



International Federation for Emergency Medicine

Model Curriculum for Emergency Medicine Specialists

The Core Curriculum and Education Committee for the International Federation for Emergency Medicine*

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ABSTRACT

To meet a critical and growing need for emergency physicians and emergency medicine resources worldwide, physicians must be trained to deliver time-sensitive interventions and lifesaving emergency care. Currently, there is no globally recognized, standard curriculum that defines the basic minimum standards for specialist trainees in emergency medicine. To address this deficit, 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 training of specialists in emergency medicine. This curriculum document represents the consensus of recommendations by this committee. The curriculum is designed to provide a framework for educational programs in emergency medicine. The focus is on the basic minimum emergency medicine educational content that any emergency medicine physician specialist should be prepared to deliver on completion of a training program. It is designed not to be prescriptive but to assist educators and emergency medicine leadership to advance physician education in basic emergency medicine no matter the training venue. The content of this curriculum is relevant not just for communities with mature emergency medicine systems but in particular for developing nations or for nations seeking to expand emergency medicine within the current educational structure. We anticipate that there will be wide variability in how this curriculum is implemented and taught. This variability will reflect the existing educational milieu, the resources available, and the goals of the institutions' educational leadership with regard to the training of emergency medicine specialists.

Keywords: curriculum, graduate medical education, house officers, international emergency medicine, medical education, residents

EXECUTIVE SUMMARY

This executive summary will provide a brief overview of the status of international curriculum development in emergency medicine and define the vision, rationale, demand, strategy, goal, resources, and progress to date on this important initiative.

- Vision:* To create an International Model Curriculum for Emergency Medicine Specialist Training on behalf of the International Federation of Emergency Medicine (IFEM). This consensus-based curriculum model will provide educators and institutions with the minimum basic requirements for the development of graduate level training for Emergency Medicine Specialists.
- Rationale:* There is critical, overwhelming and growing need for emergency physicians and other emergency medicine resources worldwide. Currently, there exist a small number of national curricula for Emergency Medicine, and no standard, recognized international curricula for the training of Emergency Medicine Specialists.
- Demand:* Currently, worldwide, there are more than 100 countries involved in the processes of emergency medicine development. There is consensus that a standardized international Emergency Medicine curriculum is needed.
- Strategy:* The IFEM invited a consortium of physicians, health professionals and other experts in Emergency Medicine and International Emergency Medicine development to establish, develop and evolve a standardized International Curriculum for Emergency Medicine. This was accomplished through the compilation and review of existing national curriculum documents and development of consensus opinion regarding the minimum basic requirements for graduate level training of Emergency Medicine Specialists. The resulting curriculum document shall be approved, amended and maintained by an international collection of such experts.
- Goal:* To provide a curriculum document that will foster the education of physicians, medical professionals and other experts in Emergency Medicine, who will provide the best quality emergency care in the growing number of nations where Emergency Medicine is currently practiced, and to further establish Emergency Medicine as a medical profession worldwide.
- Resources:* The successful implementation of this document will require faculty who are dedicated to the establishment, development and maintenance of an International Curriculum for Emergency Medicine, as well as faculty and administrative support at every training institution which implements the documents recommendations. This resource requirement will increase commensurately with program expansion.
- Progress to Date:* There has been tremendous interest in and support for an International Curriculum in Emergency Medicine from member societies of IFEM, including the American College of Emergency Physicians (ACEP), College of Emergency Medicine (CEM), European Society for Emergency Medicine (EuSEM), and many other national and international Emergency Medicine organizations, and from multiple Universities, Departments of Emergency Medicine and Emergency Medicine training programs, and from multiple individuals involved in national and international Emergency Medicine development. This International Curriculum for Emergency Medicine is the product of this interest and dedication.

MISSION STATEMENT

In 1991, the IFEM (available at: http://www.ifem.cc/About_IFEM.aspx [accessed Dec 1, 2010]) defined emergency medicine as a field of practice based on the knowledge and skills required for the prevention, diagnosis, and management of acute and urgent aspects of illness and injury affecting patients of all age groups with a full spectrum of episodic, undifferentiated physical and behavioural disorders; it further encompasses an understanding of the development of prehospital and in-hospital emergency medical systems and the skills necessary for this development.

This curriculum defines the educational framework, administrative oversight, goals and objectives, content, experience, and desired outcomes of an educational program, which will provide the foundational knowledge required of any specialist in emergency medicine. The goal of any such training program is to instil in its graduates an adequate level of knowledge, skill competency, and sound attitudes that will form the foundation of a lifetime of safe, expert, and independent emergency medicine practice. This requires that the training program provide adequate clinical experience, progressive responsibility, competent oversight, and accuracy of assessment to ensure that its graduates function at the specialist level.

As a result of specialist training, the communities served by these physicians have the right to expect that they possess a comprehensive knowledge of emergency care and the emergency procedural skills to manage common acute medical and surgical problems.

At the completion of training, specialist emergency medicine physicians will be able to:

- Provide comprehensive, immediate, and stabilizing care in an emergency situation, independent of the location of the emergency
- Manage situations in which decision making under pressure of time is essential to save lives
- establish the initial provisional diagnosis and differential diagnoses and rule out life-threatening situations
- Demonstrate mastery of the knowledge, skills, and attitudes delineated within the academic framework of their certifying body and meet any and all certifying criteria and academic examination requirements
- Manage patients of all age groups with acute and urgent illness and injury who present with a full spectrum of episodic undifferentiated physical and behavioural symptoms and/or disorders
- Be competent in coordinating and overseeing the management of multiple patients simultaneously, including mass-casualty incidents
- Determine when consultation with another specialist is required
- Act as the patient's advocate, advisor, and guide within the acute phase of his or her illness or injury
- Demonstrate a commitment to patient care above all other issues

PROFESSIONAL DEVELOPMENT OF A SPECIALIST IN EMERGENCY MEDICINE

During specialist training, trainees should:

- Acquire and refine basic science knowledge and its application to emergency medicine and the assessment and immediate treatment of emergencies
- Develop and improve existing clinical and examination skills and apply them in clinical practice to develop comprehensive differential diagnoses and management plans

