Scholarship Track in Emergency Medicine

Robbie Paulsen, MD
Anita Goel, MD
Amanda Ventura, MD
Andrew Golden, MD
Adam Gottula, MD
James Li, MD

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Background

Many medical schools across the country have developed longitudinal curricular tracks for first through fourth year students who have an established interest in a particular medical specialty. At the University of Cincinnati College of Medicine, several Medical Student Scholars Programs (MSSPs) have been developed in fields such as OB/GYN, Pediatrics and Neurology. As the number of students applying to residencies in Emergency Medicine from the College of Medicine has increased, the field of Emergency Medicine (EM) has become more competitive nationally. We now have an opportunity to meet this increased demand for early exposure to Emergency Medicine by creating a longitudinal track of our own.

Our Scholarship Track in Emergency Medicine (STEM) would allow two students per year to gain additional classroom, clinical and research exposure within the field of Emergency Medicine. While the program is designed for medical students, the entire Department of Emergency Medicine stands to benefit from this undertaking. Students will benefit greatly through numerous educational opportunities, summer research, and departmental mentorship from faculty and residents. Residents who are particularly interested in education will have the chance to act as instructors and mentors for STEM students. While the STEM program will require faculty investment to be successful, the Department of Emergency Medicine will gain research productivity from the students involved and visibility within the College of Medicine.

The following document will outline the application process, basic curriculum, research structure, and mentoring model for the STEM program.

Goals and Objectives

1. Understand the role of Emergency Medicine within the healthcare system.
2. Integrate basic science and clinical research into the care of the undifferentiated patient.
3. Develop communication skills vital to the practice of Emergency Medicine through clinical experience, simulation and discussion.
4. Nurture a mentoring relationship with Emergency Medicine faculty and residents.
5. Explore a niche within Emergency Medicine and complete a scholarly project.
6. Become a leader through service within the College of Medicine and Cincinnati community.

Scholar Track Personnel

Scholar Track in Emergency Medicine (STEM) Director: Robbie Paulsen, MD
Dr. Paulsen will administer the STEM Program under the oversight of Dr. Art Pancioli (Chair of the Department of Emergency Medicine).

STEM Core Faculty
1. Robbie Paulsen, MD
2. Anita Goel, MD
3. Uwe Stolz, PhD

EM Resident involvement will be solicited on a volunteer basis, particularly among students enrolled in the EM Department's Education Leadership Academy. Residents will act as mentors and instructors for the program's quarterly educational activities.

Scholar Track Enrollment and Participation

Criteria for Admission

Applicants must be first-year students (M1) in the College of Medicine in good academic standing. Applicants should have an interest in EM, however no prior EM or research experience is required for admission. We anticipate selecting two students per year during the first few years of enrollment as the STEM curriculum is fully established, however we may choose to expand enrollment in the future as demand and departmental resources allow.

Application Process

Please refer to the Appendix for the Medical Student Scholars Program Application link.

1. August 2019: Call for applications at Student Activities Fair and MSSP Student/Director Lunch Talk
2. October 1, 2019: Written MSSP application due
   Interested students will submit a CV (including college academic performance and COM academic performance to date) and personal statement.
   Applications will be reviewed by STEM Director and STEM Core Faculty.
3. November 1, 2019: Interview invitations sent to selected applicants
4. November 15 – December 15, 2019: Interviews
   Following initial selection, a small group of finalists will undergo a brief interview with the STEM Director.
5. December 20, 2019: Acceptance to STEM Program sent

Criteria for Ongoing Participation

Since the STEM Program is an optional opportunity with significant time commitment, all students must remain in good academic standing within the College of Medicine to participate. Students are encouraged to be forthcoming and disclose problems with academic performance early on to their mentors and STEM Director. Academic standing will be reviewed each semester by the STEM Director. Students that fall out of good academic standing or into academic warning will be suspended from STEM activities until academic performance improves. Professional misconduct, both academic and non-academic, will not be tolerated and will result in dismissal from the STEM Program.

