

Swiss catalogue of objectives for emergency physicians during their anesthesia rotation

Board on emergency medicine of the swiss society of anesthesiologists (SGAR)

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A basic training in core competencies of Clinical Anaesthesia is regarded essential for emergency physicians in the prehospital setting. On the other hand, some aspects are included which are important so that the candidate can function inside an anesthesia service. Still, anesthesia training for emergency physicians should emphasize physiopathologic disease thinking with skills development in airway management, vascular access and monitoring.

For the sake of simplicity, we recommend a «scaled down» version of the Swiss Anesthesia Catalogue. This Catalog describes the programm for emergency physicians during their one year anesthesia rotation.

Roles

To become an expert in one field, you may need basic skills and knowledge from another field. Prehospital emergency physicians require fundamental training and knowledge in basic monitoring, venous access, airway management and applied pharmacology of central acting, cardiovascular and muscle relaxant drugs,. These competencies can only become acquired in everyday clinical anaesthesia practice. Therefore, the SGAR/SSMUS supports one-year rotations into anesthesia for basic training of non-anaesthetists.

Domains and competencies

The competences are classified according to the ABCD system, which is as follows:

- A. The candidate knows and can describe the procedure
- B. The candidate can execute the procedure under supervision
- C. The candidate is able to perform the procedure in an independent way and is able to demonstrate it.
- D. The candidate is able to teach and to supervise the procedure.

Domain 1.1: Disease Management, Patient Assessment and Preoperative Preparation

During the course of their training, anesthesia residents must acquire clinical abilities and skills in the anesthetic and perioperative care of patients. These include the following competences:

	<u>Competence statement</u>	
1.1.1	Identifies all relevant patient pathologies, including those with direct impact on anesthetic techniques (anterior mediastinal mass, pulmonary hypertension, tamponade)	B
1.1.2	Assesses preoperative risk	C
1.1.3	Uses and interprets preoperative investigations appropriately and rationally	C
1.1.4	Assesses airway for potential difficulty with intubation and /or ventilation	C
1.1.5	Knows and applies the principles involved in pre-operative therapy, fasting guidelines and pre-medication	C
1.1.6	Provides adequate information and obtains consent for anesthesia	B

Learning Objectives

a. Basic knowledge

During the course of the training, anesthesia residents must acquire knowledge on all relevant medical pathologies and those with direct impact on anesthetic techniques.

- Anatomy, physiology, physiopathology of following organs systems
 - o Airway
 - o Respiratory
 - o Cardiovascular
 - o Nervous and muscular
 - o Urinary/excretory
 - o Endocrine
 - o Digestive

- Knowledge and experience of the etiology, natural history, diagnosis, treatment and complications:
 - o Respiratory
 - Obstructive lung disease (COPD and asthma)
 - Restrictive lung disease
 - Pulmonary hypertension (primary and secondary)
 - Acute respiratory failure
 - Airway compromise due to traum

 - o Cardiovascular:
 - Congestive heart failure
 - Coronary artery disease
 - Hypertension
 - Arrhythmias
 - Valvular heart disease and cardiac shunt
 - Hemorrhage classes in trauma patients according to ACS guidelines

 - o Nervous and muscular
 - Cerebrovascular diseases
 - * TIA, carotid artery disease, stroke
 - Intracranial tumor and raised IC pressure
 - Head trauma and raised ICP
 - Chronic spinal cord transection
 - Epilepsy

 - o Urinary/excretory
 - Renal failure and common causes
 - Disorder of acid-base balance
 - Electrolyte disorders

 - o Digestive
 - Esophageal disease (reflux, hiatus hernia)
 - Gastric disease (peptic ulcer disease)

