Training Guidelines in Anaesthesia of the European Board of Anaesthesiology Reanimation and Intensive Care

The following Guidelines for specialist training in Anaesthesiology are intended to help in the process of harmonizing specialist education in Europe. Thus, they reflect common minimum criteria for training, and these Guidelines should be reviewed regularly.

It is recognized that individual EU member countries are responsible for specialist training. However, within the EU mutual recognition of fully trained specialists is obligatory, and for this reason a long-term educational harmonization process is presently taking place.

The year 2001 Guidelines describe the basic knowledge, skills and attitudes a modern practising specialist in Anaesthesiology must possess. They do not deal with advanced training in subspecialties following recognition of specialist competence – special guidelines are in preparation for some of these.

The Guidelines deal with objectives of training, aims of the teaching programme, basic science content of the training programme, core syllabus in anaesthesia, core syllabus in intensive care medicine, core syllabus in pain management and therapy, core syllabus in resuscitation and emergency medicine, quality control of training through a hospital visitation programme, a common minimum duration of training, and the use of logbooks. In addition, the Board recommends the use of simulators in training where available.

Contents

Objectives 563
Requirements of the teaching program 564
Aims 564
Basic science content 564
Core syllabus for anaesthesia 565
Core syllabus for intensive care medicine 566
Core syllabus for pain management 566
Core syllabus for prehospital and emergency medicine 567
Ensuring the quality of training 568
Hospital visitation programme 568
Use of simulators in training 568
Duration of training 569
Assessment of training 569
EBA logbook of training in anaesthesiology 569
Logbook in anaesthesia 569
Logbook in intensive care medicine 570
Logbook in pain management 570
Logbook in prehospital and emergency medicine 570

Objectives

• To allow a specialist to demonstrate appropriate behaviour in all relevant professional situations through the acquisition of adequate knowledge, skills, and attitudes.
• To set a minimum standard for training and assessment in anaesthesia which could be uniformly accepted in Europe.
• To set a standard for basic training in intensive care medicine; to provide a basis for later learning in managing intensive care medicine.
• To set a standard for basic training in pain management which is appropriate for the management of acute pain in the surgical setting and following trauma. To provide a basis for later learning in managing chronic pain.
• To set a standard for basic training in prehospital care and emergency medicine; to provide a basis for later learning in managing prehospital care and emergency medicine.
Requirements of the teaching programme

Aims

• Preparation of patients for surgery with special reference to counselling and premedication;
• Management of the unconscious patient including support of all vital functions;
• Management of the immediate postoperative period;
• Methods for ablating pain during and after surgery, labour and delivery;
• Modifying or preventing the stress of anaesthesia and surgery;
• Diagnosis and management of common medical conditions which may present coincidentally in patients in any of the categories listed above;
• Knowledge of the process and complications of common conditions in surgery and obstetrics managed by operative procedures;
• Diagnosis, sequelae or natural history of common complications occurring during anaesthesia or analgesia for surgical and other procedures and in the postoperative period;
• Cardiac and respiratory resuscitation;
• Recognition and management of respiratory failure;
• Recognition and management of circulatory failure;
• Recognition of and first-line management of organ failure including the stabilization of organ donors;
• Recognition and management of various fluid, electrolyte and metabolic disturbances;
• Knowledge, use and relevance of electronic and other monitoring devices;
• Ability to communicate satisfactorily with patients and relatives and with professionals in medicine, surgery, nursing, etc.
• Understanding the role of Guidelines, evidence based medicine, and other quality issues, and the appropriateness of audit;
• Understanding the role of departmental and general health care management;
• Development of teaching skills by participation in teaching and training of more junior trainees.

Basic science content

Relevant basic scientific background in:

Physiology

Cardiovascular
Respiratory
Metabolism
Acid-base
Fluid exchange and loss
Blood and tissue electrolytes
Kidney
Liver
Central nervous system
Neuromuscular junction
Muscle
Autonomic nervous system
Pain and nociception
Temperature control
Endocrine
Coagulation
Gastrointestinal function
Pregnancy, neonate and child
Old age

Pharmacology

Basic pharmacokinetics
Principles of pharmacodynamics
Transplacental passage of drugs
Drugs used in premedication
General anaesthetics and theories of anaesthesia
Local anaesthetics/analgesics
Neuromuscular blocking drugs and their antagonists
Antimuscarinics
Opioids and antagonists
Other analgesics
Hypnotics and anxiolytics, and antagonists
CNS stimulants
Control of nausea and vomiting
Antacids
Cardiovascular drugs
Inotropes
Diuretics
Antiarrhythmics
Adrenergics and antiadrenergics
Anti-hypertensives
Nitrites and calcium channel blocking drugs
Nitric oxide
Sympathomimetics
Compounds affecting coagulation and haemostasis

