EuSEM core curriculum for emergency medicine

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Preamble to the EuSEM core curriculum for emergency medicine

> 'The specialty of emergency medicine meets the scientific, clinical and organisational need for a medical discipline that has a primary concern with emergencies. It requires a physical and/or conceptual presence in the pre-hospital, in-hospital and inter-hospital care of emergency patients.
>
> 'The province of emergency medicine is early diagnosis and treatment of all life, organ or limb-threatening conditions. Timely and well-coordinated care limits both immediate and late mortality and reduces the duration and severity of morbidity from sudden illness and injury. The relief of suffering is also of paramount importance.
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> 'The emergency health care system must be clinically, organisationally and financially independent. Certain features such as triage, resuscitation and facilities for short-term observation and therapy should be incorporated into the system. The amount and type of emergency work is difficult to predict with certainty and so staffing and resources must be adequate for all likely situations. Training must be extensive so as to prepare specialists for the management of a wide range of conditions.
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> 'Good practice in emergency medicine will maximise the likelihood of a favourable outcome for the patient. Therapy should be consistent with current knowledge and care must be provided in a humane and respectful manner with psychosocial support available as required. There is no defined time limit to the duration of emergency care.
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> 'Emergency medicine encourages collaboration between all members of the health care team. An efficient chain of care requires liaison with pre-hospital care providers, hospital specialists and other staff and also with community medical and nursing staff and social workers. Team work is essential and must involve close cooperation and integrated facilities for protocol development and implementation, teaching and research.'

Manifesto for Emergency Medicine in Europe, Council of the European Society for Emergency Medicine *European Journal of Emergency Medicine* (1998) **5** (4), 389-390

Emergency medicine, as a specialty, is thus a discipline that covers emergency and urgent aspects of virtually all facets of medicine, in contrast to most other specialties that are considerably circumscribed by age, sex, organ system, or other factors.

The variety of clinical material presenting to the emergency department demands the attention of a medical practitioner with significant breadth and depth of experience and knowledge, ensuring a detailed understanding of the patient's requirements.

The specialist in emergency medicine must have sufficient knowledge and skills to be capable of dealing with the following areas of patient care:

- Reception of undifferentiated emergency presentations;
- Triage;
- Initial assessment and resuscitation of undifferentiated emergency presentations;
- Detailed assessment and investigation;
- Transitional evaluation and monitoring;
- Disposition after the completion of medical care, or transfer of care to another discipline for definitive management.

Measuring the effectiveness of teaching emergency medicine

The major aim of this document is the auspice that the introduction of an education programme across Europe will lead to improvements in the management of emergency patients. It is to be expected that this will lead, in truth, to improved outcomes, both in terms of survival and the quality of the survival.

We should try to measure the effectiveness of the education strategy, even if the outcome after critical illness or injury can be influenced by many factors in addition to medical care.

It will never be easy to draw comparisons between the quality of healthcare and global statistics that measure the health of the community.

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There is a way to overcome this difficulty. There is increasing demand for research-based evidence to support management decisions. When there is good evidence that a particular treatment regimen is associated with improved outcome, then it is possible to measure the effectiveness of treatment not in terms of outcome but in terms of the frequency of its application. In other words, we can rely simply on the process of care.

Examples are the measurement of the speed and frequency of thrombolysis for myocardial infarction and the frequency of rapid computed tomography scan for serious brain injury. There are limitations to this methodology and potential drawbacks, but the concepts should be encouraged. Certainly, we must attempt to measure the effectiveness of teaching, not just in terms of the exam successes of the students, but also in the wider context of the health services in which they work.

Duration of training

In order to practise as a specialist in emergency medicine, the medical practitioner must be specifically trained for the specialty. Currently, in Europe, this is governed by EU Directive 93/16 EEC (soon to be superseded by Directive 2001/19/EC) and is set at 5 years. The specialty is currently recognized in Ireland and in the United Kingdom (in which latter country it is titled 'accident and emergency medicine').

