medical toxicology board examination. As a foreign medical graduate, that may be an obstacle. The specific program of interest should be contacted prior to application to address this potential problem. The current trend in the toxicology match is there are more positions than applicants; therefore, being an international applicant does not place you at a disadvantage. Keep in mind that physicians on Visa cannot moonlight and cannot work as attending during a fellowship. Some programs are not funded by GME office and fellows have to work as an Emergency attending to fund their positions.

APPLICATION PROCESS

How many applications should I submit?

In general, applying broadly is encouraged but try to include those of serious interest.

How do I pick the right program for me?

Geography and funding are two important factors that typically play a role in choosing a fellowship. Moreover, each program has its own strengths and weaknesses. The best way to evaluate those is to seek out former graduates, contact the program directors and, ideally, participate in a rotation prior to application.

Common mistakes during the application process

- **Not applying to enough programs.** There are usually more positions than applicants during a given match cycle, so every applicant has the potential to match. However, as mentioned previously, some programs are in higher demand than others so this may be a critical issue and, therefore, applying more broadly is a good idea.
- **Not meeting the necessary deadlines.** This goes without saying. If you are serious in applying to a medical toxicology fellowship (or any program for that matter), ensure all your material is completed on time. If it isn't it reflects poorly on the applicant.

Application deadlines

Contact either the program director or program coordinator to find out more about the exact application process. In general, the earlier the better for all involved. Moreover, this shows enthusiasm and interest. This information is also usually located on the program's website. Be aware the deadline for rank list submission can be found on the [NRMP website](#). It usually occurs the first week of November.

Tips for writing your personal statement

Personal statements should be well-written, concise, and include why a fellowship in medical toxicology is being pursued. Highlight all germane activities related to medical toxicology. Have the statement proof-read at least once before submission. Reading poorly-written or rambling personal statements is a detraction for program directors.

Is this a match process?

Yes, toxicology fellowships participate in the NRMP match. Important dates regarding the match can vary every year so make sure to check the website. Customarily, important dates are:

- August — Match opens
- September — Ranking enabled
- November — Rank list deadline
- November — Match day

What happens if I don't obtain a fellowship position?

If you don't match you should check with your program director and see if there are any programs that didn't fill their positions and scramble. Ultimately, if you don't receive a fellowship position you can accept a job as an attending emergency physician and consider re-applying the following cycle.

INTERVIEW PROCESS

How do I stand out from the crowd?

Without a doubt, be prepared. Research the program ahead of time before the interview. Know what has been published from the program or any of its unique features. Dress and act professionally. Relax, and be yourself. Try to enjoy the process and meeting others. The good news is the "crowd" is not as large as some other fellowships.

What types of questions are typically asked?

Having gone through medical school and residency interviews, most fellowship applicants should be seasoned interviewees. Be prepared to answer basic and simple questions such as:

- What are your career aspirations?
- Why toxicology?

The interview process is equally important for the applicant. This is your chance to figure out which program is the right fit for you. Do not be shy about asking any questions to help you make this important decision.

How many interviews should I accept?

There is no magic number. As many as it takes you to feel comfortable about securing a position.

PREPARING FOR FELLOWSHIP

Textbooks with which to be familiar:

- Hoffman RS, Howland MA, Lewin NA, Nelson LS, Goldfrank LR. Goldfrank's Toxicologic Emergencies. 10th ed. New York, NY: McGraw-Hill; 2015.
- Olson KR. Poisoning & Drug Overdose. 7th ed. New York, NY: McGraw-Hill; 2018.
- Critical Care Toxicology, 2nd Edition.

Important skills to practice while in residency to prepare for fellowship

The number one priority in emergency medicine residency is to become an excellent emergency medicine physician. Most of the same skills are acquired during residency will obviously be applicable to those needed in fellowship. However, learning more about medical toxicology during residency will make you better prepared when starting fellowship.

Tips on how to succeed as a fellow

One of the most important factors in succeeding as a fellow is to pick the program that is right for you. No two programs are the same, and it is important to decide what you need. Ask yourself, "Is this somewhere where I could work for two years?", "Do I get along with this group?", and "Are the program's goals in line with mine?". Some nervousness and trepidation is normal. However, if you really have serious reservation or compunction about a program (especially financially or geographically), then it is better to not proceed rather than quit during fellowship.

Be enthusiastic about your choice and new career. You are on your way to becoming a specialist. Focus on your studies and passion that brought you to this choice in the first place. Try to learn something new every day.

Know your limitations. While many will be looking to you as an expert, do not be afraid to ask your attending probing questions.

Manage your time efficiently. Make sure you allot time for studies as well as outside interests. Burnout is real; you want to allow yourself time to decompress.

Maintain a positive attitude. Fellowship is the light at the end of a very long tunnel. Make sure to preserve a good outlook that will help you develop as a clinician and sharpen your medical expertise.

CONCLUSION

Additional resources

Websites

[EMRA Toxicology Division](#)

[ACEP Toxicology Section](#)

[American College of Medical Toxicology](#)

[American Academy of Clinical Toxicology](#)

[American Associations of Poison Control Centers](#)

Podcasts

[ACMT Podcast](#)

[EM:RAP](#)

[Tox Now](#)

[OHSU Toxicology Journal Club](#)

Blogs

[AAPCC](#)

[Twin Cities Toxicology Conundrums](#)

[The Poison Review](#)

[Life in the Fast Lane toxicology collection](#)

Journals

Journal of Medical Toxicology

Clinical Toxicology

National organizations

American College of Medical Toxicology

American Academy of Clinical Toxicology

Emergency Medicine Residents' Association

EMRA Toxicology Committee

ACEP Toxicology Section

Conferences

NAACT Annual Scientific Meeting

ACMT Annual Scientific Meeting

ACEP

SAEM

ACOE

How to find a mentor

Choosing a mentor is a beneficial way to help guide your career. Although reputation within the field is important, it is more valuable to choose someone that you respect, is willing to help, and has similar interests. A mentor should be a role model who has certain aspects of their practice or life that you want to emulate. It would be helpful to have a mentor who is a toxicologist in terms of fellowship applications, networking, and career guidance. The best way to find a mentor is networking, whether that is through a toxicology rotation, conference, or research project. A less personal and more challenging approach would be to contact toxicologists nearby, if none exist in your residency. The EMRA Toxicology Committee is also a great resource to use.

Emergency Ultrasound Fellowship

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INTRODUCTION

Description of the specialty

Ultrasound is a rapidly progressing field and has become a widely-accepted medical imaging modality that has revolutionized the field of acute care medicine. This fellowship specifically targets those who are interested in becoming experts and future leaders in utilizing ultrasound in emergency medicine.

History of the specialty/fellowship pathway

Emergency medicine (EM) now includes bedside ultrasonography as a standard part of EM practice. The history of ultrasound in EM can be traced back to the publication of the first emergency ultrasound curriculum by Mateer et al. in 1994. The initial curriculum was composed of core applications such as trauma/focused assessment with sonography in trauma (FAST), renal, cardiac, biliary, aorta, and early pregnancy ultrasonography. Due to the portability, relative ease of use, and lack of harmful radiation, bedside ultrasound rapidly increased in popularity through the 1990s as a means to improve and expedite patient care. The first formal policy statement for the use of ultrasound in EM was published by the American College of Emergency Physicians (ACEP) in 2001. The concept of emergency ultrasound (EUS) gained momentum throughout most of the residency training programs in the United States and became a required part of the core curriculum of EM residency programs by the ACGME Residency Review Committee for Emergency Medicine (RRC-EM). The rapid growth of EUS has led to the development and validation of new point-of-care ultrasound (POCUS) applications and the dissemination of basic training in developing

standard systems of care in the United States and abroad. As the use of POCUS has grown, so too have its applications. The emergency physician can learn to use ultrasound to diagnose vascular, musculoskeletal, soft tissue, ocular, gastrointestinal, genitourinary, thoracic, gynecological, and cardiac pathology and can also use it to guide fluid resuscitation. Ultrasound has become an important tool to facilitate bedside procedures including vascular access, thoracentesis, paracentesis, pericardiocentesis, incision and drainage, arthrocentesis, peripheral nerve blocks, foreign body removals, and lumbar punctures.

Why do residents choose to follow this career path?

