HEALTH TECH ACADEMY

Anesthesia, Physiological Monitoring, & Post anesthesia Recovery

Treating the Surgical Patient

Lesson Objectives:

1. Explain important anesthesia concepts
2. Describe the components of physiological monitoring
3. Describe basic anesthesia equipment and its use
4. Describe the concepts of airway management
5. Define general anesthesia and describe induction, maintenance, and emergence
6. Explain how regional anesthesia is used
7. Define common types of regional anesthesia
8. Define the role of the surgical technologist during the use of regional anesthesia
9. Discuss the elements of a handover from the circulating nurse to the PACU nurse
10. Discuss unanticipated PACU outcomes
11. Define the purpose of discharge planning

Anesthesia

- Anesthesia means “without sensation
- **Types of anesthesia**
  - General anesthesia: Altering patients level of consciousness
  - Regional anesthesia: prevents sensory nerve impulse in specific location of body
    - remain conscious but do not feel the pain
- **Goal**
  - patient safety, optimal surgical outcome, homeostasis
- **Considerations for Anesthesia**
  - Procedure length, position, age, height, weight, mental status, medications, allergiec, substance abuse, emergency

Anesthesia Concepts

Consciousness

- A state **of awareness in which a person is able to sense the environment and respond to it**

Sensation

- Awareness of stimuli

Analgesia

- Loss of Pain Sensation

Sedation

- A state **of consciousness described along a continuum** between conscious and unconscious

Central Nervous System

- Diminished **mental, sensory, and physical capacity**

Amnesia

- Loss of recall(memory) of events

Techniques of Anesthesia

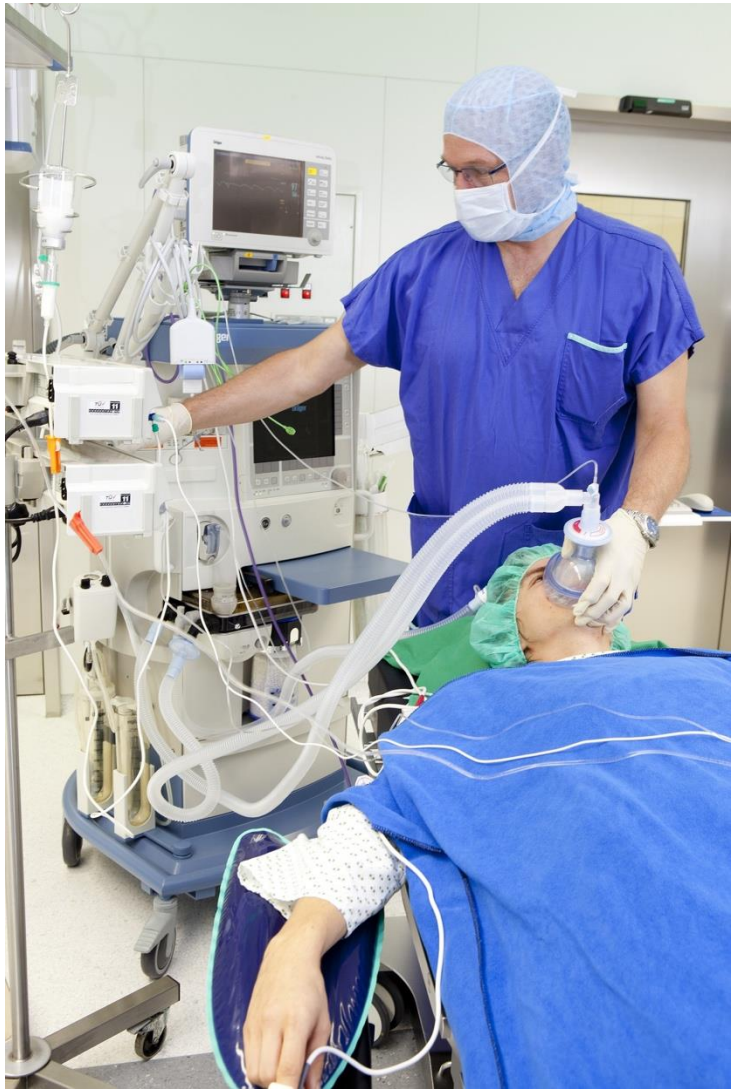
Hypnosis	• Altered state of consciousness
Anesthesia	• Relief from pain
Amnesia	• Lack memory/recall
Muscle relaxation	• Paralyze
Patient position	• Surgical site access while maintain homeostasis
Homeostasis of vitals	• Stable vitals

Anesthesia Personnel

- Personnels licensed according to their academic level, knowledge and skills demonstrated in residency

Includes:

- Anesthesia provider (AP)
  - Administers anesthetic agents and performs physiological monitoring.
- Anesthesiologist (MDA)
  - Medical doctor with specialist training in anesthesia.
- Certified registered nurse anesthetist (CRNA)
  - Licensed to deliver anesthesia after achieving a master of science degree in nursing.
- Certified anesthesia assistant (CAA)
  - Assists AP in delegated tasks.
- Anesthesia technologist
  - Assists AP in maintaining equipment.



