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Laksmi Candrisari
UCSF School of Medicine

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Bringing Emergency Medicine Innovation into Medical Student Electives

Why should medical students interested in Emergency Medicine learn about innovation?

The landscape of healthcare is dynamic and continuously evolving, driven by advancements in medical technology, shifts in patient demographics, and the constant demand for improvements in patient care. Future healthcare professionals should be encouraged to explore novel approaches and be equipped with the skills needed to embrace and lead these changes. Innovation demands creativity and problem-solving, and these are characteristics that prepare students to become critical thinkers and future leaders in the field. In Emergency Medicine, innovation is key to optimizing resource utilization, managing patient flow, reducing wait times, and improving overall efficiency and safety. In times of pandemics, natural disasters, or other large-scale emergencies, innovation plays a role in disaster preparedness and response. Students with an innovation mindset can leverage technology to streamline processes and develop efficient response protocols. As such, prioritizing innovation in medical education ensures that students and healthcare professionals remain at the forefront of patient care.

Creating a Student Elective

Student electives are great spaces to share knowledge, promote dialogue, and connect with like-minded individuals and mentors. An Emergency Medicine Innovation elective can inspire students considering EM as their future specialty or any student interested in learning more about what innovation can look like in the healthcare setting. Careful planning and coordination will be required to prepare a new elective for success. Steps involved in creating an elective include:

1. **Identify goals and objectives:** These provide students with the clarity to understand the elective's intent. Consider both clinical and educational objectives. What do you hope students learn or gain from this experience?
2. **Define the curriculum:** Outline the topics that will be covered in the elective, which may include new technologies (i.e., Artificial Intelligence, Blockchain, Virtual Reality, Chatbots, Mobile Health Apps, 3D printing, etc), patient flow optimization, root-cause analysis, lean startup methodology, protecting intellectual property, developing prototypes and minimal viable products, fundraising, and principles of quality improvement. Consider incorporating a mix of lectures, workshops, and case studies.
3. **Obtain institutional approval:** Present a proposal and curriculum to the medical school's elective committee and highlight how the elective aligns with the institution's values in medical education.
4. **Secure faculty, preceptors, and speakers:** Recruit experienced faculty members with expertise in emergency medicine and innovation. Identify guest speakers who can contribute to the elective and speak about their experiences innovating in medicine.
5. **Determine logistics:** Decide the elective's duration, format (zoom vs. in-person), and schedule (weekly, monthly, etc). If in-person, decide the appropriate-sized location in which to hold the elective.

6. **Develop a syllabus:** Once the goals, objectives, curriculum, and logistics have been finalized, outline everything in a syllabus. Include the course schedule, pre-work/readings, speaker information, and assignments.
7. **Advertise and recruit students:** Post about the elective on student channels, send emails, and/or make flyers. Use inviting language and provide succinct detail on the curriculum and benefits of participating. Consider collaborating with existing student organizations related to emergency medicine or innovation, as they can help promote the elective within their networks.
8. **Assess and review:** Establish a process for ongoing evaluation and improvement based on feedback. Consider formal feedback gathering via pre- and post-elective surveys.

Examples of student learning goals that can be achieved with this elective:
Recognize the impact of emerging technologies on diagnostic tools, treatment modalities, and patient care in the emergency department
Learn how to recognize inefficiencies, safety concerns, and opportunities for improvement within the emergency department
Learn how to perform a root cause analysis, including how to use a fishbone diagram to identify causes of problems or adverse events
Apply the principles of quality improvement to propose and implement changes
Learn how to conduct needs assessments through structured interviews with stakeholders to identify gaps in knowledge, operational challenges, and opportunities for improvement
Prioritize interventions based on their potential impact and feasibility
Investigate the use of telemedicine in emergency settings and understand its potential benefits and challenges
Explore ways to integrate AI into clinical workflows to enhance efficiency, accuracy, and patient outcomes
Critically assess the strengths, limitations, and ethical considerations of AI algorithms and other new technologies used in emergency settings
Explore ways to integrate Virtual Reality for medical training and patient education

Engaging students and new learners in an innovation elective can be fun and rewarding. Faculty and students can mingle and share new ideas, inspire one another, and discuss new ways to innovate and bring positive change to improve patient outcomes. By following the 8 steps outlined in this article, you will know the core components involved in elective building and can begin to prepare setting up a new and exciting student elective.