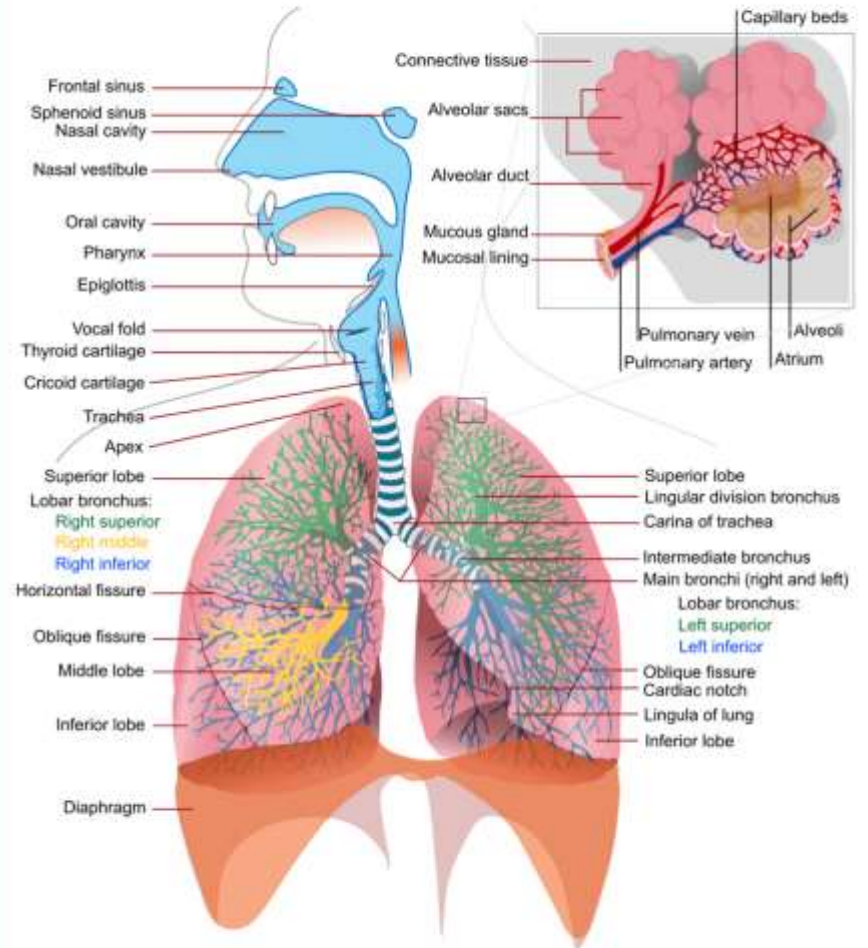


# CHAPTER 5

## RESPIRATORY SYSTEM

# Respiratory System



# Lesson 5.1

## **FUNCTION, ANATOMY, PHYSIOLOGY, AND PROCEDURES OF THE RESPIRATORY SYSTEM**

1. State the function of the respiratory system and analyze associated terminology.
2. Write the names of the structures of the respiratory system when given their descriptions, define the terms associated with these structures, and label the structures.
3. Write the meanings of word parts associated with this system and use them to build and analyze terms.
4. Distinguish between structures of the upper respiratory tract and those of the lower respiratory tract.
5. Write or recognize the sequence of the flow of air from the atmosphere through the respiratory structures.
6. Match the structures of the respiratory system with the instruments and procedures that are used to study them, or write the names of the procedures when given their descriptions.