- Assume progressive responsibilities for patient care and emergency department management
- Analyze clinical findings and develop and modify the differential diagnosis to a full range of clinical circumstances
- Demonstrate competence in commonly used procedural skills, including all forms of resuscitation, life support, airway management, and commonly used emergency procedural skills in both adults and children
- Acquire specialized communication and interpersonal skills required for outstanding communication with patients, families, other providers, and administrative staff
- Perform allocated tasks; manage departmental follow-up, demonstrate capacity to perform parallel tasks, and reprioritize tasks as needed to accomplish these goals
- Work closely with a wide variety of inpatient or outpatient teams and with primary care and prehospital providers to safely and effectively coordinate post-emergency care treatments
- Demonstrate a comprehensive understanding of clinical management issues as applied to acute care situations
- Perform audit projects, demonstrate an understanding of the audit cycle to monitor care delivery, and improve care quality
- Critically appraise the medical literature and research methodology and apply these principles to acute care situations
- Demonstrate a commitment to improve care by maintaining continuing professional development, using up-to-date evidence, being committed to lifelong learning, and being innovative
- Teach informally during the provision of clinical care and in specified circumstances in a more formal setting
- Know how to conduct a research or scholarly project designed to improve medical knowledge or enhance patient care
- Take the lead in and demonstrate the capacity to work in multiprofessional teams
- Recognize their own limitations in the provision of emergency care
- Demonstrate a practice of emergency medicine that is caring, empathetic, conscientious, and culturally competent without prejudice
- Demonstrate a commitment to the highest standards of care and of ethical and professional behaviour within the specialty of emergency medicine and the medical profession as a whole
- Demonstrate effective advocacy for patients, populations, emergency medicine, and the ambient health care system to promote health

STRUCTURE OF TRAINING

The objectives of specialist training are to expose trainees to a wide variety of emergencies and to equip them with the knowledge and skills to handle these critical situations. The educational program should be structured such that trainees have a well-designed course of study complete with learning objectives for core rotations and measures of interval progress designed to be both formative and summative. By the completion of the training program, all trainees should have undergone comprehensive assessment and evaluative examinations designed to measure proficiency in the core knowledge, skills, and attitudes of an emergency medicine specialist.

All trainees should complete a minimum of 3 years of recognized training in an accredited emergency medicine training program. Training paradigms and duration of training should be modified by individual programs to meet the educational requirements of incoming trainees. Given the variation seen in medical school preparation from country to country, it is probable that each nation's physician trainees will require

different lengths of postgraduate education to meet specialty-specific requirements. Disease prevalence and availability of alternative training modalities may require extended lengths of training for the trainee to experience the full breadth of emergency medicine conditions expected of a specialist. Many other aspects of training than patient volume, years of undergraduate training, and availability of emergency medicine supervision may provide further rationale for mandating longer core training paradigms.

Training structure should be designed to offer trainees optimal clinical exposure as well as adequate clinical experience—either real or simulated—so that they can be expected to perform similar or related tasks in an unsupervised manner in the future.

Summary tables of selected national curricula are attached for comparison purposes (Table 1).

EDUCATIONAL MILIEU

Clinical setting

Clinical settings for specialist training should provide excellent emergency care to their population. A variety of experience within the primary training site should be made available to trainees as they acquire the diverse set of knowledge, skills, and attitudes needed to become an emergency medicine specialist. The emergency department accredited as a training site should be staffed with full-time consultant faculty who are dedicated to the oversight and education of clinical trainees. The range, complexity, and number of cases at the accredited emergency department should provide broad exposure to the trainee. Although minimum and maximum patient census numbers are not specified in this document, the census should allow the typical trainee, within the time frame of the training program, to see a sufficient patient population, of all ages and both sexes, with a wide variety of clinical problems to meet the educational needs of the trainee. Ideally, trainees should be exposed to a sociodemographically and culturally diverse patient population to increase the generalizability of their training to multiple eventual practice settings.

Training sites should provide laboratory and diagnostic imaging facilities in support of the provision of emergency care. Training sites should also provide support facilities for educational activities, including access to adequate medical references, Internet access, and suitable venues for lecture, seminars, and regular assessment. All training sites should engage in regular systematic audits of clinical performance, including mortality and morbidity conferences, and these results should be shared with clinicians with the goal of improving care. Ideally, trainees should have exposure to a variety of training sites where there is a variation in clinical volume and patient type.

Learning experiences

All trainees should have the opportunity to participate in regular educational programs focused on acquiring the knowledge, skills, and attitudes required of an emergency medicine specialist. Although the majority of learning is self-directed from clinical practice and by working under the supervision of a qualified specialist or emergency medicine faculty, other types of learning opportunities should be provided. These additional learning opportunities should include formal situations such as didactics, case conferences, seminars, procedure workshops, journal clubs, and case presentations. Group teaching within the department and regional teaching programs are encouraged. Learning opportunities outside the department may include life support courses and skills laboratory-based teaching.

All specified learning experiences should provide trainees with the opportunity to receive formative feedback, demonstrate proficiency, and advance their responsibility throughout all years of their training. Individual focused study outside mandated hours is essential for adequate knowledge development and is a key component of professionalism. As part of the learning process, trainees should maintain an adequate record of their own training activities. This should be reviewed regularly by program staff.

The most significant component of specialized training will be centred in the emergency department

setting; however, it is acknowledged that clinical experiences outside the emergency department, in terms of intensity of training and volume of specific training opportunities, are important. This knowledge base is best obtained by being part of a team responsible for care of patients admitted from the emergency department to inpatient units. Other areas of emergency medicine practice may require dedicated time with specialists in clinical units outside the emergency department prior to practicing such skills within the emergency department, for example, critical care and anesthesia. Within all clinical contexts, trainees must have a chance to assume greater responsibilities throughout the educational program and provide more complex care and departmental administrative management as their skills grow.

