# AIRWAY MANAGEMENT

# Objectives

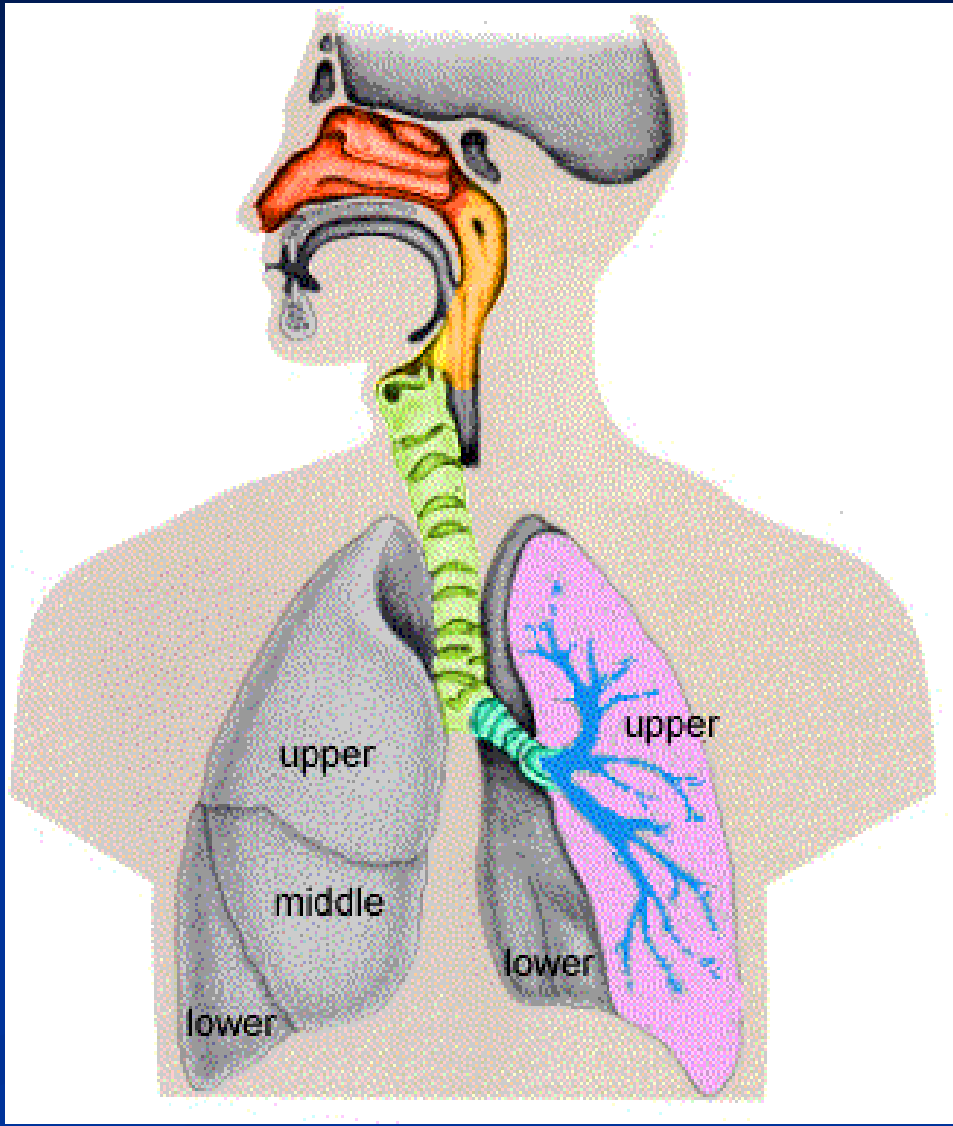
2-1.1 Identify simple facts about humidified oxygen and venturi mask, step-by-step procedures for suctioning, obtaining breath sounds, ventilating a patient with a flow-restricted oxygen-powered ventilation device, and why and when airway management techniques must be done, with at least 80% accuracy.