Within the 5 years specialist training, it is our view that a minimum of 3 years be spent purely in emergency department-based emergency medicine training, with varying exposure to other specialties, depending on the needs for training and the scope of practice expected in that country.

Educational approval of training centres

Each country will have a National Training Authority to visit and accredit centres to national criteria, which will be based on, and referenced to, European criteria. There should be a programme of periodic re-visitation and re-accreditation by representatives of the National Training Authority.

Training programmes

Training programmes in emergency medicine are designed to train physicians for the practice of emergency medicine. Training programmes must teach the fundamental skills, knowledge, and humanistic qualities that constitute the foundations of emergency medicine practice and provide progressive responsibility for, and experience in, the application of these principles, to enable the effective management of clinical problems.

Opportunity must be provided for the trainees, under the guidance and supervision of a qualified faculty, to develop a satisfactory level of clinical maturity, judgement, and technical skill. This is likely to take some years of guided and reflective training opportunities.

Trainers

These will be practitioners in emergency medicine and, where appropriate, other specialties recognized by the National Training Authority. Locally or regionally, they will come under the direction of a Programme Director, also approved by the National Training Authority.

The Programme Director, or principal tutor, must ensure that the degree of professional responsibility accorded to a trainee is progressively increased through the course of training, commensurate with skill and experience. Opportunities to develop clinical and administrative judgement in the areas of patient care, teaching, administration, and leadership should be included.

The style of learning

This document is mainly concerned with what to learn, what makes an emergency physician. It is important also to consider briefly how this knowledge is acquired.

Trainers in emergency medicine have to balance the need for trainees to be able to provide prompt disciplined actions in life-threatening situations with the need for them to have a more reflective and 'problem-based' approach to the clinic. Hence the syllabus contained in this document should be considered by its potential users, the trainers, not merely as a list of what to teach but also as a stimulus to consider how to teach. There is increasing evidence that we acquire and retain useful information more effectively if we look at problems in small groups, on a very practical and interactive basis, exchanging possible solutions with each other, and work out the answers for ourselves. We do not retain information very well if we are taught the answers in large lecture halls.

Assessment

During the training period, the progress of the trainee will be continually evaluated by the trainers and, at least on an annual basis, be formally assessed by the Programme Director. Issues such as knowledge, clinical and managerial skills and attitudinal issues such as interaction with patients, colleagues and others will be covered.

On completion of the programme, trainees should be capable of practising emergency medicine, able to incorporate new skills and knowledge during their careers, and able to monitor their own physical and mental wellbeing and that of others.

Final assessment

In addition to continuous formative assessment, it is recognized that a formal final evaluation be performed on

various aspects of knowledge, skills and attitudes. The format of such a final assessment is yet to be determined, but will be based on the core curriculum and core competencies.

Core competencies

Training programmes in emergency medicine should produce emergency physicians prepared with the following basic competencies:

1. Provide for the recognition, resuscitation, stabilization, evaluation, and care of the full range of patients who present to the emergency department;
2. Apply critical thinking to determine the priorities for evaluation and treatment of multiple emergency department patients with different complaints and needs;
3. Evaluate oxygen supply, oxygen need, oxygen deficit and oxygen debt;
4. Arrange appropriate follow-up or referral as required;
5. Manage the out-of-hospital care of the acutely ill or injured patient;
6. Participate in the administration of the emergency medical services system providing out-of-hospital care;
7. Provide appropriate patient education directed towards the prevention of illness and injury;
8. Engage in the administration of emergency medicine;
9. Engage in the teaching of emergency medicine;
10. Understand and evaluate research methodologies and their application;
11. Understand and apply the principles and practice of continuous quality improvement;
12. Manage resource utilization effectively;
13. Utilize information resources effectively and apply evidence-based medicine to update their clinical practice;
14. Communicate effectively with patients, families and healthcare professionals;
15. Utilize resources to address domestic violence and other public health issues, including violence prevention;
16. Demonstrate the fundamental qualities of professionalism;
17. Demonstrate how optimal patient care is provided in the context of a larger healthcare delivery system by effectively using system resources to support the care of patients.