Supervision

The core of all training programs is a dedicated cohort of faculty who have a special interest in and commitment to the education of trainees. At each site, there must be a sufficient number of qualified faculty to instruct and supervise all trainees. Faculty must dedicate adequate time to the educational program to accomplish their supervisory and teaching responsibilities and to show a strong interest in the education of residents. Faculty should create and uphold an environment of inquiry and scholarship and should participate in organized clinical discussions, patient care review rounds, journal clubs, and conferences. The ultimate goal is the administration and maintenance of an educational atmosphere advantageous to educating residents in each of the areas of required competency. Although not all faculty will have obtained extra certification in educational methods, it is desirable that at least one faculty member have such advanced knowledge. Further, at least one faculty member must assume responsibility for the entire training program as the program director. Ideally, teaching faculty should have protected time dedicated to education.

The program director must have authority and accountability for the operation of the program. The program director will serve as a liaison between the faculty, administration, and the trainees; ensure that all trainees are compliant with the regulations and requirements of the training program; provide needed consultation with the faculty on trainee progress throughout the program; and oversee and ensure the quality of didactic and clinical education in all sites that participate in the program, including resident supervision.

Evaluation and feedback

The program director should provide ongoing evaluation and one-on-one feedback for all trainees. This should include documented evaluation of performance with indication of progress through the training program. This evaluation and feedback should take two forms, formative and summative. Formative evaluation and feedback should occur for all trainees' performance in a timely manner so as to allow trainees the opportunity for behavioural change. We recommend the use of multiple methods of evaluation to provide trainees and faculty with the most comprehensive data available to monitor and measure trainee progress through the program.

We recommend that this process occur during or at the completion of each rotation or educational assignment. Further, this feedback should be documented as evidence of trainees' satisfactory progressive scholarship and professional growth through the training program. Summative evaluation must be provided to substantiate that the trainee has acquired sufficient competence and proficiency in the required emergency medicine learning outcomes to enter practice without ongoing direct supervision. This summative evaluation should become part of the resident's permanent record maintained by the institution.

In situations where remediation is required, a plan to remedy deficiencies must be in writing and on file. Adherence with the remediation program must be monitored and changes in performance documented to

substantiate a trainee's progress with the defined program. The program director is also responsible for managing any grievance or due process procedures, promotion of residents, and disciplinary action that may occur during training.

ASSESSMENT

Accurate assessment is paramount to the educational process. Properly done, it will provide a valid, highly reliable method to provide formative feedback to learners and guide and track their progress through the educational program. Further, it provides educators with substantial insight into the effectiveness of the educational program design and directs subsequent programmatic change and innovation. Demonstrating competency and/or proficiency in critical emergency medicine knowledge, skills, and attitudes requires an integrated approach to measurement and clear, concise learning objectives to guide the design of the assessment experience. Multiple methods of assessment are available to the educator. These span the spectrum from knowledge-based testing to complex interactive measures of skills and knowledge application in simulated settings. No matter what type of assessment is selected by the educator, it should be well paired to the learning objectives that define the content to be mastered. The results of the measurement should allow the educator to draw conclusions about what the learners know, believe, and can do. Attempts should be made to establish performance standards that are both normative (compare a trainee's performance to that of their peers) and criterion referenced (compare a trainee's performance to an accepted benchmark). A broad overview of assessment methods useful to the emergency medicine educator is presented in Table 2.

EDUCATIONAL OUTCOMES AND LEARNING OBJECTIVES

During training, the specialist should:

- Develop a full complement of basic knowledge of emergencies and acute and urgent presentations and be prepared to apply this knowledge to a full range of conditions
- Acquire further specialist knowledge to support clinical care in the emergency department
- Acquire basic and advanced life support skills, including the diagnosis and treatment of shock and the related procedural skills, and demonstrate the application of these principles in real or simulated patient care scenarios
- Demonstrate the capacity to differentiate among and treat common acute problems
- Provide a comprehensive assessment of the undifferentiated patient
- Analyze clinical findings and develop and modify differential diagnoses in a full range of circumstances
- Demonstrate proficiency in cardiopulmonary resuscitation
- Become proficient at all resuscitative skills, including leading a resuscitation of adults and children, and be able to perform emergency procedures in most circumstances
- Recognize and initiate first aid and definitive therapy for airway obstruction
- Recognize and be prepared to intervene, in any age group, for all causes of shock etiology
- Be able to provide rapid stabilization with intravenous access and fluid or blood administration
- Understand the principles of cerebral resuscitation in brain illness and injury
- Demonstrate proficiency in the use of a defibrillator and other advanced methods of cardioversion
- Understand principles of wound care and demonstrate advanced wound care techniques in the management of common injury patterns
- Understand the principles of trauma management
- Demonstrate trauma management skills such as initial assessment using the airway, breathing,

circulation (ABC) approach, full spine immobilization, secondary survey, stabilization, and appropriate consultation

- Demonstrate mastery of commonly used procedural skills, such as airway management and deep venous access
- Demonstrate mastery of basic focused ultrasound skills, including focused assessment of sonography in trauma (FAST)
- Recognize life-threatening illness or injury and apply principles of stabilization to the early management of these entities
- Plan and prioritize tasks in both the clinical setting and professional life
- Develop the skills of delegation to other personnel in the emergency department and the leadership skills required to maintain the pace of others working in the clinical environment to ensure that patient needs are met
- Demonstrate the capacity to prioritize attention to those patients with more urgent conditions
- Demonstrate the capacity to recognize and treat common toxicologic emergencies
- Become competent in the delivery of training to other professionals and teach and supervise others in areas of emergency medicine practice, as well as develop and demonstrate mentoring and appraisal skills
- Complete specified management projects, particularly around staff management and complaints
- Carry out audit projects, support others in completing audit projects, and contribute to the implementation of guidelines, care plans, and other aspects of clinical governance related to emergency medicine issues
- Develop the skills needed for a lifetime of selfdirected learning and demonstrate the capacity to critically appraise the literature and apply the literature to clinical practice
- Develop areas of special interests that facilitate growth as a professional
- Take and accept the lead of multiprofessional teams
- Demonstrate a nuanced understanding of the ethical issues associated with emergency medicine, including, but not limited to, assessment and establishment of competency, do not resuscitate and advance directives, informed consent, confidentiality, nonaccidental illness and injury, sexual assault, errors in care, and lapses in patient safety
- Be capable of describing the importance of the emergency department as the link between the general population and the health care system
- Become a recognized expert and understand the role of these situations, which are common to emergency medicine: all acute critical illness and injury, intoxicated patients, media, out-of-hospital personnel, prehospital medicine, disaster management, language barriers, environmental illness or injury, injury prevention, death notification for sudden unexpected death, toxicology, resource use, medical decision making