There are many reasons why residents choose an ultrasound fellowship after graduation. Some may feel they did not receive adequate training during residency, simply want to improve their ultrasound skills, or want to obtain an advanced ultrasound skill set. Many will also hope to become an ultrasound director, whether in a community or academic setting, and require a fellowship to learn the requisite administrative skills required of the position. Ultrasound fellowships also afford graduating residents an opportunity to work at an academic center in a specific geography, with the hopes of being offered a faculty position after fellowship completion. Ultrasound fellowships provide specific ultrasound-oriented research opportunities for interested fellows. Some may be interested in global health and the applications of ultrasound to resource-limited settings in low-to-middle income countries.

How do I know if this path is right for me?

Residents who have a strong interest in bolstering their ultrasound skills, have an interest in pursuing a career as an ultrasound director, or working in an academic setting teaching ultrasound to students and residents should consider an ultrasound fellowship. The ideal applicant should be passionate about ultrasound in clinical, educational, and research settings. The path is right for you if you enjoy being involved in ultrasound practice and teaching and training others in ultrasound.

Career options after fellowship

An ultrasound fellowship affords many different career pathways, including education, research, and administration. Opportunities are available to become an EUS division director or residency program director, whether in an academic or a community setting. Those who are more educationally inclined can pursue a career as an EUS fellowship director or assistant/associate director. Some may find their passion within ultrasound research, while others may want to be primarily an academic faculty member with ultrasound

as their clinical and educational niche. Getting a strong background in educational administration also lends to the possibility of becoming a member of a residency leadership team. As ultrasound is also being taught and used in the setting of global health, many physicians are using their skills to be an educator and leader in ultrasound while travelling abroad.

Academic vs. community positions

Ultrasound training prepares physicians for both clinical and academic positions. Those interested in teaching and/or research tend to gravitate towards academic positions. When choosing a position, it is important to consider the department's support of ultrasound, current ultrasound equipment, and willingness to purchase future equipment.

IN-DEPTH FELLOWSHIP INFORMATION

Number of programs

In July 2018, there were 121 fellowships available, according to the [Emergency Ultrasound Fellowships website](#). Some programs offer “global/international” tracks, geared toward those interested in both global health and ultrasound. These programs provide additional training on establishing ultrasound programs and ultrasound education internationally.

Differences between programs

Ultrasound fellowship programs are varied, just like residency programs. Emphasis can be placed on clinical ultrasound, research, international work, or education. Speaking directly with the ultrasound fellowship director, as well as current and former fellows, will allow prospective applicants to better understand the education offered. To a MUCH greater degree than in residency, WHO you work with in the fellowship has a massive effect on what you learn and focus on during fellowship. For example, the EUS Fellowship Program Director may have an area of specialization in international activities that may or may not align with your personal goals — a key consideration when choosing a program!

Length of time required to complete the fellowship

1-2 years. Some programs incorporate either a master's degree in clinical epidemiology or combined training in another specialty, such as global health.

Skills acquired during fellowship

Fellows can expect to learn how to perform and interpret both basic and advanced ultrasound

applications and apply them to their clinical practice. You will also learn how an EUS program functions within the larger hospital or health care system. Many administrative aspects of running and maintaining an ultrasound program are emphasized: machine purchases and maintenance, integration with your electronic medical record (billing, coding and documentation), working with other medical specialties that utilize ultrasound such as radiology and cardiology, and physician credentialing and education. Specific skills in ultrasound research will likely be a part of your fellowship education as well.

Typical rotations/curriculum

ACEP has provided an EUS fellowship curriculum that most programs follow. Overall, you are required to obtain at least 1,000 scans during the year, participate in image review and Q-and-A sessions, submit a scholarly project, prepare ultrasound-related lectures, attend a national ultrasound meeting, and perform hands-on teaching to medical students, residents, and physicians in other specialties. In addition, you will likely work as a part-time attending in the emergency department to help fund your residency position.

Board certification afterwards?

While the possibility of accreditation for EUS is being explored, this fellowship is not currently recognized by the ACGME as a certified subspecialty in EM. There is debate in the specialty of EM about the utility of outside certification (e.g. ARDMS) in EUS. ACEP “strongly opposes the use of any non-emergency medicine external certification process to validate competency in the use of emergency ultrasound.”

Average salary during fellowship

The average salary during fellowship varies. Some programs pay fellows commensurate to their PGY level and also allow you to moonlight. Others fund the fellowship by paying you as a part-time faculty member. You should discuss salary with each specific site you are considering.

PREPARING TO APPLY

How competitive is the fellowship application process?

Some geographical locations can be competitive. The number of positions and applicants vary from year to year. In the past few years, there have been more spots than applicants, but this may not predict future years.

Requirements to apply

Many programs require that you are EM-trained and either board-eligible or board-certified. Additionally, applicants should have some basic exposure to ultrasound and meet the RRC requirements for POCUS in residency.

Suggested elective rotations to take during residency

If available, residents should take a dedicated ultrasound rotation or participate in an ultrasound elective.

Suggestions on how to excel during these elective rotations

Be engaged and learn any novel approaches to ultrasound in different settings. You should be familiar with the ACEP Emergency Ultrasound Compendium. Overall, being enthusiastic, asking questions, and getting your hands on as many scans as possible will be beneficial.

Should I complete an away rotation?

There is no need for an outside rotation during residency, unless your residency program does not offer strong ultrasound training, or you are looking at a specific program and want to do an audition rotation.

What can I do to stand out from the crowd?

Getting involved in ultrasound education and/or research during your residency will allow you to stand out from other applicants. Clinical excellence, the desire to work hard, and your accomplishments during residency are all important. Different fellowship directors use different criteria for selecting a fellow. One common theme is personality; they want fellows who are likable and who fit in with the rest of the crew. Energetic and proactive applicants with a history of getting things accomplished will be the most sought-after candidates.

Should I join a hospital committee?

This is not required. However, hospital committees can be a valuable learning experience and can help to develop your leadership skills.

Publications other than research

Being engaged academically certainly helps, and having non-research publications, such as in EMRA's *EM Resident* magazine or in *ACEP Now* magazine, will certainly make you stand out.

How many recommendations should I get?

Who should write these recommendations?

Three recommendations are fine. At least one should be from a faculty member active in ultrasound. The others should be from leaders at your EM residency or department.

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

You can still be competitive in many programs if you are applying after working clinically. Be prepared to explain why you did not do a fellowship right out of residency.

What if I'm a DO applicant?

You can apply for a fellowship position if you completed a DO residency in emergency medicine.

What if I am an international applicant?

International applicants with a license to practice medicine in the United States can be competitive applicants for EUS fellowships. International applicants without a license to practice medicine in the United States will have difficulty participating fully without the ability to work clinically, especially considering ultrasound fellows generally work part-time as EM attendings. Applicants who need a visa should apply to sites with experience in accepting such applicants.

APPLICATION PROCESS

How many applications should I submit?

There is no right answer to this question. It is good to see multiple fellowships so you can more accurately compare them. The average applicant applies to 7-8 programs.

How do I pick the right program for me?

There is no "right" program for most applicants, as many programs will provide good training. If you have a strong interest in an area of ultrasound, you may want to find a program that focuses on that

area. Applicants should be specific in identifying which clinical ultrasound applications they will master during their fellowship training. Look at the structure of the fellowship to see if they can fulfill your needs. Ask where their prior fellows have gone and see if they have found good jobs. Geographical location is paramount to some fellows.

Common mistakes during the application process

The most common mistake made during the application process is to have letters submitted to a site that refers the application to another site. Another common mistake is not having a good answer about why you want to attend that particular program. Prospective applicants may assume that an ultrasound fellowship is akin to a simple extension of residency, and some applicants come into the process without having a good explanation as to why they are interested in the fellowship. Using the years as a resident to solidify basic ultrasound skills, engage in research, and attend national meetings is now the norm for competitive fellowship programs.

Application deadlines

[Follow the NRMP Fellowships Match calendar](#). In general, the match opens in August, and results are announced in November.

Tips for writing your personal statement

Don't overthink the personal statement. Try to make a compelling narrative about why you want to do ultrasound. Please be simple, brief, and concise. A long letter describing various skills is unlikely to be helpful, because fellowship directors already have your CV.

Is this a match process?

Yes. EUS joined the NRMP Fellowships Match in spring 2018.

What happens if I don't obtain a fellowship position?

If you do not obtain a position the first day that offers go out, you can scramble and contact other fellowship programs that have open slots. This is coordinated through eusfellowships.com. You can also wait a year and reapply. If you plan to reapply, try to do something ultrasound-related during that gap to improve your application. Do not hesitate to contact the fellowships you applied to and ask how to make your application stronger. If you simply desire to improve your skill set in POCUS, many great courses are available online and in-person.