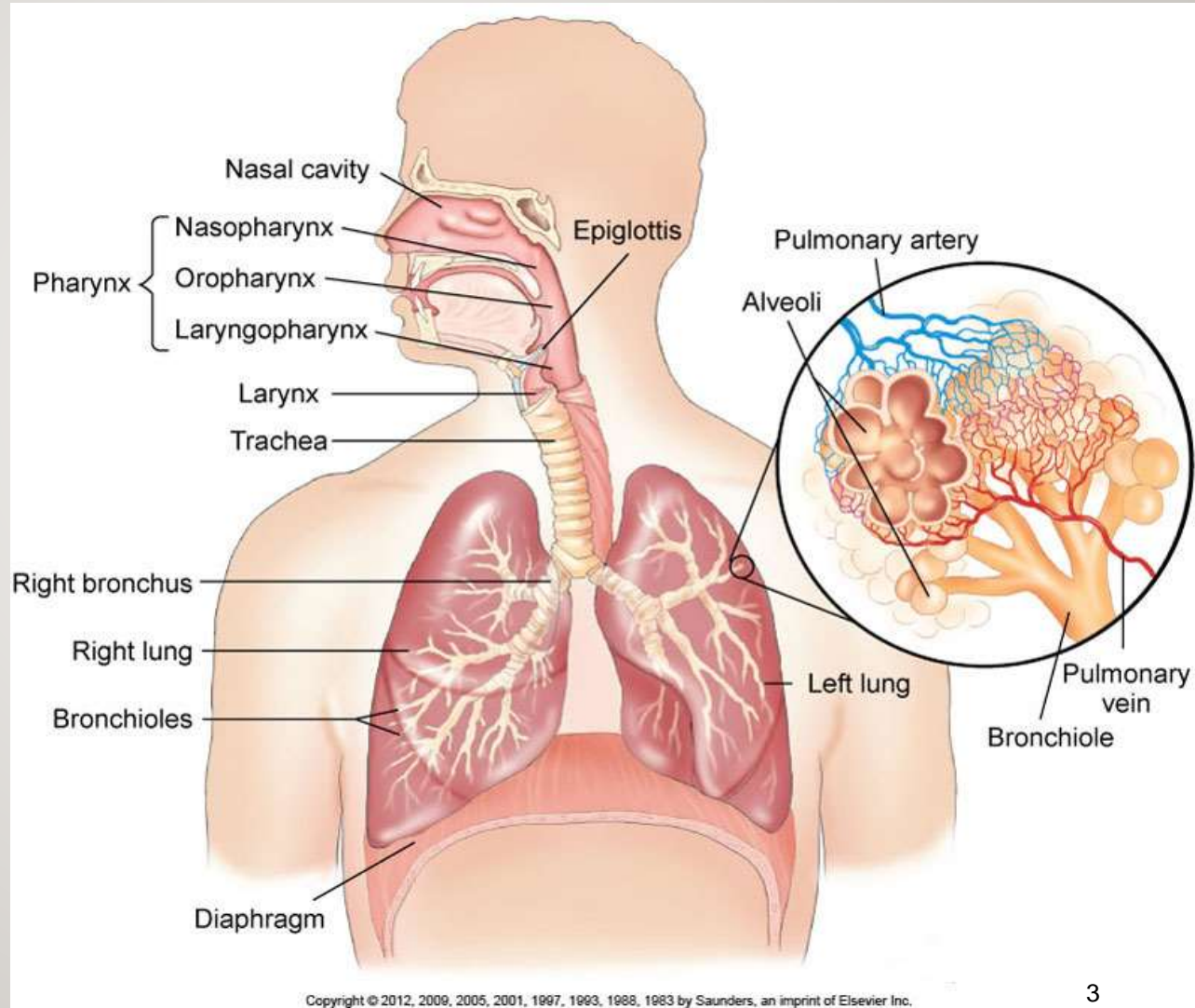
# STRUCTURES OF THE RESPIRATORY SYSTEM

## Upper Respiratory

- Nose
- Nasal cavity
- Paranasal sinuses
- Pharynx
- Larynx

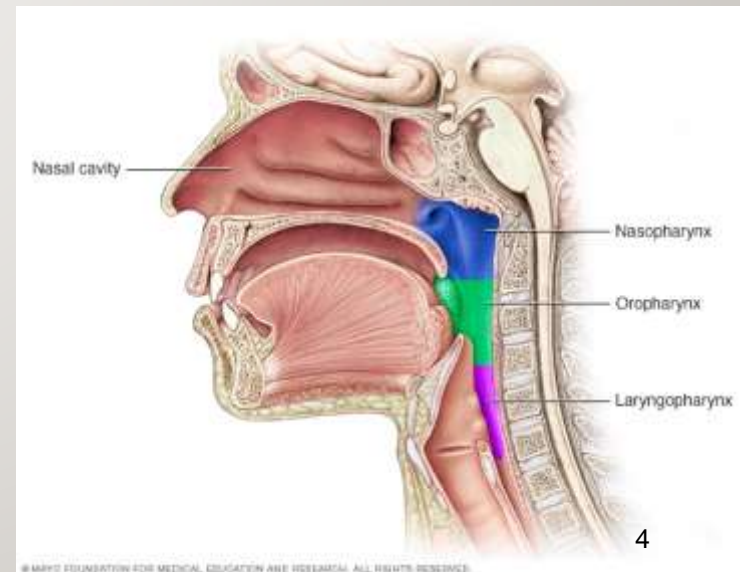
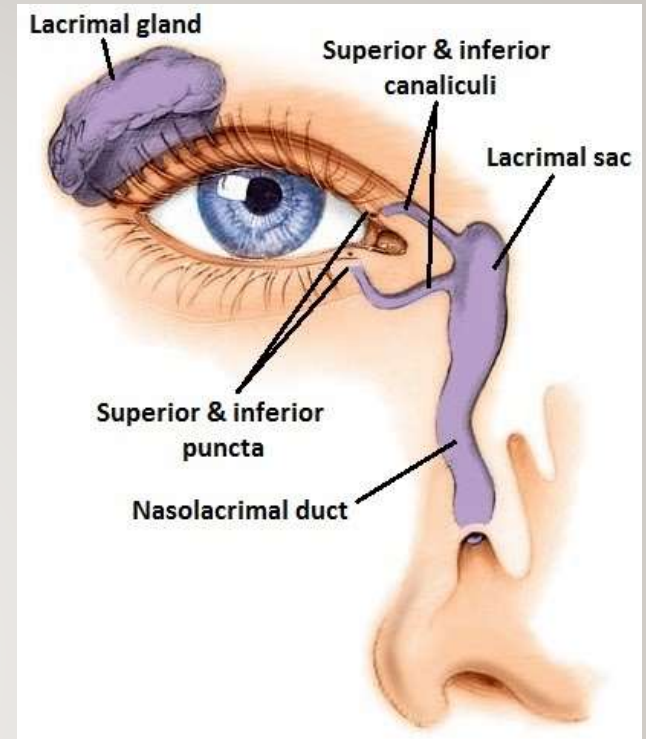
## Lower Respiratory

- Trachea
- Lungs
  - Primary bronchi (2), secondary bronchi
  - Bronchioles
  - Alveolar ducts
  - Alveoli



# TERMINOLOGY: UPPER RESPIRATORY TRACT

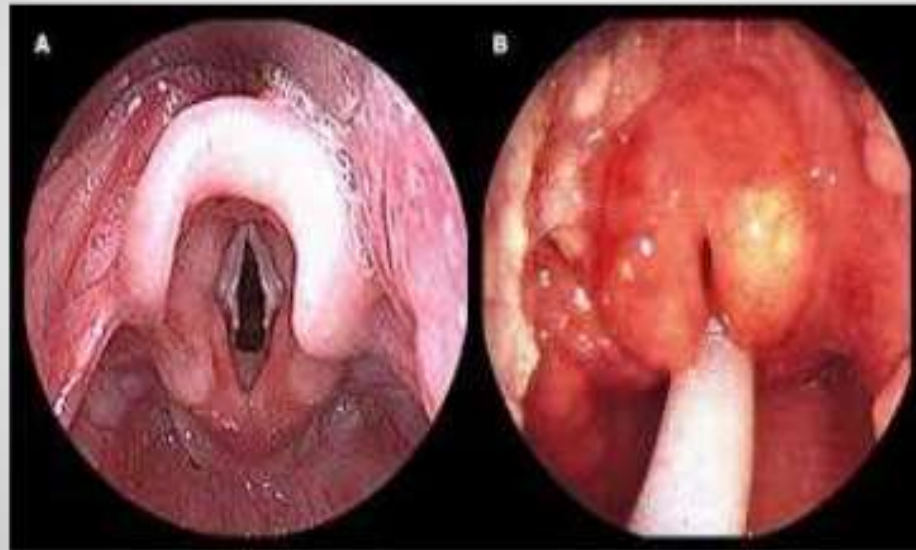
- Retronasal, supranasal, endonasal
- Nasal septum, nares, naris
- Nasolacrimal duct, lacrimal
- Oral, palate, palatine, uvula
- Olfactory, olfaction
- Nasopharynx, oropharynx, laryngopharynx
  - Pharyngeal, laryngeal, laryngopharyngeal
- Glottis, vocal cords
- Epiglottis (epiglottides)