Attendance in STEM activities is required, with important dates published in advance. STEM activity attendance will be monitored and reviewed each semester. Students must meet hourly requirements for shadowing in the Center for Emergency Care (CEC) during the preclinical years, and complete a scholarly project by the end of their fourth year. Students who meet all requirements will be designated as STEM Program graduates in the Dean's Letters and receive a Certificate of Completion upon graduation from the College of Medicine and recognition at the Honors Day Ceremony.

Curriculum Overview

Didactics and Procedure Labs

Care of the undifferentiated patient is a core component of medical training. Quarterly, we will have a two-hour session in the evening covering core topics and skills in emergency medicine for all STEM participants. Each session will revolve around a central theme, including a relevant case presented by a resident or faculty member, short didactic, and a procedural or exam skill. Please refer to the appendix for specific lesson plans. In addition, students are invited to EM Resident and Emergency Medicine Interest Group programming.

Clinical Experience

All STEM students are required to shadow in the Center for Emergency Care (CEC) at the University of Cincinnati Medical Center. Students will be assigned to an attending physician or upper level resident for each shadowing shift. To verify attendance, students will have to obtain a signed form from their assigned attending physician. STEM students are expected to complete a total of 60 hours of shadowing during their pre-clinical years, and are required to complete the M3 Emergency Medicine Elective and M4 Emergency Medicine Acting Internship.

Scholarly Project

After the M1 year, students will embark on a scholarly project of their choosing. Under the oversight of Uwe Stolz, PhD, students will be offered a list of summer opportunities within the Department of Emergency Medicine. Opportunities may include laboratory research, clinical research in the ED or the prehospital setting, or chart review. There must be an end-product worthy of either formal presentation or publication. Each student will meet quarterly with an assigned Faculty Project Mentor through completion of his/her scholarly work. All students will receive financial compensation for their efforts.

Mentorship

Each STEM student will be assigned a Faculty Mentor within the Department of Emergency Medicine at the end of their M1 year. At the beginning of M2 year, students will also be assigned a Resident Mentor through the department's Education Leadership Academy. Mentor-mentee pairs are expected to meet quarterly to discuss academic progress, extracurricular activities within and outside of emergency medicine, and eventually the residency application process. As stated above, STEM students will also have a Faculty Project Mentor to assist with their required scholarly project.

Leadership and Service

STEM students are highly encouraged to take an active role within the College of Medicine and the Cincinnati community. Students may choose to serve on College of Medicine committees, lead interest groups for medical students (EMIG), or participate in community service organizations. Students are expected to log a minimum of 40 hours of service across their 3.5 years in the STEM Program.

Didactics and Procedure Labs

Goals and Objectives:
1. Understand basic diagnosis and management of core clinical topics in emergency medicine.
2. Practice essential procedures in emergency medicine.
3. Apply knowledge and skills gained to related case scenarios and simulations.
4. Serve as a near-peer educator, with senior learners (M3-M4 students) guiding junior learners (M1-M2 students) through didactic and procedural activities.

Eight core topics and procedural skills in emergency medicine have been chosen. There will be four quarterly topics, creating a two-year curricular cycle. Each STEM student will cycle through the curriculum twice, once as a junior student and once as a senior student. This will help reinforce concepts and allow STEM students to function as near-peer instructors. Quarterly Activities will be led by at least one faculty member with assistance from interested residents in the Education Leadership Academy. Due to the high degree of investment from department instructors, attendance at Quarterly Activities is required.

Didactic	Activity
Chest Pain	Principles of ACLS
Shortness of Breath	Airway Management
Shock	IV Access
Altered Mental Status / Stroke	The Neurologic Exam
Approach to Trauma	Laceration Repair
Orthopedic Injuries	Splinting and Reduction
Delivering Bad News	Role Play
EM and Public Health	Movie and Discussion

EMIG Activities
The Emergency Medicine Interest Group (EMIG) holds approximately six lunchtime talks and three procedure workshops a year. STEM Program participants would be expected to attend at least 75% of EMIG events over the first two years. This expectation is waived during the M3-M4 clinical years.