INTERVIEW PROCESS

How do I stand out from the crowd?

Be yourself! Be energetic and enthusiastic about the subspecialty. Research the program where you are interviewing so you can ask individualized questions. Be professional — remember, this is a job interview. Be prepared to discuss your reason for pursuing the subspecialty, as well as all aspects of your application.

What types of questions are typically asked?

- “Why do you want to come to this fellowship?”
- “Why do you want to do an ultrasound fellowship?”
- “What do you want to do with your career in ultrasound?”

How many interviews should I go on?

You should go on as many interviews as you want and can afford. There is no right number. Most applicants go to around seven interviews.

PREPARING FOR FELLOWSHIP

Textbooks to consider reading

Dawson M, Mallin M. Introduction to Ultrasound: Volume 1. Emergency Ultrasound Solutions; 2013.

Ma, O J, James R. Mateer, Robert F. Reardon, and Scott Joing. *Ma and Mateer's Emergency Ultrasound*, 2014.

Carmody KA, Moore CL, Feller-Kopman D. Carmody K.A., Moore C.L., Feller-Kopman D Eds. Kristin A. Carmody, et al.eds. Handbook of Critical Care and Emergency Ultrasound. New York, NY: McGraw-Hill; 2011

Important skills to practice while in residency to prepare for fellowships

In addition to working on your ultrasound skills, practice interviewing, team-building, demonstrating reliability in accomplishing tasks, and taking initiative.

Tips on how to succeed as a fellow

During fellowship, take advantage of all opportunities offered. Fellowship is a unique time to develop your skills in image acquisition and interpretation, the education of other healthcare providers in ultrasound, leadership and administrative skills in developing ultrasound infrastructure and curriculum, and, finally, research skills. Also, strive to maintain a balance with your life outside of fellowship to help prevent burnout.

CONCLUSION

Additional resources

[Emergency Ultrasound Fellowships](#)
[EMRA Ultrasound Committee](#)

Blogs/Podcasts

[ALIEM Ultrasound for the Win](#)
[Emergency Ultrasound Podcast](#)
[SonoMojo](#)

National organizations

[ACEP Emergency Ultrasound Section](#)
[EMRA Ultrasound Committee](#)
[SAEM Academy of Emergency Ultrasound](#)

Conferences

Some of the conferences with EUS activities include ACEP, SAEM, AAEM, AIUM, and P2SK. They are very different, but each is attended by ultrasound enthusiasts and offers opportunities to learn about and get involved in ultrasound on a national level.

How to find a mentor

Local mentors are best, so ask around your residency first, or [check the Former Fellows Map](#) listed on EUS. You can also network at national meetings to identify individuals who will help you with your interest in ultrasound. Email individuals directly. The community is friendly, open, and willing to help.

Undersea and Hyperbaric Medicine Fellowship

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INTRODUCTION

Description of the specialty

Undersea and hyperbaric medicine (UHM) is a unique subspecialty of emergency medicine that involves the therapeutic use of oxygen under pressure to treat disease. Hyperbaric oxygen is used to treat diving emergencies, arterial gas emboli, radiation injuries, complex wounds, carbon monoxide (CO) poisoning, deadly infections, ocular emergencies, and much more. The specialty of UHM includes treatment with hyperbaric oxygen but also the study of extreme environments, immersion effects, and marine life injuries.

The patient population is diverse, including recreational and commercial divers, patients requiring daily wound care, patients with complications after radiation therapy, and those who are critically ill. Fellowship training prepares physicians to care for patients with emergent and elective indications, participate in research, and become medical directors and leaders in the field.

History of the specialty/fellowship pathway

The history of hyperbaric medicine is long and storied. The first use of pressurized gas to treat medical disorders was recorded in 1662 by Henshaw. Decompression sickness, also known as caisson disease or “the bends,” was first described during the building of the Eads Bridge and Brooklyn Bridge in the 1860s. In the 1930s and 1940s, Behnke pioneered the first dive tables allowing for longer dives with increased safety for the diver. This foundation would be the beginning of what we now understand as hyperbaric medicine. Since then, many others have helped transform the field from one of observation and anecdote to

the evidence-based use of hyperbaric medicine today. The American Board of Emergency Medicine began board certification for UHM in 2000. The indications for hyperbaric oxygen therapy are published by the Undersea and Hyperbaric Medical Society (UHMS).

Why residents choose to follow this career path

Hyperbaric medicine is an exciting field that gives the emergency physician a new and powerful tool. Further, for those with interests in diving, wound care, or extreme environments, this is an incredibly useful skill that can help patients in and out of the emergency department. The field of UHM is growing, treatment indications are expanding, and there are many research opportunities available. Fellowship training will help you become a leader in undersea and hyperbaric medicine.

How do I know if this path is right for me?

If you love the pace of emergency medicine and resuscitation, have an interest in diving and physiologic effects of high pressure environments on human tissue, and love teaching and expanding the body of medical knowledge in which you have found your niche, then hyperbaric medicine may be the right path for you.

Career options after fellowship

The career options are broad and diverse, including practicing at dive clinics, hyperbaric tertiary referral centers, hyperbaric wound care facilities, commercial dive-related careers, and classic emergency medicine. Employment facilities can also be varied, with large multiplace chambers (multiple chambers connected, able to treat many patients at one time) that may be more focused on hyperbaric treatments, monoplace chambers (single person chambers) with an emphasis on wound care, or academic centers that have hyperbaric/hypobaric chambers and may be more focused on research into extreme environments.

Splitting time between departments

Many UHM careers are a mix of emergency medicine, hyperbaric medicine, and wound care, and it's important to find the right balance.

Academic vs. community positions

Fellowship training would be highly advantageous if you desire to stay in academia, although many fellowship trained hyperbaric physicians continue to practice in the community and become medical directors of their facility.

IN-DEPTH FELLOWSHIP INFORMATION

Number of programs

There are presently 7 institutions offering fellowship programs accredited by the Accreditation Council for Graduate Medical Education (ACGME) and one which is a DO only program:

[Duke University School of Medicine](#), Durham, NC

[Hennepin County Medical Center](#), Minneapolis, MN

[Louisiana State University](#), New Orleans, LA

[SUNY Upstate Medical University](#), Syracuse, NY

[San Antonio Uniformed Services Health Education Consortium](#), San Antonio, TX

[UC San Diego](#), San Diego, CA

[University of Pennsylvania Medical Center](#), Philadelphia, PA

[University of Texas Southwestern](#), Dallas, TX

[Kent Hospital](#), Warwick, RI (not ACGME accredited, DO only)

Several fellowship programs are in the works and upon publication of this guide may be active at the following locations:

- University of Texas Southwestern, Dallas, TX
- Intermountain Healthcare, Salt Lake City, UT
- Aurora Health Care, Milwaukee, WI

Differences between programs

Programs vary in the time fellows spend on call, time spent in wound care clinic, amount of critical care experience, and didactic requirements. Some programs place emphasis on hyperbaric medicine for wound care whereas others have a stronger diving medicine curriculum. All programs guarantee ample exposure to traditional and innovative applications of hyperbaric technology.

Length of time required to complete fellowship

The fellowship is one year with time divided between the clinical experience, participating in research, attending national conferences, and allotted vacation. Most institutions have allowance for one to five fellows however this can vary between programs and with year-to-year funding of the institution.

Skills acquired during fellowship

Fellowship programs include a diverse range of clinical responsibilities along with research requirements. All fellowships prepare candidates to treat emergent and elective patient indications for hyperbaric oxygen therapy. The fellowships also teach participants occupational and environmental safety standards, the clinical aspects of diving medicine, and hyperbaric chamber operations.

Typical rotations/curriculum

Fellows are responsible for managing elective and emergent patients receiving hyperbaric treatments in the chamber, completing consults, attending didactic sessions, and gaining basic understanding of hyperbaric chamber operations and management. It is not uncommon for an emphasis on wound care to be part of the hyperbaric fellowship curriculum. On-call time is built into schedules where fellows will respond to emergent hyperbaric treatment indications. Fellows typically attend one or more conferences related to the field throughout the year. Most fellows attend the NOAA Physicians Training in Diving Medicine course, held in Seattle, WA in October and the UHMS Annual Scientific Meeting (ASM) held in June.

Board certification afterwards?

UHM is an ACGME-accredited fellowship. Board certification in UHM is available after completing the fellowship. This certification covers the individual for a period of ten years upon which they will need to re-certify in order to continue working within UHM.