# Objectives

- Anatomy review
- Opening the Airway
- Techniques of Suctioning
- Airway Adjuncts
- Oxygen
- Special Considerations

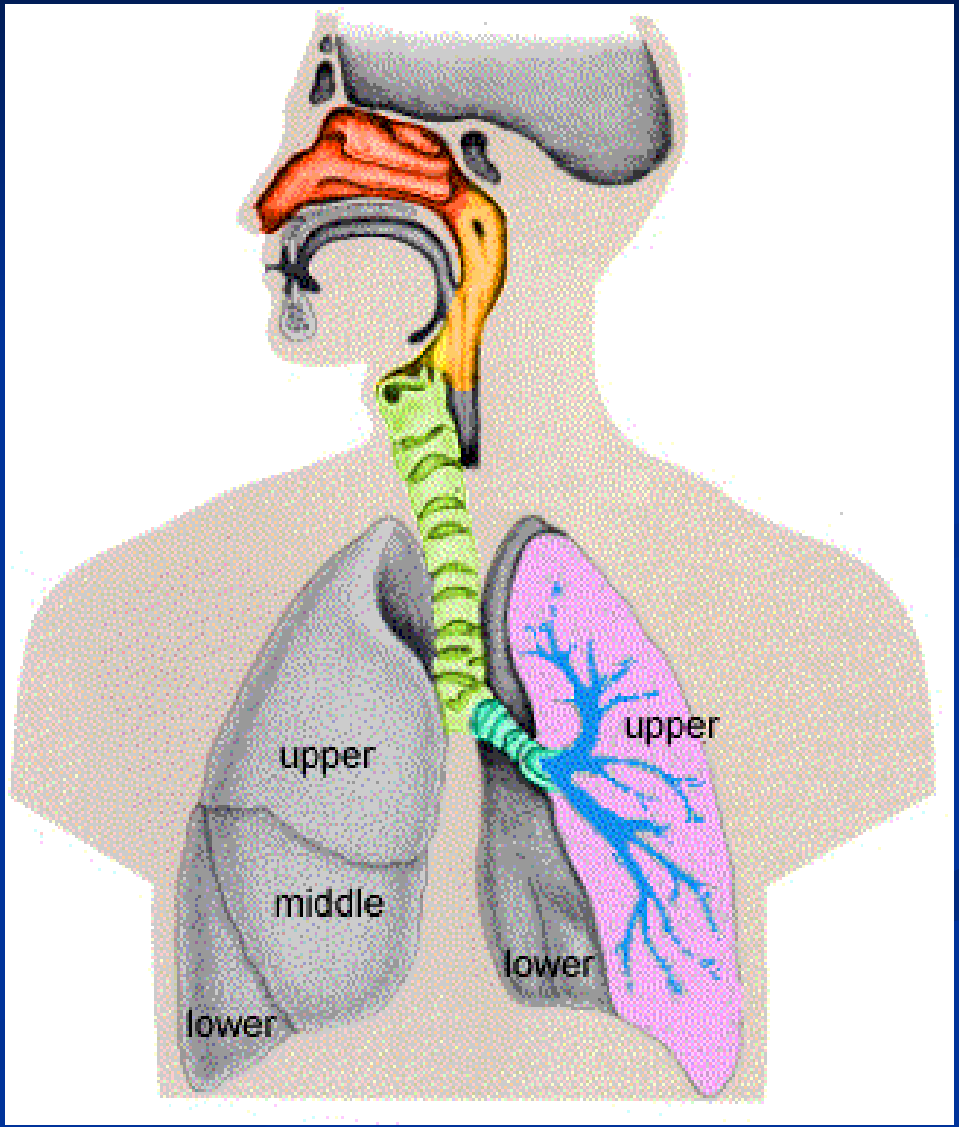
# Respiratory System

- Nose and mouth
