Objectives

- Describe how to complete a targeted postanesthesia and post-surgical assessment
- Identify signs of compromise using a systematic approach
- Discuss how to initiate appropriate interventions for postanesthesia and post-surgical patients

Post Anesthesia Assessment, Care and Emergencies

And other bad things....

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Post Anesthesia Care

- Immediate Phase I
- Attention to actual and potential problems related to surgery and anesthesia
- Management requires coordination of surgery and anesthesia personnel

PACU Assessment

- Airway/ventilation
- Cardiovascular stability
- Awakening
- Temperature control
- Pain control
- Surgical assessment
- Monitoring for complications

Stable PACU Patient

- What constitutes stability?
- How do you know patient is stable?

Airway Complications

- Hypoxemia
- Hypercarbia
- Obstruction
- Croup
- Laryngospasm
- Aspiration
**Tongue Obstruction**
- Tongue: Primary cause of upper airway obstruction
- S/S: Somnolence, snoring, activation of accessory muscles
- Patients at risk: Anatomy, poor tone, swelling
- Treatment: Achieve a patent airway...step by step....

**Tongue Obstruction: Step by Step**

**Laryngeal Obstruction**
- Partial or complete spasm of intrinsic or extrinsic muscles of the larynx
- S/S: awake, agitated, (no) air, stridor
- Patients at risk: Irritable airway
- Treatment: Positive pressure ventilation, consider succiny/choline
- Prevention: Extube deep, steroids

**Croup**
- Postextubation croup-expiratory stridor, barking cough
- S/S: barking cough
- Patients at risk: 3 mos-4 years
- Treatment: Humidified oxygen
  - Racemic epi
  - Prolonged observation

**Hypoxemia**
- PaO2 < 60 or SaO2 < 90%
- S/S: agitation to somnolence
tachycardia to bradycardiahypertension to hypotension
Causes: Atelectasis
- Pulmonary edema
- Pulmonary embolism
- Aspiration
- Bronchospasm
- Pneumothorax
- Hypoventilation

**Cardiovascular Complications**
- Hypotension
- Hypertension
- Dysrhythmias
- Bleeding
- Chest pain
Hypotension
- Hypovolemia: Volume loss
- PEEP: Decreases venous return
- Primary cardiac dysfunction
  - Dysrhythmias, MI, tamponade
- Low systemic vascular resistance
  - Meds, sepsis

Hypertension
- Sympathetic stimulation
- Pain
- Hypoxemia/hypercarbia
- Pre-existing HTN
- Following vascular surgery: Reperfusion
- Medication induced

Dysrhythmias
- Alteration in cardiac rate or rhythm
- Most have an identifiable cause
- Most are not life-threatening

Dysrhythmias
- Hypoxemia
- Hypercarbia
- Hypokalemia
- Acid-base changes
- Hypotension
- Anemia

Major Contributing Factors
- Pre-existing disease
- Hypothermia
- Vagal reflexes
- Residual anesthetics
- Stress and Pain
- Aging
Risks of Dysrhythmias
- Death
- Hypotension
- Syncope
- Emboli formation
- Prolonged stay in PACU
- Admission after ASU

Treatment
- Treat the cause
- If life-threatening, treat the cause and the rhythm
- Remember, oxygen is a drug!!

Neurologic Complications
- Delayed awakening
- Emergence Delirium
- Neurologic injury

Delayed Awakening
- Prolonged action of anesthetic agents
- Metabolic causes
  - Hypoglycemia
  - Hyperglycemia
- Electrolyte imbalances-Sodium

Emergence Delirium
- Medication induced
  - Ketamine
- Withdrawal psychosis
  - ETOH, opioids, hallucinogens
- Functional psychosis
- MUST r/o hypoxemia before sedating!!!!

