Emergency Medicine Clerkship Curriculum: An Update and Revision

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Abstract
In 2006, the latest version of a national curriculum for the fourth-year emergency medicine (EM) clerkship was published. Over the past several years, that curriculum has been implemented across multiple clerkships. The previous curriculum was found to be too long and detailed to cover in 4 weeks. As well, updates to the Liaison Committee on Medical Education (LCME)'s form and function document, which guides the structure of a clerkship, have occurred. Combining experience, updated guidelines, and the collective wisdom of members of the national organization of the Clerkship Directors in Emergency Medicine (CDEM), an update and revision of the fourth-year EM clerkship educational syllabi has been developed.

Since 1995, when the Macy Report first highlighted the need for medical students to receive formalized training in handling medical emergencies, emergency medicine (EM) has continually gained a stronger foothold in undergraduate medical education. In response to this movement, it became necessary to develop a standardized syllabus for EM clerkships nationwide.

Previous well-received versions of such a syllabus have since been published and updated. The most recent curriculum was developed in 2006 by consensus from a formal collection of educators and has been offered as a guideline for clerkship development. Implementation of the syllabus brought up concerns that the syllabus was too large to implement in a fourth-year clerkship and did not allow individual institutions to utilize their educational strengths. As well, development of specific objectives under both the core competency and the procedural syllabi were requested by formal feedback at Clerkship Directors in Emergency Medicine (CDEM) meetings.

The Consensus-Building Process
Development of this project was based on the National Institutes of Health (NIH) model of consensus building with relation to the 2006 national syllabus. The process began when the 2006 syllabus was implemented at a majority of fourth-year EM clerkships and was found to be too large to cover in a 4-week rotation. A corollary was that the syllabus did not allow time for individual institutions to teach utilizing the strengths of their departments.
In 2007, the first CDEM organization was founded. In 2008, it became the first academy of the Society for Academic Emergency Medicine (SAEM). CDEM is an educational organization comprised of EM clerkship directors and medical student educators. CDEM’s mission is to advance the education of medical students in EM; to serve as a unified voice for clerkship directors and educators; to provide a forum to communicate, share ideas, and generate solutions to common problems; to foster undergraduate medical education research; to foster the professional development and career satisfaction of EM clerkship directors and educators; and to foster relationships with other organizations that promote medical education. At this writing, CDEM has approximately 120 members, has representation from the majority of mandatory clerkships, and is the representative body from EM to the Alliance of Clinical Education. The development of this organization allowed for the call for collaboration from EM medical student educators.

In July 2008, after the initial syllabus had been implemented by more than 50% of the mandatory fourth-year clerkships (informal survey, data not shown), CDEM issued a call to all interested members to review the issues associated with the implementation of the syllabus. The current review committee was formed including education experts, developers of the 2006 syllabus, leaders in CDEM, clerkship directors who implemented the syllabus, and developers of the online self-study modules for the EM syllabus. The committee represents 20 medical schools in 11 different states and Canada.

The primary aims targeted by the consensus panel were to:

1. Refine the objectives based on the Accreditation Council for Graduate Medical Education (ACGME) core competencies.
2. Refine the knowledge content of the current curriculum.
3. Develop objectives for the procedural syllabus.
4. Identify where requirements from the Liaison Committee on Medical Education (LCME) are addressed by the syllabus.

By review, discussion via e-mail (continuous), phone conference (every other month), and in-person debate (four times in the year at national conferences), the proposed changes were developed. The debates and discussions at national conferences were open to all CDEM and SAEM members. This process continued over a 1-year period of time.

**Application of Syllabi**

These syllabi are designed to provide educators with a standardized set of core objectives that should enable a more consistent didactic experience for medical students studying EM across the country. Improved uniformity of an EM syllabus will also make the education, evaluation, and testing of all students in EM more comparable.

Exposure to this material can be achieved through multiple educational modalities including direct patient contact, simulated patient encounters, or other didactic activities (tabletop exercises, asynchronous learning modules, journal clubs, self-directed study, etc). Institutions are encouraged to utilize their uniquely available resources such as cadaver labs or simulation centers. While this document outlines common objectives, it has also been designed to allow for space and flexibility of educational content and teaching modalities at any given institution. Specific expertise of faculty or departmental and institutional resources should mold the proposed syllabus to the strengths of the institution. For example, a center with expertise in disaster medicine may cover blast injuries, while another with strength in wilderness medicine may choose instead to cover altitude sickness.

Other core rotations may provide students with exposure to some of the listed common chief complaints, specific disease entities, and procedural skills. These topics can then be omitted from that site’s EM rotation. Other factors that can affect how the didactic and procedural curricula are implemented at a given institution include the number of clinical rotation sites, number of students assigned to each site, and availability of protected time provided for the clerkship director and faculty involved with teaching.

**GENERAL COMPETENCIES**

These competencies address in general terms the attitude, behaviors, knowledge, and skills that should be taught and assessed during the EM rotation. The American Association of Medical Colleges student general competencies were reviewed and distilled into the framework of the ACGME core competencies. In this way, faculty who teach and evaluate both residents and students will be applying the same evaluation construct instead of learning two separate tools. A rationale has been added to each core competency and the objectives have been updated.