- Pharynx
  - Oropharynx
  - Nasopharynx



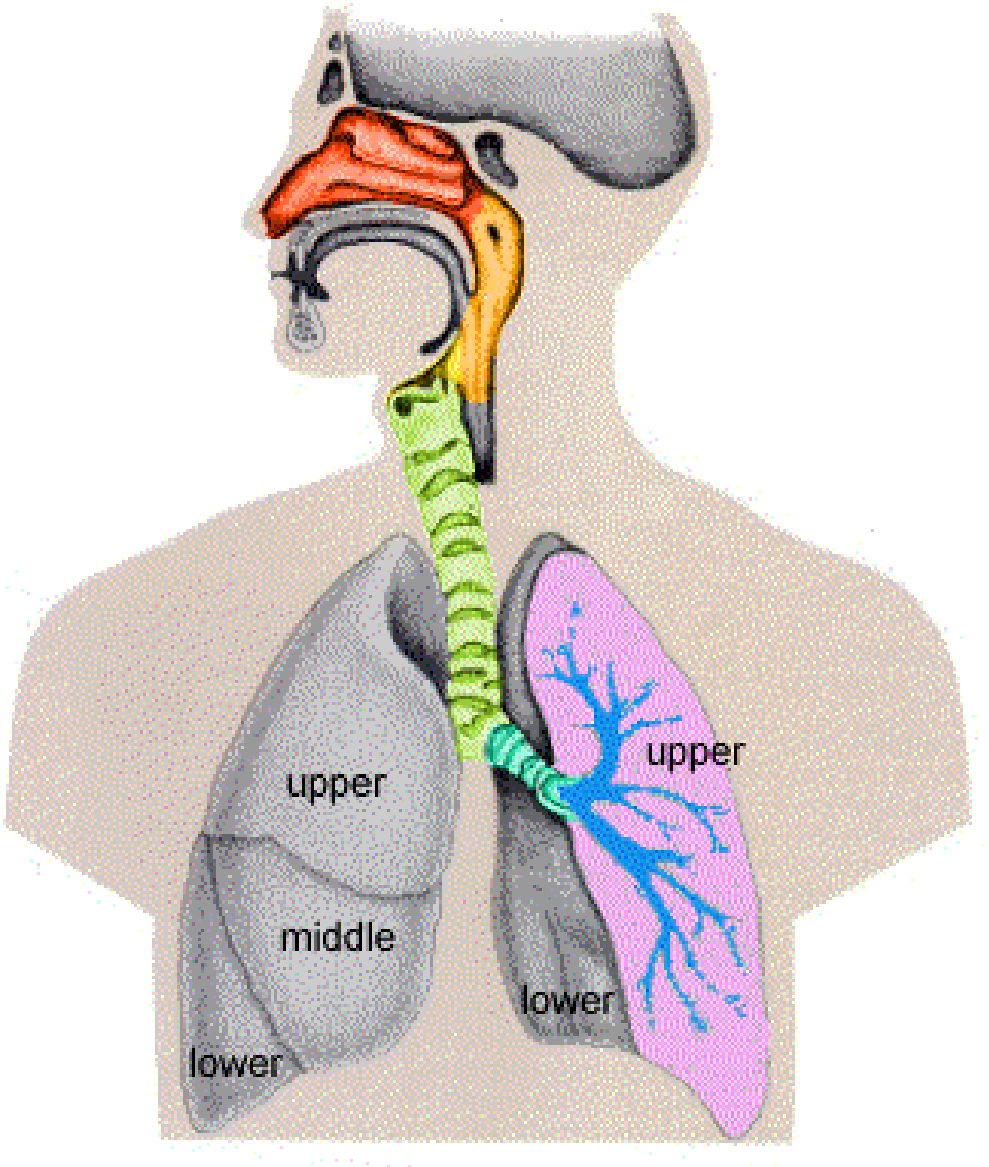
# Respiratory System

- Epiglottis
- Trachea
- Larynx
- Cricoid cartilage
- Bronchi



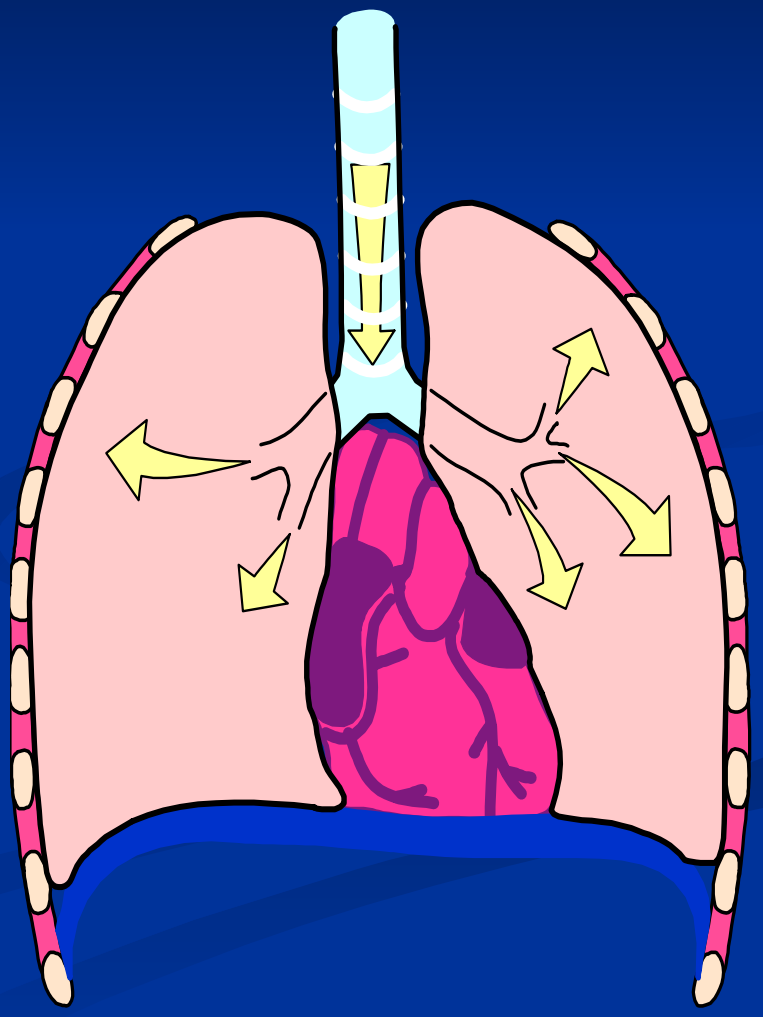