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Vitamin K antagonists
Antiplatelet drugs
Fibrinolytics/antifibrinolytics
Respiratory agents
Bronchodilators
Respiratory stimulants
Oxygen
Carbon dioxide
Drugs used for diabetes
Thyroid and antithyroid drugs
Corticosteroids
Antibiotics
Blood, blood components and blood substitutes

Common drug interactions
Mechanism and management of anaphylaxis

Core syllabus for anaesthesia
Preoperative assessment and preparation
Preoperative assessment
Disease and drug therapy
Assessment of risk
Preparation of patients
Preoperative information of patients
Preoperative medication

General anaesthesia: methods and techniques
Components of general anaesthesia
Narcosis
Neuromuscular blockade and muscle relaxation
Analgesia
Inhalational anaesthesia
Intravenous anaesthesia
Major complications: prevention and treatment
(malignant hyperthermia, difficult airways…)

Local and regional anaesthesia
Epidural anaesthesia
Spinal anaesthesia
Local intravenous anaesthesia
Nerve blocks and plexus blocks
Major complications: prevention and treatment

Anaesthesia for special situations
Day stay surgery
Urology
Gynaecology
Obstetric anaesthesia and analgesia
Immediate care of the newborn
Paediatric surgery
Ear, nose and throat surgery
Ophthalmic surgery
Endocrine surgery
Neurosurgery
Thoracic surgery
Cardiac surgery
Vascular surgery
Transplantation
Orthopaedic surgery
Anaesthesia for nonsurgical procedures
Positioning of the patient
Postoperative care

Postoperative recovery
Later postoperative management including transfusion and fluid therapy
Postoperative pain
Control of nausea and vomiting
Communication with patients, relatives, nurses, and other health care personnel

Technical equipment and monitoring

Equipment
- Central gas supplies
- Anaesthetic machines and systems
- Ventilators
- Ventilation systems
- Scavenger systems
- Equipment for haemodilution and blood sparing techniques
- Pacemakers
- Defibrillators

Monitoring
- Measuring pressure, flow and volume of gases with respect to anaesthetic apparatus
- Analysis and monitoring of breathing including capnography
- Gas and vapour concentrations
- Pulse oximetry
- Electrocardiogram
- Arterial pressure and haemodynamics
- Cardiac function
- Neuromuscular transmission
- Temperature
- Level of sedation
- Electrical safety

Core syllabus for intensive care medicine

Diagnostic and therapeutic problems of the cardiovascular system
- Monitoring of the cardiovascular system
- Diagnostic investigations
- Myocardial infarction
- Cardiac failure
- Cardiogenic shock and other types of shock
- Management of haemorrhage
- Haemostasis, thrombosis

Head injury and other CNS affections
- Head injury
- Multitrauma
- Sepsis
- Fluid, electrolyte, nutrition, and acid-base disorders
- Care of the unconscious patient regardless of aetiology
- Sedation

Care of the patient with multiple organ system failure, injury or disease
- Care of the patient requiring life support techniques
- Renal failure
- Hepatic failure
- Understanding and treatment of underlying disease
- Care of the organ donor
- Principles of hyperbaric oxygen therapy

Communication skills
- Communication with patients and relatives
- Communication with other health care personnel
- Management of organ transplant coordination

Pharmacology
- Opioids
- Non-steroidal anti-inflammatory drugs
- Other systemic analgesics including adjuvants
- Neurolytics
- Local anaesthetic agents
Anatomy and physiology of pain
Peripheral mechanisms of pain
Central mechanisms for pain transmission
Pain modulation
Factors which perpetuate pain
Psychological aspects of pain

General principles of pain evaluation and management
Pain assessment
• History taking and physical examination in patients suffering from postoperative, cancer, and neuropathic pain;
• Pain measurement in man, basic concepts and bias, scoring systems (VAS, VRS, NRS, etc.);
• Psychological aspects of pain (individual differences, sociocultural influence, situational and environmental factors, the family and pain).