Emergency Medicine Residency Program Activities
Students will be invited to attend residency-wide academic programming, including:

1. Grand Rounds: Wednesdays from 0800-1300
2. Coffee Talk: Every other Wednesday from 0700-0800
3. Topical Mentoring and leadership academies

Clinical Experience

Goals and Objectives:
1. Observe patient encounters in an urban, academic emergency department.
2. Apply pathophysiology learned in the classroom to patient care.
3. Discuss what personal and professional life is like for emergency physicians.

Emergency Department Shadowing

The University of Cincinnati Medical Center's Center for Emergency Care (CEC) offers shadowing to pre-clinical medical students from November to June of each academic year. While shadowing is open to any medical student that wishes to participate, all STEM students will be required to participate in the shadowing program. STEM students will be expected to complete a total of 60 hours of shadowing by the end of their M2 year.

The shadowing experience is variable depending on patient volume, time of day, and clinical staff. Students will be assigned to an attending physician for each shadowing shift. Students will follow the attending through patient encounters, procedures, and observe attending-resident interaction and teaching. To maximize the educational yield, students are encouraged to ask questions along the way.

In order to accommodate student schedules, students can select a shift length that works for them. Shifts will be a minimum of 4 hours and a maximum of 12 hours in length and must begin and end with the same attending physician. To verify attendance, students will obtain a signed form from their assigned attending physician. Forms will be turned into the black evaluation boxes in the CEC, which will be collected by our Department Administrator, Ms. Kim Regan. The STEM director will receive updates in December, March and June to monitor for completion of the Clinical Experience requirement. Students who fail to meet the Clinical Experience requirement at the end of their M2 year will be suspended from STEM activities until the requirement is fulfilled.

Subspecialty Clinical Opportunities

Additional clinical opportunities in emergency medicine subspecialties may be pursued as desired by STEM students on an individual basis. These opportunities may include:
1. Toxicology: Poison center, Toxinology at the Zoo
2. Pediatric Emergency Medicine: Shadowing in the Cincinnati Children's Hospital Medical Center Emergency Department, Burnet Campus
3. Critical Care: Shadowing in NSICU or MICU
4. Ultrasound: Scanning shifts with Pattie Smith, RDMS

Emergency Medicine Clinical Rotations

STEM Students are required to enroll in the M3 Emergency Medicine Elective, which is a two-week rotation directed by Drs. John Campbell amd Whitney Bryant. Students that remain in the STEM Program must also complete the M4 Emergency Medicine Acting Internship, which is directed by Dr. Robbie Paulsen (STEM Director).

Scholarly Project

Goals and Objectives:
1. Investigate an area of interest in emergency medicine.
2. Under the guidance of a Faculty Project Mentor, create a poster, abstract, manuscript, or book chapter based on a summer-long or longitudinal project.
3. Present findings to an audience at the College of Medicine and/or at a local or national emergency medicine conference.

As the field of emergency medicine becomes more competitive, residency programs are looking for students who have completed an emergency medicine based scholarly project. This demonstrates student interest, work ethic, and commitment to the field. After the M1 year, students will embark on a scholarly project of their choosing. While many scholarly projects will be research-based, research is not a requirement. At a minimum, students must work on their scholarly project full time during the summer between M1-M2 year. Some students may choose to continue beyond the summer requirement and throughout their medical school education.

Opportunities
Under the oversight of Uwe Stolz PhD, students will be offered a list of summer opportunities within the Department of Emergency Medicine. Opportunities may include, but are not limited to:
1. Laboratory research
   a. Stroke and thrombolytics
   b. Cardiovascular and metabolic disease
2. Clinical research
   a. CHF
   b. Allergy
   c. Neurologic emergencies
   d. Prehospital medicine
   e. Resuscitation
   f. Wilderness medicine
   g. Airway
3. Education research
4. Operations research
5. Public health research
   a. HIV/AIDS
b.   Drug addiction
6.   Medical device design
7. Medical writing – book chapter, review article