# Respiratory System

- Lungs
- Diaphragm



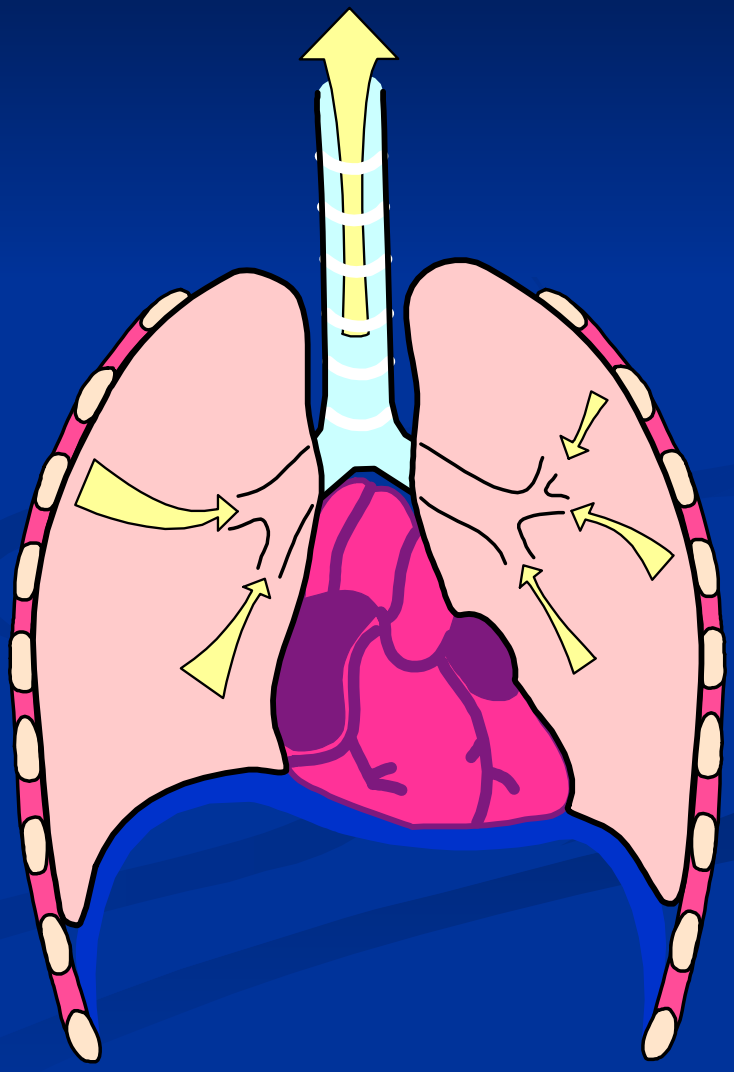
# The Process

- Inhalation (active)
  - Diaphragm contracts
    - Increases the size of the thoracic cavity