CONTENT OF LEARNING

The IFEM recognizes that although the majority of content unique to the discipline of emergency medicine will be shared among member nations, there will be regional variation in the actual content practitioners will most use in their practice and must therefore emphasize in their training. The IFEM also recognizes that excellent content-specific lists of clinical content have been developed by its member nations. Complete and detailed content can be found in the curriculum documents identified in Table 1. Each of these curriculum documents sets out the general professional and specialty-specific content to be mastered, with specific knowledge, skills, and expertise identified.

Two major educational frameworks have been identified that provide educators with a structure for the development of locally applicable curricula. These are the CanMEDS used by the majority of Commonwealth nations and the Accreditation Council for Graduate Medical Education (ACGME) core competencies used in the United States. For comparison purposes, these are presented in Table 3. Both frameworks provide a structure for educators and allow them to identify educational outcomes that provide clarity of educational purpose to both the trainee and the supervisor. Table 3 compares these two major academic formats. The IFEM does not endorse either as a preferred method and recognizes the utility of both formats in the construction of a complete educational program.

To support educators as they develop educational materials for their individual nations a sample curriculum format and an expanded list of emergency medicine goals and objectives are provided online as Appendix A and Appendix B respectively.

BASIC EMERGENCY MEDICINE CURRICULUM CONTENT

A comprehensive review of the curricular documents of the IFEM member nations demonstrates that multiple nations have excellent outlines that define the scope and content of clinical emergency medicine. The IFEM does not endorse any specific content outline but refers the reader to the outstanding documents provided by our member nations. These curriculum documents can be accessed on individual member nation websites.

ADDITIONAL READINGS

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Table 1. Representative division of clinical experiences for selected IFEM member nation curricula

IFEM member nation organization	Duration of postgraduate training	Critical care including anesthesia	General and subspecialty surgery including gynecology	General and subspecialty medicine including psychiatry	Pediatrics	EMS—disaster	ED	Scholarly activity or research	Elective and/or selective
American College of Emergency Physicians (< http://www.acep.org >)	3–4 yr	2 mo of inpatient critical care plus 3% of all ED patients	Experiences required, but no time specified—must be adequate to ensure competency is achieved		4 mo or 16% of ED clinical experience with minimum of 50% in ED setting	Required, but time not specified	No less than 50% of all clinical experience under the direction	No time defined; however, project is required	
Australasian College for Emergency Medicine (< http://www.acem.org.au >)	Basic training: 2 yr through a variety of posts Provisional training: minimum of 12 mo Advanced training: minimum of 48 mo	Advanced training includes a minimum of 6 mo and a maximum of 12 mo anesthesia/ICU as a portion of the 18 mo of non-ED disciplines*	Maximum of 6 mo in any one subspecialty	Maximum of 6 mo in any one subspecialty	Advanced training includes minimum of 6 mo in pediatric ED or its equivalent as defined by the College	Up to 6 mo in retrieval medicine	Provisional: minimum of 6 mo Advanced: 30 mo with at least 12 mo in the adult ED	Completion and presentation of a research project during training	Provisional: 6 mo of either additional ED or approved non-ED disciplines Advanced: 18 mo in non-ED disciplines*
Canadian Association of Emergency Physicians (< http://www.caep.ca >)	5 yr	6 mo	8 mo required between medicine and surgery; at least 1 mo of acute psychiatry		Minimum of 4 mo pediatric EM, 2 mo as a senior resident	1 mo	24 mo	Complete a project suitable for peer review	12 mo
Canadian Association of Emergency Physicians	Family medicine + 1 yr	1 mo			2 mo		6 mo		2 mo

Emergency Medicine Society of South Africa	4 yr	6 mo	11 mo	7 mo	3 mo	3 mo	18 mo		
Hong Kong College of Emergency Medicine (< http://www.hkam.org.au/colleges/em.htm >)	6 yr		6 mo at basic	6 mo at basic			12 mo basic training and 24 mo higher training		Maximum of 12 mo of critical care, geriatrics, and surgical subspecialties
			Maximum of 24 mo of elective drawn from these disciplines						
Dutch Society for Emergency Physicians (NVSHA) (< http://www.nvsha.nl >)	3 yr	3–6 mo	2–4 wk	2–4 wk	1.5–3 mo	2 wk	At least 50% of all training	No time required, but all trainees must meet project criteria	Maximum of 3 mo
The Royal College of Physicians of Thailand (< http://www.rcpt.org >)	3 yr	; 16 wk	; 12 wk	; 8 wk	; 4 wk	4–16 wk	72 wk	Completion of a research project during training	; 16 wk of at least 4 of either additional ED or approved non-ED disciplines*
Society for Emergency Medicine in Singapore	5 yr	At least 3 mo	At least 12 mo	At least 12 mo	At least 3 mo, which may be included as part of subspecialty medicine	2 wk EMS and a part-time program to teach and practice basic principles of disaster care	At least 30 mo (12 mo within first 3 yr and the rest in the final 2 yr)	Show evidence of training in clinical biostatistics and EBM; need to undertake assessment in critical appraisal of medical literature	Optional and up to 6 mo in any area relevant to emergency medicine
College of Emergency Medicine, United Kingdom (< http://www.collemergencymed.ac.uk >)	6–7 yr	6 mo Advanced intensive care training (optional) requires additional 6 mo	Minimum 3 mo acute medicine in first 2 yr Further specialty-specific experience is aligned to competency acquisition and is tailored to trainee portfolios		6 mo pediatric emergency medicine as part of 3rd year of specialist training	Not required, but participation in major incident management course encouraged	3 yr	Original research encouraged—submission of a clinical topic review forms part of exit examination	Not required but can be arranged on individual basis as “out of program” experience

@TF=EBM = evidence-based medicine; ED = emergency department; EMS = emergency medical system; ICU = intensive care unit; IFEM = International Federation for Emergency Management.