Marked **edema** of  
supraglottic structures

Airways obstruction



Normal  
epiglottis

Swollen and **red**  
epiglottis

# UPPER RESPIRATORY ABNORMALITIES

- Croup, diphtheria, pertussis
- Aphonia, dysphonia
- Dysphasia, aphasia
- Coronavirus: severe acute respiratory syndrome (SARS)
- Influenza

# UPPER RESPIRATORY ABNORMALITIES

- Palatitis, pharyngitis, pharyngodynia, nasopharyngitis
- Pharyngomycosis, pharyngopathy
- Tonsillitis, laryngitis, laryngalgia, laryngoplegia
- Laryngospasm, laryngopathy
- Epiglottitis, epiglottiditis

# UPPER RESPIRATORY ABNORMALITIES

- Upper airway obstruction, respiratory arrest
- Sinusitis, rhinitis
  - Coryza, rhinorrhea
- Rhinorrhagia, epistaxis (nosebleed)
- Rhinolithiasis, rhinoliths

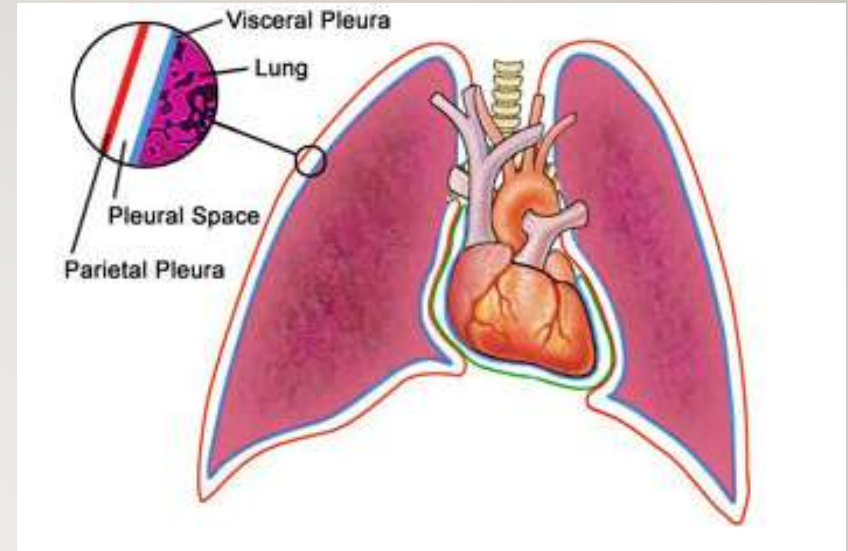


# COMBINING FORMS: UPPER RESPIRATORY TRACT

- Nas(o), rhin(o)                      nose
- Epiglott(o)                              epiglottis
- Laryng(o)                                larynx
- Palat(o)                                 palate
- Pharyng(o)                              pharynx
- Sin(o), sinus(o)                        sinus

# TERMINOLOGY: LOWER RESPIRATORY TRACT

- Tracheal, endotracheal
- Bronchial, alveolar
- Bronchoalveolar, interalveolar
- Apex, apical; base, hilum
- Mediastinum
- Pleura, visceral, visceral pleura, parietal pleura
  - Pleural, extrapleural, pleural cavity
- Pulmonary, pulmonic
  - Extrapulmonary, subpulmonary
- Diaphragm,
  - Diaphragmatic
- Phrenic, subphrenic space



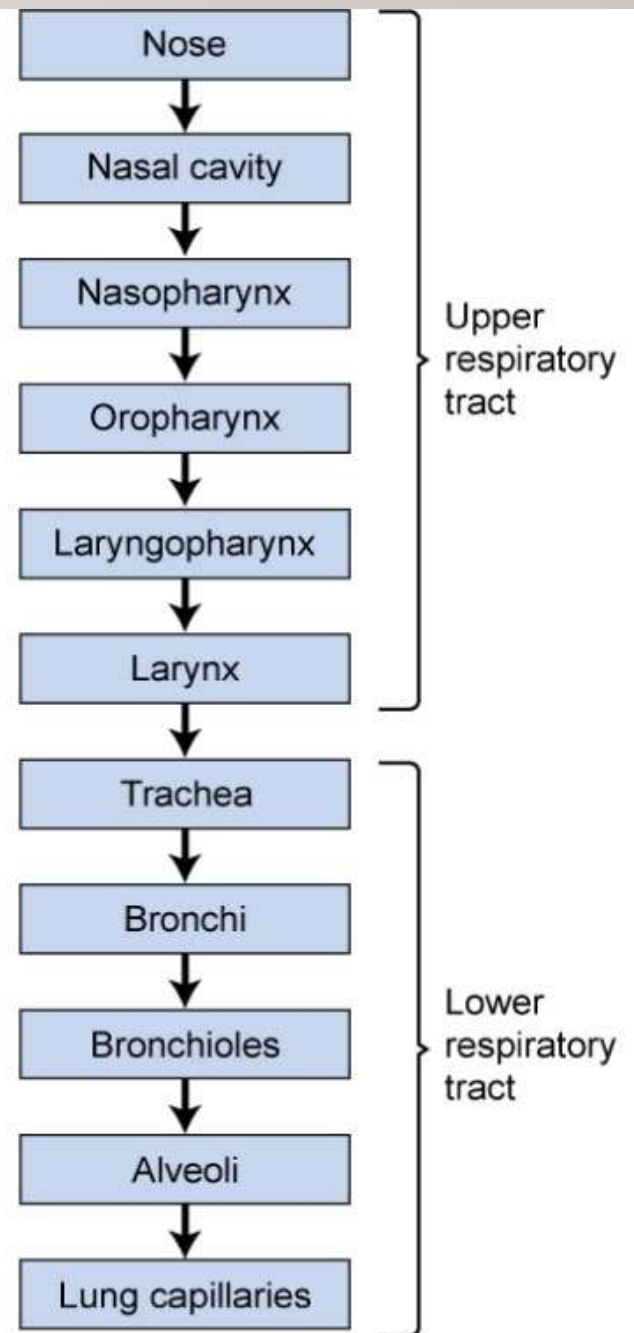
# LOWER RESPIRATORY ABNORMALITIES

- Infections
- Obstructive conditions
- Malignancies
- Aplasia
- Respiratory distress syndrome (RDS)
- Sudden infant death syndrome (SIDS)