# The Process

- Exhalation (passive)
  - Diaphragm relaxes
    - Decreasing the size of the thoracic cavity



# Respiratory Physiology

- Alveolar/Capillary exchange
  - Oxygen rich air enters the alveoli on inspiration
  - Oxygen poor blood in the capillaries passes to the alveoli

# Respiratory Physiology

- Alveolar/Capillary exchange
  - Oxygen enters the capillaries as carbon dioxide enters the alveoli

# Respiratory Physiology

- Capillary/Cellular exchange
  - Cells give up carbon dioxide to the capillaries
  - Capillaries give up oxygen to the cells

# Adequate Breathing

- Normal rate
  - Adult 12-20/min
  - Child 15-30/min
  - Infant 25-50/min
- Rhythm
  - Regular

# Adequate Breathing

- Quality
  - Breath sounds
    - Present and equal
  - Chest expansion
    - Adequate and equal

# Adequate Breathing

- Quality
  - Effort of breathing
  - Depth (Tidal Volume)

# Inadequate Breathing

- Rate
  - Outside the normal ranges

# Inadequate Breathing

- Quality
  - Breath sounds
    - Diminished or absent
  - Chest expansion
    - Unequal or inadequate
  - Increased breathing effort

# Inadequate Breathing

- Depth
- Skin
  - Cyanotic
  - cool/clammy
- Muscle retractions
  - Often seen in children

# Inadequate Breathing

- Nasal flaring
  - Often seen in children
- See-saw respirations in infants
- Agonal Respiration's
  - Gasping respirations

# Infant/Child Anatomy Considerations

- Mouth/nose
- Pharynx
- Trachea (windpipe)
- Cricoid cartilage
- Diaphragm

# Effective Artificial Ventilations

- Rise and fall of chest
- Regular ventilation rate
  - Adults-12/min
  - Children/Infants-20/min
- Heart rate returns to normal

# Opening the Airway

- BSI
- Head tilt, chin lift
  - No suspected neck injuries
- Jaw-thrust
  - Suspect spinal injuries