Average salary during fellowship

Salary is typically based on a PGY-4 (or 5) contract.

PREPARING TO APPLY

How competitive is the fellowship application process?

Programs report the selectivity for applying residents as moderate to highly competitive.

Requirements to apply

Candidates must have completed an ACGME-accredited training program and be board eligible/board certified in their specialty. Emergency medicine (EM) training is common among most applicants, though other specialties are able to apply including surgery, anesthesiology, emergency medicine, internal medicine, preventative medicine, neurology, pediatrics, and family practice. Additionally, applicants must hold a valid medical license in whichever state they will be attending the fellowship.

Research requirements

Research is not a requirement for applying to fellowship but will improve your chances of being offered a fellowship position.

Suggested elective rotations to take during residency

If your residency institution has a hyperbaric center, it is recommended to rotate through to gain experience. Also, scuba diving certification is not a pre-requisite for the fellowship, but it may be encouraged at some point before or during training.

Suggestions on how to excel during these elective rotations

To excel, read current literature on hyperbaric medicine, get involved with your seniors and faculty members during cases, and take initiative when it comes to exploring research and case report opportunities.

Should I complete an away rotation?

Away rotations are not required, but will certainly help make you more competitive.

What can I do to stand out from the crowd?

Research in hyperbaric medicine, case report publications, talks given at local and national conferences, as well as service to the field of undersea and hyperbaric medicine are great ways to demonstrate interest and set yourself apart from other applicants.

Should I join a hospital committee?

This is not required, but it is encouraged to demonstrate interest and open new opportunities for yourself.

Publications other than research

Case reports, articles in magazines and websites dedicated to UHM, and review articles are other great ways to publish in the specialty.

How many recommendations should I get? Who should write these recommendations?

Most programs require at least 2 letters of recommendation. Recommendations should come for senior hyperbaric faculty and from your program director. Ensure that you thoroughly research the program for specific requirements.

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

Attendings who have been practicing and are looking to further develop their careers are welcome to apply and are competitive for fellowship.

What if I am a DO applicant?

Graduates of MD and DO granting medical schools will be considered as long as residency has been completed and licensing has been achieved.

What if I am an international candidate?

International applicants are also welcome to apply provided they meet licensing requirements.

APPLICATION PROCESS

How many applications should I submit?

Apply broadly, as there are limited slots for fellows and few programs nationally. Also, ensure that you are able to obtain a medical license in that state for which you are applying.

How do I pick the right program for me?

As with residency application, the “right” program will be based on personal and professional preferences.

Common mistakes during the application process

A common mistake is to apply later in the year (September or October), when most of the positions have already been filled.

Application deadlines

There is no match for UHM, most programs use a rolling admissions process. Start applying early (usually July or August of the year prior to starting fellowship). Interviews typically run from August through December, but candidates can contact programs earlier. Occasionally programs do not fill all their spots or spots will open, so it is never too late to contact programs to ask if applications are still being accepted.

Tips for writing your personal statement

The personal statement is a key part of the application. Your statement should demonstrate basic knowledge of the field, address why you want to enter the field of hyperbaric medicine, and what you plan to do in the next 5-10 years.

Is this a match process?

No. Applications are sent directly to the programs.

What happens if I don't obtain a fellowship position?

If you do not obtain a fellowship you can reapply, though it may be more difficult to obtain a fellowship offer the second time around. If you do not receive an offer, it is recommended that you continue to work clinically while exposing yourself to hyperbaric medicine and stand out by doing research, joining committees, and getting involved in other ways.

INTERVIEW PROCESS

How do I stand out from the crowd?

It is essential that you come prepared. Read up on the program and latest topics in hyperbaric medicine. Obtain information specific to the program at which you are interviewing so you have a general understanding of the fellowship training offered by the program. As with any interview, the interest in that position should not start upon acceptance. Rather the individual should already be engrossed in UHM research, clinical work, and aware of the future of the field and that particular program. Be sure to have questions prepared and have a strategy in place that allows you to emphasize your most appealing attributes. Arrive on time, be polite, and be interested. Be prepared to answer the question: “Why do you want to do a hyperbaric fellowship?”

What types of questions are typically asked?

Interviewers will ask you why you want to go into hyperbaric medicine and ask you pointed questions about current topics in hyperbaric medicine as well as questions regarding items in your CV and application.

How many interviews should I go on?

Given the limited number of programs, you should accept all interview offers in order to improve your chances of being offered a fellowship position.

PREPARING FOR FELLOWSHIP

Textbooks to consider reading

Neuman T, Thom S. Physiology and Medicine of Hyperbaric Oxygen Therapy. 1st ed. Philadelphia, PA: Saunders and Elsevier; 2008.

Edmonds C, Bennett M. Diving and Subaquatic Medicine. 5th edition. Boca Raton, FL: CRC Press; 2015.

Weaver LK. Hyperbaric Oxygen Therapy Indications. 13th ed. North Palm Beach, FL: Best Publishing Company; 2014.

Important skills to practice while in residency to prepare for fellowship

Become well-versed in the indications for hyperbaric therapy and gain general knowledge regarding chamber function and diving. The pursuit of diving is not a requirement however experience in the field will be appreciated. Coupled to that should be familiarity with principles of wound care and management using hyperbaric medicine.

Tips on how to succeed as a fellow

Fellows must be committed to the specialty. This means being professional, invested in your work, and willing to contribute to the community of your specialty.

CONCLUSION

Additional resources

Journals

Undersea and Hyperbaric Medical Society (UHMS) Journal

Diving and Hyperbaric Medicine Journal

Online seminars

[Divers Alert Network](#) (DAN)

National organizations

[Undersea and Hyperbaric Medical Society](#)

[ACEP UHM Section](#)

Conferences

UHMS Annual Scientific Meeting in June

ACEP UHM Section annual meeting at *ACEP Scientific Assembly*

How to find a mentor

Prior to fellowship, contacting your local hyperbaric chamber to talk about careers in hyperbaric medicine would be valuable. A week to month-long rotation at a hyperbaric chamber, or becoming involved in hyperbaric medicine research projects, would also be helpful.

* * *

Note: The views expressed in this chapter are those of the author and do not necessarily reflect the official policy or position of the Department of the Navy, Department of Defense, nor the U.S. Government.

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Wilderness Medicine Fellowship

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INTRODUCTION

Description of the specialty

Wilderness medicine (WM) is the practice of medicine with limited resources in austere environments, or health care provided anywhere in which environmental conditions have physiologic insult to a patient. This simple definition belies the complexity of this specialty, as well as the extensive and varied opportunities it provides. Training in wilderness medicine can prepare physicians to treat mountaineers and sherpas on Everest, serve as directors of national parks, provide medical training and oversight for search and rescue organizations, work in hyperbarics or dive medicine, and provide medical care on expeditions or at remote scientific base camps. A wilderness medicine physician must not only have knowledge of medical problems that arise in the elements (i.e. acute mountain sickness, hypothermia, lightning strikes, dysbarisms, and envenomations, to name a few), but also how to acutely manage these problems outside of the hospital and often with minimal support.

Wilderness medicine includes, but is not limited to:

- Trauma and Emergency Medicine
- Sports Medicine
- Rescue and Evacuation
- Diving and Hyperbaric Medicine
- Disaster Medicine
- Tropical and Travel Medicine
- Expedition Medicine
- High-Altitude/Mountaineering Medicine
- Envenomations
- Survival Medicine
- Tactical Medicine
- Space Medicine

History of the specialty/fellowship pathway

If defining wilderness medicine as health care performed beyond the boundaries of existing civilized medical infrastructure, one may argue that surgeons from early Greece and Rome were the true founders of the field.¹ The evolution of wilderness medicine has been closely tied to military operations, a statement that remains true today. The current field of wilderness medicine gained momentum starting in the early 1970s, when experienced Himalayan mountaineers gathered in London to share stories and discuss tips on high altitude survival. A few years later in Wales, scientists joined the discussion and gave lectures on high altitude physiology. In 1975, the Yosemite Mountain Medicine Symposium expanded discussions beyond altitude medicine, to include topics such as search and rescue, trauma, and backcountry first aid. The first textbook on wilderness medicine, *Management of Wilderness and Environmental Emergencies*, was written by Dr. Paul Auerbach and Dr. Edward Geehr in 1983. The Wilderness Medical Society (WMS) was established in 1982, and this was the first national society for wilderness medicine.² The first fellowship in wilderness medicine was established in 2003, and today 15 fellowships are offered throughout the United States.