Watch "How Anesthesia Affects your Brain and Body" video for an introduction to Anesthesia

How Anesthesia affects your brain and body Video

How Anesthesia affects your brain and body Video

Summary of Video:

- Surgery only progressed when Anesthesia progressed
- Anesthesia catered to type of surgery being done
- 3 Things for General Anesthesia:
  - Analgesia: Not in Pain
  - Amnesia: Don't remember
  - Operating Conditions for surgeon

Perioperative Patient Assessment

- Surgeon and AP (or qualified personnel) conduct a comprehensive assessment.
- Typically occurs 1 week to 3 days before surgery.
- Purpose: Determine patient’s medical needs and anesthesia risk factors.
- Decision on anesthesia type (general, sedation, regional) may be discussed.
- Patients address concerns about physical and psychological well-being.
- Patient education resolves fears and misconceptions about anesthesia and pain control.
- Assessment modified based on surgery type and known risks (e.g., difficult airway, drug allergies).

American Society of Anesthesiologists (ASA) Risk Assessment

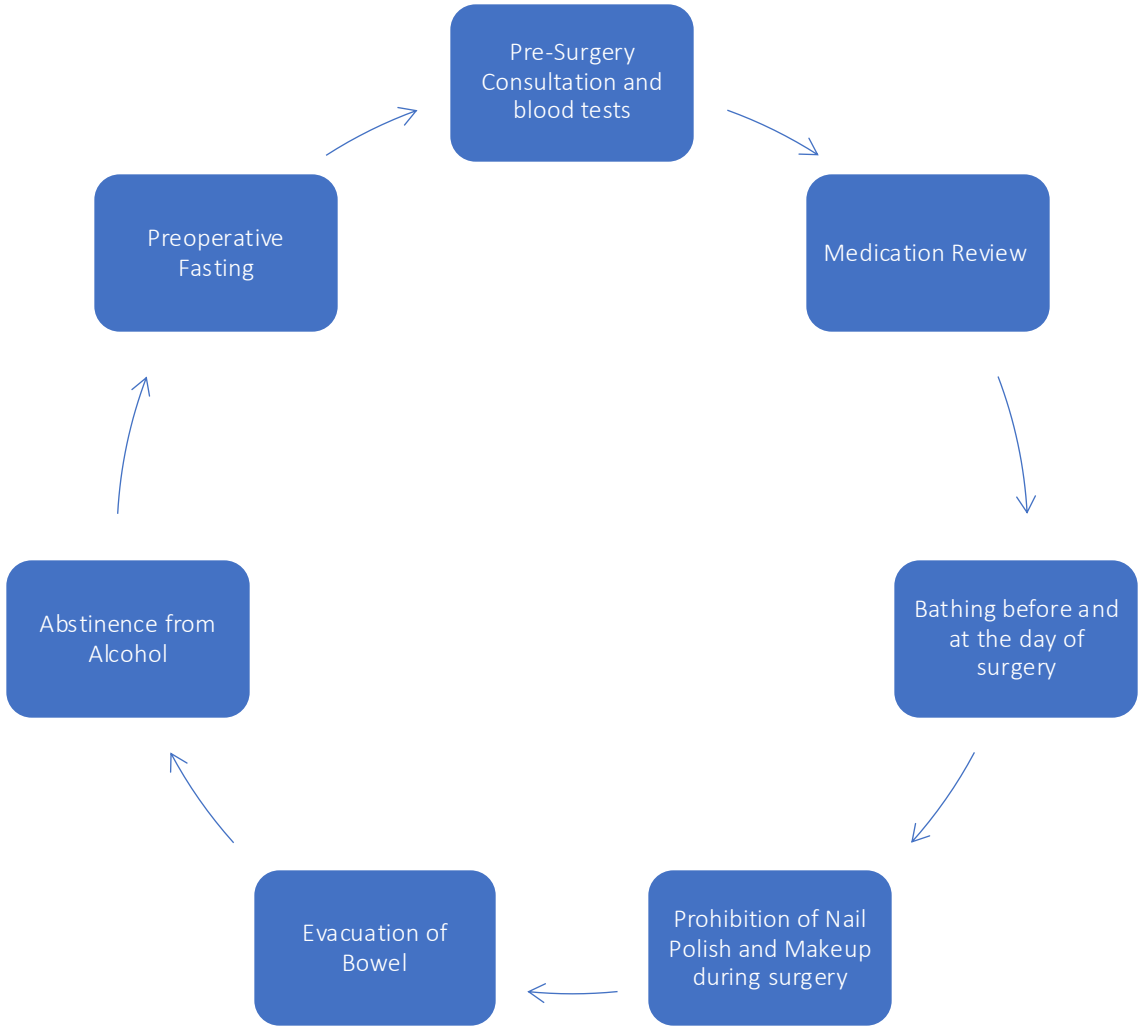
Patient risk assessment-ALL surgical patients

Class 1	• No disease-physically healthy
Class 2	• Mild disease-asthma, smoker, obesity, under 1 over 70
Class 3	• Severe disease-MI, massive obesity
Class 4	• Life threatening disease-CHF, kidney failure
Class 5	• Near death-not expected to live
Class 6	• Brain dead-organ procurement
Emergency modifier	• Emergency case