# Suctioning Techniques

- BSI
- Purpose
  - Remove blood, liquids and food particles from the airway

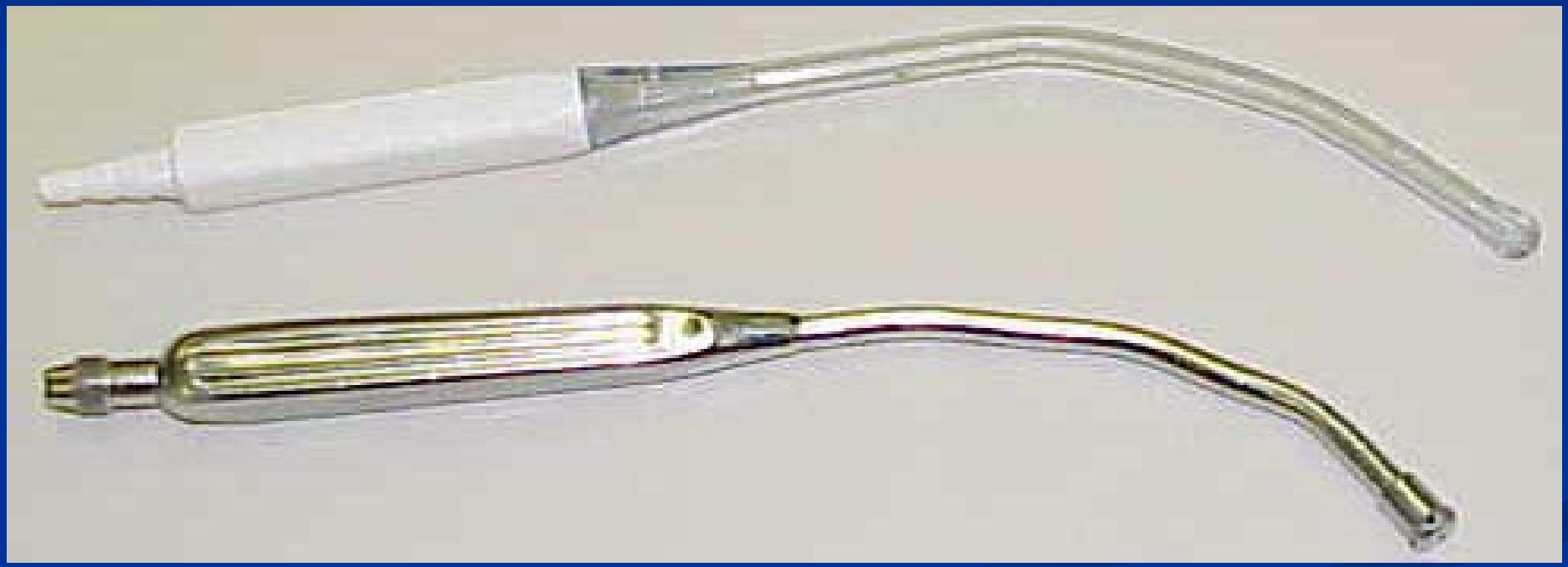
# Suctioning Techniques

- Types of units
  - Mounted
  - Portable
    - Electric
    - Hand operated

# Suctioning Techniques

- Suction Catheters
  - Hard/rigid
    - Used to suction mouth/oropharynx

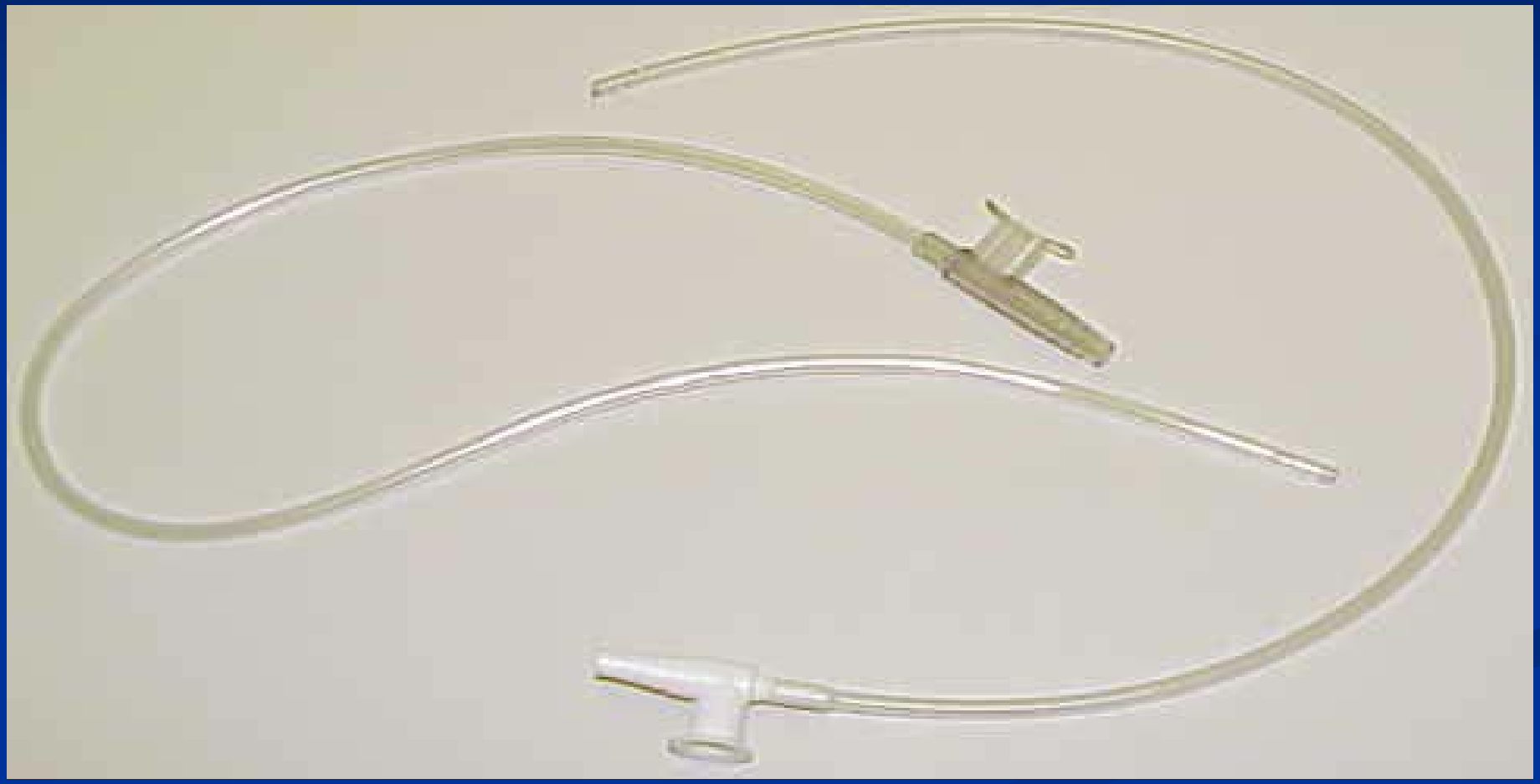
# Hard/Rigid Catheter



# Suctioning Techniques

- Soft (French)
  - Useful for suctioning nasopharynx

# Soft/French Catheter



# Techniques of Artificial Ventilation

- Mouth to mask
- Two-person BVM
- FROPVD
- One-person BVM

# Mouth-to-Mask

# Mouth-to-Mask

- Should be connected to oxygen
- Provides 50% oxygen concentration

# Bag-Valve-Mask (BVM)

# Bag-Valve-Mask (BVM)

- Consists of
  - Self-inflation bag
  - One way valve
  - Oxygen reservoir
- Delivers close to 100% oxygen

# Bag-Valve-Mask Issues

- Provides less volume than mouth-to-mask
- More effective with two people
- Available in infant, child, adult sizes
  - Remember CPR?

# Flow restricted, oxygen-powered ventilation device

# FROPVD

- Highest oxygen delivery
- Pressure relief valve
- Audible alarm

# Bag to Stoma or Tracheostomy Tube

- Tracheostomy – an artificial permanent opening in the trachea
- If unable to ventilate, suction
- Need to seal the mouth and nose when air is escaping during ventilation

# Bag to Stoma or Tracheostomy Tube

- Bag-valve-mask to stoma
  - Use infant or child size mask to ventilate
  - Technique very similar to ventilating though mouth