Techniques
Transcutaneous nerve stimulation
Perispinal opioid administration systems
Frequently used analgesic nerve blocks (diagnostic purposes and pain control)

Surgical and nonsurgical methods
Neurosurgical pain relieving procedures (basic knowledge, indications, contraindications, and complications)
Psychological, psychiatric, and behavioural interventions
Multidisciplinary pain management

Acute pain
Postoperative pain (mechanisms, physiological effects, treatment modalities, acute pain service)
Pain following trauma
Acute pain in children

Chronic pain
Diagnostic characteristics and treatment modalities of:

• Headaches (migraine, tension headache, headache of cervical origin, cluster headache, atypical facial pain, trigeminal neuralgia);
• Low back pain (anterior and posterior compartment syndrome, radicular and pseudoradicular syndrome);
• Neuropathic pain and pain syndromes (deafferentiation pain, phantom pain, sympathetic reflex dystrophy, causalgia, neuromata, postherpetic neuralgia, central thalamic pain);
• Cancer pain
  (a) pharmacological treatment with opioids, NSAIDs, acetaminophen, antidepressant drugs, anticonvulsive drugs and other mixed agents (coanalgesics);
  (b) indications and treatment possibilities using perisplanial opioid administration systems;
  (c) transcutaneous nerve stimulation: indications and procedures;
  (d) indications and treatment modalities using specific radiofrequency and neurolytic blockade techniques.

Case management and communication skills
Show a relevant attitude towards patients suffering from chronic pain
• establish an acceptable contact with the patient and his/her family;
• set up and maintain an acceptable contact with nurses, social workers, medical psychologists, psychiatrists, other consulting specialists, and the general practitioner;
• show abilities of self confidence, knowledge of his/her own functioning, and self criticism;
• make adequate patient records.

Core syllabus for prehospital and emergency medicine
General principles of emergency medicine
Principles of triage
Airway management
Prehospital care

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Cardiopulmonary resuscitation including advanced life support

Transport of gravely ill patients

Injured patients
Multiple injuries
Management of shock
Head injury
Injuries to the neck and face
Chest injury
Burns
Spinal injury

Intoxications and poisoning

Communication skills
Communication with multidisciplinary resuscitation team
Communication with patients and relatives

Ensuring the quality of training

The organization of training depends upon various bodies, and the balance of responsibility is different in each EU member country (government, medical councils, professional unions, national boards, colleges of specialists, etc.).

Methods of assessment are also very different: formative vs. summative assessment, thesis essay, MCQ, viva voce, clinical examination.

It is accepted that qualification as a specialist will remain, for the immediate future, under the responsibility of each member country.

The European Board of Anaesthesiology wishes to harmonize the quality of training through recommendations and proposals for standards of training and training assessment based on:

- A European hospital visitation programme;
- The use of logbooks of training;
- Uniform minimum duration of training;
- The creation of a Recognition of Quality (RQ). The RQ is not mandatory for practice in Europe but will constitute a European label of quality. Other systems may be useful as an index of quality (ISO 9002 as an example).

Hospital visitation programme

In accordance with its remit to set standards for specialist training in Europe, the European Board of Anaesthesiology has implemented a programme of hospital visits as part of a process to develop assessment of training. The aims of this programme are to assess the training facilities of hospitals or groups of hospitals and where appropriate to recognize these as having achieved an acceptable standard.

The visitation programme is performed together with the European Academy of Anaesthesiology. Both bodies recognize that several European countries have their own visiting programme and wish to develop these rather than offering an alternative.

The main purpose of the visiting programme is to assess the scope of clinical training methods available, the nature of practical and didactic teaching, opportunities for private study and opportunities for access to research experience. Consideration is also given to the stated objectives of the training programme and methods of formative (in-training) and summative (end-of-training) assessment.

Three visitors take part, one from the Board, one from the Academy, and one from the host country. A confidential report on the visit is made and given to the training institution and to the two bodies. A successful outcome will result in a certificate issued by the two bodies. This certificate is valid for a period of five years. Recertification may take place without a new visit pending a written description of the changes that have taken place since the last visit. Special weight is laid on follow-up on the recommendations made at the last visit.

It is practically impossible to visit all teaching institutions in each member country. Instead, it is the aim to visit at least one institution in each member country and let the visited institutions disseminate information obtained through the visit to other teaching institutions in the country. These visits will then form the basis of monitoring the teaching standards and the training harmonization process throughout the EU.

Use of simulators in training

The Board supports the use of simulators in training where available. Simulation is a very efficient
way of learning by committed errors (which all anaesthetists incidentally make while practising their specialty) without harming the patients. Also, it is possible to expose the trainee to rare conditions which he/she will normally not meet during training.

The full-scale anaesthesia simulator has been found especially useful for training in human resource management and communication, topics which may be difficult to teach and demonstrate otherwise.

Multidisciplinary simulator training for whole treatment teams including surgeons and nurses also seems to be useful and is therefore recommended.

Full-scale simulator training is generally expensive because of the manpower required to run the simulator. Therefore it is recommended that simulator training is reserved for purposes not easily taught otherwise.

For each simulator setting specific training objectives should be defined, and debriefing should take place in a structured way securing discretion of individual trainees.

**Duration of training**

The duration of training for specialist recognition should be at least 5 years, of which a minimum of 6 months should be spent in intensive care medicine, 3 months in emergency medicine, and 3 months in pain therapy.