Anesthesia Selection - Factors

- ASA classification
  - 1-6, assigned by Anesthesiologist and based on risk factors/comorbidities of the patient, and can be helpful in predicting operative risks. The higher the number, higher the risk.
- Physiological status
- Metabolic disease
  - Patient's ability or inability to metabolize medications will be a factor
- Psychological status
  - Addressing patient fears and concerns about anesthesia and pain.
- Type of surgery
  - How the patient will need to be monitored, type/length of anesthesia, and risks related to the operation will affect planning
- Length of the procedure
- History of adverse reactions to anesthetics and drug allergies
  - Especially with Malignant Hyperthermia

Patient Preparation: One Day Before Surgery



ASA Fasting Recommendations

- 2 hours (Clear liquids)
- 4 hours (Breast milk)
- 6 hours (Formula, milk, light food, bread)
- 8 hours (Solids, meat, heavy food)

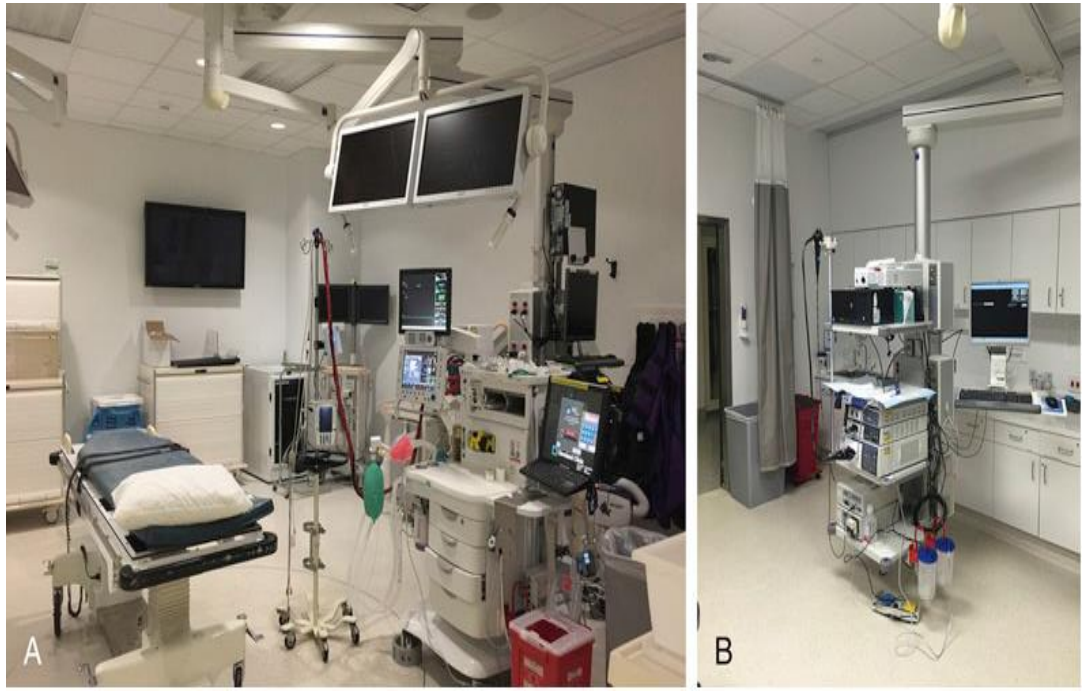
Immediate Preoperative Preparation of Patient

Surgical Checklist before surgery:

- Patient education completed
- Identification verified
- Correct procedure, side, and site verified
- Consents verified
- Resuscitation orders verified
    - DNR status is usually suspended during a procedure (Meaning the patient is a Full Code), but patients may request a modified code status by talking with their surgeon and anesthesiologist
    - Patients may also refuse some or all blood products.
- Allergies verified
- Preoperative medications documented
- Prostheses removed
- Jewelry removed
- Medical records accompany the patient