This table is intended to provide an overview of the educational processes in the listed nations. The information presented is a minimum abstraction from the host nations' primary regulatory educational documents and is not intended to provide all details of the educational program. Within each specific document, these requirements are often modified by additional or more specific criteria too lengthy for inclusion in this document.

*At least four of either aeromedical transport, emergency illness and injury control, patient safety and quality improvement, emergency ophthalmology, emergency psychiatry, recreation and wilderness medicine, medical forensics, public health emergencies, emergency diagnostic radiology and ultrasonography, rural emergency medical managerial science, emergency medical toxicology, emergency medical epidemiology and research, emergency blood service medicine, traumatic medicine, military medicine, observational medicine, occupational and environmental medical emergencies, emergency geriatric medicine, international emergency medicine, disaster and mass gathering medicine, hyperbaric medicine, emergency medical education, emergency medical information and communications, or emergency otolaryngology.

Table 2. Commonly used assessment methods

Type	Description	Uses
Chart-stimulated recall oral examination	The examinee's own cases are used as the basis for a structured dialogue between the examinee and a trained experienced physician examiner. The examiner questions the examinee about the care provided, identifying the rationale for the workup, differential diagnoses, interpretation of clinical findings, and treatment plans. The examinee is scored using a defined protocol and scoring procedure. Multiple cases are used to create the complete examination.	To assess clinical decision making and the application of medical knowledge within the context of previously delivered actual patient care
Global rating of performance	Global ratings are retrospective general impressions of the trainee that the rater has collected during the scoring time frame (eg, a clinical rotation). The rating is the result of the subjective summing of multiple sources of information such as direct observation, input from other colleagues, and written materials. Global assessments differ from other rating forms in that a rater judges general categories of ability rather than specific skills. Forms are based on a Likert scale, which allows the evaluator to qualitatively indicate the range of trainee performance. Written comments supplement the evaluation and assist with explanation of high or low scores.	Used for end of rotation and summary assessments of trainee performance that has occurred over the course of an extended observation period
Objective Structured Clinical Examination (OSCE)	Examinations are constructed by the sequential administration of multiple assessment tools at a series of separate encounter stations. Each station consists of a single standardized patient case assessment, data interpretation task, or a technical skill assessment. Candidates may be asked to complete patient notes or take a brief written examination about the previous station in a postencounter exercise.	This format provides a standardized means of assessing physical examination, history, and communication skills. In addition, with the proper case construction and postcase assessment, this format can be used to measure the examinee's knowledge and capacity to summarize and document findings, as well as apply the correct treatment modality
Procedure or case logs	These are lists or documentation of the individual trainees' experience with particular cases, procedures, or applied skills designated by the training program as important for comprehensive skill development. Logs do not imply competency or mastery of the skill; they simply provide a quantitative measure of the cases performed during the provision of clinical care.	Useful for assessing the scope of patient care experience at either an individual or a programmatic level

Portfolios	A portfolio is a reflective document that contains a collection of materials to demonstrate thoughtful learning along the designed curriculum. It may contain written documents, audiovisual entries, photographs, or other artistic media that allow learners to reflect on and digest the clinical material and assimilate it into their clinical practice. Portfolios may also contain a representative sample of the “best work” of learners, demonstrating the breadth and depth of their clinical experiences.	Demonstration of mastery of competencies that are difficult to assess by other methods (eg, practice-based improvement and professionalism are well suited to portfolio-based learning). They may also be used as a catalogue of teaching experiences and a means to showcase teaching materials. They are also useful adjuncts to quality audits. For any of these content areas, they can be used to monitor progress through the course of the training program.
Record review	Trained auditors or colleagues completing a quality review evaluate a set of patients’ records to determine compliance with predetermined clinical or billing standards	Record review demonstrates written charting competence and can provide some level of insight into clinical decision making. Determination of levels of clinical competence using record review of trainees’ charts should be done with caution; as most will have consulted with attending physicians and therefore the clinical decision making may be entirely reflective of the trainee.
Simulations and models	Simulations are designed to imitate clinical problems and situations and provide trainees with the stress of solving the problem in real time. This modality also provides trainees with immediate feedback and demonstrates key physiologic concepts when the correct and/or incorrect manoeuvres are performed. Many options exist for creating simulated environments. These range from simple paper-based tabletop exercises to complex virtual reality environments. In addition, key components of behaviour or decision making can be isolated (haptic vs cognitive) to provide a more focused learning or assessment experience. Simulation in itself is not an assessment method; rather, it is an experience in which a learner can acquire and demonstrate competence. As such, some other method of assessment (global assessment form, structured checklist, etc.) must be employed in concert with the simulation.	Simulations can be used for both summative and formative assessment. As training materials, they are very useful for complex haptic manoeuvres and for real-time decision making under stress.