**Patient Care**

**Rationale.** Under direct faculty supervision, students should be given primary responsibility for patient care (of noncritical patients) and begin to act independently during the fourth-year EM rotation. Primary responsibility for patient care will help foster the students’ ability to think critically, assess their knowledge and skills, and allow them to make clinical decisions affecting patient care.

**Specific Learning Objectives.**

1. Obtain an accurate problem-focused history and physical examination.
2. Recognize immediate life-threatening conditions.
3. Patient management skills:
   a. Develop an evaluation and treatment plan;
   b. Monitor the response to therapeutic interventions;
   c. Develop appropriate disposition and follow-up plans.
4. Health promotion:
   a. Educate patients on safety and provide anticipatory guidance as necessary related to the patient’s chief complaint;
b. Educate patients to ensure comprehension of discharge plan.

Medical Knowledge\textsuperscript{17,18}

\textbf{Rationale.} Students should develop a differential diagnosis that is prioritized on potential life-threatening conditions and likelihood of disease. Students should demonstrate a knowledge (or understanding) of basic diagnostic modalities and interpretation of results. Most importantly, students should cultivate an appreciation of risk stratification and pretest probabilities for selected conditions.

\textbf{Specific Learning Objectives.}
1. Develop a differential diagnosis when evaluating an undifferentiated patient:
   a. Prioritize likelihood of diagnoses based on patient presentation and acuity;
   b. List the worst-case diagnoses.
2. Create a diagnostic plan based on differential diagnoses.
3. Develop a management plan for the patient with both an undifferentiated complaint and a specific disease process.

Practice-based Learning and Improvement\textsuperscript{19}

\textbf{Rationale.} Practice-based learning can be demonstrated through systematically evaluating patient care and population features; teaching other students and health care professionals; and applying knowledge gained from a systematic evaluation of the medical literature, including study design and statistical methodology.

\textbf{Specific Learning Objectives.}
1. Effectively use available information technology, including medical record retrieval systems and other educational resources, to optimize patient care and improve their knowledge base.

Interpersonal and Communication Skills\textsuperscript{20,21}

\textbf{Rationale.} Students are an important element of the health care team, and effective communication with patients and other health care providers is essential for patient care. Students must demonstrate interpersonal and communication skills that result in effective information exchange and interaction with patients, family members, and health care providers.

\textbf{Specific Learning Objectives.}
1. Humanistic qualities:
   a. Effectively communicate with patients, family members, and other members of the health care team;
   b. Demonstrate a compassionate and nonjudgmental approach when caring for patients.
2. Presentation skills:
   a. Present cases in a complete, concise, and organized fashion;
   b. Effectively communicate with consultants and admitting services.

Documentation

Provide accurate and organized documentation in the medical record when appropriate.

Professionalism\textsuperscript{22,23}

\textbf{Rationale.} Professionalism should be viewed as an academic virtue, not just an expected set of behaviors. Students should learn to reflect on their professionalism during clinical rotations and learn from faculty role models.

\textbf{Specific Learning Objectives.}
1. Work ethic:
   a. Be conscientious, on time, and responsible;
   b. Exhibit honesty and integrity in patient care.
2. Practice ethical decision-making.
3. Professional behavior:
   a. Exercise accountability;
   b. Maintain a professional appearance;
   c. Be sensitive to cultural issues (age, sex, culture, disability, etc.);
   d. Work in a collegial manner with other members of the health care team.

Systems-based Practice\textsuperscript{19}

\textbf{Rationale.} Systems-based practice extends beyond the individual patient’s bedside to include an understanding of how EM relates to other practitioners, patients, and society at large, while considering the cost of health care and the allocation of health care resources. Understanding the “system” involves learning ways to advocate for patient care and assist patients in dealing with system complexities (such as assuring appropriate follow-up) and how to partner with health care providers to assess, coordinate, and improve patient care.

\textbf{Specific Learning Objectives.}
1. Recognize when patients should be appropriately referred to the emergency department (ED).
2. Recognize the importance of arranging appropriate follow-up plans for patients being discharged from the ED.
3. Recognize the role of EM in the community, including access to care and its impact on patient care.
4. Understand the indications, cost, risks, and evidence behind commonly performed ED diagnostic studies.

KNOWLEDGE CONTENT AND PROCEDURAL SKILLS

The content of the original syllabus was too expansive to cover during a single 4-week rotation. This also left little flexibility for institutions to add content to teach to their strengths. As such, the consensus committee aimed to refine the syllabus such that it:

- Is achievable within a 4-week period while also allowing time for any additional material particular institutions may cover (based on their strengths and resources);
• Covers knowledge and skills important to all graduating medical students regardless of their specialty choice;
• Integrates into a medical school’s longitudinal syllabus without unnecessary overlap of educational topics covered in the third year core clerkships.

The material described is broken down into three sections: 1) a fundamental set of emergent patient presentations (chief complaints), 2) a set of specific disease entities, and 3) procedural skills.

