International Federation for Emergency Medicine Model Curriculum for Medical Student Education in Emergency Medicine

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Abstract

There is a critical and growing need for emergency physicians and emergency medicine resources worldwide. To meet this need, physicians must be trained to deliver time-sensitive interventions and life-saving emergency care. Currently, there is no internationally recognized, standard curriculum that defines the basic minimum standards for emergency medicine education. Therefore, the International Federation for Emergency Medicine (IFEM) convened a committee of international physicians, health professionals and other experts in emergency medicine and international emergency medicine development to outline a curriculum for foundation training of medical students in emergency medicine. This curriculum document represents the consensus of recommendations by this committee.

The curriculum focuses on the basic minimum emergency medicine educational content that any medical school should be delivering to its students during their undergraduate years of training. It is designed not to be prescriptive, but to assist educators and emergency medicine leadership in advancing physician education in basic emergency medicine content. The content would be relevant not just for communities with mature emergency medicine systems, but also for developing nations or for nations seeking to expand emergency medicine within current educational structures. We anticipate that there will be wide variability in how this curriculum is implemented and taught, reflecting the existing educational milieu, the resources available, and the goals of the institutions’ educational leadership.

MeSH Words: curriculum, international emergency medicine, medical education, medical students
Executive Summary

Vision: To create an international model curriculum for medical student foundation training in emergency medicine.

Rationale: There is critical, overwhelming and growing need for emergency physicians and other administrative, professional, clinical and academic emergency medicine resources worldwide. Currently, there exist a small number of national curricula for emergency medicine, but there is no standard, widely recognized international curriculum for medical students.

Demand: Currently, worldwide, there are roughly 50+ countries involved in the processes of emergency medicine development. Internationally, a consensus is building regarding the demand for an international minimum basic standard for emergency medicine curriculum content.

Goal: To establish, develop and maintain an international curriculum for medical student foundation training in emergency medicine. The curriculum should be compiled by an international consortium of physicians, health professionals and other experts in emergency medicine and international emergency medicine development. Further it should be approved, amended and maintained by an international collection of such experts.

Endpoint: To further train and educate physicians, medical professionals and other experts in emergency medicine, in order to provide the best quality emergency care in the multiple and growing number of nations where it is currently practiced, and to further establish emergency medicine as a medical profession worldwide.

Mission Statement

The International Federation for Emergency Medicine believes that:
-- Society has a right to expect that at the completion of their undergraduate medical school training, all physicians possess the basic knowledge of emergency care and the skills to manage common acute problems.
-- Emergency medicine is a core medical discipline and should be a required portion of the curriculum for every medical school, and every medical student, in the world.
-- Every physician, and graduating medical student, should be able to provide care in an emergency situation without any faults or lack of confidence and should be independent of the site of the emergency.
-- Every physician, and medical student, should be able to manage clinical decision-making under pressure of time when it is essential to save lives.
-- Competence in basic emergency medicine should be an outcome measure for all medical students and constitutes a required criterion for conference of the degree.

Introduction

This curriculum establishes an international consensus on the core content of undergraduate level emergency medicine training with the goal of elevating the quality of acute care worldwide through an expansion of basic emergency medicine education. This curriculum further reflects the importance of emergency medicine as a medical profession worldwide. The document is organized sequentially, as a framework rather than a comprehensive plan. Educators using this curriculum should make use of the framework to develop educational programs that are contextualized and specifically meet local educational requirements. This model allows easy adaptation of any of the features and provides an example of an expanded 4-year curriculum for a single learning objective.

Professional Development

The clinical settings and environmental contexts for medical education vary widely throughout the world. To attain minimum basic competency in emergency medicine core learning objectives, medical students must be given a variety of opportunities for professional development. These opportunities should be longitudinal in nature, begin early in the preclinical years, and extend into clinical contexts that allow focus on acute and emergency conditions. The following basic guidelines should structure the educational process of achieving core competencies in...
minimum emergency medicine knowledge and skills.

During undergraduate and early training every medical student should:

- Acquire a fundamental knowledge of basic sciences as applied to emergency medicine and have the ability to assess and immediately treat common emergencies.
- Develop existing clinical examination skills and apply them in clinical practice to formulate differential diagnoses and provisional management plans for acute medical conditions and undifferentiated patients.
- Acquire expertise in a range of commonly used emergency procedural skills, including basic life support.
- Perform allocated tasks, learn to process serially so as to optimally manage time within the shift, and meet clinical deadlines.
- Teach informally in the clinical setting and in specified circumstances in a more formal setting.
- Develop an understanding and basic awareness of clinical management issues when applied to acute care situations.
- Select and perform simple audit projects and understand the audit cycle to monitor care delivery and improve care quality.
- Understand the principles of critical appraisal and research methodology and apply these to acute care situations.
- Demonstrate the capacity to work in multi-professional teams.
- Learn to recognize his or her own limitations in the provision of emergency care.