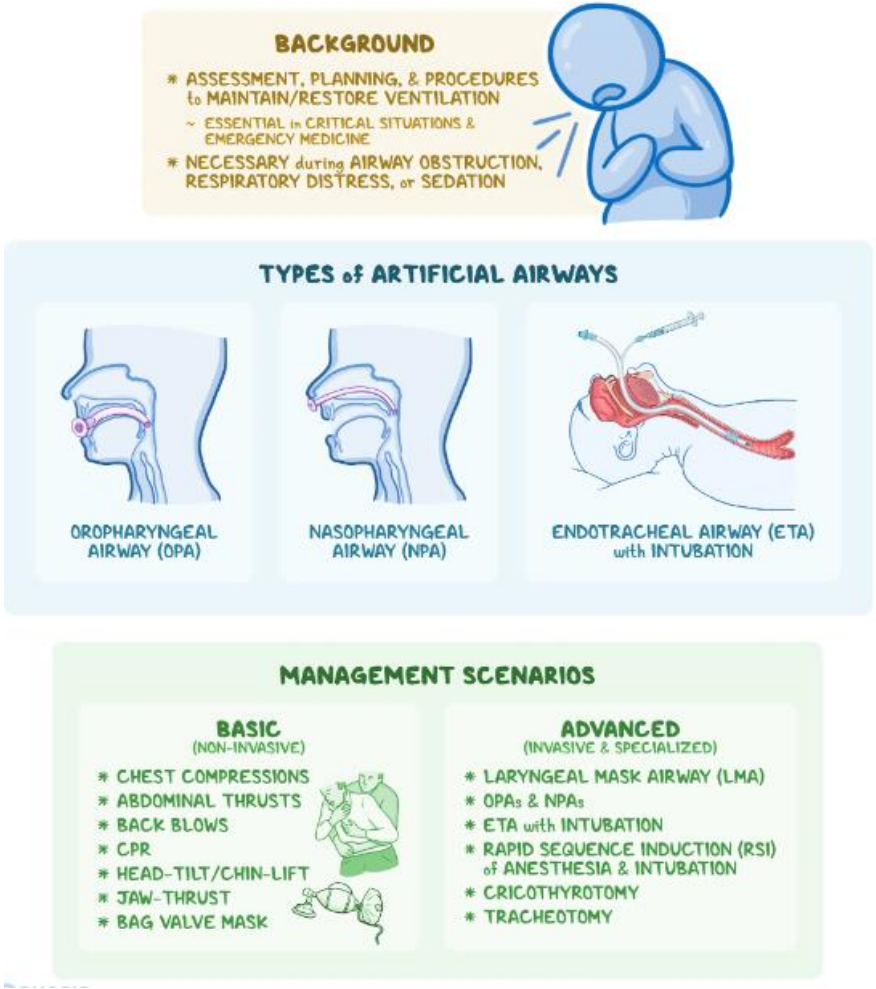
Anesthesia Equipment and Devices

- Anesthesia workstation
- Scavenging system for waste gases
- Medical gas cylinders
- Oxygen delivery systems
- Anesthesia face mask
- Airways



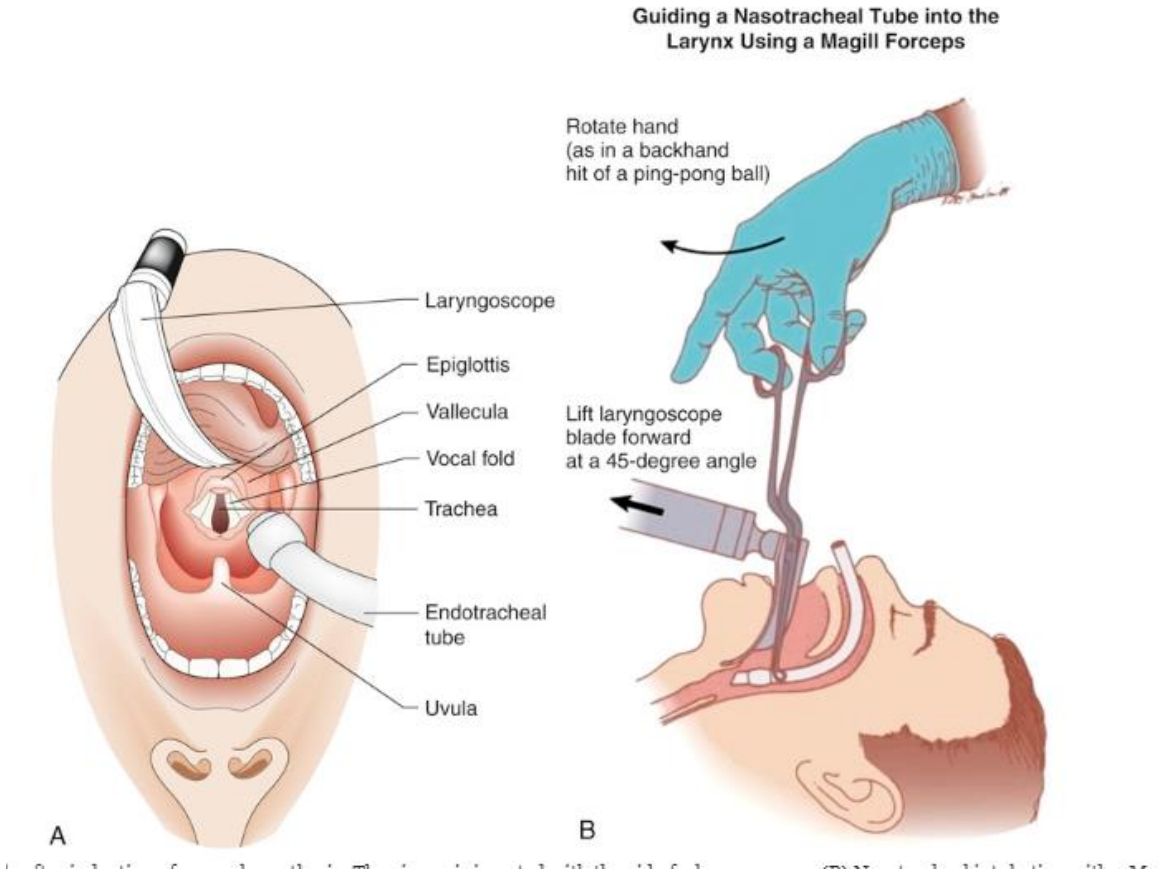
Types of Airways

- Endotracheal tube
- Laryngeal mask (LMA)
- Oropharyngeal airway (OPA)
- Nasopharyngeal airway