# COMBINING FORMS: LOWER RESPIRATORY TRACT

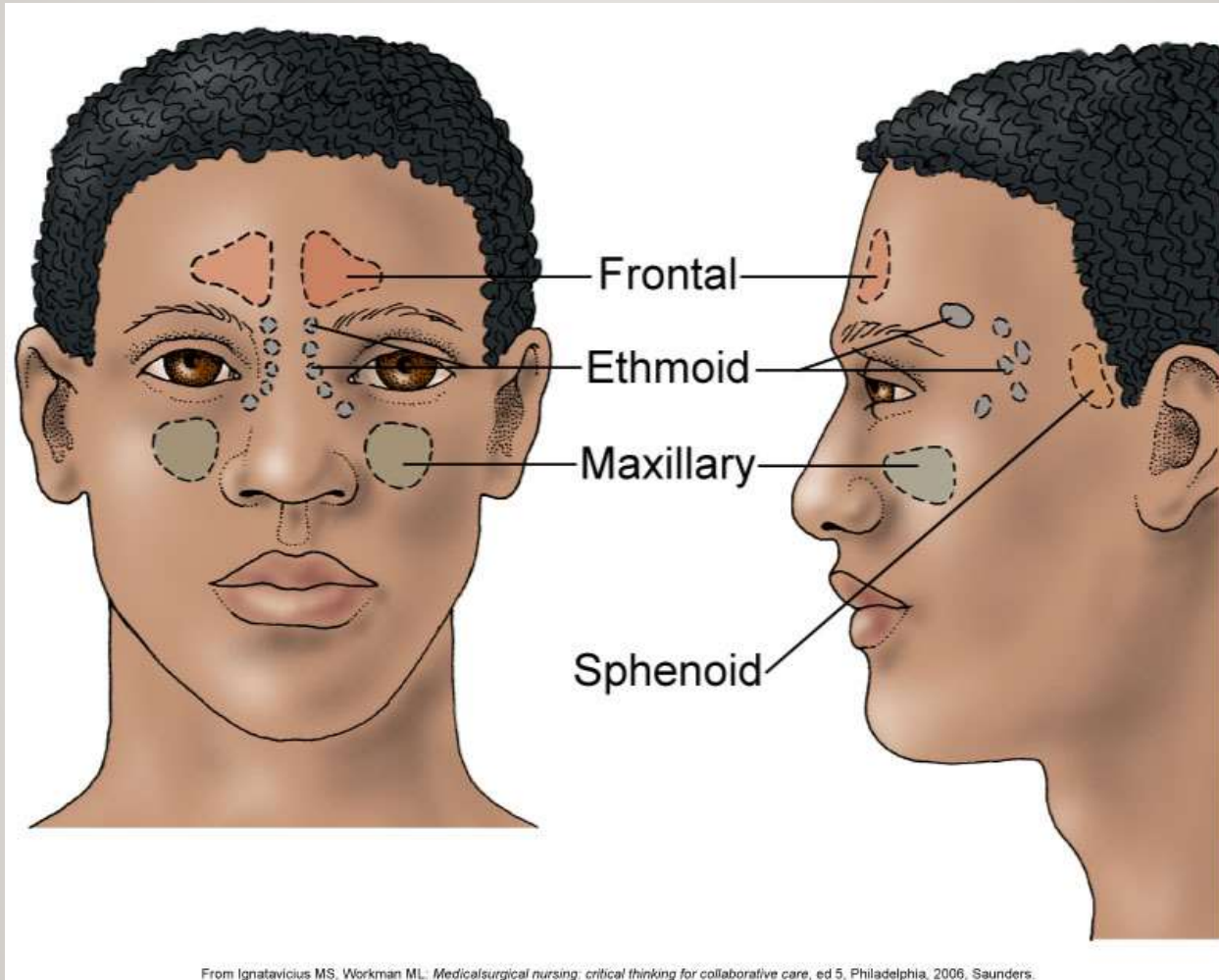
- Alveol(o) alveolus (pl. alveoli)
- Apic(o) apex
- Bronch(o), bronchi(o) bronchus (pl. bronchi)
- Bronchiol(o) bronchiole
- Lob(o) lobe
- Phren(o) diaphragm (sometimes means mind)
- Pleur(o) pleura
- Pneum(o) lungs or air
- Pneumon(o), pulm(o), pulmon(o) lung
- Thorac(o) chest
- Trache(o) trachea (windpipe)