European curriculum in emergency medicine

This body of knowledge should, where possible, be evidence-based and will include the following areas:

Overview of emergency medicine

The orientation of training in emergency medicine shall encompass the following:

1. Principles of emergency care
   (a) Organizational issues and quality standards
   (b) Manpower and skill mix
   (c) Resuscitation, recognition of threats to life and limb
   (d) Triage of the emergency department patient
   (e) Understanding of 'timeliness' and documentation
   (f) Interface with primary/community care
   (g) Therapeutics and pain control
   (h) Patient dignity and privacy
   (i) Ethical issues and confidentiality
2. Emergency medical services
   (a) Pre-hospital care and the ambulance service
   (b) Paramedic training and function
   (c) Major incident planning/procedures/practice
3. Epidemiology of accidents and emergencies
4. Accident prevention and health promotion
5. Legislation
   As appropriate to the legal and social setting of the country of practice

Problem-oriented core curriculum

1. Cardiac arrest
   (a) Cardiopulmonary resuscitation
      (i) Chain of survival
      (ii) Cardiopulmonary resuscitation
      (iii) Choking victim
   (b) Cardiac life support to advanced level
      (i) Universal algorithm
      (ii) Ventricular fibrillation/ventricular tachycardia treatment
      (iii) Pulseless electrical activity/asystole treatment
      (iv) Peri-arrest arrhythmias
      (v) Drugs and pacing
      (vi) Resuscitation team
2. Airways management and anaesthesia
   (a) Principle of airway management
      (i) Rapid sequence intubation
      (ii) The difficult airway
   (b) Pain management
   (c) Conscious sedation
3. Headache
   (a) Primary headaches
      (i) Hemicranias
   (b) Secondary headaches
      (i) Cerebrovascular diseases
      (ii) Meningitis
      (iii) Encephalitis
4. Chest pain
   (a) Acute coronary syndromes
   (b) Pulmonary embolism
   (c) Aortic dissection
5. Dyspnoea and respiratory failure
   (a) Heart failure and pulmonary oedema
   (b) Hypoxemic respiratory failure
   (c) Hypercapnoeic respiratory failure
   (d) Asthma attack
   (e) Pneumothorax
   (f) Foreign body
   (g) Chest infections
6. Syncope
   (a) Brady-arrhythmias
      (i) Cardiac pacing
   (b) Other causes of syncope
7. Palpitations
   (a) Tachy-arrhythmias
      (i) Electric cardioversion
      (ii) Anti-arrhythmic drugs
8. Shock
   (a) The cardiovascular triad
   (b) Haemorrhagic shock
      (i) Gastrointestinal bleeding
   (c) Cardiogenic shock
   (d) Septic shock
   (e) Anaphylactic shock
   (f) Adrenal failure
   (g) Blood/blood products
   (h) Cardiovascular drugs
      (i) Fluids
      (ii) Vasopressors
9. Abdominal pain
   (a) Acute abdomen
   (b) Aortic aneurysm
   (c) Intestinal ischaemia
   (d) Cholangitis, cholecystitis
   (e) Acute pancreatitis
10. Vomiting and diarrhoea
   (a) Intestinal occlusion
   (b) Pseudo-obstruction
   (c) Colitis and enteritis
   (d) Dehydration
11. Pelvic and back pain
   (a) Urinary tract infections
   (b) Nephrolithiasis
   (c) Acute renal failure
   (d) Pelvic inflammatory disease
   (e) Sexual assault
   (f) Ectopic pregnancy

(g) Epididymitis
(h) Testicular torsion
(i) Obstetric emergencies
(i) Emergency delivery
(ii) Bleeding in pregnancy

12. Leg pain
(a) Deep venous thrombosis
(b) Peripheral arterial diseases
(c) Thrombophlebitis
(d) Osteomyelitis
(e) Arthritis