Intubation

- Intubation is a routine procedure during general anesthesia or an emergency to maintain the airway.
- During general anesthesia, the patient is intubated immediately after induction.
- This is the placement of a "Breathing Tube", usually an Endotracheal Tube (ET Tube) that will be used for Artificial Ventilation during Surgery



General Anesthesia

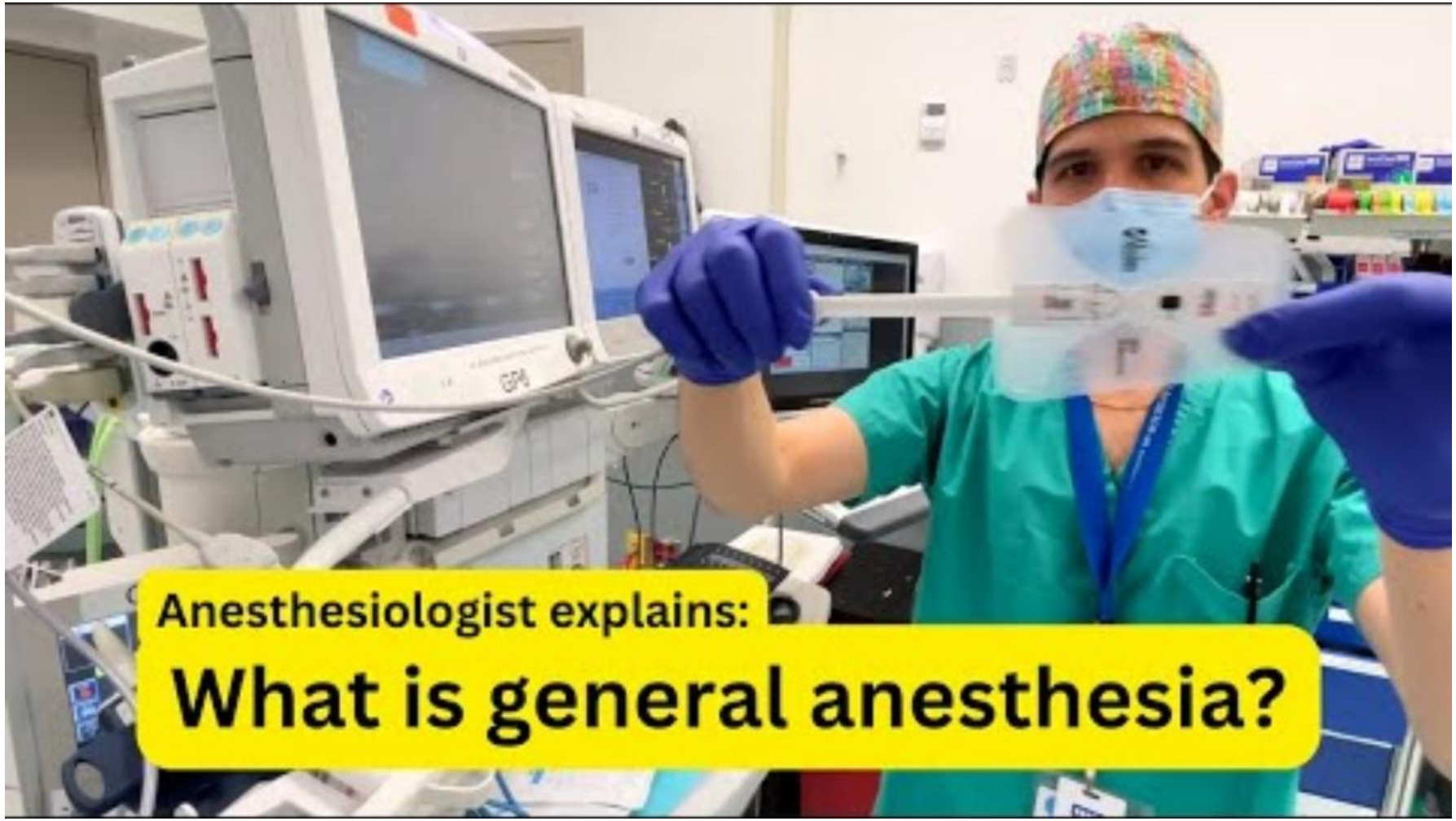
- **Reversible loss of consciousness followed by:**

- **The absence of**
  - Pain
  - Sensory perception
  - Cognition
  - Memory
  - Some autonomic reflexes

- **Stages:**
  - Preinduction
  - Induction
  - Maintenance
  - Emergence
  - Recovery

Watch the "General Anesthesia" Video for an Overview of the different depths of Anesthesia

General Anesthesia Video



General Anesthesia Video

Summary of Video:

- Minimal Sedation
- Moderate "Conscious Sedation": purposefully responsive to verbal or tactile stimulus
- Deep Sedation
- General Anesthesia: No memory of when asleep. May use of Paralytics
- Anesthesia type is based on surgical needs