The 6 months in intensive care medicine should be of full-time work in an intensive care unit. The 3 months in pain therapy may be organized in various ways depending on the structure of the teaching institution. The trainee may be part of an acute pain team or work in a pain clinic. The 3 months in emergency medicine may likewise be organized in various ways. If no emergency department exists in which the trainee can work, the trainee may be dedicated to this type of work during training in such a way that he/she be called for life-threatening medical and trauma emergencies.

The trainee should work under supervision of a specialist teacher.

A certificate that training has been completed successfully and that the trainee has reached specialist competence is issued by the relevant authority.

**Assessment of training**

Where there is national diploma examination, which is of an acceptable standard it should, within the country in question, be recognized as the method of summative assessment of training.

Where there is no established examination the Board wishes to encourage the development of the diploma examination of the European Academy of Anaesthesiology as the summative assessment of theoretical knowledge. In addition the Board finds that the formative in-training examination established by the European Academy of Anaesthesiology is a relevant tool of assessing the quality of training.

**EBA logbook of training in anaesthesiology**

The Board recommends a common logbook for monitoring the trainee’s practice in anaesthesia, intensive care medicine, pain management, and emergency medicine.

The target number of procedures required must be regarded as a minimum number, sufficient to familiarize the trainee with the procedures and allow acquisition of basic skills. To become an expert in any field requires much more experience, which may be obtained during daily work as a specialist and during further highly specialised training. The need for such training varies for each individual specialist depending on work place and organization.

The data to be entered into the logbook may be kept either electronically with any database system, or manually. It is recommended that the training institutions incorporate the necessary data into the systems used for documentation of departmental workload.

The purpose of the logbook is:

- to demonstrate scope, quantity, and quality of training which the individual trainee receives;
- to monitor scope, quantity, and quality of training which the teaching departments and institutions offer the trainees;
- to allow for comparisons of training between different institutions and countries.

**Logbook in anaesthesia**

The suggested minimum data set includes:
• Age of patient (years, and for children less than 1 year, months);
• ASA status (including E status);
• Type of procedure;
• Technique used (general anaesthesia, regional anaesthesia, peripheral nerve block, sedation), airway management, special procedures (fibreoptic intubation, insertion of Swan–Ganz catheter, etc.);
• Type of supervision (continuous direct supervision, intermittent supervision, no supervision).

The suggested minimum target number of procedures to be performed concerning:

• Different types of anaesthesia
  General anaesthesia 500
  Spinal anaesthesia 50
  Epidural anaesthesia 50
  Peripheral nerve blocks 20
  Total minimum number of anaesthetics 1500

• Different types of surgery
  Pediatrics of which (< 5 year) 30
    (< 1 year) 10
  Obstetrics (Caesarian section) 10
    (epidural for delivery) 10
  Thoracic 15
  Neuro (intracranial) 15
  Vascular (abdominal and thoracic) 10
  Urology (TUR) 10
  Head and neck surgery, including eye, ENT, and face surgery 15
  Orthopaedic alloplastic endoprostheses 15
  Daycase surgery 30

• Catheterizations
  Arterial 25
  Central venous 25
  Pulmonary artery 10

• Special procedures
  The trainee should log his/her participation in special procedures, e.g. fibreoptic intubation, blind nasal intubation, endobronchial intubation, blood saving techniques, etc.

Logbook in intensive care medicine

The trainee should take full care of the patient under supervision of a specialist teacher. This includes communication with doctors from other medical specialties and with relatives.

Target minimum number of patients treated

• Total number of patients 50
  of which:
    < 5 year 3
    < 1 year 2
  Primary respiratory disorder 3
  Primary cardiovascular problem 2
  Primary CNS problem 2
  Septic patient 2
  Renal failure 1

Logbook in pain management

Target minimum number of patients treated

• Postoperative pain – total number 50
  of which are:
    Paediatric 5
    Major surgery 10
    Thoracic surgery 5
    Major orthopaedic surgery 5
    Day case surgery 10

• Other types of pain:
  The trainee should log his/her participation in treatment of other pain problems.

In view of the increasing role of the anaesthesiologist in the management of chronic pain (benign and cancer) it is recommended that the trainee should be exposed to invasive and noninvasive management of chronic pain problems.

Logbook in prehospital and emergency medicine

Target minimum number of patients treated

• Transportation of patients – total number 5.
• Resuscitation – total number 5.
• It is recommended that the trainee gains experience in the initial treatment of medical and traumatic life-threatening conditions both on-site out of the hospital and in the emergency rooms. The trainee should log his/her experience in this field.
• Transportation may be from place of injury into hospital or between hospitals. Where this is not
possible because of the structure of the teaching institution, transportation may be within the hospital.

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