13. Fever and infections
(a) Fever of unknown origin
(b) Systemic inflammatory response syndrome/sepsis
(c) Tuberculosis
(d) Malaria
(e) HIV
(f) Hepatitis

14. Seizures
(a) Epileptic seizures
(b) Other causes of seizures

15. Vertigo and dizziness
(a) Peripheral vertigo
(i) Labyrinthitis
(ii) Cupulolithiasis
(iii) Meniere disease
(b) Central vertigo
(c) Causes of dizziness

16. Coma and neurological impairment
(a) Metabolic coma
(i) Hypoglycaemia
(ii) Ketoacidosis
(iii) Hyperosmolar coma
(iv) Hepatic encephalopathy
(b) Neurological coma

17. Other metabolic and endocrine disorders
(a) Electrolyte abnormalities
(i) Hyper/hyponatremia
(ii) Hyper/hypokalemia
(iii) Hyper/hypocalcemia
(b) Acid-base abnormalities
(c) Acute thyroid crisis

18. Haemorrhagic diathesis
(a) Disseminated intravascular coagulation
(b) Thrombotic thrombocytopenic purpura
(c) Heparin-induced thrombocytopenia
(d) Myeloproliferative diseases

19. Eye emergencies
(a) Non-traumatic
(i) Conjunctivitis
(ii) Uveitis
(iii) Retinal artery occlusion
(iv) Retinal vein occlusion
(v) Acute glaucoma
(vi) Retinopathy
(b) Traumatic
(i) Chemical burns
(ii) Retinal traumatic injuries
(iii) Hyphema
(iv) Foreign body/corneal abrasion

20. Intoxications
(a) Initial management of poisoning
(i) Decontamination
(ii) Elimination
(b) Recognition of clinical syndromes
(c) Antidotes

21. Trauma
(a) Trauma resuscitation
(i) Primary survey
(ii) Secondary survey
(iii) FAST
(iv) Definitive care
(v) Transfer arrangements
(b) Head and spinal cord trauma
(c) Chest trauma
(i) Blunt/penetrating
(ii) Tension pneumothorax
(iii) Cardiac tamponade
(iv) Massive haemothorax
(v) Open chest wound
(vi) Aortic dissection
(vii) Blast injury
(viii) Flail chest/lung contusion
(d) Abdominal trauma
(e) Pelvic/genitourinary trauma
(i) Pelvic fractures
(ii) Bladder rupture
(f) Extremity trauma
(i) Skeletal trauma
(ii) Vascular trauma
(iii) Soft tissue trauma
(iv) Accurate diagnosis of bony, tendon and nerve injuries
(g) Trauma in pregnancy

22. Environmental
(a) Burns
(b) Heat illness
(c) Hypothermia and frost bites
(d) Near drowning
(e) Lightning and electrocution

23. Paediatrics
(a) Paediatric resuscitation (basic and advanced)
(b) Paediatric trauma
(c) Croup and pseudo-croup
(d) Asthma
(e) Fever
(f) Dehydration/gastrointestinal disorders
(g) Meningitis
(h) Seizures
(i) Child abuse
(j) Pain management

24. Dermatological emergencies
    (a) Erythroderma
    (b) Lyell syndrome
    (c) Stevens–Johnson syndrome
    (d) Pemphigus/pemphigoid
    (e) Erysipelas
    (f) Necrotizing fasciitis
    (g) Herpes zoster
    (h) Scabies
25. Musculoskeletal disease
    (a) Orthopaedic and neurovascular examination
    (b) Strains/sprains/fractures
    (c) Dislocations
    (d) Nerve entrapment syndromes
26. Behaviour
    (a) Mental state examination
    (b) Organic illness manifest as behavioural disorders
    (c) Acute psychosis
    (d) Suicidal and homicidal evaluation
    (e) Alcohol abuse
    (f) Drug abuse
    (g) Aggression
27. Social and geriatrics
    (a) Overall care of the patient
    (b) Psychosocial assessment
    (c) Homelessness
    (d) Frequent attenders
    (e) Multisystem pathology
28. Pre-hospital
29. Disaster medicine

Clinical skills

The candidate should become familiar with, or expert in, each skill. The skills should be learned either during the emergency department frequency or during specific rotations.