Student Expectations

1. Dedicate a minimum of 40 hours per week of work over 8 weeks during summer break. Hours must be logged and submitted at Week 4 and Week 8 of the summer session.
2. Attend all necessary meetings and training sessions for the scholarly project's work-group or lab.
3. Produce an end-product which is suitable for dissemination or publication. This can be a poster, abstract, manuscript, or book chapter. An end-product must be produced by March of M4 year.
4. Present findings to an audience at the College of Medicine (Emergency Medicine Interest Group of the College of Medicine, Emergency Medicine Research Interest Group for the Department of Emergency Medicine) and/or at a local or national emergency medicine conference. Findings must be presented by April of M4 year.
5. Inform STEM Director (Dr. Paulsen) of any issues regarding mentor professionalism.

Faculty Expectations

1. Provide a minimum of 40 hours per week of work over 8 weeks for their medical student.
2. Include student in all relevant meetings and training sessions.
3. Guide student through the creation of an end-product which is suitable for presentation or publication. This can be a poster, abstract, manuscript, or book chapter. An end-product must be completed by March and/or presented by May of the student's M4 year.
4. Meet with student quarterly while he/she remains actively engaged in the scholarly project. While these meetings are intended to be focused on the student's scholarly work, faculty mentors are encouraged to provide additional guidance professional life in emergency medicine.
5. Inform STEM Director (Dr. Paulsen) of any issues regarding student professionalism or insufficient performance.

Summer Program Logistics:

Beginning in February-March of each year, Drs. Paulsen and Stolz will recruit faculty who are willing to serve as Faculty Project Mentors. STEM Program leadership will provide a list of available opportunities to M1s in the STEM Program. Students will rank their top three choices. Students will meet with potential Faculty Project Mentors to finalize scholarly project details. While students will have a defined role with a defined end-product in mind (chart review, book chapter, poster, manuscript), students are expected to fully integrate into the scholarly environment, participating in all relevant meetings for their faculty work group. Both students and faculty will provide a mid-summer and end-of-summer progress update to the STEM Director. Students will have to submit their work hours at the end of Week 4 and Week 8. Thanks to generous support from our Department Chair, Dr. Arthur Pancioli, each student will receive a stipend of $2000 for their work.

Scholarly Project Logistics

After completion of the summer work commitment, students will begin working on an end-product.

Acceptable end-products include:
1. Manuscript submitted to peer-reviewed journal
2. Abstract submitted to peer-reviewed journal
3. Abstract submitted to national, regional or local conference
4. Oral presentation at national, regional or local conference
5. Poster presentation at national, regional or local conference
6. Oral presentation at College of Medicine event, such as Emergency Medicine Research Interest Group (EMRIG) or COM Student Research Symposium
7. Poster presentation at COM Research Symposium
8. Book chapter submitted for publication

Students will meet with their Faculty Project Mentor quarterly to ensure follow through and on time completion of their chosen end-product. End-products must be completed by March of the student's M4 year and submitted for presentation or peer-review by April of the M4 year. Students may continue to take on more work as desired and mutually agreed upon with their Faculty Project Mentor.

Mentorship

Goals and Objectives:
1. Nurture mentoring relationships with faculty and residents in the Department of Emergency Medicine.
2. Incorporate academic and professional guidance into career trajectory.
3. Work with Faculty Project Mentor to complete a scholarly project.

While many students in the College of Medicine express some interest in Emergency Medicine, very few students at any level of training can actually identify a faculty or resident mentor within the field. We hope to change this with the STEM Program. The program is not only designed to give students early exposure to Emergency Medicine, it will give students access to faculty and residents to serve as a role model and guide across all academic years.

Student Mentee Expectations
1. Take an active role in the mentoring relationship, contacting faculty/resident mentors as desired.
2. Be open to advice and constructive criticism from mentors.
3. Meet with faculty and resident mentors a minimum of twice a year to discuss academic progress, extracurricular activities, evolving interests in emergency medicine, and residency application process.
4. Provide feedback on mentoring experience to STEM Director (Dr. Paulsen) during semi-annual review.

