Student Teaching and Evaluation

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. To address this deficiency, the International Federation for Emergency Medicine 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 is designed with a focus on the basic minimum emergency medicine educational content that any medical school should be delivering to its students during undergraduate 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.

Keywords: curriculum, international emergency medicine, medical education, medical students

RÉSUMÉ

À l'échelle mondiale, la pénurie de médecins d'urgence et de ressources en médecine d'urgence ne cesse de s'accentuer et se fait cruellement sentir. Afin de répondre à ce besoin, il faut former des médecins capables d'appliquer rapidement des interventions et de prodiguer des soins d'urgence qui sauveront des vies. À l'heure actuelle, il n'existe aucun programme standard internationalement reconnu pour asseoir les normes de base minimales de la formation en médecine d'urgence. Dans l'espoir de combler cette lacune, la Fédération internationale de médecine d'urgence a formé un comité international de médecins, professionnels de la santé et autres experts de la médecine d'urgence et du développement international dans ce domaine; le comité a été chargé de tracer les grandes lignes d'un programme d'études pour la formation de base des futurs médecins d'urgence. Ce programme est issu des recommandations auxquelles le comité en est arrivé par voie de consensus.

Le programme met l'accent sur le contenu didactique minimum de base en médecine d'urgence que toute faculté de médecine doit offrir à ses étudiants durant les années qui mènent à l'obtention du diplôme. Il est conçu non pas de façon normative, mais bien de façon à aider les enseignants et les leaders en médecine d'urgence à donner plus de profondeur à la formation des futurs médecins d'urgence. Le contenu sera adapté non seulement aux communautés qui disposent de systèmes de médecine d'urgence arrivés à maturité, mais également aux nations émergentes et à celles qui cherchent à faire plus de place à la médecine d'urgence à l'intérieur de structures pédagogiques existantes. L'application et l'enseignement du programme auront comme importante caractéristique une grande souplesse, reflet de la variété des milieux d'enseignement, des ressources accessibles, ainsi que des objectifs fixés par les administrations d'établissement.

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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 internationally recognized curriculum for medical students.
Demand: Currently, worldwide, there are roughly 50 or more 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.
End point: 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 practised, 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 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 at 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 represent a criteria required 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 context for medical education varies 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 develop differential diagnoses and provisional management plans for acute medical conditions and undifferentiated patients;
- acquire expertise in a range of commonly used

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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 multiprofessional 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;
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 "airway, breathing, circulation" 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 emergency department as a key link between the general population and the health care system;
18. understand the role of the physician in 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 and injury prevention. The student must also demonstrate the ability to assess complex and undifferentiated patients, and 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
- Prehospital care
- Transition point between community and hospital
- Focused history and examination
- 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 use
- Toxicology

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EXAMPLE 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-, nation- and institution-specific models for content delivery. This method is not intended to be prescriptive, but to provide a simple model for tailoring content to the unique educational models that exist throughout the world.

Learning objective # 5: Recognize and initiate first aid for airway obstruction

Curriculum year 1

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

Performance indicators

- Obtain basic cardiac life support certification
- Demonstrate chin lift
- Demonstrate bag–valve mask ventilation
- 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

- Demonstrate endotracheal intubation
- List indications for intubation
- List contraindications for intubation
- Describe medications used for rapid sequence intubation
- Describe the physiology of artificial ventilation

Outcome measures

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

- manage an obstructed airway;
- manage a basic airway;
- 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.

MEDICAL STUDENT 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
  1.6: Continuity of care
  1.7: Therapeutic interventions
2: Communication skills
  2.1: With colleagues
  2.2: With patients and caregivers
  2.3: Breaking bad news
  2.4: Working with a team
3: Maintaining good medical practice — lifelong learning
  3.1: Audit and clinical outcomes
  3.2: Critical appraisal
  3.3: Information management
4: Professional behaviour and probity — professional attributes
  4.1: Career and professional development
5: Ethics and legal
  5.1: "Do not attempt resuscitation" and advanced directives
  5.2: The competent adult
  5.3: Informed consent
6: Education — developing learning for others
  6.1: Basic educational information delivery
  6.2: Assessment and appraisal
  6.3: Feedback
7: Maintaining good clinical care — risk management
  7.1: Medico-legal issues
  7.2: Confidentiality

Specialty-specific curriculum

1: Generic objectives for resuscitation
  1.1: Resuscitation — airway
  1.2: Cardiac arrest/periarrest
  1.3: Shock — all varieties
  1.4: Coma
2: Anesthetics and pain relief — pain management
  2.1: Local anesthetic techniques
  2.2: Safe conscious sedation
3: Wound management

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- 3.1: Basic wound débridement and closure
- 3.2: Identification and treatment of infected wounds

4: Generic objectives for trauma
- 4.1: Major trauma
- 4.2: Head injury
- 4.3: Chest trauma
- 4.4: Abdominal trauma
- 4.5: Spinal injury
- 4.6: Maxillofacial trauma
- 4.7: Burns
- 4.8: Orthopedic trauma

5: Generic objectives for musculoskeletal conditions
- 5.1: Upper limb disorders
- 5.2: Lower limb and pelvis disorders
- 5.3: Spine and spinal cord conditions

6: Vascular emergencies
- 6.1: Arterial limb threat
- 6.2: Venous — deep venous thrombosis

7: Abdominal conditions
- 7.1: Undifferentiated abdominal pain
- 7.2: Haematemesis/malena
- 7.3: Anal pain and rectal bleeding
- 7.4: Diverticulitis
- 7.5: Abdominal aortic aneurysm

8: Urology
- 8.1: Acute urinary retention or bladder obstruction
- 8.2: Nephrolithiasis and colic

9: Sexually transmitted diseases
- 9.1: Identification and initial treatment for endemic diseases

10: Eye problems
- 10.1: Acute conjunctivitis — bacterial and viral
- 10.2: Acute vision loss
- 10.3: Acute eye trauma including globe rupture

11: Ear, nose and throat conditions
- 11.1: Epistaxis
- 11.2: Infections of the head and neck

12: Dental emergencies
- 12.1: Dental abscess
- 12.2: Dental fracture

13: Gynecology
- 13.1: Pelvic pain
- 13.2: Dysfunctional uterine bleeding

14: Obstetrics
- 14.1: Ectopic pregnancy
- 14.2: Uncomplicated emergency vaginal delivery

15: Cardiology
- 15.1: Basic electrocardiographic analysis
- 15.2: Recognition and initial treatment of acute myocardial infarction
- 15.3: Recognition and initial treatment of life threatening arrhythmia

16: Respiratory medicine
- 16.1: Airway obstruction
- 16.2: Respiratory failure
- 16.3: Asthma and restrictive airway disease
- 16.4: Acute pneumothorax
- 16.5: Pulmonary embolism

17: Neurological emergencies
- 17.1: Acute stroke
- 17.2: Spinal cord lesions
- 17.3: Peripheral neuropathies
- 17.4: Acute mental status change
- 17.5: Migraine
- 17.6: 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: Haematology
- 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

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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 tumours
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

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