Oral examination	A type of performance assessment using previously designed patient scenarios that are provided to the examinee by a trained physician examiner. The examinee is asked to direct the case orally, and the examiner provides additional information or the results of the management to the examinee as the case moves forward. The examiner may also ask questions designed to identify key concepts in clinical reasoning and pathophysiology.	This type of assessment is focused on clinical decision making and medical knowledge application with standard but realistic patient case scenarios
Standardized patient (SP) examination	SPs are medical actors who are trained to present the components of history and physical examination of particular disease states. They are trained to a uniform standard to recreate the highest degree of consistency of medical information. An SP examination is a series of SP cases requiring learners to examine the SP as if they were examining a real patient. Checklists or rating forms are scored by either trained observers or the SP. Criteria for successful performance on a single case and for the entire examination are predetermined by the examiner.	This type of examination is well suited to assessing communication, history, physical examination skills, and case management in a realistic setting. Significant limitations exist for the presentation of complex critically ill patients and the case requiring physical examination findings; therefore, cases must be designed carefully.
Clinical patient examination skills	Stable patients with physical signs that are relevant to the practice of emergency medicine are examined by candidates based on a short scenario provided by the examiner. The examiner would evaluate the candidate's approach to the patient, his systematic examination skills of the relevant body system, and ability to pick up the physical signs that the patient has. The examination would usually be followed by a short discussion on the findings, likely diagnoses, and some aspects of initial management.	This format of examination assesses approach to a real patient, physical examination skills, and whether the candidate can identify existing physical signs. The limitation to this method would usually be the inability to use critically ill patients in an emergency situation and assess the ability of the candidate to evaluate patients and make crucial decisions in time-critical situations.
Written examination	Written examinations are composed of multiple-choice questions or essay-style questions designed to measure medical knowledge and understanding. A complete examination is composed of an item set that broadly queries the most important concepts in the content area.	Uses include identification of areas of content knowledge and deficit, as well as some components of clinical reasoning. They are not useful for other skills, such as communication, professionalism, etc. Test results from written tests are commonly compared across training programs, years of training, and national trainee cohorts. Comparisons of this type are useful for regulators and program directors as they seek to accredit programs, target specific content areas, and improve educational offerings.

This table is partially abstracted from the Accreditation Council for Graduate Medical Education Toolbox of Assessment Methods.

Table 3. CanMEDS and ACGME core competency frameworks

@TS=CanMEDS educational framework*
<p><i>Medical expert</i></p> <p>As medical experts, specialist emergency physicians integrate all of the CanMEDS Roles, applying medical knowledge, clinical skills, and professional attitudes in their provision of patient-centred care</p>
<p><i>Communicator</i></p> <p>As communicators, specialist emergency physicians effectively facilitate the doctor-patient relationship and the dynamic exchanges that occur before, during, and after the medical encounter</p>
<p><i>Collaborator</i></p> <p>As collaborators, specialist emergency physicians effectively work within a health care team to achieve optimal patient care</p>
<p><i>Manager</i></p> <p>As managers, specialist emergency physicians are integral participants in health care organizations, organizing sustainable practices, making decisions about allocating resources, and contributing to the effectiveness of the health care system</p>
<p><i>Health advocate</i></p> <p>As health advocates, specialist emergency physicians responsibly use their expertise and influence to advance the health and well-being of individual patients, communities, and populations</p>
<p><i>Scholar</i></p> <p>As scholars, specialist emergency physicians demonstrate a lifelong commitment to reflective learning, as well as the creation, dissemination, application, and translation of medical knowledge</p>
<p><i>Professional</i></p> <p>As professionals, specialist emergency physicians are committed to the health and well-being of individuals and society through ethical practice, profession-led regulation, and high personal standards of behaviour</p>

@TS=ACGME core competency educational framework [†]
<p><i>Patient Care</i></p> <p>Residents must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health</p>
<p><i>Medical Knowledge</i></p> <p>Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiologic, and social-behavioural sciences, as well as the application of this knowledge to patient care</p>
<p><i>Practice-Based Learning and Improvement</i></p> <p>Residents must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and lifelong learning</p>
<p><i>Interpersonal and Communication Skills</i></p> <p>Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals</p>
<p><i>Professionalism</i></p> <p>Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles</p>
<p><i>Systems-Based Practice</i></p> <p>Residents must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care</p>

*The CanMeds educational framework is used by the majority of Commonwealth nations as the format for organizing the goals and objectives for graduate medical education training.

[†]The core competency educational framework is used in the United States as the format for organizing the goals and objectives for graduate medical education training.

APPENDIX: EMERGENCY MEDICINE GOALS AND OBJECTIVES FOR TRAINING

Postgraduate Year 1

Goals

The goals of this rotation can be described by the ACGME general competencies:

1. Learn to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health (Patient Care)
2. Learn about established and evolving biomedical, clinical, and cognitive (eg, epidemiologic and sociobehavioural) sciences and the application of this knowledge to patient care (Medical Knowledge)
3. Develop the ability to appraise and assimilate scientific evidence and investigate, evaluate, and improve their patient care practices (Practice-Based Learning and Improvement)
4. Develop interpersonal and communication skills that result in effective information exchange and teaming with patients, patients' families, and professional associates (Interpersonal and Communication Skills)
5. Develop a commitment to carry out professional responsibilities, adhere to ethical principles, and develop sensitivity to a diverse patient population (Professionalism)
6. Develop an awareness of, and responsiveness to, the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value (Systems-Based Practice)

Objectives

By the end of their first year, emergency medicine residents will:

1. Demonstrate the ability to provide appropriate care to patients with nonemergent problems:
 - a. Obtain an accurate and complete clinical and psychosocial history and perform a comprehensive physical examination
 - b. Develop appropriate differential diagnoses
 - c. Know the available investigative and therapeutic options
 - d. After review, implement an appropriate investigative and therapeutic plan
 - e. Develop and, after review, implement an appropriate written and verbal discharge plan
 - f. Demonstrate an awareness of the available information systems to support patient care and discharge planning
 - g. Demonstrate competency (including an understanding of the indications, contraindications, and techniques) in the core procedures used on nonemergent patients (eg, laceration repair, reduction in or immobilization of extremity injury, pelvic examination, slit-lamp examination)
 - h. Demonstrate an understanding of the concepts of disease prevention as it applies to emergency medicine
 - i. Properly document all historical, physical examination, and diagnostic test findings

2. Demonstrate a level-appropriate knowledge of the biochemical, clinical, epidemiologic, and social-behavioural basis of diseases seen in the emergency department:
 - a. Demonstrate a basic understanding of the principles of evidence-based medicine
 - b. Demonstrate mastery of minor acute and nonemergent conditions
 - c. Demonstrate mastery of the principles of ACLS and ATLS
 - d. Demonstrate a level-appropriate understanding of the core curriculum

3. Demonstrate the ability to appraise and assimilate scientific evidence and analyze and improve their own practice:
 - a. Demonstrate the ability to critically assess their competency in managing minor acute and onemergent cases
 - b. Demonstrate the ability to apply published studies to their own practice
 - c. Demonstrate the ability to use available information technology appropriate to the care of their patients