Faculty Mentor Expectations
1. Be available by email, phone or in-person over three-year commitment to your student mentee.
2. Meet with student mentee quarterly to discuss academic progress, extracurricular activities, evolving interests in emergency medicine, and residency application process.
3. Help explore student's career interests within emergency medicine, guiding them toward additional faculty contacts where appropriate.
4. Provide insight into life as a practicing emergency physician.
5. Report any concerns to STEM Director (Dr. Paulsen).

Resident Mentor Expectations
1. Be available by email, phone or in-person to your student mentee.
2. Meet with student mentee quarterly to discuss academic progress, extracurricular activities, evolving interests in emergency medicine, and residency application process.
3. Help explore student's career interests within emergency medicine, guiding them toward additional faculty or resident contacts where appropriate.
4. Provide insight into life as an emergency medicine resident.
5. Report any concerns to STEM Director (Dr. Paulsen).

Mentoring Program Logistics

At the end of M1 year, each STEM student will be assigned a Faculty Mentor within the Department of Emergency Medicine. We will solicit volunteer faculty annually, making the expectations and three-year commitment clear in advance. With two students per year enrolling in the STEM Program, we will need four to eight faculty active in the mentoring program.

Resident Mentors will be recruited among R2-R3s in our department's Education Leadership Academy. Drawing from the Education Leadership Academy not only ensures that residents are dedicated to the mission, but gives residents valuable mentorship experience moving into their future careers in medical education. Resident mentors will provide a complimentary perspective distinct from their faculty counterparts, creating a more casual pairing given their proximity to medical school graduation, similar age, and social standing relative to their student mentees.

Mentor-mentee pairs are expected to meet quarterly to discuss academic progress, extracurricular activities within and outside of emergency medicine, and eventually the residency application process. Some may choose to meet as a group (Faculty-Resident-Student) forming a tiered mentoring relationship, while others may meet independently (Faculty-Student and Resident-Student). As stated above, STEM students will also have a Faculty Project Mentor to assist with their required scholarly project, which is entirely separate.

Leadership and Service

Goals and Objectives:
1. Gain valuable leadership experience and visibility within the College of Medicine.
2. Represent the College of Medicine through service in the Cincinnati community.

Through the STEM Program, we hope to recruit and nurture future leaders within the College of Medicine and the field of Emergency Medicine. It is important for students to be well-rounded, demonstrating both academic excellence and involvement in the community. Students may choose to serve on College of Medicine committees, lead interest groups for medical students (EMIG), or participate in a variety of community service organizations. To meet the Leadership and Service obligation, students are expected to log a minimum of 40 hours of service across their 3.5 years in the STEM Program. Students will submit their service hours to the STEM Director in advance of their semi-annual meetings.

Curriculum Timeline by Academic Year

M1
1. Participation in Quarterly Didactic Activities
2. Participation in 75% of EMIG Activities
3. CEC Shadowing x 60 hours total combined across M1/M2 years (November – June)
4. COM/Community Service x 40 hours total combined across M1 - M4 years

M1-M2 Summer
1. Full-time Scholarly Project (40 hr/week x 8 weeks)
2. COM/Community Service

M2
1. Participation in Quarterly Didactic Activities
2. Participation in 75% of EMIG Activities
3. Completion of CEC Shadowing x 60 hours (November – June)
4. COM/Community Service
5. Work on EM Scholarly Project End-Product

M3
1. Participation in Quarterly Didactic Activities
2. Completion of COM/Community Service as necessary
3. Work on EM Scholarly Project End-Product

M4
1. Participation in Quarterly Didactic Activities
2. Completion of COM/Community Service as necessary
3. Submission and/or presentation of EM Scholarly Project End-Product

Recurring Meetings
1. Meet with Faculty and Resident Mentors quarterly
2. Meet with Faculty Project Mentor quarterly until Scholarly Project is complete
3. Meet with STEM Director twice a year for cumulative performance review

Evaluation

The STEM Program was created due to student interest. Feedback from students, as well as participating residents and faculty, will be critical to the program's evolution and success. Additionally, due to built-in mentorship within the STEM Program, students will have the opportunity to receive feedback on their progress through the program twice a year.

