

ANESTHESIOLOGY-RELATED GUIDELINES FOR ADAPTATION IN PART OR IN TOTO, INTO VARIOUS MEDICAL STUDENT CURRICULA

The SEA Committee on Medical Student Education has published a proposed set of guidelines for content of teaching blocks for medical students taking anesthesiology rotations. These guidelines are merely suggestions, made by a consensus of educators from across the country. We think this is pertinent medical information medical students should know before graduating that might reasonably be taught in anesthesiology. The basic outline is extensive and can be covered in a four-week rotation. Realizing that many departments only have one or two-week rotations, we have also highlighted those topics which are of critical importance and can be covered in the shorter time periods.

I. Preanesthetic Evaluation

- A. The student shall acquire an appreciation of the Anesthesiologist's considerations in preoperative evaluation of the patient. This is demonstrated by:
 1. Conduction several preanesthetic assessments, including
 - a. Taking and recording a pertinent history
 - b. Performing an appropriate physical examination, including assessment of:
 - airway
 - cardiovascular system
 - respiratory system
 - other systems as indicated
 - c. Reviewing pertinent laboratory data
 - d. Assigning appropriate ASA physical status
 2. Discussing how the following factors may influence the patient's course during the perioperative period:
 - a. Age
 - b. Nature of surgery, including minor versus major, peripheral versus central, and elective versus emergent
 - c. Cardiovascular disorders, including but not limited to:
 - coronary insufficiency
 - hypertension
 - myocardial failure
 - dysrhythmias
 - d. Respiratory disorders
 - known or suspected difficult intubation
 - upper and/or lower respiratory infection
 - asthma
 - chronic obstructive pulmonary disease
 - lab work-up
 - e. Central nervous system disorders
 - increased intracranial pressure
 - convulsive disorders
 - cerebrovascular insufficiency
 - quadriplegia or paraplegia
 - f. Gastrointestinal disorders
 - pulmonary aspiration risks:
 - hiatal hernia/gastro-esophageal reflux/full stomach
 - functional or mechanical bowel obstructions
 - hepatitis, hepatic insufficiency, portal hypertension
 - g. Renal insufficiency
 - h. Hematologic disorders
 - anemias
 - coagulopathies
 - hemoglobinopathies
 - i. Personal or family history of unusual response to anesthesia
 - malignant hyperthermia susceptibility

- abnormal succinylcholine metabolism
 - j. Lifestyle factors
 - obesity
 - substance abuse - tobacco, alcohol, chemicals
 - k. Pregnancy
 - concomitant surgery
 - pre-eclampsia and eclampsia
 - 3. Discussing medication histories and the influence of chronic and current medications on the perioperative period, including:
 - a. Which drugs should be discontinued and why
 - Do monoamine oxidase inhibitors pose a potential danger?
 - The rebound phenomena resulting from abrupt discontinuation of some classes of drugs, notably beta blockers, and clonidine
- Approaches to perioperative management of patients taking insulin or anticoagulants

II. Preoperative Medication

- A. The student shall demonstrate knowledge of the objectives of effective preanesthesia medication by naming and discussing drugs used for:
 - 1. Relief of anxiety
 - 2. Sedation
 - 3. Amnesia
 - 4. Analgesia
 - 5. Drying secretions
 - 6. Reducing gastric acidity and volume
- B. The student shall demonstrate knowledge of the basic pharmacology and pharmacokinetics of the following premedication agents, including dosage schedules and relative and absolute contraindications:
 - 1. Narcotics
 - a. Morphine
 - b. Meperidine
 - c. Others
 - 2. Sedatives
 - a. Benzodiazepines
 - diazepam
 - midazolam
 - lorazepam
 - b. Antihistamines
 - Benadryl
 - c. Barbiturates
 - secobarbital
 - 3. Anticholinergics
 - a. Atropine
 - 4. Drugs used to reduce the incidence or consequences of pulmonary aspiration
 - a. H2 antagonists
 - b. Antacids
- C. *NPO guidelines*
 - 1. *Fasting periods (assuming no risk for increased gastric emptying time)*
 - a. *Adults*
 - 2-4 hours clear liquids*
 - 6-8 hours for solids*
 - b. *Pediatrics*
 - 2 hours clear liquids*
 - 4 hours breast milk*
 - 6 hours formula, non human milk, solids*
 - 2. *Definition of clear liquids*
 - Water, fruit juices without pulp, carbonated beverages, clear tea, and black coffee*