# AIR PATH

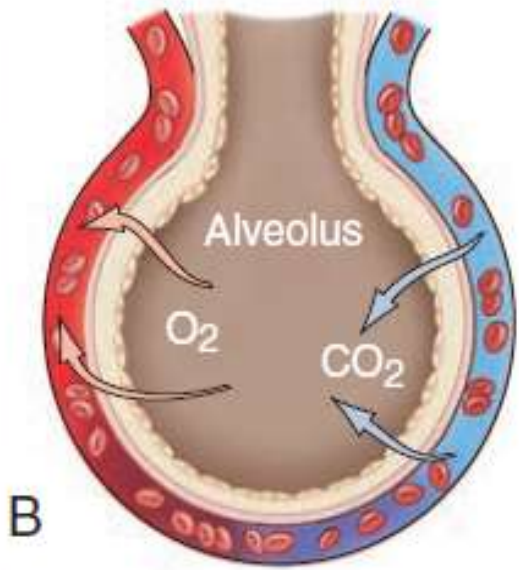
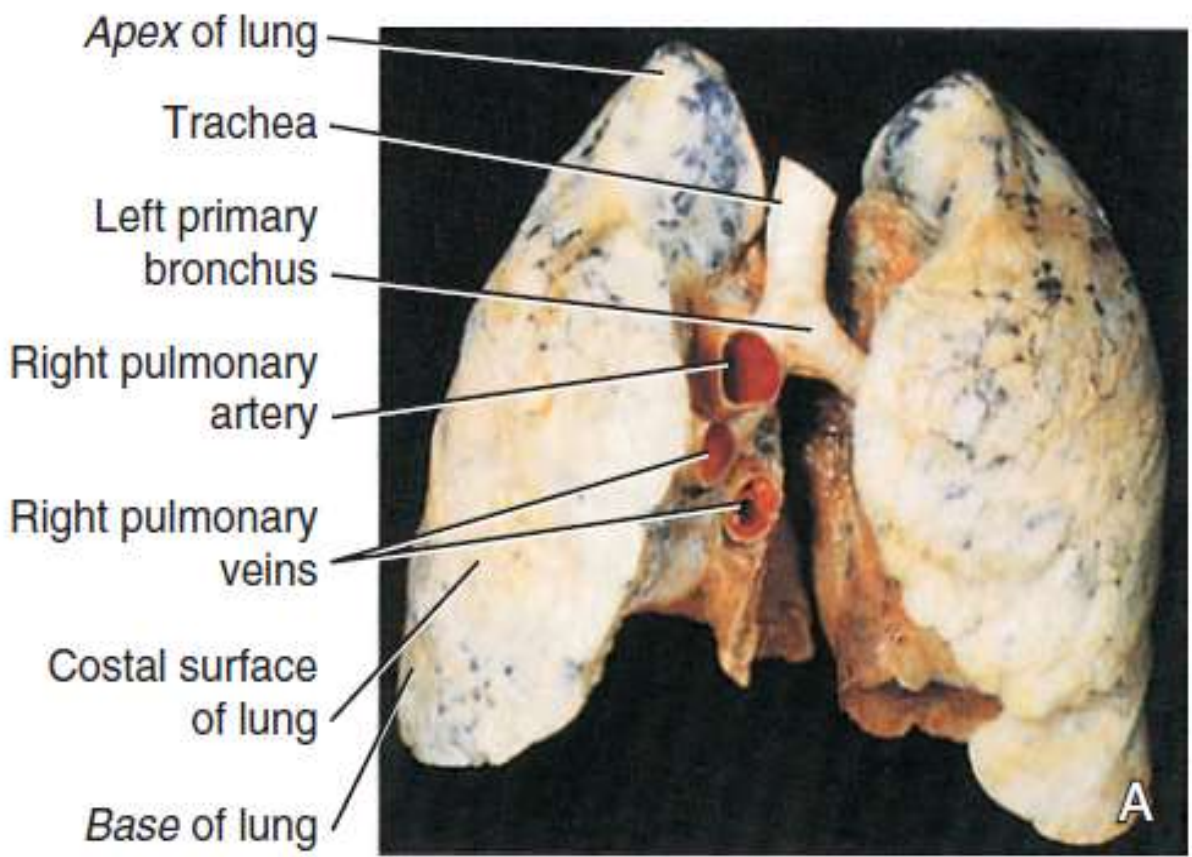




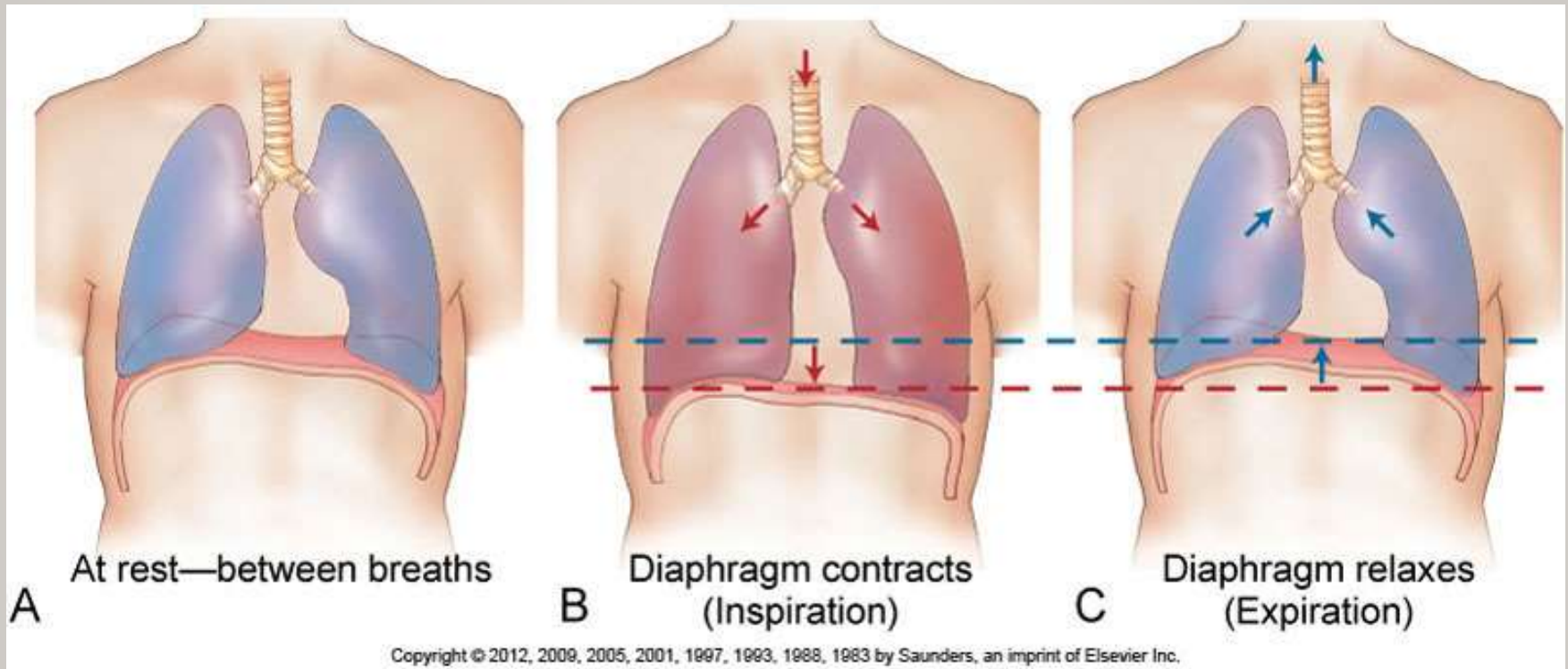
# PARANASAL SINUSES



# LUNGS, BRONCHI, AND TRACHEA



# EXTERNAL RESPIRATION



# WORD PARTS: RESPIRATORY FUNCTION

- Ox(i) oxygen
- -capnia (carbon dioxide)
- Acid(o) acid
- Alkal(o) alkaline; basic
- -ation process
- Phas(o) speech
- Phon(o) voice
- Spir(o) to breathe
- -pnea breathing
- -ptysis spitting