Approach to Emergent Patient Presentations

The ability to develop risk-stratified (worst-case scenario) differential diagnoses based on a patient’s chief complaint is paramount to emergency physicians and should be part of the armamentarium of all physicians. In the ED, students have the unique opportunity to evaluate patients from the start without the convenience of laboratory data, radiographs, time for disease progression, or opinions of consultants. Students should be aware that while some undifferentiated patients do not require emergent or even urgent attention, others may need immediate life-saving interventions even before a definitive diagnosis is reached.

The emergent conditions identified as core educational topics in the 2006 syllabus were reviewed and revised by this committee. Items were added, deleted, or reorganized based on the overarching goals of making the syllabus more teachable within a 4-week time span and more applicable to every graduating medical student.

Specific changes include the following. Vaginal bleeding was deleted because this topic is adequately covered in an obstetrics-gynecology clerkship. Environmental exposures and psychiatric diseases were removed from this list but preserved under specific disease entities. Shortness of breath was recategorized as respiratory distress to better emphasize the emergent aspects of this complaint. Resuscitation was reclassified as cardiac arrest with technical aspects of airway and arrhythmia management now covered in the procedures syllabus. Wound care was moved to the procedures syllabus. Weakness and dizziness were moved and restructured as neurologic emergencies under specific disease entities. Eye pain and vision were removed from the syllabus to be covered at the discretion of the clerkship director.

The revised list of emergent conditions that students should be exposed to during the course of their EM rotation is presented in Table 1. The objectives for each of these presentations are for students to be able to: 1) develop a differential of common emergent causes, 2) describe classic presentation of emergent causes, and 3) describe the initial evaluation and management. Additional items were identified as important objectives specific to some of these emergent patient presentations and are listed in Data Supplement S1 (available as supporting information in the online version of this paper).

Specific Disease Entities Exposure

In the course of a rotation, it is not possible to anticipate what specific final diagnoses or clinical presentations a student will either care for or have an opportunity to see. There are, however, several specific core diseases that are true emergencies, and all medical students must be exposed to these core presentations. In the event that real patient encounters are limited, this exposure should be augmented by way of simulation, lecture, reading, or Web-based learning. The specific disease entities are listed by organ system in Data Supplement S1.

Procedures Syllabus

Emergency medicine is a procedure-intensive specialty. Different EM training sites have widely variable levels of specialty medical service and ancillary support, leading to wide differences in the scope of procedures that students might participate in during an EM rotation. Further, many departments have developed areas of expertise outside the classic scope of EM, allowing students who rotate in such departments to receive advanced training in specialized procedures. Regardless of venue, however, there is a core set of procedural skills that physicians must be able to perform competently. The lists of procedures listed (Data Supplement S2, available as supporting information in the online version of this paper) were based on 1) application to any medical student regardless of specialty, 2) feasibility to practice or see procedure in EM rotation, and 3) time in 4-week rotation to allow for exposure.

In addition to proper technique, focus should be given to recognizing the indications, contraindications, and complications associated with each. The student should be able to discuss aftercare and reasons to return for further evaluation with the patient. The medical educator should make the distinction between procedures the students must be able to “perform competently” (e.g., IVs) and those procedures with which students only need to be familiar (e.g., central lines). Many of the procedures will not be performed by every student. Although students may not develop psychomotor skills through hands-on practice, students can acquire knowledge of some procedures through text, pictures, videos, observation, simulation, or other modalities.

Although students are not permitted to obtain informed consent from patients, they should be able to describe the elements of this necessary step for all procedures they perform. The EM procedure syllabus was not created nor implemented in a vacuum. Procedures may be learned, performed, and assessed in other rotations.

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<tr>
<th>Table 1</th>
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<tr>
<td>Approach to Emergent Patient Presentations</td>
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<tr>
<td>Abdominal pain</td>
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<td>Altered mental status</td>
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<td>Cardiac arrest</td>
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<td>Chest pain</td>
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<td>Gastrointestinal bleeding</td>
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<td>Headache</td>
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<td>Poisoning</td>
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<td>Respiratory distress</td>
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<td>Shock</td>
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<td>Trauma</td>
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EM CLERKSHIP CURRICULUM

The goal is to attain greater uniformity in teaching topics that are fundamental to the practice of EM. Of note, the Clerkship Directors in Emergency Medicine is leading efforts to develop educational materials for use by clerkships to implement the syllabus in the form of lectures, self-study modules, online interactive learning modules, and simulation cases. These will become available at http://www.cdemcurriculum.org/. To implement any curriculum, evaluation and assessment tools are also required and should be developed. As the syllabus becomes more uniform, it is expected that assessment tools will become more reliable.

Continued experience with the application of these objectives will undoubtedly lead to further adjustments to the syllabus. Additionally, with the pressures of a changing health care system, the role of EM will continue to evolve, requiring refinements in the educational experiences for students.

REFERENCES


Appendix A

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Supporting Information

The following supporting information is available in the online version of this paper:

Data Supplement S1. Specific disease entities list by organ system.

Data Supplement S2. EM clerkship procedural curriculum.

Data Supplement S3. LCME standards for educational (ED) program addressed by the syllabus.

The documents are in PDF format.

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