Semi-Annual Reviews with STEM Director
Once a semester, each STEM student will meet with the STEM Director. This meeting will review the following:
1. Criteria for ongoing participation
    a. Verification of good academic standing within the College of Medicine
    b. Attendance at all Quarterly Activities
    c. Attendance at 75% of EMIG Activities (M1-M2 year only)
    d. Participation logs
        i. CEC Shadowing: 60 hour total requirement over M1-M2 year
        ii. Leadership and Service: 40 hour total requirement over four years
    e. Scholarly Project
        i. Work hours: 40 hours/week x 8 weeks in summer between M1-M2 year
        ii. Progress toward completion/submission of Scholarly Project
        iii. Performance review by Faculty Project Mentor
2. Student feedback regarding STEM Program
3. Faculty feedback regarding student performance

STEM Student Criteria for Ongoing Participation and Recognition
      Since the STEM Program is an optional opportunity with significant time commitment, all students must remain in good academic standing within the College of Medicine to participate. Students are encouraged to be forthcoming and disclose problems with academic performance early on to their mentors and STEM Director. Academic standing will be reviewed each semester by the STEM Director. Students that fall out of good academic standing or into academic warning will be suspended from STEM activities until academic performance improves. Professional misconduct, both academic and non-academic, will not be tolerated and will result in dismissal from the STEM Program. Attendance in STEM activities is required, with important dates published in advance. STEM activity attendance will be monitored and reviewed each semester. Students must meet hourly requirements for shadowing in the Center for Emergency Care (CEC) during the preclinical years, and complete a scholarly project by the end of their fourth year.
      As part of the Emergency Medicine Match, students who are on target to complete the STEM Program and choose to match in Emergency Medicine will also receive special recognition in the narrative portion of the Departmental Standardized Letter or Evaluation (SLOE). Students who meet the above requirements will be designated as STEM Program graduates in the Dean's Letters and receive a Certificate of Completion upon graduation from the College of Medicine at the Honors Day Ceremony.

Activity and Program Evaluation
Please refer to the appendix for proposed evaluations regarding:
1. Quarterly Activities
2. Scholarly Project Evaluation for Students
3. Scholarly Project Evaluation for Faculty
4. Program Evaluation for Students
5. Program Evaluation for Faculty/Residents
6. Semi-Annual Review Form for STEM Director

Program Withdrawal
      While we certainly hope that all STEM students choose to pursue a career in emergency medicine, we realize that student interests change throughout medical school. Enrollment in the STEM Program is not binding, though students are encouraged to remain with the program for the educational benefit regardless of their future specialty choice. Students who wish to leave the STEM Program will meet with the STEM Director (Dr. Paulsen) to withdraw and discuss reasons for leaving. If a slot becomes available at the conclusion of M1 year, the spot will be offered to other applicants who were considered highly during the initial STEM application process. In the event of attrition beyond the M1/M2 summer, spots cannot be refilled due to the Scholarly Project requirement.

Appendix

MSSP Application

To apply: click the following link to MedOneStop www.medonestop.uc.edu . Once logged in, the application can be found under the Extracurricular tab named Medical Student Scholars Program (MSSP).

Quarterly Activities: Lesson Plans
- Chest Pain / ACLS
- Shortness of Breath / Airway Management
- Shock / IV Access
- Altered Mental Status / The Neurologic Exam
- Approach to Trauma / Laceration Repair
- Orthopedic Injuries / Splinting and Reduction
- Delivering Bad News / Role Play
- EM and Public Health / Movie and Discussion

Evaluations
- Quarterly Activities
- Scholarly Project Evaluation for Students
- Scholarly Project Evaluation for Faculty
- Program Evaluation for Students
- Program Evaluation for Faculty/Residents
- Semi-Annual Review Form for STEM Director