Why residents choose to follow this career path

While residents may choose to pursue wilderness medicine with different specific goals in mind, the overarching commonality is a desire to combine one's passions for both medicine and the outdoors. Now more than ever the emergency medicine community is recognizing wilderness medicine as an important academic subspecialty. Residents are drawn by the plethora of opportunities to contribute meaningful research to a rapidly growing field, and the opportunity to further expand the role of wilderness medicine physicians.

How do I know if this path is right for me?

Residents and medical students who come down with serious cases of wanderlust the week before an exam or after a weekend of working 12-hour shifts will be well-suited for wilderness medicine. Those who daydream about a life outside of the hospital, revel in their sense of wonder in the world, have a propensity for adventure, and gravitate towards adrenaline-spiking experiences should consider this subspecialty.

Furthermore, wilderness medicine can fulfill one's desire for involvement at the academic, community, national, and even international level. While all

physicians serve their community by providing medical care, those trained in wilderness medicine are able to extend their skills to ski clinics, marathons and ultramarathons, and search and rescue efforts. At the national and international levels, wilderness medicine physicians are well prepared to provide care after natural disasters. Still others support scientific discovery by providing care to researchers collecting data in austere environments, like the Amazon or Antarctica. If you are looking for "something bigger" in your life, consider wilderness medicine.

Career options after fellowship

There are many paths to take after fellowship. Some physicians become involved with EMS, serving as medical directors for search and rescue teams, or training medics in the National Park Service program. Others volunteer as medical officers for disaster relief efforts on the local, national, and international scale. Wilderness medicine trained physicians provide medical care at races and ultramarathons, and on expeditions. There are many opportunities to become involved in education, including serving as a fellowship director, establishing and/or directing wilderness medicine student electives, and teaching training courses such as Advanced Wilderness Life Support (AWLS). Others contribute to the field through research on a variety of topics, including high altitude medicine, hypothermia, ultramarathon physiology, and effects of climate change on human health. Some physicians are able to devote the entirety of their careers to wilderness medicine, while others work full time in the emergency room and participate in wilderness medicine activities in their free time.

Splitting time between departments

Negotiations are not traditionally between separate departments but rather within the department regarding how you will utilize your wilderness medicine training. For example, you may have aspirations to create a medical student rotation in wilderness medicine, or to become a fellowship director within this specialty. Some physicians find part time employment with national parks, ski lodges etc. in addition to their emergency department responsibilities.

Academic vs. community positions

Academia affords many opportunities for education in comparison to community positions, and provides

significant support in terms of both finances and protected time for research. In a community setting, it will likely be up to the individual to network and find opportunities for involvement. In many cases, geographic location is a key determinant in how easy or difficult it will be to find such opportunities. In some rural community emergency departments (EDs), you will likely be incorporating wilderness medicine into all of your shifts!

IN-DEPTH FELLOWSHIP INFORMATION

Number of programs

There are currently 15 available fellowships, 1 of which is only open to active military personnel:

- [Medical College of Georgia](#)
- [Virginia-Tech Carilion](#)
- [George Washington University](#)
- [Yale University](#)
- [Baystate Medical Center](#)
- [Massachusetts General Hospital](#)
- [SUNY Upstate Medical University](#)
- [University of Colorado and Denver Health](#)
- [University of New Mexico](#)
- [University of Utah](#)
- [Stanford University](#)
- [University of California \(San Francisco\) — Fresno](#)
- [University of California \(Irvine\)](#)
- [University of California \(San Diego\)](#)
- [Madigan Army Medical Center](#) (active duty military only)

For ongoing updates, please refer to the [ACEP Wilderness Medicine Section](#) and [EMRA Match](#).

The Wilderness Medical Society (WMS) also offers a unique certification pathway: [Fellowship in the Academy of Wilderness Medicine](#), or FAWM. This is a great option for anyone who does not want to complete a formal year of fellowship, or for those who want flexibility in completing fellowship training. Fellows must complete lessons from a pre-established WM curriculum of twelve categories, similar to those covered in formal fellowships. In addition, they must gain experiential knowledge in 6 categories: publishing and research, volunteer teaching, public service, practice, service to WMS, and board certification and conference attendance. On average it takes Fellows 3-5 years to complete all requirements for their FAWM.

You can start working towards your FAWM in residency and as early as medical school. In addition, the FAWM is open to any WMS member, regardless of medical specialty.

Differences between programs

All fellowship programs follow a standardized curriculum and core content. Clinical opportunities will differ between programs, depending on geographic location and which organizations (outdoor, rescue, international relief) faculty are involved. Likewise, research focuses and specific teaching opportunities will vary by program. Some fellowships have a heavier emphasis on incorporating EMS, international, disaster, or expedition medicine. We recommend spending time reviewing each fellowship's website, noting opportunities that are particularly interesting to you.

Length of time required to complete fellowship

Most fellowships are one year. Several fellowships have the option to extend a second year to pursue a Master of Public Health (MPH) degree.

Skills acquired during fellowship

In general, a fellow can expect to develop a high level of proficiency in treatment of high altitude illnesses, wilderness trauma, envenomations, dysbarisms, and tropical diseases. They will receive search and rescue and/or EMS training and become proficient in medical evacuation. Fellows also develop leadership and educational skills and experience.

Typical rotations/curriculum

Emergency medicine-based wilderness medicine fellowships follow a [standardized minimum core curriculum](#) over one year. This core content was agreed upon by the Fellowship Subcommittee and Taskforce of the American College of Emergency Physicians Wilderness Medicine Section, and published in *Academic Emergency Medicine* in 2014. The curriculum provides an outline of topics that an expert in wilderness medicine is expected to master. Fellowship programs vary in presenting this material through educational and clinical experiences, as well as some self-learning. Most curriculums also include a scholarly project that can range from a simple case report to extensive vigorous research projects. Often fellows have the opportunity to give presentations at local, national, and international conferences.

Most fellowships provide 1-3 months of protected time for the fellow to dedicate to specific wilderness activities, off-site clinical experience, or site-specific

research. Fellows have used this time staffing the Himalayan Rescue Association clinics in Nepal, working as expedition doctors, or other similar activities.

Because wilderness medicine fellowships are not ACGME accredited at this time, most fellows are hired as junior faculty and are expected to do a certain amount of shift work in the ED (specific amount of time required in ED varies by program).

Board certification afterwards?

No.

Average salary during fellowship

Anticipate a salary consistent with that of a PGY-4 or 5. However, because most fellows are hired as junior faculty, some programs provide salaries from \$75,000-\$110,000. Moonlighting is allowed in most cases.

PREPARING TO APPLY

How competitive is the fellowship application process?

Competitiveness will vary year to year. As the number of fellowship options continues to expand, the chance of finding a fellowship that suits your specific needs gets better and better. However, if you are focused on only 1-2 programs and they have 1 spot each, it can be quite competitive.

Requirements to apply

Currently, almost all fellowships require American Board of Emergency Medicine (ABEM) eligible or ABEM certified physicians. However, an increasing number of fellowships are now open to both EM and non-EM applicants. Madigan is only open to military personnel.

Most fellowships will require a letter of intent or personal statement, updated curriculum vitae (CV), and 2-3 letters of recommendation.

Research requirements

There are no standard research requirements for the application process. Specific wilderness medicine research will definitely help you stand out as an applicant. However, Fellowship Directors understand that it may be difficult for residents to complete wilderness medicine research if they are training at a program without a robust WM interest. Any quality research will speak to your proficiency in the process, so take your residency research requirement seriously and be able to speak eloquently about your project during fellowship interviews.

Suggested elective rotations to take during residency

If your program offers international experience, EMS rotations, or flight medicine opportunities, they can provide a good base for branching into wilderness medicine. See below for more elective ideas.

Suggestions on how to excel during these elective rotations

Show your enthusiasm for the projects at hand whether they be specific to medicine or simply a new outdoor skill. Do not worry if you are not already a wilderness expert; after all, what would be the point of training if you already knew everything? Take advantage of every opportunity to learn skills and tips from your instructors as well as other more experienced members of your elective. Get to know the directors/staff of any wilderness related rotations as they can be valuable resources for future opportunities as well as solid letters of recommendation.

Should I complete an away rotation?