Phases of General Anesthesia

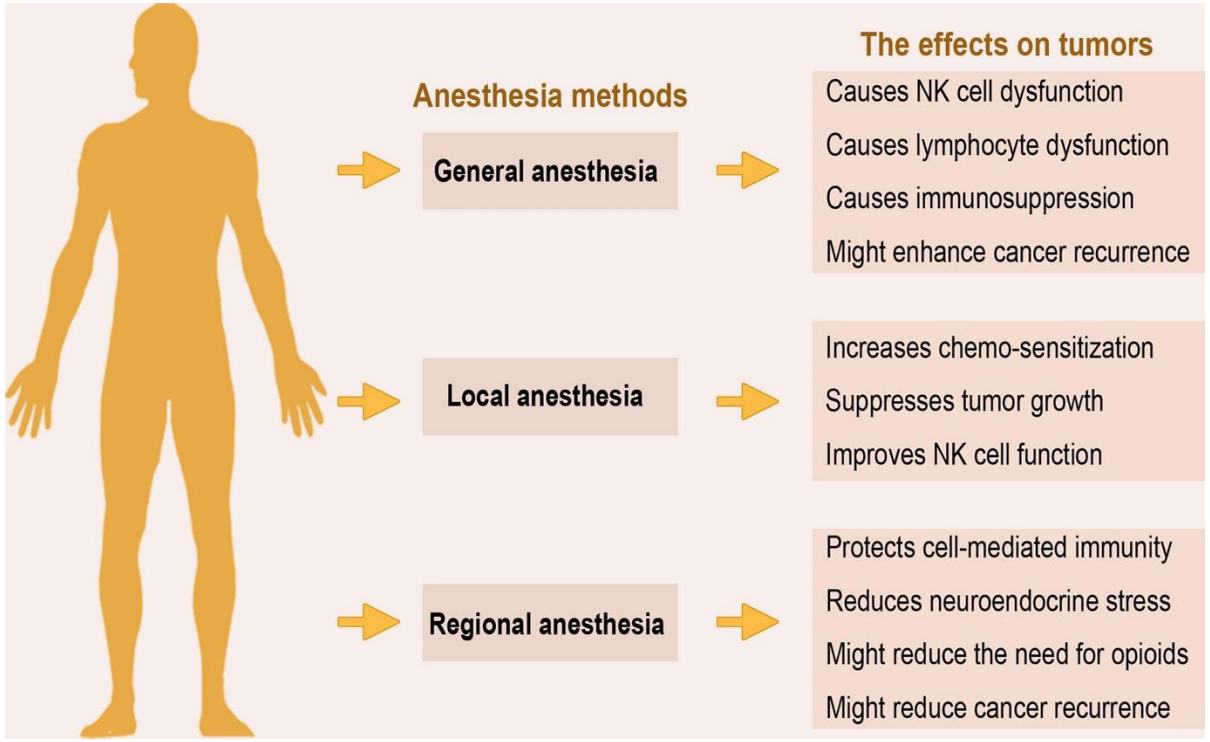
Pre-Induction phase	• Relaxation meds given w/ O2
Induction (1)	• Consciousness to unconscious-hearing last
Maintenance (2)	• Surgery, monitor vitals, pain control
Emergence (3)	• Surgery done-extubation , laryngospasm?
Recovery (4)	• Recover -OR to PACU

Risks of General Aesthesia

Nausea and Vomiting
Nerve Damage
Shivering
Itching
Aspiration Pneumonia
Headache
Muscle Aches

Regional Anesthesia

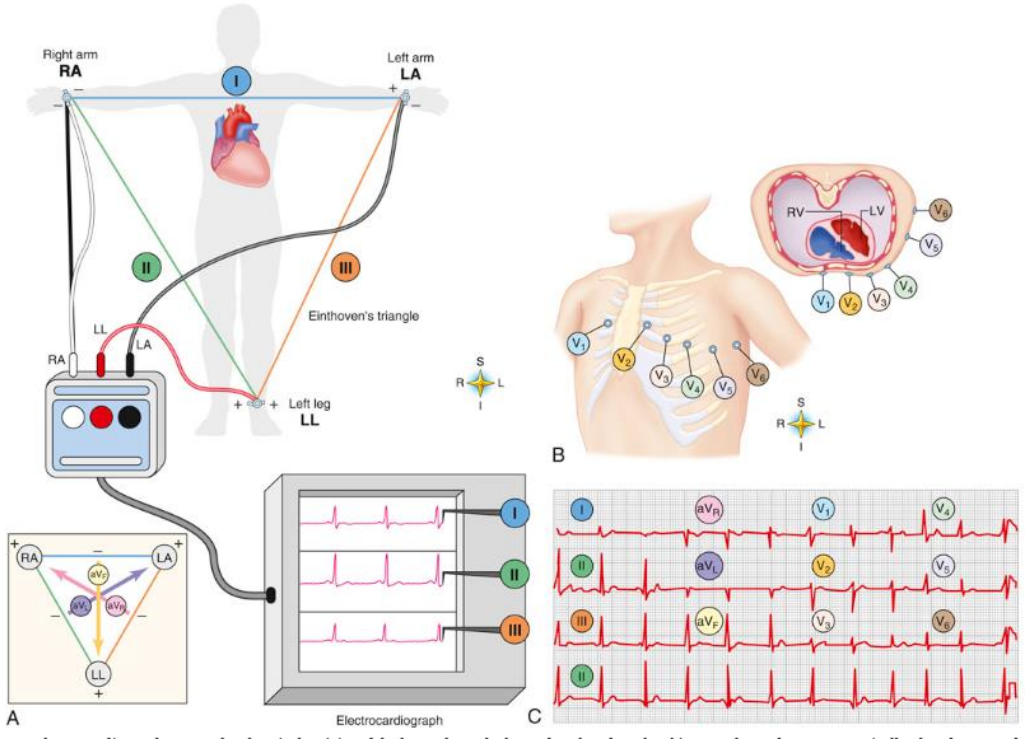
- Anesthesia specific to the region of the body it is needed.
- **Types:**
  - Topical
  - Local infiltration
  - Nerve block
  - Spinal, caudal, epidural
- Dosage must be monitored to prevent Local Anesthetic Toxicity



