

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.

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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
 Nitrates and calcium channel blocking drugs
 Nitric oxide
 Sympathomimetics
 Compounds affecting coagulation and haemostasis

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

Physics and measurement

Behaviour of gases. Detection
 Temperature measurement
 Measuring acid-base balance, oxygen and CO₂ in
 blood, gas and tissues
 Cardiac output; blood flow; pressure
 Pulmonary function
 Gas volumes
 Renal function
 Hepatic function
 Neuromuscular blockade
 CNS electrical activity; arousal
 Basic statistics

Anatomy

Nose
 Mouth
 Pharynx
 Larynx
 Lungs and their relations
 Heart, arteries and veins
 Relevant anatomy of regional anaesthesia and com-
 monly used nerve blocks

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 respiratory system

Monitoring of the respiratory system
Diagnostic investigations
Oxygen therapy
Artificial ventilation
Artificial airway
Management of postoperative pulmonary complications
Management of respiratory failure

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

Core syllabus for pain management

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 (deafferentation pain, phantom pain, sympathetic reflex dystrophia, 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 perispinal 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

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 (fiberoptic 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. fiberoptic 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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