- Disease of liver
 - Acute hepatitis (toxic, infectious) and chronic hepatitis
 - Cirrhosis and complications
- o Endocrine
 - Diabetes mellitus and complications (hyperglycemia, hypoglycemia, acidocetosis)
 - Thyroid gland dysfunction (hyperthyroidism, hypothyroidism)
 - Adrenal gland dysfunction
 - Hypoadrenocorticism
 - Pheochromocytoma
- Understanding disease processes, natural evolution and knowing the influence on the management of perioperative period
 - Pharmacology of perioperative drugs
 - Fasting guidelines
 - Airway assessment including bedside tests to assess difficult ventilation and intubation
 - Other medical history (personal and family history of previous anesthesia, allergy, drug abuse, habits)

b. Clinical skills

- o Patient assessment based on history and physical examination, use of appropriate examinations and laboratory tests
- o Evaluation of the preoperative ASA physical status
- o Specific consideration in airway management (c.f. domain airway)
- o Interpretation, considering the value and limitation of:
 - Electrocardiogram, and other methods assessing cardiovascular function (echocardiography, ergometry myocardial scintigraphy, coronography)
 - Pulmonary function test and arterial blood gas analysis
 - Common radiological testing with special emphasis on chest X-ray
 - Coagulation
 - Liver and renal function test
 - Endocrine function
 - Drug monitoring
- o Selection and planning of the anesthesia technique, including monitoring and other equipments required for the procedure

c. Specific attitudes

- Effectively communicate with patients, let patients know of risks and benefits of various techniques used, and treat patients with respect and courtesy in answering all questions and concerns they may have
- Establishing effective interaction with patients and their relatives

Domain 1.2: Intraoperative Care

During the course of their training, anesthesia residents must acquire clinical abilities and skills in the anesthetic and intraoperative care of patients. These include the following competences:

	<u>Competence statement</u>	
1.2.1	Prepares the workplace according to local checklists (equipment and anesthesia machine, drugs, monitoring, etc...)	B
1.2.2	Uses appropriately all standard safety (electrical, laser, X- ray) and infection control (HIV, Hepatitis, resistant organism infection) measures	C
1.2.3	Uses and monitors patient's positioning safely	C
1.2.4	Masters knowledge of pharmacology relevant to general, including preparation, administration and monitoring of drug effects	C
1.2.5	Provides a safe induction, maintenance, and emergence from general anesthesia, including choice of drugs, airway management, ventilation techniques and monitoring	C
1.2.6	Uses appropriate skills for safe provision of general anesthesia (c.f. Technical Skills)	B
1.2.7	Maintains homeostasis of organ systems of patients throughout different procedures, including adequate fluid and volume management, safe use of blood and blood products, and maintains normothermia	C
1.2.8	Provides adequate record keeping of anesthetic procedures	C
1.2.9	Recognizes, diagnoses and manages most common intraoperative critical incidents	B

Learning Objectives

a. Basic knowledge

- Physics and Clinical measurement (Behavior of fluids (gases and liquids); Flow of fluids; Measurement of volumes, flows, and pressures; Measurement of temperature; Humidification; Oximetry; Analysis of gases; Capnography; Electrical safety; Fires and explosions)
- Equipment and apparatus (Equipment design and standards; Gas supply in bulk and cylinders; bag-valve ventilation devices ; Devices to maintain the airway such as laryngoscopes, endotracheal tubes, tracheotomy tubes, face masks, airway devices; Information systems)
- Minimum monitoring standards, and additional monitoring when appropriate
 - Principles of safety such as lifting and positioning patients
 - Conduct of anesthesia:
 - Management of the airway and intraoperative complications
 - Applied cardiac and respiratory physiology

b. Skills

- Routine intravenous inductions; Maintenance of anesthesia
- Application of mechanical ventilation
- Applied pharmacology and variability in drug response
- Correct use of muscle relaxants, neuromuscular blockade monitoring
- Application and interpretation of monitored variables
- Fluid management, including blood replacement therapy
- Maintenance of accurate records

Technical skills:

- Rapid sequence induction
- Intubation with cervical spine protection
- Maintenance of an adequate airway
- Advanced Life Support
- Aseptic techniques
- Peripheral venous access including cannulation of major vessels for volume resuscitation, arterial blood gas collection
- ECG recording and interpretation

Clinical and case management skills:

Trainees are expected to identify and manage the following co-existing medical conditions relevant to anesthesia:

- Disorders of the airway and respiratory system
- Disorders of the cardiovascular system
- Disorders of the nervous system
- Renal disorders; water, electrolyte and acid-base disturbances

- Hematological disorders, including coagulopathies
- Disorders of the liver, biliary tract and gastrointestinal system
- Psychiatric disorders and substance abuse
- * Ageing
- * Obesity

Trainees are further expected to identify and manage the following major intraoperative problems:

- Inadequate airway: obstructed airway, failed intubation, esophageal intubation, endobronchial intubation, and unplanned extubation
- Laryngospasm and Bronchospasm
- Gas embolism, Pulmonary aspiration, and Pneumothorax
- Hypoxia, Hypocarbica, Hypercarbia, Hypoventilation, Hyperventilation, and High ventilator peak inspiratory pressures
- Hypertension, Hypotension, Arrhythmias, Myocardial Ischemia Hypothermia, Hyperthermia, and Malignant hyperthermia
- Anaphylaxis
- Seizures

c. Specific attitudes

- Effectively communicate with other members of the operating room in order to voice issues and concerns; work together with other health care professionals to ensure smooth patient care and safety

Domain 1.3: Postoperative patient care and pain management

During the course of their training, anesthesia residents must acquire clinical abilities and skills in the anesthetic and perioperative care of patients. These include the following competences:

	<u>Competence statement</u>	
1.3.1	Provides appropriate handover of a patient in recovery or ICU, summarizing relevant clinical features of the patient's pre- and intraoperative care	C
1.3.2	Provides adequate patient monitoring in PACU	C
1.3.3	Assesses and adequately treats post-operative pain and post-operative nausea and vomiting	C
1.3.4	Anticipates, recognizes, diagnoses and manages postoperative critical incidents, including indication for transfer to ICU	B

Learning Objectives

a. Knowledge

- Postoperative Care:

- o Safe transport and handover of anesthetized patient
- o Acute pain Management:

Anatomy and physiology of pain pathways, the neuroendocrine response to acute pain and its effects of major organ systems

Knowledge of the clinical pharmacology of medications used in treatment of acute pain, including:

Medications: opioids, NSAIDS, alpha-2 agonists

Route of administration: oral, SC, IM, IV (including PCA), epidural, intrathecal, peripheral nerve blocks

- o Knowledge of common complications related to the anesthetic technique and

the surgical procedure used, as well as therapeutic issues:

Bronchoaspiration / Pneumothorax

Hypoxemia

Hypercarbia

Hypotension/Bleeding/Shock of different etiologies

Fluid requirements/Electrolyte disturbances

Arrhythmias

Nerve and muscular damage

Patient malpositioning

- o Knowledge of potential complications related to comorbid conditions of patients

Respiratory distress

Ischemic, rhythmic and hypertensive heart disease

Renal failure

Sepsis

Diabetes

- Transfusion and coagulation disorders
- Appropriate monitoring techniques and their interpretation

b. Skills

Technical skills:

- * Basic vascular access and airway management
- * CPR (basic and advanced life support)

Clinical and case management skills:

Trainees are expected to understand relevant principles, apply knowledge in practice and to demonstrate clinical skills and case management in the following areas:

- Indications and interpretation of common laboratory and radiological exams
- Manage common and life threatening adverse reactions to medications used during anesthesia and to treat acute pain
- Perform drills such as advanced life support to manage emergencies conditions (see above)

c. Specific Attitudes

- Demonstrate knowledge of the policies which must be in place to safely and effectively treat acute pain
- Recognition of life-threatening complications requiring ICU transfer

Domain 1.4: Practical anesthetic procedures / skills

During the course of their training, anesthesia residents must acquire the clinical abilities and skills to perform the following procedures in an appropriate and safe way.