4. Demonstrate effective interpersonal and communication skills with:
 - a. Patients and their families
 - b. Other physicians
 - c. Other health care providers

5. Demonstrate the professionalism required of a physician:
 - a. Accept responsibility for continuity of patient care
 - b. Demonstrate respect for patients' privacy and autonomy
 - c. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities
 - d. Demonstrate a commitment to sound ethical principles regarding the care of patients
 - e. Demonstrate respect for the dignity of patients and colleagues as persons

6. Demonstrate a basic understanding of the role of the emergency department in the larger context of health care delivery:
 - a. Demonstrate an understanding of the principles of a cost-benefit analysis
 - b. Know the relative costs of the various tests and treatment contemplated
 - c. Serve as an advocate for the patient in their dealing with the complexities of the health care system, specifically with regard to appropriate referral and follow-up

Course Description

The first year emergency medicine rotation is primarily geared toward learning the evaluation and management of minor acute and nonemergent conditions as well as assisting in the management of acute life-threatening conditions.

The resident will see all nonemergent patients in order of triage. After evaluating the patient, the resident will present the patient to the attending physician or senior emergency medicine resident on duty before initiating any diagnostic or therapeutic plans. Given that residents progress at different rates and faculty have different supervisory styles, it is understood that this description may be altered in

certain cases at the discretion of the attending physician. All procedures will be done under the direct or indirect supervision of the attending physician on duty.

The resident is responsible for properly documenting all historical, physical examination, and diagnostic test findings and for ensuring that the attending physician has the opportunity to review and discuss the documentation.

First year residents will assist in major trauma cases and cardiac arrests.

Residents on this rotation will:

- Perform the number of assigned work shifts each month as directed by the schedule distributed by the program coordinator
- Attend scheduled emergency medicine teaching conferences

Evaluation Process

The resident is formally evaluated by the attending faculty on a regular basis, with intervals determined by the program director. This evaluation is based on residents' proficiency in achieving the rotations' objectives as demonstrated by their ability and participation in the following resident functions:

1. Examine patients
2. Present patients to the attending on duty
3. Implement management plan
4. Demonstrate clinical experience gained on the rotation
5. Attend weekly emergency medicine conference
6. Perform noted procedures

Feedback Mechanisms

Each emergency medicine resident will perform the evaluation on completion of the rotation and comment specifically on didactic curriculum and training specific to the discipline. Feedback will occur at the prescheduled review, where the resident discusses the experience regarding procedures, teaching, supervision, and overall quality of the rotation. Feedback is also obtained via the mentor/advisee relationships. Immediate feedback is available if potential difficulties with the resident or the rotation are revealed. These will be investigated by the program director.

Resources and Facilities

Residents will have access to the electronic and other educational reference materials of the emergency department and of the residency program.

Postgraduate Year 2

Goals

The goals of this rotation can be described by the ACGME general competencies:

1. Learn to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health (Patient Care)
2. Learn about established and evolving biomedical, clinical, and cognitive (eg, epidemiologic and sociobehavioural) sciences and the application of this knowledge to patient care (Medical Knowledge)
3. Develop the ability to appraise and assimilate scientific evidence and investigate, evaluate, and improve their patient care practices (Practice-Based Learning and Improvement)
4. Develop interpersonal and communication skills that result in effective information exchange and teaming with patients, patients' families, and professional associates (Interpersonal and Communication Skills)
5. Develop a commitment to carry out professional responsibilities, adhere to ethical principles, and develop sensitivity to a diverse patient population (Professionalism)
6. Develop an awareness of, and responsiveness to, the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value (Systems-Based Practice)

Objectives

By the end of their second year, residents will, in addition to the objectives achieved during the first year:

1. Demonstrate the ability to provide appropriate care to patients with emergent and life-threatening conditions:
 - a. Obtain an appropriately focused history and perform an appropriately focused physical examination
 - b. Develop comprehensive differential diagnoses
 - c. Develop an investigative and therapeutic plan
 - d. Develop and, after review, implement an appropriate written and verbal discharge plan
 - e. Demonstrate competency (including an understanding of the indications, contraindications, and techniques) in the core procedures used on patients with emergent and life-threatening conditions (eg, endotracheal intubation, tube thoracostomy, defibrillation/cardioversion, etc.)
2. Demonstrate a level-appropriate knowledge of the biochemical, clinical, epidemiologic, and social-behavioural basis of diseases seen in the emergency department:
 - a. Apply the principles of evidence-based medicine
 - b. Demonstrate mastery of the emergent and life-threatening conditions that present to the emergency department
 - c. Demonstrate a level-appropriate understanding of the core curriculum@endNLA

3. Demonstrate the ability to appraise and assimilate scientific evidence and analyze and improve their own practice:
 - a. Demonstrate the ability to critically assess their competency in managing the emergent and life-threatening conditions that present to the emergency department
 - b. Use published studies to improve their own practice
 - c. Use available information technology appropriate to the care of their patients

4. Demonstrate a level-appropriate understanding of the role of the emergency department in the larger context of health care delivery:
 - a. Demonstrate the ability to divide his or her time and energies appropriately to provide optimal care for several patients concurrently
 - b. Develop plans for evaluation and treatment that, without compromising patient care, acknowledge the patient's particular health care system

Course Description

The number of months spent in the emergency department during the second year of the residency should be specified by the program director. The second year rotation is primarily geared toward learning the evaluation and management of emergent and life-threatening conditions. The resident will see all emergent patients in order of triage. Nonemergent patients will also be seen if no emergent patients are awaiting evaluation. After evaluating the patient, the resident may order radiographs and basic laboratory tests but must present the patient to the attending physician before ordering any more invasive or expensive tests or initiating major therapeutic interventions. The attending physician must be notified promptly of all unstable patients. Given that residents progress at different rates and faculty have different supervisory styles, it is understood that this description may be altered in certain cases at the discretion of the attending physician. All procedures will be done under the direct or indirect supervision of the attending physician on duty.