In wilderness medicine nothing is as valuable as hands-on experience. Using your elective time to pursue medical experience in a wilderness setting is a smart option. Elective time can be spent in an official wilderness medical course, an international medical mission, or something you come up with on your own. The [EMRA Wilderness Committee](#), [ACEP Wilderness Medicine Section](#), and [Wilderness Medical Society](#) list elective opportunities for residents and students. Other groups, such as the Wilderness Medicine Institute (WMI) of the [National Outdoor Leadership School](#) (NOLS), offer courses and medical expeditions. Set up your elective time early as some of them are popular and spots fill fast.

What can I do to stand out from the crowd?

Try to complete wilderness medicine-specific research or projects. Even if you are not in a region known for WM, you can come up with creative ways to incorporate aspects of WM into your scholarly project. For example, you could research the incidence of hypothermia in the homeless urban patient population during winter months. Write up the patient you took care of in Chicago who had just landed from her vacation in Mexico with a jellyfish sting. Organize a Medical Wilderness Adventure Race (MedWAR) for your residency program, or design a WM track for your residency program if one does not already exist.

Apply to serve on wilderness medicine committees through EMRA, ACEP, SAEM, or the WMS. If selected to serve on a committee, take an active role in the organization and have a tangible end result to show for your invested time.

Seek opportunities for valuable hands-on wilderness experience. Volunteer as medical support for ultramarathons, ask local hiking groups if you can host a workshop on packing survival kits, or sign up for a MedWAR. Consider using your residency elective to take a course through the WMS or NOLS.

Spend time reading about each area of WM and find an area that interests you. Reach out to fellowship directors early on in your residency training; ask about the program, let them know your area of interest, and stay in contact. Being known as a motivated candidate with sincere interest in WM will not only open the door to more opportunities for involvement, but will also make you more of a known candidate when it comes time to apply for fellowship. You don't want a fellowship director hearing your name for the very first time when he or she reads your application!

Should I join a hospital committee?

There are few hospital committees that directly relate to wilderness medicine. Focusing your energy elsewhere will likely prove more advantageous.

Publications other than research

There are ample opportunities to publish editorial, educational, and experience reports through various publications. *EM Resident* (EMRA publication), *Wilderness and Environmental Journal*, *Wilderness Medicine Magazine* (WMS publication), and ACEP's wilderness medicine committee newsletter all accept manuscripts other than strict research. Any publication in the field of wilderness medicine shows your interest and level of commitment to the field and can help you get into a fellowship program.

How many recommendations should I get?

Who should write these recommendations?

Most programs require 2-3 letters of recommendation. One should come from your residency program director. If you have done a wilderness medicine related elective, the director of that rotation could provide valuable insight into your skills and commitment to the field of wilderness medicine.

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

Yes. Working prior to fellowship should not make you less competitive.

What if I'm a DO applicant?

DO vs MD is unlikely to be an issue if you have a strong CV.

What if I am an international applicant?

Again, the strength of your CV is the strongest predictor of being accepted into a fellowship program. However, visa issues may in some cases affect the consideration of an application.

APPLICATION PROCESS

How many applications should I submit?

Clearly, applying to more programs will increase your chance of being accepted. However, every program is different, so do your research on what each program offers. Often finding 3-5 programs that will best fit your goals is sufficient.

How do I pick the right program for me?

Every program offers a unique experience beyond the standardized core content. Some fellowships are more academic and research driven, while others focus more on experiential training. Some fellowships have a strong EMS component while others have little or no EMS focus. There are several programs that allow the fellow to extend a year and add a Master's of Public Health (MPH) into their program curriculum. Each program will offer unique travel and expedition opportunities. An applicant that is interested in pursuing dive medicine will likely be drawn to certain fellowships while an applicant interested in pursuing altitude medicine will be drawn to other programs. Geography also plays a role, not only because of personal preference, but also because certain locations will provide more access to certain wilderness experiences. Again, the best way to determine the best programs for your interests is to spend time reviewing each program's website and reaching out to fellowship directors.

Common mistakes during the application process

Get involved as early as you can. Massachusetts General Hospital's fellowship website offers this sage advice: "It is never too early to be in contact with us about your future plans. We tend to take a long view

of relationships. Over the years, we have discussed wilderness medicine fellowship training with EMT's, college and medical students, residents and practicing physicians. While we have hired applicants who first approached us less than a year before starting their fellowship, we maintain an active roster of prospective fellows — some over more than 5 years — many of whom we have then hired as fellows. We are friendly people who like to talk about wilderness medicine. We ask you to begin a conversation with us early.”³

In addition to starting too late, not having a clear goal is a common mistake. Most fellowships allow you to tailor your experience and research according to your specific area of interest. During the interview process be able to clearly define what you want to accomplish during your fellowship.

Application deadlines

In the past each fellowship program accepted applications, interviewed, and extended offers throughout the fall. More recently fellowships have agreed to follow more specific deadlines to help prospective fellows who are considering multiple fellowship options. Most now follow a verbal agreement to have an application submission deadline of October 1 and final decisions and offers extended on November 1. Submit your applications as early as possible, as scheduling travel during residency can be challenging. Check each fellowship program's website for dates.

Tips for writing your personal statement

Clearly highlight your past experiences and exposure to wilderness medicine. Describe your reasons for wanting to pursue a fellowship and what you hope to accomplish. In most cases you will be acting as both fellow and junior faculty, working several shifts each month in the emergency department. In addition to specific wilderness accomplishments, also describe why you would be a good fit in their emergency medicine department.

Is this a match process?

No.

What happens if I don't obtain a fellowship position?

There are many opportunities to pursue wilderness medicine with or without a fellowship. You can still get involved in many different areas of wilderness medicine. One option is to work toward becoming a Fellow in the Academy of Wilderness Medicine.

INTERVIEW PROCESS

How do I stand out from the crowd?

Use your question responses to highlight your interests, research, projects, and accomplishments that demonstrate your commitment to the academic field of wilderness medicine. This is not the time to be timid about why you are the perfect candidate for that fellowship spot! Take pride in your CV and let your excitement about your future career plans shine through. In addition to knowing your own research projects inside and out, have a few ideas about where your past and current projects may lead you in the future. Anticipate questions about lessons learned from your field experiences. Importantly, articulate clear and attainable goals for your year of fellowship. If you want to start your own WM fellowship after training, have an answer prepared for how you developed that goal. It is OK not to know exactly where you want to end up within WM, but have a plan for how you want to explore one or two specific interests. Since each fellowship program offers unique field experiences, do your research ahead of time and tell fellowship directors why you have chosen to apply to his or her program as opposed to somewhere else. Additionally, the value of being amiable and friendly can never be overstated. In many cases you will be traveling and working under stressful environments with your fellowship staff, so they will want someone who is flexible and enjoyable to work with.

What types of questions are typically asked?

As with most interviews, fellowship directors will likely review pertinent aspects of your CV with you. You will be asked what you learned from your specific wilderness experiences. You will be asked what you hope to accomplish during your fellowship and about your long-term wilderness medicine goals.

How many interviews should I go on?

Most applicants end up going on 3-5 interviews. It is uncommon for applicants to do more than 5 interviews.

PREPARING FOR FELLOWSHIP

Textbooks to consider reading

- Auerbach, Paul S. *Wilderness Medicine*. Philadelphia, PA: Elsevier/Mosby, 2012.
- Auerbach, Paul S. *Field guide to wilderness medicine*. Elsevier Health Sciences, 2013.

Important skills to practice while in residency to prepare for fellowship

Consider doing a skills course and getting a wilderness related certification. One of the most common is the Advanced Wilderness Life Support (AWLS). This is a multiday course with lectures and hands on experience and is taught in locations across the country throughout the year. Organizations such as the Wilderness Medicine Institute (WMI), National Ski Patrol (NSP), and Aerie also offer a variety of courses including Wilderness First Responder (WFR), Wilderness First Aid (WFA), Wilderness Medicine Essentials (WME), Wilderness Advanced First Aid (WAFA), Wilderness EMT (W-EMT), and Outdoor Emergency Care Course (OEC). These courses vary in length and amount of information covered. A more extensive course is the Diploma in Mountain Medicine (DiMM). It is quite expensive and requires a significant time commitment. For these reasons, a DiMM is more commonly completed either during a fellowship or after. Also consider sport-specific certifications such as American Institute for Avalanche Research and Education (AIARE) courses, ski patrol, swiftwater rescue, or SCUBA.

