

Introduction to Anesthesiology

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Anesthetic History

- Anesthetics
Previous types, complications, satisfaction, familial history of complications, acute and chronic pain issues
- Airway
Dentition/dental appliances, temporomandibular joint (TMJ) disease, pain or focal neurologic symptoms with cervical motion, snoring, obstructive sleep apnea, radiation therapy with subsequent calcification/sclerosis

Medical History

- Pulmonary
COPD, asthma, recent upper vs. lower respiratory tract infection, orthopnea
- Cardiovascular
CAD, HTN, angina, MI, palpitations/arrhythmias, DOE, paroxysmal nocturnal dyspnea, activity tolerance, PVD, cardiovascular interventions (PTCA, stents, etc.), CHF, myocardial dysfunction
- GI
GERD and other risks for aspiration, dysphagia, PUD, hepatic disease

Medical History

- Endocrine
Thyroid disease, diabetes
- Renal
Renal insufficiency, dialysis (when/type of dialysis and site of AV fistula if used)
- Musculoskeletal
Rheumatoid/osteoarthritis, DJD of spine, contractures, myopathies, arthropathies, positioning preferences

Medical History

- Neurologic
CVA, paresis, paralysis, seizures, migraines, focal signs (numbness, paresthesias)
- Hematologic
Bleeding, DVT/PE

Surgical History

- Severity of comorbidities
- Repeat procedures– expect longer operation time and higher blood loss
- Tracheostomy/other airway surgery– may require modification of intubation technique

Social and Medicine History

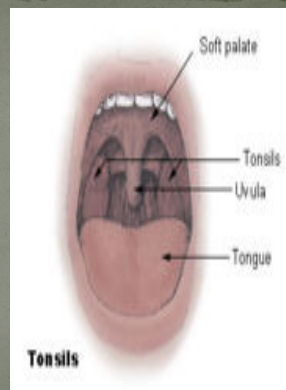
- Smoking
- Alcohol use
- Illicit drug abuse especially cocaine and narcotics
- Medications
 - Analgesics, sedative/hypnotics, insulin, neurologic/pulmonary/cardiovascular medications, chemotherapy (cardiopulmonary toxicity), anticoagulants/antiplatelet (aspirin O.K.), anti-GERD, herbal supplements

Physical Exam

- Assess for airway management and ease of intubation
- Assess for focal signs and severity of disease
- Assess for patient's ability to tolerate a particular anesthetic or consider delay of surgery for further medical optimization

Physical Exam

- Mallampati Classes
- I: All
- II: Tonsils and lower half of uvula hidden
- III: Only see soft and hard palate
- IV: Only see hard palate



Physical Exam

- Dentition, loose/chipped teeth, dental appliances
- Mouth opening (> 5 cm)
- Thyromental distance
 - ≥ 6 cm women
 - ≥ 6.5 cm men
- Prognath
- Cervical range of motion with illicit focal signs (radicular pain, paresthesias, numbness)

Physical Exam

- Pulmonary
- Cardiac
- Musculoskeletal
- Neurologic

Preoperative Orders

- NPO except medications for 6-8 hours for particulate food (milk, antacids, baby formula)
- NPO for 2 hours for clear liquids/breast milk (To establish an empty stomach based on average gastric emptying times)
- Hold particulate antacids (aspiration), diuretics (complicates fluid management), and hypoglycemics
- Modify insulin therapy
- Consider caring for special populations as the starting case (eg. Pediatrics, latex allergy, cirrhosis)

Testing/Optimization

- Age-related lab testing/studies
- Other lab testing/studies as appropriate for comorbidities
- Consultation- for medical optimization
- Physiologic tests (eg. PFT's, stress test)
 - Establish baseline
 - Assess maximum capacity (physiologic reserve)
 - Assess responsiveness to therapy
 - Make an intervention and assess response to therapy

American Society of Anesthesiologists Physical Status

- I: Healthy
- II: Mild to moderate systemic disease medically controlled
- III: Moderate to severe systemic disease that affects quality of life
- IV: Same as III with disease posing constant threat to life
- V: 50 - 50 chance of survival with or without surgical intervention
- VI: Organ donor
- E: Emergency modifier

Types of Anesthesia

- Monitored Anesthesia Care (MAC)/ local with sedation/ "twilight" anesthesia
- Regional
 - Neuraxial- spinal, epidural
 - Plexus block
 - Nerve block
 - Infiltration
- General
 - Endotracheal intubation, laryngeal mask airway, mask airway

Complications of Anesthesia

- MAC/local
 - Insufficient analgesia >> recall
- Regional
 - Postdural puncture headache > block failure > bleeding/epidural hematoma, backache, epidural abscess, neurologic trauma
- General
 - Sore throat > nausea and/or vomiting > oral trauma, aspiration

Stages of General Anesthesia

- I: Sedation
 - +/- Recall
- II: Excitation
 - Hypereflexia
 - Cardiovascular (HTN, tachy)
 - Motor
 - Bronchospasm, laryngospasm
 - Saliv/Urin/Defac/Lacrim(ation)
 - Divergent gaze

Stages of General Anesthesia

- III: Surgical
 - 5 Goals achieved
- IV: Overdose
 - Cardiovascular collapse

Clinical Stages of General Anesthesia

- Induction
 - Mask
 - Intravenous
 - Routine (using nondepolarizing muscle relaxant)
 - Induction agent- check mask ventilate- relaxant-
 - ventilate 3-5 minutes- intubate
 - Rapid-sequence (using succinylcholine/SUX)
 - Induction agent- (mask if Modified)- SUX-
 - intubate with cricoid pressure (Sellick)

Clinical Stages of General Anesthesia

- Maintenance
- Emergence
- Recovery
 - Return to baseline neurologic status
 - Control pain (IV, epidural, regional block)
 - Cardiopulmonary stability

Anesthetic Agents

- Volatile agents
 - Sevoflurane, Desflurane, Isoflurane, (Halothane)
- Nitrous oxide
- Induction agents
 - Propofol, etomidate, ketamine, thiopental
- Muscle relaxants
 - Succinylcholine (depolarizing)
 - Pancuronium, vecuronium, atracurium, rocuronium (nondepolarizing)
- Analgesics
 - Morphine, Fentanyl, NSAIDS
- Benzodiazepines
 - Versed
- Local Anesthetics

5 Goals of Anesthesia

- I: Amnesia
- II: Analgesia
- III: Anxiolysis-Sedation-Hypnosis
- IV: Muscle relaxation
- V: Reflex control

Achieving the 5 Goals of Anesthesia

Medication	Amnesia	Anxiolysis	Analgesia	Muscle Relaxation	Reflex Control
Volatile Agents	X	X	X	X	X
Nitrous Oxide	X	X	X		
Benzodiazepines	X	X		X	
Muscle Relaxants				X	X
Analgesics		X	X	X	X
Induction Agents	X	X	Ketamine	Propofol	Propofol
Local Anesthetics			X	X	X

The "Do No Harm" Anesthetic

- Induction agent
 - Etomidate (CV stable), Propofol (least N/V)
- Volatile agent
 - Sevoflurane
- Muscle relaxant
 - Vecuronium
- Opioid
 - Fentanyl

Malignant Hyperthermia

- Pathophysiology
 - Inability for reuptake/sequestering calcium into sarcoplasmic reticulum resulting in iatrogenic rhabdomyolysis
- Syndrome
 - Fever, metabolic acidosis, renal failure, DIC
- Triggers
 - Succinylcholine, volatile agents
- Therapy
 - Dantrolene