Educational Outcomes – Learning Objectives

These learning objectives are designed to allow easy modification to the local needs and are written so that objective measures of performance and competency can be designed to measure attainment of the learning objective.

The student should:

1. Acquire basic life support skills, including the diagnosis and treatment of shock and the related basic procedural skills; and demonstrate the basic application of these principles in real or simulated patient care scenarios.
2. Demonstrate the capacity to differentiate and treat common acute problems.
3. Provide a comprehensive assessment of the undifferentiated patient.
4. Demonstrate proficiency in basic life support skills and cardiopulmonary resuscitation.
5. Recognize and initiate first aid for airway obstruction.
6. Recognize and be prepared to intervene for all causes of shock in any age group.
7. Be able to provide rapid stabilization with intravenous access and fluid/blood administration.
8. Understand the principles of cerebral resuscitation in brain illness and injury.
9. Demonstrate proficiency in the use of an automatic external defibrillator (AED).
10. Understand the principles of wound care.
11. Demonstrate basic wound care techniques.
12. Understand the principles of trauma management.
13. Demonstrate basic trauma management skills, such as initial assessment using the ABC approach and full spine immobilization.
14. Demonstrate mastery of basic procedural skills, such as airway management and venous access.
15. Recognize life-threatening illness or injury, and apply basic principles of stabilization to the early management of these entities.
16. Demonstrate the capacity to prioritize attention to those patients with more urgent conditions.
17. Describe the importance of the ED as a key link between the general population and the health care system.
18. Understand the role of the situations that are unique to emergency medicine: acute critical illness, intoxicated...
patients, media, out–of–hospital personnel, death notification for sudden unexpected death, disaster, language barriers, environmental illness/injury, injury prevention, assessment of complex and undifferentiated patients, ability to synthesize multiple and often incomplete sources of information to develop a management plan.

Unique Content Areas for Emergency Medicine in Foundation Training

- Undifferentiated patient presentation
- Time-constrained decision making
- Environmental illness and injury
- Pre-hospital care
- Transition point between community and hospital
- Focused history and exam
- Prioritized differential diagnoses

Lead Role Areas for Emergency Medicine in Foundation Training

- Acute illness
- Acute injury
- Disaster management
- Death notification
- Injury prevention
- Medical decision-making
- Resource utilization
- Toxicology

Example of a Curriculum Format

To assist educators in crafting a curriculum that fits local needs, we have provided an example of a 4-year plan for a single learning objective. Educators may use this as a guide to construct individual-, national-, and institution-specific models for content delivery. This method is not intended to be prescriptive, but to provide a simple format for tailoring content to the unique educational models that exist throughout the world.

Curriculum Year 1

Readings – Basic life support manuals, basic first aid manuals (e.g., American Heart Association Advanced Life Support Manual, Dallas, TX USA or equivalent manuals from the local community)

Performance indicators:

1. Obtain basic cardiac life support (BCLS) certification
2. Demonstrate chin lift
3. Demonstrate bag–valve mask ventilation
4. Demonstrate the ability to clear an obstructed airway

Curriculum Year 2

Readings – Pathophysiology of respiratory failure

Curriculum Year 3 and/or 4

Readings – Introduction to anesthesia, introduction to airway management

Performance indicators:

1. Demonstrate endotracheal intubation
2. List indications for intubation
3. List contraindications for intubation
4. Describe medications used for rapid sequence intubation
5. Describe the physiology of artificial ventilation

Outcome Measures

At the time of graduation, the student will demonstrate the ability to:

- Manage an obstructed airway
- Manage a basic airway, and
- Perform an endotracheal intubation.

This will be assessed by simulation on a mannequin or using direct observation of student skills by trained faculty during clinical situations.