Tips on how to succeed as a fellow

Get started early. A year goes faster than you would expect. As soon as you are accepted to a fellowship, start to identify what you hope to accomplish. You often can start research projects early so you can hit the ground running. Most fellowships will have several optional experience opportunities. To a certain extent your fellowship will be what you make of it. Take as many opportunities as possible and be self-motivated. The more experiences you have the more successful your fellowship will be. At the same time, do not be afraid to say no to opportunities that will not suit your goals. It is very easy to overbook yourself as a fellow and struggle to finish all of your projects by the end of one year.

CONCLUSION

Additional resources

Journals

Wilderness and Environmental Medicine
High Altitude Medicine and Biology Journal
Wilderness Medicine Magazine

National organizations

[Wilderness Medical Society](#)
[ACEP Wilderness Medicine Section](#)
[EMRA Wilderness Committee](#)
[SAEM Wilderness Medicine Interest Group](#)

Conferences

[Offered through WMS](#)
[National Wilderness Medicine conferences](#)

Local conferences are available and often sponsored by individual residency programs, such as UCSF Fresno, University of Michigan, WellSpan York Hospital, and Virginia Tech — Carilion School of Medicine.

How to find a mentor

Sign up for a mentor through the [EMRA Wilderness Committee Virtual Mentorship](#). Reach out to program directors or past fellows with similar interests. Go to conferences and network, and join a national organization or committee.

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Women's Health Fellowship

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INTRODUCTION

Description of the specialty

This fellowship is known as Women's Health Fellowship, Global Women's Health Fellowship, and/or Sex and Gender Fellowship.

Some of these fellowships focus more on the research of domestic and global women's health issues. These programs create physician leaders in education and research in gender-specific medicine, with translation of these concepts to real-life emergency medicine practice. Additionally, fellows learn how to promote high-quality and culturally competent care for women, both locally and globally.

Other women's health fellowships focus primarily on clinical training in the clinic, urgent care, and emergency department settings. These programs allow for additional female and reproductive health training, beyond the usual training in emergency medicine residencies.

History of the specialty/fellowship pathway

Originally, women's health was essentially synonymous with reproductive and gynecologic care. As such, initial fellowships were geared toward OB-GYN physicians. Because internal medicine physicians and family physicians are also involved in gynecologic care, it was a natural fit for these fellowships to offer training to these physicians as well. Over time, interest arose into developing a better understanding of how certain disease states affect women throughout their life. Women's health has subsequently expanded, beyond reproductive and gynecologic care, to include the interactions of biological, societal, behavioral, political, and environmental issues on the overall health of women. With this expanded vision of the women's health fellowship, it comes as no surprise that psychiatry and emergency medicine physicians are now completing women's health fellowships.

Why residents choose to follow this career path

This career path is for residents interested in the development of academic research, educational initiatives, and leadership skills specific to women's health, or for residents interested in additional clinical training in gynecology and obstetrics. Fellows obtain a foundation of knowledge of women's health issues in the setting of social, cultural, and political environments. This foundation helps physicians achieve successful careers post-fellowship that are dedicated to the health and well-being of women.

How do I know if this path is right for me?

Are you interested in cardiovascular disease and how it affects women? Are you interested in learning more about female genital mutilation: why it exists, how it impacts a woman (both in the gynecological capacity and psychological perspective), and how to stop it? Would you like to help women with family planning in a war-torn country or in a country devastated by Zika virus? Do you want to be a leader and expert among emergency physicians in regard to the health of women? Do you have a specific research interest in the health issues of women displaced due to disaster? Do you want more advanced procedural training in the fields of gynecology and obstetrics? Are you interested in rural or critical access emergency medicine and want focused clinical OB-GYN training? If so, this may be the career path for you.

Career options after fellowship

Physicians who have completed this fellowship have gone on to achieve:

- Board member for the Sex and Gender Women's Health Collaborative.
- Leadership positions in the American Medical Women's Association.
- Funded researchers specializing in gender differences in medicine.
- International employment with focus on (but not limited to) gender based violence, human trafficking, mental health, sexually transmitted diseases, health services to rural communities, etc.
- Leadership in humanitarian response in war-torn countries.
- Appointments with Ministry of Women's Rights.
- Appointments with Partners in Health.
- Appointments with Department of Health and Human Services.
- Rural or critical access emergency medicine attending positions with higher likelihood of managing complications of second and third-trimester pregnancy and labor and delivery.

Academic vs. community positions

When choosing between academic, community, or global positions after fellowship, this is typically determined by the applicant's personal career aspirations. For example, those with strong research interests gravitate toward academia, whereas others may seek appointments working in underserved areas.

IN-DEPTH FELLOWSHIP INFORMATION

Number of programs

Programs with options for primary research focus:

- [Brigham and Women's Global Women's Health Fellowship](#)
- [Warren Alpert Medical School of Brown University](#) (Rhode Island Hospital): Sex and Gender in Emergency Medicine
- [UCSF, GloCal Health Fellowship](#) (must be affiliated with University of California to apply)
- [Cedars Sinai Women's Heart Disease and Health Fellowship](#)

Programs focused on clinical education and varying levels of research emphasis:

- [Cleveland Clinic Women's Health Fellowship](#)
- [University of Michigan Women's Health Fellowship](#)
- [VHA Advanced Fellowship in Women's Health](#) (8 sites: Boston, Los Angeles, Madison, Milwaukee, Pittsburgh, San Diego, San Francisco, and West Haven). Please contact each site individually for eligibility requirements.

Fellowships that do not currently accept EM resident applications:

- [Mayo School of Graduate Medical Education Women's Health Training Track](#)

Additional fellowships (unclear if they accept EM resident applications):

- [University of Illinois College of Medicine at Peoria Women's Health Fellowship](#)
- [Florida Hospital Women's Health Faculty Development Year](#)
- [East Carolina University, Maternity and Women's Health Fellowship](#)
- [Case Western Women's Health Fellowship](#)
- [Columbia Faculty and Fellowship Development in Women's Health](#)
- [OHSU Women's Health Fellowship](#)
- [UMDNJ Reproductive Health Fellowship in Family Medicine](#)

Differences between programs

Some programs focus more on research, with opportunities to obtain advanced degrees such as a master's degree in public health, science, and/or clinical research. These programs often have access to research funding and can propel a young researcher into a future niche in women's health. Some programs are focused on clinical training and expanding a women-specific clinical skillset. These programs provide the opportunity to gain specialized skills in areas including labor and delivery, cesarean sections, management of low-risk prenatal care, preventative health, mental health, office-based gynecologic procedures, and breast health. Most clinical fellowship programs also offer opportunities for research with varying levels of emphasis on publication. Finally, some programs have a focus on international opportunities and on public health education.

Length of time required to complete fellowship

Varies by program: 1-3 years.

Skills acquired during fellowship

- Research experience
- Formal public health education
- Global health experience/exposure for those who are interested
- Leadership and administrative skills
- Education and curriculum development
- Education and training on the following topics, including but not limited to:
 - Obstetrics: low-risk prenatal care, labor and delivery, cesarean section, breastfeeding, ultrasound
 - Gynecology: pelvic pain, office-based gynecologic procedures, family planning, hysterectomy alternatives
 - Preventative care: breast health, pap smears
 - Eating disorders
 - Women and heart disease
 - Endocrinology and bone health

Typical rotations/curriculum

Fellows typically divide their time between research, education, and clinical services. The percentage spent in each varies based on the program.

Board certification afterwards?

No. However, many fellowships offer the opportunity to obtain an MPH or advanced degree/certificate in research.

Average salary during fellowship

Varies based on program. Some programs pay PGY-4, 5, or 6 level salary and others offer a more competitive salary. Moonlighting opportunities, if offered/allowed by a program, will also influence yearly salary.

PREPARING TO APPLY

How competitive is the fellowship application process?

This is a hard question to answer, as this field is one of the newest in fellowship offerings for emergency medicine physicians. Additionally, the interest among emergency physicians in these fellowships is low, especially as compared to other fellowship opportunities. Most women's health fellowships were originally designed for residents from family practice, psychiatry, OB-GYN, surgery, and internal medicine. Many of these programs are open to receiving applications from EM applicants, even if they have not had an EM-trained fellow yet. An applicant must be prepared to "sell" to such programs the advantages of an emergency medicine trained physician and in how choosing such a physician would benefit their program. The list of eligible programs is always changing for the EM resident, thus we recommend contacting all programs to ask if they will accept an EM resident. Because there are limited fellowship opportunities available for the emergency physician, this inherently makes it a competitive fellowship. But, there are also a small number of applicants per year.