# TERMINOLOGY: DIAGNOSTIC TESTS AND PROCEDURES

- Pulse oximetry
- Nasal speculum, nascope
- Chest auscultation
  - Sounds: rhonchi, wheezes, crackles, friction rub, stridor
- Arterial blood gas (ABG): O<sub>2</sub>, CO<sub>2</sub>, pH
- Cultures of phlegm or sputum for bacteria or fungi
- Spirometry



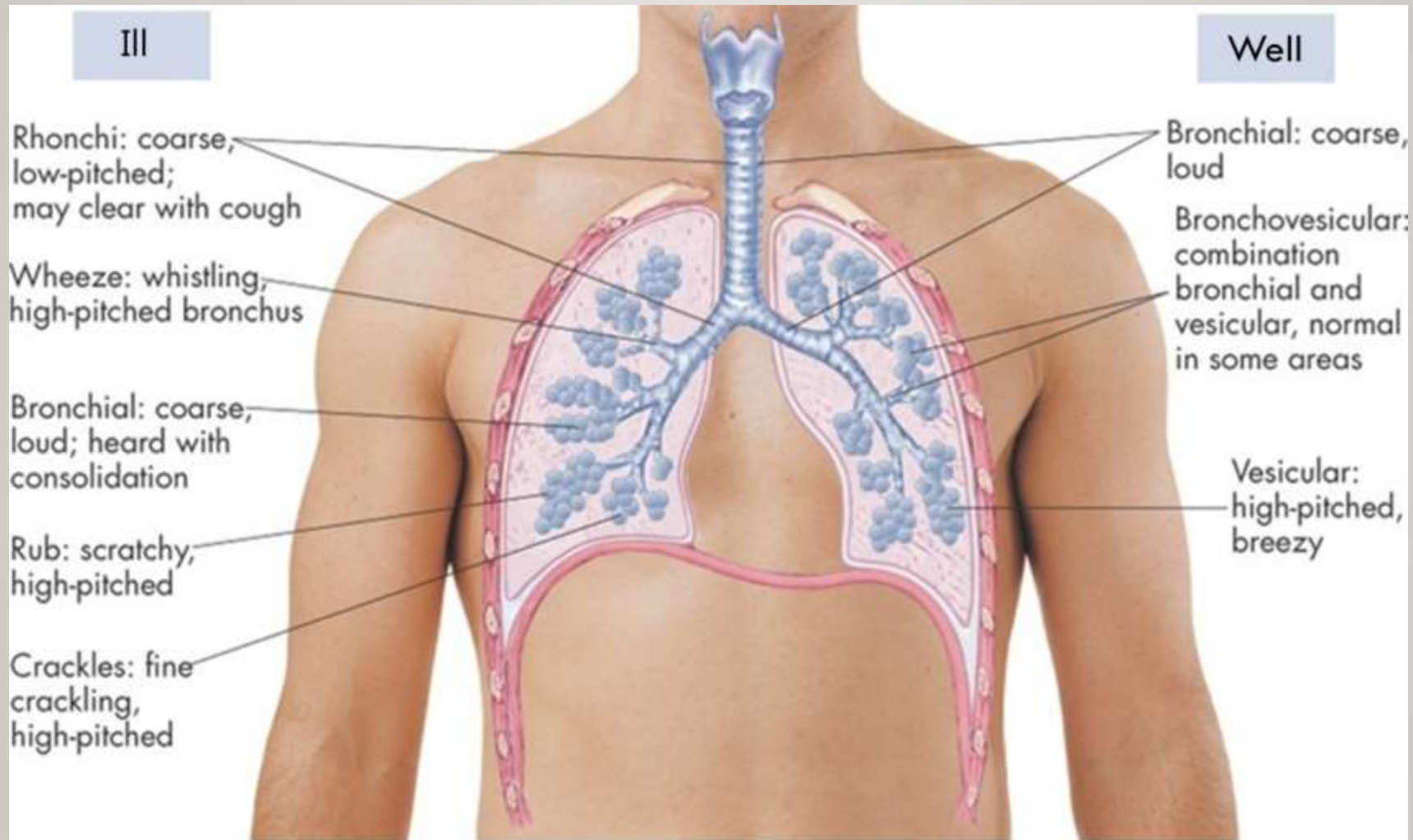
# DIAGNOSTIC TESTS: PULSE OXIMETRY



From Potter PA, Perry AG: *Basic nursing*, ed 7, St Louis, 2011, Mosby.