	<u>Competence statement</u>	
1.4.1	Provides basic airway management	D
1.4.2	Provides specific airway management	C
1.4.3	Provides basic vascular access	D
1.4.4	Provides specific vascular access	B
1.4.5	Operates BVM devices, transport respirators, monitors and machines and trouble- shoots basic technical malfunctions	C
1.4.6	Can describe specific monitoring procedures	C

Learning objectives

a. Knowledge

□ Airway Management

- Anatomy of the upper airway
- Airway assessment and identification of the potential difficult airway (scores / grading)
- Knowledge of the algorithm for the difficult airway
- Knowledge of criteria for a safe extubation
- Protocol for extubation of a difficult airway
- Management of pulmonary aspiration during general anesthesia

• Vascular accesses:

- Basic anatomy relevant to the vascular accesses
- Knowledge of indications and contraindications of the different vascular accesses
- Knowledge of risks and complications of the different vascular accesses

• Peripheral and central blocks

- Basic anatomy relevant to the peripheral and central blocks
- Knowledge of risks and complications of peripheral and central blocks with special emphasis on coagulation disorders.
Technical devices

b. Skills

Airway management

- Uses different available maneuvers to clear the airway (head extension, jaw-thrust, oropharyngeal and nasopharyngeal airways)
- Airway management using the following devices:
 - Face mask and self inflating bag
 - Laryngoscope and different blades
 - LMA and other supraglottic airways

Endotracheal tubes

- Performs routine preparation of equipment
- Performs equipment setup for the difficult intubation
- Performs routine airway management (mask ventilation, intubation and extubation)
 - Performs drills in the algorithm for the difficult mask ventilation
 - Performs the rapid sequence induction
 - Performs drills in the handling of the difficult airway
 - Performs drills in cricothyroidotomy and jet ventilation
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Vascular accesses

- Correct identification of landmarks and positioning of patient
- Demonstrates effective skin antisepsis and site preparation
- Insertion of peripheral intravenous lines
- Is able to recognize and treat complications related to vascular accesses

Technical devices

- Is able to check and operate the following equipment and machines:
 - Gas supply
 - Breathing systems
 - Anesthetic ventilator machines
 - Infusion pumps/rapid infusion devices
 - Warming devices

Selects the appropriate monitoring methods, both invasive and non invasive, and provides a critical interpretation of the monitored variables

c. Specific attitudes

- Is aware of his own limits when performing technical procedures, anticipates problems and can act accordingly, including calling for help early

Domain 1.5: Anesthesia Non-Technical Skills (ANTS)

During the course of their training, anesthesia residents must acquire non-technical abilities to master interpersonal and organizational tasks during the perioperative care of patients. These include the following competences:

	<u>Competence statement</u>	
1.5.1	Develops and maintains an overall dynamic awareness of the situation based on perceiving the elements of the operating room environment (patient, team, time, monitoring and equipment) and understands what they mean and anticipates what could happen in the near future	B
1.5.2	Makes decisions to reach a judgment or diagnosis about a situation, or to select a course of action, based on experience or new information under both normal conditions and in time-pressured crisis situations	B
1.5.3	Manages resources and organizes tasks to achieve goals, be they individual case plans or longer term scheduling issues	B
1.5.4	Communicates effectively and works with others in a team context, in any role, to ensure effective joint task completion and team satisfaction	C

Learning objectives:

a. Knowledge

- Psychological aspects of team performance for successful task performance
- Crisis resource management
- Human error research, relevant for the perioperative setting
- Behavioral marker systems, relevant for successful training

b. Skills (Aberdeen)

Task management

- o Planning_and_preparing
- o Prioritizing
- o Providing_and_maintaining_standards
- o Identifying_and_utilizing_resources

Team working

- o Coordinating_activities_with_team_members
- o Exchanging_information
 - o Using_authority_and_assertiveness
- o Assessing_capabilities
- o Supporting_others

Situation Awareness

Gathering information

- o Recognizing_and_understanding
- o Anticipating

Decision making

- o Identifying options
- o Balancing risks and selecting options
- o Re-evaluating

Leadership

- o To work as a team member but to assume responsibilities and to delegate duties as a team leader when necessary