Requirements to apply

You must be graduating or have graduated from an accredited emergency medicine residency. You must contact each of these programs individually to formally apply.

Research requirements

Research is encouraged but not required.

Suggested rotations to take during residency

Here are some rotations to consider when planning your elective time: international rotations, women's health clinic, community health clinics, public health administration, addiction clinics, preventive counseling, family planning clinics, domestic violence clinics, etc.

Suggestions on how to excel during these elective rotations

Residents who do well on these rotations are those who are interested, hard-working, and engaged. Your passion for medicine and helping others should be evident. Strive to make connections with your patients,

families, and each member of the health care team. Continue to read and learn throughout the duration of your rotation. It also never hurts to arrive early and stay late; being late to your rotation is a sure way to obtain a bad evaluation.

Should I complete an away rotation?

There is no need to attend another institution for an away rotation, unless it is for a desired elective that is not offered by your home institution. If there is a fellowship program that you are highly interested in, it is worth considering arranging an away rotation at this program. This would allow for both you and the program to get to know one another which could be potentially advantageous during the fellowship application process. If you do arrange such an away rotation, make sure that you are on your best behavior and treat every day as an interview day. Creating a bad impression during the rotation would most assuredly negatively affect your chances at becoming their future fellow.

What can I do to stand out from the crowd?

Become involved in projects that are geared toward women's health. Participating in meaningful leadership and research opportunities is key. By the time you apply for fellowship during your third (or fourth) year of residency, your research project should be near completion. It's better to have one completed research project than three projects still in the data collection phase. Additionally, women's health is a broad field, so it may be wise to narrow your focus to a particular "niche" that interests you.

Should I join a hospital committee?

Absolutely pursue this opportunity. This would be an excellent way to gain leadership skills and make a difference within your institution.

Publications other than research

Publishing book chapters, blog posts, newsletter articles, etc. that discuss a topic within the field of women's health would certainly help to strengthen your application and show your dedication to the field. More important, however, such publications help to expand your knowledge base about the topics and about this field of medicine.

How many recommendations should I get? Who should write these recommendations?

In general, three letters of recommendation are required, one of which must be from your program director or chair of the emergency department. If possible, try and obtain a letter of recommendation from a physician whose career is linked to women's health topics, such as an international emergency physician or a physician who completes research in related topics. Do not fret, however, if you do not have such physicians available as letter writers from your residency program. Focus instead on obtaining three strong and outstanding letters of support.

What if I decide to work as an attending before applying? Can I still be competitive when I apply for fellowship?

Absolutely. The key when applying after residency is to continue to be involved in leadership and/or research activities during your time as an attending physician and to continue to gear your resume toward the desired fellowship.

What if I'm a DO applicant?

Please note some programs do require applicants to submit USMLE scores.

What if I am an international applicant?

International applicants are highly encouraged to contact each individual program and inquire whether or not they are willing to accept your visa.

APPLICATION PROCESS

How many applications should I submit?

Apply to all programs you would seriously consider if you were offered a position.

How do I pick the right program for me?

The goal is to pick a program that best fits your career goals and is also located in a place where you would feel happy. You want to make sure the program fellows and faculty fit your personality. Trust your gut instinct during and after an interview with a program. Decide if you are interested in this fellowship for furthering your academic research career or more for advancing your clinical skills in women's health, as each program emphasizes these differently. Also, look for a mentor/faculty who has similar educational and/or research interests and will be able to help you navigate your time, both during fellowship and beyond. Location is always important, as are the needs of your spouse/family.

Common mistakes during the application process

Some mistakes will quickly sink your chances at gaining a fellowship position. Beware of:

- Turning in your application late and/or incomplete.
- Letters of recommendation from physicians who do not know you well or who do not endorse you 100%.
- Sloppy, overly short or long, grammatically incorrect, and/or overall strange personal statements.
- Incomplete research projects.
- Too many projects (research, leadership, or otherwise) without any meaningful contribution in any of the projects.
- Having a CV that does not demonstrate any interest in the women's health field.
- Being late for your interview.
- Treating program staff (such as program coordinators) poorly.
- Poor interview skills (not making eye contact, rambling or not saying anything at all, etc.).

Application deadlines

Residents should plan to submit applications at the beginning of their last year of residency. Many programs have an August/September application deadline and November-February admission decisions for a July 1 start date. It is recommended to contact each program individually regarding their application timeline.

Tips for writing your personal statement

The best personal statements are easy and enjoyable to read. They usually tell a story in such a way that the reader understands why you are passionate about the field and what you hope to achieve in your career. Be careful not to simply repeat what is in your CV; instead, strive to make your statement show your personality. Programs are interested to know what sparked your interest in the field; if you have a particular patient or event in your life that's driving you, use that as the foundation for your personal statement. For some programs who have never graduated an EM physician, it may be beneficial to use your personal statement to demonstrate why emergency medicine training is beneficial for a women's health fellowship program. Have multiple people that you trust provide you with honest feedback on your statement. Take the extra time to make sure there are no grammatical errors.

Is this a match process?

No.

What happens if I don't obtain a fellowship position?

Contact the programs where you applied and respectfully ask why you were not accepted. The goal is to gain insight to the weaknesses in your application so you can correct them and apply again next year. It may also be helpful to ask another physician in a leadership role (not necessarily from the women's health field) to look at your application and identify weaknesses. Practice your interview skills. If all else fails, it is possible to create a niche within this field as an attending. Consider attending conferences, becoming engaged in research, earning an advanced degree, and/or becoming involved in international opportunities.

INTERVIEW PROCESS

How do I stand out from the crowd?

The best way to stand out is simply to be a well-rounded overall candidate. Build a strong CV that ideally includes research but also displays your leadership skills and skills as a clinician and educator. Becoming chief resident would certainly boost your application. Display a clear interest in the field, and write a strong personal statement. Pick strong writers for your letters of recommendation; try to find a writer who is well-known within the field and is a strong advocate for you. When you interview, aim to appear strong and confident — but not arrogant. Research the program itself and ask pertinent questions that display your interest but are not easily answered on their website. Have a vision about where you would like your career to go and how the fellowship can help you achieve that. Meet all the deadlines, respond quickly to interview invites, and send thank-you notes after your interviews.

What types of questions are typically asked?

Why do you want to complete a women's health fellowship?

Why do you want to complete a fellowship at our institution specifically?

What are your 5- and 10-year plans after fellowship?

Tell me more about [fill in the blank] that you listed here on your CV?

What are your goals to accomplish during fellowship?

How many interviews should I go on?

You should attend every offered interview, since this is a small fellowship field with limited spots.

PREPARING FOR FELLOWSHIP

Textbooks to consider reading

- Oertelt-Prigione S, Regitz-Zagrosek V. Sex and Gender Aspects of Clinical Medicine. New York, NY: Springer; 2012.
- Legato MJ. Principles of Gender-Specific Medicine. London: Academic Press; 2009.
- Oliffe JL, Greaves LJ. Designing and Conducting Gender, Sex and Health Research. Los Angeles, CA: SAGE Publications, INC; 2011.

Important skills to practice while in residency to prepare for fellowship

Focus on developing research, leadership, and educator skills. Work on expanding your foundation of knowledge about local and international women's health topics. Find ways to become engaged in this small community of physicians.

Tips on how to succeed as a fellow

Maintain your work-life balance: make sure you sleep, exercise, eat healthy, and make time for your family and hobbies. Remain dedicated, compassionate, and reliable while on your clinical rotations. Read every day to increase your knowledge base. Decide what your legacy will be: What will you leave behind at your fellowship? Will you create a new curriculum for medical students? Will you develop a program for sex trafficking victims? Find a meaningful project to become engaged in and develop your niche in the field.

CONCLUSION

Additional resources

Websites

www.womenmdresources.com

<http://swahr.org>

<http://orwh.od.nih.gov/resources/cme.asp>

Journals

[Journal of Women's Health](#)

[International Journal of Women's Health](#)

[NEJM Journal Watch Women's Health](#)

National organizations

[American Medical Women's Association](#)

[Academy of Women's Health](#)

[ACEP American Association of Women Emergency Physicians](#)

Conferences

Academy of Women's Health

University of New Mexico Annual Women's Health Conference

UC Davis Health System Women's Health Conference

How to find a mentor

Unfortunately, there is no central website that we are aware connecting you to mentors in the field. Our best advice is to reach out and network with physicians in this field via attending conferences, sending emails to these two programs, and by finding leaders in women's health within your health system.