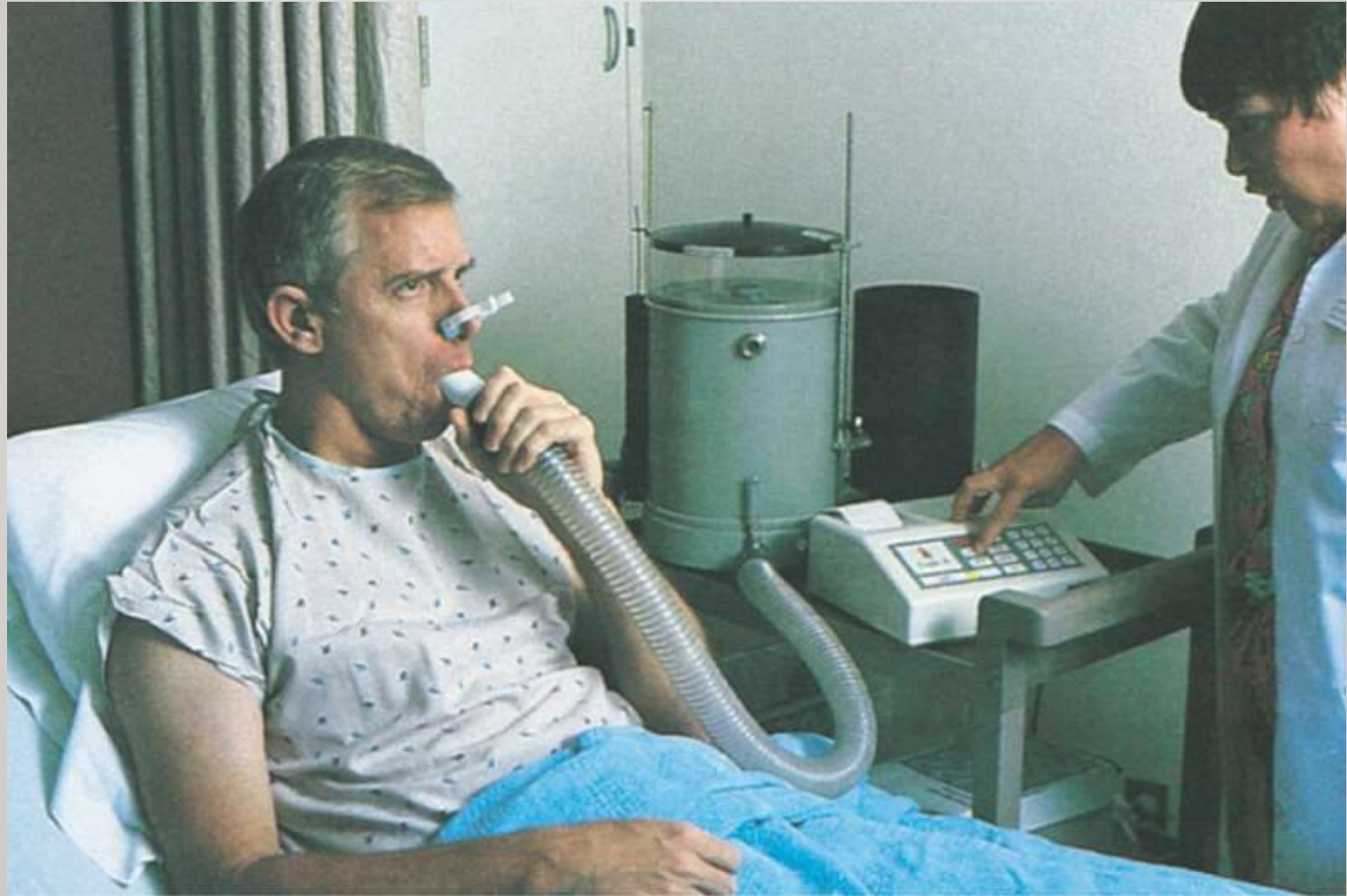
# BREATH SOUNDS

# Breath Sounds Video



From Seidel HM, Ball, JW, Dains JE, Flynn JA, Soloman BS, Stewart RW: *Mosby's Guide to Physical Examination*, ed 8, St. Louis, 2015, Mosby.

# SPIROMETRY

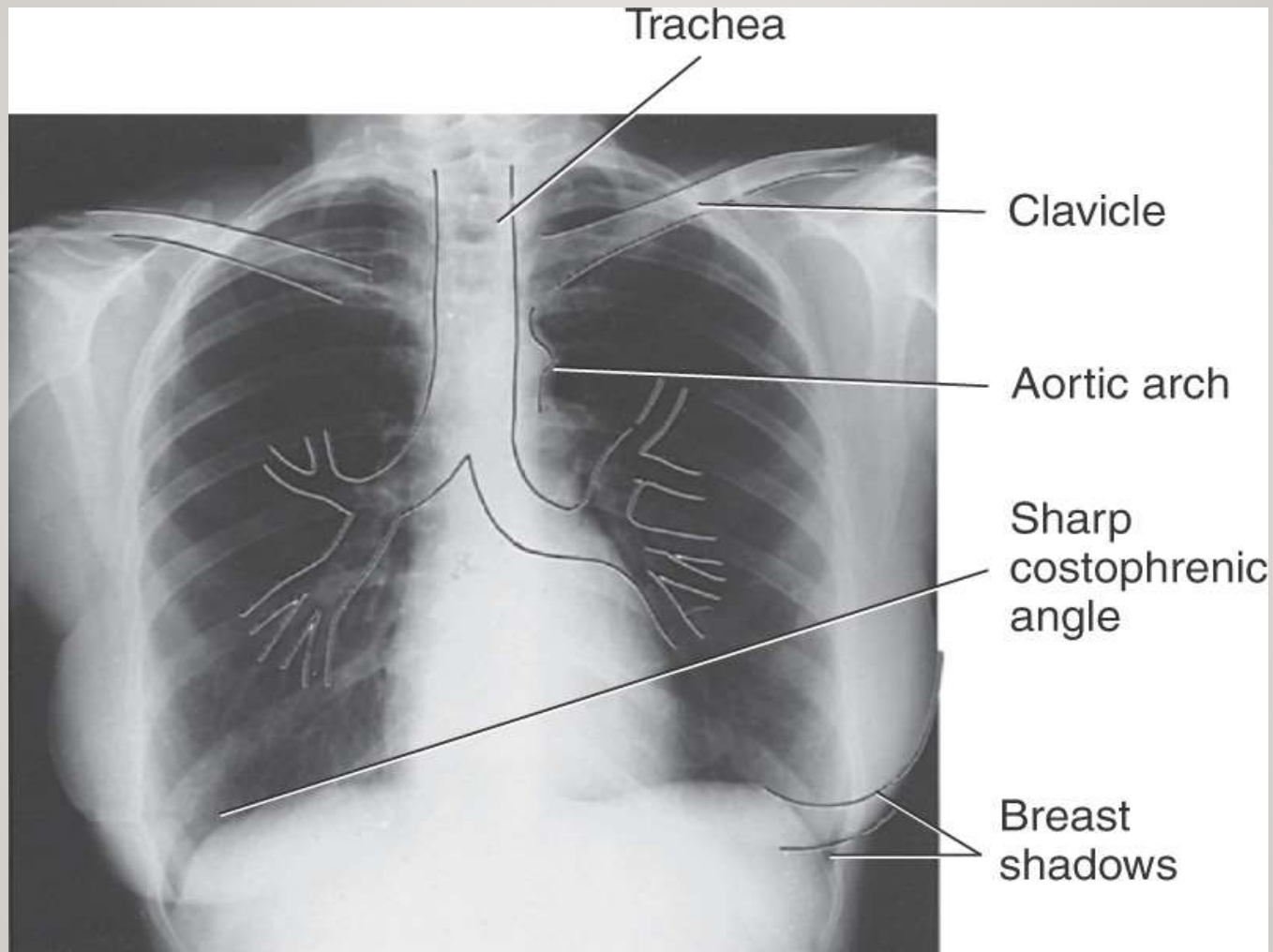


From Wilson SF, Thompson JM: *Respiratory disorders*, St Louis, 1990, Mosby.