The resident is responsible for properly documenting all historical, physical examination, and diagnostic test findings and for ensuring that the attending physician has the opportunity to review and discuss the documentation.

Second year residents will assist in major trauma cases and cardiac arrests. They will run medical resuscitation cases in the absence of a higher level resident.

Second year residents will respond to emergency medical system (EMS) radio calls after having completed the required communications course.

Residents on this rotation will:

- Perform the number of assigned work shifts each month as directed by the schedule distributed by the program coordinator
- Attend emergency medicine teaching conferences

Evaluation Process

The resident is formally evaluated by the attending faculty on a regular basis. This evaluation is based on residents' proficiency in achieving the rotations' objectives as demonstrated by their ability and participation in the following resident functions:

1. Examine patients
2. Present patients to the attending physician on duty
3. Implement a management plan
4. Demonstrate clinical experience gained on the rotation
5. Attend weekly emergency medicine conferences
6. Perform noted procedures

Feedback Mechanisms

Each emergency medicine resident will perform the evaluation on completion of the rotation and comment specifically on didactic curriculum and training specific to the discipline. Feedback will occur at the prescheduled review, where the resident discusses the experience regarding procedures, teaching, supervision, and overall quality of the rotation. Feedback is also obtained via the mentor/advisee relationships. Immediate feedback is available if potential difficulties with the resident or the rotation are revealed. These will be investigated by the program director.

Resources and Facilities

Residents will have access to all of the electronic and other teaching materials of the emergency department and of the residency program.

Postgraduate Year 3

Goals

The goals of this rotation can be described by the ACGME general competencies:

1. Learn to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health (Patient Care)
2. Learn about established and evolving biomedical, clinical, and cognitive (eg, epidemiologic and sociobehavioural) sciences and the application of this knowledge to patient care (Medical Knowledge)
3. Develop the ability to appraise and assimilate scientific evidence and investigate, evaluate, and improve their patient care practices (Practice-Based Learning and Improvement)
4. Develop interpersonal and communication skills that result in effective information exchange and teaming with patients, patients' families, and professional associates (Interpersonal and Communication Skills)
5. Develop a commitment to carry out professional responsibilities, adhere to ethical principles, and develop sensitivity to a diverse patient population (Professionalism)
6. Develop an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value (Systems-Based Practice)

Objectives

By the end of their third year, residents will, in addition to the objectives achieved during the first 2 years:

1. Demonstrate the ability to provide appropriate care to patients
 - a. Listen to a history and physical examination presentation from a junior resident and provide appropriate feedback and guidance
 - b. Perform an appropriately focused history and physical examination, taking into consideration the previous evaluation of the junior resident
 - c. Implement an appropriate investigative and therapeutic plan
 - d. Implement an appropriate written and verbal discharge plan
 - e. Demonstrate understanding of the indications, contraindications, and techniques in uncommonly performed but lifesaving procedures (eg, cricothyroidotomy, burr craniotomy) and mastery of all other core procedures
 - f. Demonstrate an understanding of documentation as it applies to billing and reimbursement requirements
2. Demonstrate a level-appropriate knowledge of the biochemical, clinical, epidemiologic, and social-behavioural basis of diseases seen in the emergency department:
 - a. Demonstrate mastery of all conditions that commonly present to the emergency department
 - b. Teach courses such as ACLS as a certified instructor
 - c. Demonstrate an understanding of the core curriculum
3. Facilitate the learning of others
 - a. Teach and appropriately supervise medical students and junior residents

4. Demonstrate an understanding of the role of the emergency department in the larger context of health care delivery
 - a. Triage patients and direct the attention of junior-level residents so as to provide optimal care for all patients in the emergency department. Plan and participate in a mass-casualty disaster drill

Course Description

The third year rotation is primarily geared toward honing the clinical skills developed during the first 2 years and developing supervisory and administrative abilities. The resident will see emergent patients in order of triage. Nonemergent patients will also be seen if no emergent patients are awaiting evaluation. After evaluating the patient, the resident may initiate a diagnostic and therapeutic plan but should inform the attending physician promptly of all unstable patients. All patients must be presented to the attending physician prior to final disposition. Given that residents progress at different rates and faculty have different supervisory styles, it is understood that this description may be altered in certain cases at the discretion of the attending physician. All procedures will be done under the direct or indirect supervision of the attending physician on duty.

The resident is responsible for properly documenting all historical, physical examination, and diagnostic test findings and for ensuring that the attending physician has the opportunity to review and discuss the documentation.

Third year residents will run major trauma resuscitations and medical cardiac arrest cases.

Third year residents will respond to EMS radio calls.

Residents on this rotation will:

- Perform the number of assigned work shifts each month as directed by the schedule distributed by the program coordinator
- Attend emergency medicine conferences
- Provide didactic instruction for the medical students and junior residents as directed by the program director

Evaluation Process

The resident is formally evaluated by the attending faculty on a regular basis. This evaluation is based on the resident's proficiency in achieving the rotations' objectives as demonstrated by his or her ability and participation in the following resident functions:

1. Examine patients
2. Present patients to the attending physician on duty
3. Implement a management plan
4. Demonstrate clinical experience gained on the rotation
5. Attend weekly emergency medicine conference
6. Perform noted procedures
7. Supervise junior residents and medical students
8. Manage multiple patients simultaneously
9. Maintain efficient flow of patients in the emergency department
10. Demonstrate didactic teaching skills

11. Demonstrate the ability to lead teams of health care workers
12. Demonstrate the ability to manage unstable and complex emergency cases

Feedback Mechanisms

Each emergency medicine resident will perform the evaluation on completion of the rotation and comment specifically on didactic curriculum and training specific to the discipline. Feedback will occur at the prescheduled review, where the resident discusses the experience regarding procedures, teaching, supervision, and overall quality of the rotation. Feedback is also obtained via the mentor/advisee relationships. Immediate feedback is available if potential difficulties with the resident or the rotation are revealed. These will be investigated by the program director.

Resources and Facilities

Residents will have access to all the electronic and other teaching resources of the emergency department and of the residency program.