Physiological Monitoring During Surgery

- Oxygenation
- Ventilation
- Cardiac function
- Body temperature
- Neuromuscular response
- Fluid and electrolyte balance

- *Watch the "Monitoring for Anesthesia, Explained" Video for a review of these*



Monitoring for Anesthesia, Explained Video

Monitoring for Anesthesia, Explained Video

Summary of Video:

- Anesthesia team continually monitors vital signs and responds during surgery
  - ECG
  - O2 Saturation
  - CO2 (Capnography)
  - Blood Pressure
  - Temperature

Dissociative Anesthesia and Conscious Sedation

- Dissociative anesthesia
  - Ketamine blocks neurotransmission and associative pathways

- Conscious sedation: May also be called Monitored Anesthesia Care (MAC) Sedation or Twilight Sedation. Different levels used based on surgical need:
  - Minimal sedation
  - Moderate sedation
  - Deep sedation

Role of the Surgical Technologist in Anesthesia

- Assisting the surgeon during local infiltration.
- Assisting in aseptic techniques, including skin prep and draping.
- Aiding in draping the patient's arm and preparing sterile equipment.
- Regowning and regloving as per hospital policy after Bier block.
- Preparing spinal tray and correct size of spinal needles.
- Preparing prep solution and drapes.
- Assisting patient in maintaining position during procedure.
- Verifying type and strength of anesthetic used.

Anesthesia Emergencies

- Drug toxicity or allergic response
- Central nervous system toxicity
- Cardiovascular toxicity
- Allergic reaction
- Cardiopulmonary arrest
- Airway emergency
- Laryngospasm
- Anaphylaxis

- Shock
- Hypovolemic
- Cardiogenic
- Anaphylactic
- Neurogenic
- Septic
- Malignant hyperthermia
- Hemorrhage
- Hemolytic reaction
- Deep-vein thrombosis

Emergencies

- **Laryngospasm and Bronchospasm**
  - Spasm will block airway
  - Total obstruction
  - Positive-pressure
  - Fast-acting neuromuscular block
  - Succinylcholine-relax spasm
- **Malignant Hyperthermia**
  - Heat spike
  - Triggered by inhalation gases
  - Chill body
- **Allergic reaction**
  - Reaction to allergen
  - Mild to anaphylaxis
  - AVOID allergies

Emergencies

Shock

- Abnormal physiological state leads to:
  - Reduce cardiac output
  - Hypotension
  - Tachycardia
- Results from
  - Tissue damage
  - Blood loss
  - Sepsis
- Treatment: Treat infection, stop blood lo ss, fluid replacements, medication

HEMODYNAMICS OF SHOCK

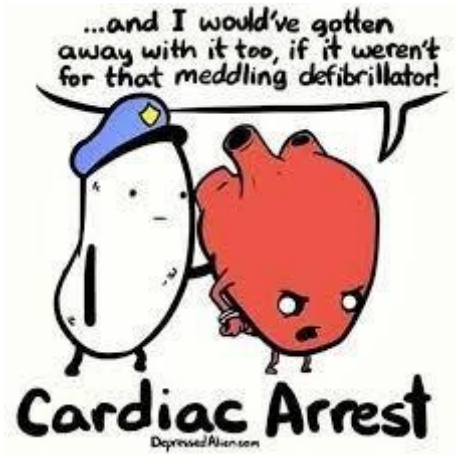
Hemodynamics of Shock

Red arrow indicates primary abnormality	PCWP (preload)	Cardiac Output	SVR (afterload)	Treatment
Hypovolemic shock	↓	↑	↑	IV fluids
Cardiogenic shock	↑	↓	↑	Inotropes Revascularization
Distributive shock (septic, neurogenic)	↓	↑	↓	Pressors IV fluids

PCWP = pulmonary capillary wedge pressure SVR = systemic vascular resistance

Emergencies

- **Cardiac dysrhythmias**
  - Abnormal heat rhythm
  - Atrial or ventricular
  - Mild to death
  - V-dysrhythmias dangerous
- **Cardiac arrest**
  - Cessation of heart
  - NO blood flow
  - Death
  - CPR than ACLS