  - Head and neck position not important

# Airway Adjuncts

- Oropharyngeal Airway
  - Used on all unconscious patient's without a gag reflex
  - Must be correctly sized
    - Corner of mouth to bottom of the ear lobe

# OP Airway

# Airway Adjuncts

- Nasopharyngeal Airway
  - Less likely to stimulate gag reflex
  - Select proper size
    - Tip of nose to the tip of the ear lobe

# Airway Adjuncts

# Oxygen

- Different sizes
  - D – 350 liters
  - E – 625 liters
  - M – 3000 liters
  - G – 5300 liters
  - H – 6900 liters

# Oxygen

- Pressure regulators
  - Full tank has 2000 psi
  - Attach by pin indexing safety system
- Flowmeter
  - Allows flow of oxygen 1-15 lpm

# Regulator/Flowmeter

# Oxygen

- Humidifiers
  - Prevents drying of the mucous membranes
  - Used on long transports

# Equipment for Oxygen Delivery

- Non-rebreather mask (NRB)
  - Best way to deliver high concentration of oxygen 12-15 lpm
  - Up to 90% concentration

# NRB

# Equipment for Oxygen Delivery

- Nasal cannula
  - Rarely the best method for oxygen delivery
  - Used on patient's who do not tolerate the NRB
  - Delivers 24-44% oxygen at 1 - 6 lpms

# Nasal Cannula

# Equipment for Oxygen Delivery

- Simple face mask
  - Up to 60% oxygen at 6-10 lpm
- Venturi mask
  - Provides precise oxygen concentrations
  - Commonly used for COPD pts

# Special Considerations

- Patient's with laryngectomies
- Infants and children
- Facial injuries
- Obstruction (FBAO)
- Dental appliances

# Review

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