Undergraduate Emergency Medicine Curriculum Content

Skills Curriculum

1. Clinical Care Skills
   1.1. History and examination
   1.2. Documentation
   1.3. Decision making
   1.4. Time management
   1.5. Safe prescribing
Continuity of care
Therapeutic interventions
Communication Skills
With colleagues
With patients and caregivers
Breaking bad news
Working with a team
Maintaining Good Medical Practice – Life-long Learning
Audit and clinical outcomes
Critical appraisal
Information management
Professional Behavior and Probity – Professional Attributes
Career and professional development
Ethics and Legal Aspects
DNAR and advanced directives
The competent adult
Information management
Maintaining Good Medical Practice – Life-long Learning
Audit and clinical outcomes
Critical appraisal
Information management
Professional Behavior and Probity – Professional Attributes
Career and professional development
Ethics and Legal Aspects
DNAR and advanced directives
The competent adult
Information management
Education – Developing Learning for Others
Basic educational information delivery
Assessment and appraisal
Feedback
Maintaining Good Clinical Care - Risk Management
Medico-legal issues
Confidentiality
Specialty-Specific Curriculum
Generic Objectives for Resuscitation
Resuscitation - airway
Cardiac arrest / peri-arrest
Shock - all varieties
Coma
Anesthetics and Pain Relief - Pain Management
Local anesthetic techniques
Safe conscious sedation
Wound Management
Basic wound debridement and closure
Identification and treatment of infected wounds
Generic Objectives for Trauma
Major trauma
Head injury
Chest trauma
Abdominal trauma
Spinal injury
Maxillo-facial trauma
Burns
Orthopedic trauma
Generic Objectives for Musculoskeletal Conditions
Upper limb disorders
Lower limb and pelvis disorders
Spine and spinal cord conditions
Vascular Emergencies
Arterial limb threat
Venous - Deep venous thrombosis (DVT)
Abdominal Conditions
Undifferentiated abdominal pain
Hematemesis / malena
Anal pain and rectal bleeding
Diverticulitis
Abdominal aortic anurysm
Urology
Acute urinary retention or bladder obstruction
Nephrolithiasis and colic
Sexually Transmitted Diseases
Identification and initial treatment for endemic diseases
Eye Problems
Acute conjunctivitis - bacterial and viral
Acute vision loss
Acute eye trauma including globe rupture
Ear, Nose and Throat (ENT) Conditions
Epistaxis
Infections of the head and neck
Dental Emergencies
Dental abscess
Dental fracture
Gynecology
Pelvic pain
Dysfunctional uterine bleeding
Obstetrics
Ectopic pregnancy
Uncomplicated emergency vaginal delivery
Cardiology
Basic electrocardiographic analysis
Recognition and initial treatment of acute myocardial infarction
Recognition and initial treatment of life threatening arrhythmia
Respiratory Medicine
Airway obstruction
Respiratory failure
Asthma and restrictive airway disease
Acute pneumothorax
Pulmonary embolism
Neurological Emergencies
Acute stroke
Spinal cord lesions
Peripheral neuropathies
Acute mental status change
Migraine
Meningitis
17.7. Vertigo
18. Hepatic Disorders
18.1. Acute hepatitis
18.2. Liver failure
18.3. Acute cholecystitis and cholangitis
19. Toxicology
19.1. Treatment of acute ingestions
19.2. Identification of basic toxidromes
20. Acid Base and Ventilatory Disorders
20.1. Identification of acid base disorders
20.2. Initial management of the mechanically ventilated patient
21. Fluid and Electrolytes
21.1. Basic principles of fluid administration
21.2. Dehydration
21.3. Hyperkalemia
21.4. Hyponatremia
22. Renal Disease
22.1. Acute renal failure
23. Diabetes and Endocrinology
23.1. Disorders of glucose metabolism
23.2. Thyroid disorders
24. Hematology
24.1. Anemia
24.2. Disorders of red cell function
24.3. Disorders of clotting
25. Infectious Diseases and Sepsis
25.1. Endemic infectious diseases
25.2. Sepsis
25.3. Common infectious diseases or conditions (e.g. pneumonia)
25.4. Cellulitis and gangrene
26. Dermatology
26.1. Blistering and exfoliative diseases
26.2. Differential diagnosis of rash
26.3. Parasitic conditions and infestations
27. Rheumatology and Immunology
27.1. Crystal arthropathy
27.2. Arthritis
27.3. Immune disorders
27.4. Anaphylaxis
28. Child Protection and Children in Special Circumstances
28.1. Child abuse signs and symptoms
28.2. Legal rights of parents to refuse care
29. Neonatology
29.1. Neonatal resuscitation
29.2. Hyperbilirubinemia
29.3. Disorders of feeding
29.4. Neonatal fever
30. Environmental Emergencies
30.1. Hyperthermia
30.2. Hypothermia and frostbite
30.3. Envenomation and environmental toxin exposure
31. Oncology
31.1. Acute leukemia
31.2. Neutropenia and neutropenic fever
31.3. Solid tumors
31.4. Complications of chemotherapeutic agents
32. Pediatrics
32.1. Basic management of pediatric airway
32.2. Basic pediatric resuscitation
32.3. Common infectious diseases of childhood
32.4. Fever in the first 6 months of life
32.5. Common injury patterns for normal children
33. Psychiatry
33.1. Acute psychosis
33.2. Mood disorders
33.3. Personality disorders
33.4. Acute suicidal and homicidal ideation
33.5. Substance abuse
34. Major Incident Management
34.1. Concepts and application of triage
34.2. Field to hospital communication and chain of command
35. Legal Aspects of Emergency Medicine
35.1. Refusal of care
35.2. Informed consent
35.3. Malpractice
36. Research
36.1. Formulating a research question
36.2. Review of the medical literature
36.3. Basic research design
36.4. Basic preparation of manuscripts and written publications
37. Management
37.1. Leading teams and giving orders
37.2. Basic concepts of debriefing and giving feedback
37.3. Time flow management

Selected References

2. Liaison Committee on Medical Education. LCME Accreditation Standards (with annotations). Liaison Committee on Medical


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