PACU Facility

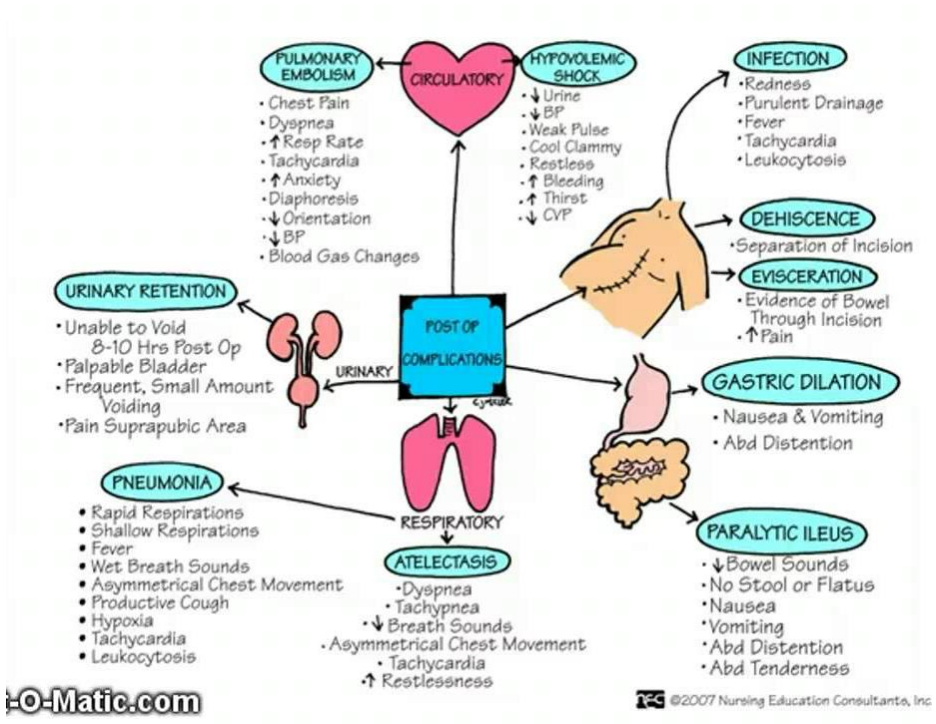
- The PACU is typically one large room with patient beds positioned in individual patient care areas.
  - Layout allows for more efficient patient care.
- The PACU is equipped with patient care supplies.
- An isolation area is also located in the PACU for select patients, such as those with an active infection.

PACU Procedures

- Admission – immediately after surgery
- Handover includes:
  - Brief patient history
  - Exact surgery and site
  - Total length of time, amount, and route of anesthesia
  - Estimated blood loss
  - Condition of the wound, drains, and other devices
  - ASA score
  - Any complications
  - Information about family members present

Patient Assessment and Care (Post-Op)

- Pain
- Alertness
- Level of calmness
- Movement
- Facial expression
- Blood pressure
- Heart rate
- Vocalization
- Muscular response
- Renal function
- Wound assessment
- Catheters and tubing



Postoperative Complications

- Pain
- Respiratory
- Airway obstruction
- Cardiovascular
- Hypothermia
- Malignant hyperthermia
- PONV (Post-Operative Nausea and Vomiting)
- Alterations in consciousness

Elements of Discharge Planning

- Collaboration between PACU staff, AP, and surgeon.
- Ensuring patient's ability to perform activities of daily living (ADLs) or arranging caregiver assistance.
- Preparation for potential postoperative problems.
- **Discharge Planning Process:**
  - Establishing discharge criteria.
  - Arranging safe patient transportation.
  - Setting objectives for home nursing care.
  - Educating patients and families.
  - Coordinating referrals and follow-up.
  - Completing documentation.

Discharge Criteria

- **Discharge Criteria:**
  - Physiological, psychological, and social conditions indicating readiness for discharge.
  - Assessment based on Aldrete scale and other criteria.
  - Ensuring patient safety outside critical care unit.
- **Transport:**
  - Arrangement of patient transport before surgery.
  - Escort accompanying patient, avoidance of public transportation.
- **Home Nursing Care:**
  - Shift from prolonged hospitalization to same-day discharge.
  - Specific objectives and instructions for home care.
  - Utilization of community resources for assistance.

Unanticipated PACU Outcomes

- **Failure to Meet Discharge Criteria**
  - Some patients may not meet criteria for discharge.
  - Further observation and care required.
  - Examples include hypothermic or posthemorrhagic patients.
- **Discharge Against Medical Advice**
  - Patient chooses self-discharge against medical advice.
  - Patient's right to leave unless posing harm.
  - Facility explains consequences and obtains signed waiver when possible.

Read Chapter 13 from the E-Book

Read Chapter 13 from your E-Book to pass the upcoming quiz from **Surgical Technology - Elsevier eBook on VitalSource, 8th Edition.**

Click Here to access Chapter 13!

Thank you!

Get ready for your quiz and rest of the activities now. Best of luck!

Congratulations!

Lesson 13 is complete.