Neurologic Injury
- CVA
- Intracranial bleed
- Increased ICP
- Embolism
Complications of Thermoregulation

- Hypothermia
- Hyperthermia

Hypothermia

- Radiation loss: Surface to air
- Convection loss: Air currents
- Conduction loss: Surface to surface
- Evaporation loss: Liquid to gas

- Consider those at risk: Prevention
- Treat as needed

Malignant Hyperthermia

- "Anesthesiologist’s nightmare"
- Biochemical alteration of intracellular calcium resulting in hypermetabolism
- Most sensitive sign: doubling ETCO2
- Most specific sign: Total body rigidity
- Other signs: HTN, Tachycardia, Temp

- Oxygenation, DANTROLENE, cooling

Surgical Complications

- Bleeding
- Infection-Will not present in PACU
- Pain
- Other: surgery specific

Positioning Problems in the PACU

- Or what should more correctly be called consequences of positioning problems in the OR, now seen in the PACU

Positioning Problems

- Goals of positioning patient for surgery:
  1. Maximize surgical exposure
  2. Patient accessibility for anesthesia
  3. Minimize circulatory compromise
  4. Protection from nerve compression
  5. Maximize respiratory function
  6. Minimal exposure and maximum comfort
**Complications of Positioning**
- Soft tissue
- Eyes
- Nerves

**Patient #1**
- 87 y/o Stanley Smith is admitted to the PACU following an exploratory lap for obstruction.
- h/o dementia
- Weight is 117 pounds
- Admission assessment unremarkable, except his tailbone

**Soft Tissue Injury**
- Pressure injuries over bony prominences
- Debilitated, elderly, malnourished, paraplegic at increased risk
- Pressure for greater than 2 hours can cause irreversible ischemia
- Injury Grading system for Pressure Injuries
- Prevention cannot be over-emphasized

**Injury Grading**
- **Stage One**: Blanching followed by nonblanching erythema
- **Stage Two**: Induration or edema with breakdown of dermis
- **Stage Three**: Ulceration extending to subcutaneous tissues and still further to fascia, muscle, and bone

**Supine Position**
- Respiratory compromise
- Vena caval occlusion
- Pressure alopecia
- Pressure point compression

**Lithotomy Position**
- Decreased FRC
- Hypotension
- Clot formation
- Low back pain
- Peroneal nerve damage
**Sitting Position**
- Hypotension
- ↓ cardiac output
- ↑ heart rate
- ↑ SVR
- Air embolism
- Facial edema

**Prone Position**
- Chest and abdominal compression
- Loss of airway when turning
- Joint damage and discomfort
- Eye abrasion
- Ear compression

**Lateral Position**
- Eye abrasion
- Ear compression
- Neck pain
- Nerve injury
- Atelectasis

**Eye Injuries**

**Nerve Injury**
*Grade I: Neuropraxis:*
  - Response to blunt force or to compression.
  - Temporary dysfunction without axonal damage

*Grade II: Axonotmesis:*
  - Destruction of axons occur, although regeneration is possible.
  - Eventually function will return.

*Grade III: Neurotmesis:*
  - Nerve is crushed, avulsed, or severed. Loss of function and anatomic continuity, Return of function impossible unless nerve ends reapproximated

**Discharge from Phase I**
- Patient may go to ICU
- Patient may go to floor
- Patient may go to Phase II
- “Fast-tracking”
**Phase Two Recovery**
- Readiness for home
- Ambulation
- Tolerating PO
- Pain control
- Teaching
- Surgical stability
- Follow up

**Recovery on the Floor**
- Initial assessment
- Post-operative priorities
  Anesthetic issues should have been resolved prior to discharge from PACU
  Surgical recovery becomes major priority at this time. Surgical team responsible for patient at this time.

**Post-operative Priorities**
- Progressive mobility
- Infection control
- Intake/output
- Respiratory adequacy
- Pain management
- Preparation for discharge

**Care Mapping**
- Designed to optimize recovery
- Sets specific end-points
- Acknowledges and investigates deviations
- Standardizing care

**References**

**Questions?**