**Introduction to Anesthesiology**

Kurt Baker-Watson, MD  
Associate Professor

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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

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**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

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**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

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**Medical History**

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

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**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 elicited 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 (e.g. 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 (e.g., 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
  - Hyporeflexia
  - Cardiovascular (HTN, tachy)
  - Motor
  - Bronchospasm, laryngospasm
  - Saliv/Urin/Defac/Lacr(ation)
  - Divergent gaze
- 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)

- **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

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<th>Analgesia</th>
<th>Anxiolysis</th>
<th>Muscle Relaxation</th>
<th>Reflex Control</th>
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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