1. Airway management and C-spine control
    (a) Basic airway management
    (b) Advanced airway management
        (i) Tracheal intubation
        (ii) Alternative procedures
    (c) Surgical airway
        (i) Cricothyrostomy
2. Electric therapy
    (a) Cardioversion/defibrillation
    (b) Cardiac pacing
3. Major trauma management and trauma team organization
4. Pulmonary procedures
    (a) Invasion ventilation principles
    (b) Non-invasive ventilation
    (c) Thoracentesis
    (d) Needle/tube thoracostomy
5. Circulation procedures
    (a) Central venous access
        (i) Subclavian vein
        (ii) Jugular vein
        (iii) Femoral vein
    (b) Arterial access
        (i) Radial artery
        (ii) Femoral artery
    (c) Pericardiocentesis
    (d) Intraosseous access
    (e) Monitoring
        (i) Electrocardiogram, NIBP, arterial oxygen satu- AQ5
        ration
        (ii) Mixed venous oxygen saturation
        (iii) CPV AQ6
6. Diagnostic skills
    (a) Interpretation of radiograph
        (i) Chest X-ray
        (ii) Plain abdominal X-ray
        (iii) Skeletal X-rays
        (iv) Computed tomography scans
        (v) Magnetic resonance imaging
    (b) Emergency ultrasound
        (i) FAST AQ4
        (ii) Emergency echocardiography
        (iii) Emergency abdominal ultrasound
        (iv) Vein compression ultrasound
7. Decontamination procedures
    (a) Gastric lavage
    (b) Skin decontamination
8. Paracentesis
9. Slit lamp
10. Wound management
    (a) Wound preparation
    (b) Wound closure techniques
    (c) Dressing techniques
    (d) Joint aspiration, soft tissue injection
    (e) Anaesthetic techniques
11. Orthopaedic emergency procedures
    (a) Splinting/immobilization
        (i) Spinal immobilization
        (ii) Limb splinting
        (iii) Logrolling
    (b) Reduction of dislocations
12. Local and regional anaesthesia
13. Emergency delivery
14. Ear, nose and throat procedures
    (a) Indirect laryngoscopy
    (b) Nasal packing
15. Transportation of patients
16. Communication skills
    (a) Patients and relatives
    (b) Colleagues and other personnel
    (c) Bereavement
17. Attitudes

(a) Leadership
(b) Reliability
(c) Teamwork
(d) Self-motivation
(e) To children. The capacity to establish and maintain a responsible and trusting relationship with the young patient and the family
(f) Health promotion

Other skills

The candidate should get experience with research, reading and writing, and with lecturing and teaching to other students and presenting at Scientific Meetings.

Moreover, he/she should acquire a basis on managerial skills.

1. Research skills
   (a) Literature survey
   (b) Scientific study design
   (c) Data evaluation/ Statistics
   (e) Preparing publications
2. Teaching Skills
   (a) Lecture preparation
   (b) Small Group techniques
   (c) Presentation techniques
   (d) Teaching critique
   (e) Departmental teaching programme
   (f) Professional Development (self-directed learning)
3. Managerial Skills
   (a) Department policies/procedures
   (b) Staff management (manpower/personnel procedures)
   (c) Equipment (from choosing to ordering)
   (d) Resource management/clinical budgeting
   (e) Contracting/standards setting
   (f) Information technology
   (g) Clinical Audit/quality monitoring
   (h) Compliments/complaints
   (i) Medico legal statements
   (j) Committee Work
   (k) Liasing with other agencies
   (l) Public Relations/media
   (m) Major Incident planning/exercises