III. The Operating Room

- A. The student will demonstrate knowledge of procedures and observe induction of anesthesia:
1. Identify several agents used on induction of general anesthesia and give their advantages and disadvantages:
 - a. Intravenous agents
 - b. Inhalation agents
 - c. Neuromuscular blocking agents
 2. Discuss emergency intubations, indications, techniques, and complications; concentrate on aspiration prophylaxis
 3. Observe and practice airway management during several uncomplicated intravenous inductions
- B. The student will demonstrate proper airway and ventilatory management by:
1. Describing the indications, risks and benefits of airway management by mask versus intubation *versus laryngeal mask airway (LMA)*
 2. Describing and identifying basic oropharyngeal and laryngotracheal anatomy
 3. Identifying and overcoming upper airway obstruction with mask ventilation, using
 - a. Various masks
 - b. Jaw thrust
 - c. Nasopharyngeal airway
 - d. Oropharyngeal airway
 4. Naming several techniques of intubation and practicing direct laryngoscopy
- C. In order to demonstrate understanding of the principles and practice of routine intraoperative monitoring, the student will:
1. Explain and demonstrate ECG lead placement and selection to optimize detection of dysrhythmias and ischemia
 2. Indications and risks for invasive methods for monitoring blood pressure
 3. Demonstrate results of arterial blood gas analysis in terms of
 - a. Oxyhemoglobin dissociation curve
 - b. Acid-base status
- D. Student will prescribe and conduct appropriate intraoperative fluid and electrolyte therapy with the guidance of his instructor by:
1. Explaining the rationales for establishing both central and peripheral venous access
 2. Identifying the common sites for venous access and the contraindications and indications for each
 3. Demonstrating skill at establishing venous access by:
 - a. Using sterile technique and universal precautions
 - b. Successfully inserting several peripheral catheters of various calibers
 - c. Protecting the venipuncture site and immobilizing the catheter
 4. Prescribing maintenance fluid and electrolytes
 - a. Predicting how the following preoperative conditions will alter requirements for perioperative maintenance therapy:
 1. NPO
 2. Bowel prep
 3. NG suction
 4. Fever
 - b. Discussing intraoperative considerations which affect maintenance fluid and electrolyte therapy including:
 1. Blood loss
 2. "Third space" loss
 3. Temperature
 - c. Correctly interpreting data from the following monitors of volume status:
 1. Examination of the patient
 2. Pulse and blood pressure
 3. Urine output
 4. CVP
 5. PCWP
 - d. Discussing indications, risks and benefits of crystalloid, colloid and blood product replacement therapies:

1. Regarding the functions of:
 - blood volume
 - oxygen carrying capacity
 - coagulation
 2. Regarding complications of each type of therapy
- E. The student shall identify several position-related injuries that patients may sustain while unconscious
- F. The student will discuss methods of recognizing and treating various perioperative problems, including:
1. Dysrhythmias
 2. Ventricular dysfunction
 3. Hypertension
 4. Myocardial ischemia
 5. Low oxygen saturation
 6. Hypercarbia
 7. Endobronchial intubation
 8. Esophageal intubation

IV. Regional Anesthesia

- A. The student will demonstrate knowledge of local anesthetic pharmacology appropriate to the practice of general medicine by:
1. Classifying commonly used agents according to amide or ester linkage
 2. Listing commonly used local anesthetics for:
 - a. Topical use
 - b. Local infiltration
 - c. Peripheral nerve blocks
 3. Listing acceptable doses of at least two agents used for topical and local infiltration anesthesia
 4. Describing and identifying signs of impending local anesthetic and/or vasopressor toxicity vs. "allergic reaction"
 5. Describing therapeutic steps necessary to prevent or treat local anesthetic toxicity in the event of an accidental intravascular injection
 6. Discussing allergic reactions to local anesthetics
 7. Contrasting allergic reactions to systemic and/or toxic reactions in local anesthetics

V. Ambulatory anesthesia

- A. *The student will demonstrate knowledge of the types of procedures and patients appropriate for ambulatory surgery*
- B. *The student will demonstrate knowledge of assessment of the ambulatory patient with respect to:*
1. *ASA classification*
 2. *NPO status*
 3. *Appropriate lab work*
 4. *Nausea/vomiting prophylaxis*
 - a. *Droperidol*
 - b. *5HT3 receptor antagonists*
 5. *Discharge criteria*
 6. *Pain management*

VI. Post operative pain management

- A. *The student will demonstrate knowledge of the different types of pain management, including:*
1. *PCA*
 2. *Epidural catheters*
 3. *Prn vs round-the clock dosing*
 4. *PO medications*
 - a. *Narcotics*
 - b. *Acetaminophen w/w codeine*
 - c. *Ketorolac*
 - d. *N-SAIDS*
- B. *The student will demonstrate knowledge of assessing post- op pain*

1. *Pain scales*
 2. *Visual analog scales*
- C. *The student will demonstrate knowledge of how to convert patient from parenteral drugs to p.o. drugs*

VII. The student should successfully complete basic CPR and ACLS training during medical school

ONE-TWO WEEK ROTATION

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 - g. Personal or family history of unusual response to anesthesia
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- B. The student shall demonstrate knowledge of the basic pharmacology and pharmacokinetics of the following premedication agents, including dosage schedules and relative and absolute contraindications:

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 - c. Others

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 1. Regarding the functions of:

blood volume
oxygen carrying capacity
coagulation

2. Regarding complications of each type of therapy

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4. *PO medications*
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B. *The student will demonstrate knowledge of assessing post- op pain*

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C. *The student will demonstrate knowledge of how to convert patient from parenteral drugs to p.o. drugs*

VII. **The student should successfully complete basic CPR and ACLS training during medical school (not necessarily during an anesthesia rotation)**