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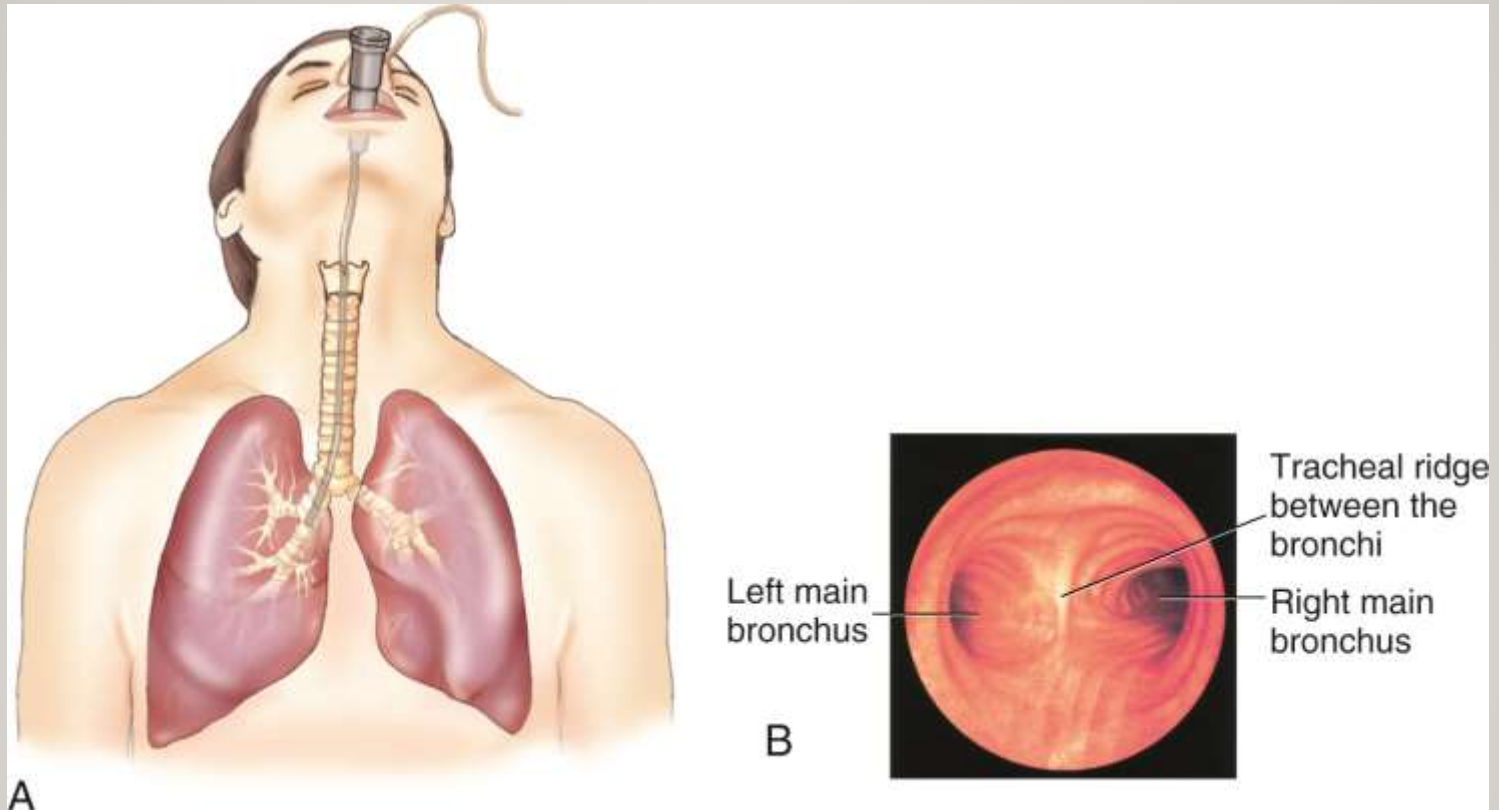


# NORMAL AP CHEST RADIOGRAPH



From Talbot LA, Myers-Marquardt M: *Pocket guide to critical care assessment*, ed 3, St Louis, 1997, Mosby.

# BRONCHOSCOPY



(B) From Drake R, Vogl W, Mitchell AWM: *Gray's anatomy for students*, ed 3, New York, 2015, Churchill Livingstone.



# TERMINOLOGY: DIAGNOSTIC TESTS AND PROCEDURES

- Pharyngoscope, laryngoscope, laryngoscopy, endoscope, tracheoscopy, tracheoscopic, bronchoscope, bronchoscopic examination, bronchoscopy, mediastinoscope, mediastinoscopy
- Laryngography, bronchography, bronchogram, chest X-ray or radiography

# TERMINOLOGY: DIAGNOSTIC TESTS AND PROCEDURES

- Pulmonary angiography
- CT, MRI, lung scans
- Pulmonary function test (PFT)

# Lesson 5.2

## **PATHOLOGIES OF THE RESPIRATORY SYSTEM**

7. Match terms for respiratory system pathologies with their meanings, or write the names of the pathologies when given their descriptions.

# DEVIATED NASAL SEPTUM



**NASAL  
POLYPS**



# LARYNGEAL POLYP



From Ignatavicius MS, Workman ML: *Medical-surgical nursing: critical thinking for collaborative care*, ed 5, Philadelphia, 2006, Saunders.



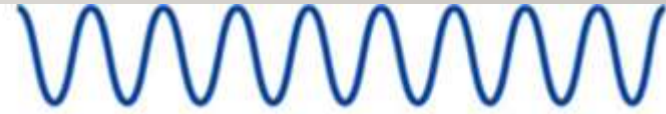
# PATHOLOGY TERMINOLOGY: BREATHING

- Hyperpnea, hypopnea
- Bradypnea, tachypnea
- Dyspnea
  - Orthopnea

## ORTHOPNEA



**Normal  
(Eupnea)**



Regular at a rate  
of 12–20 breaths per minute

**Bradypnea**



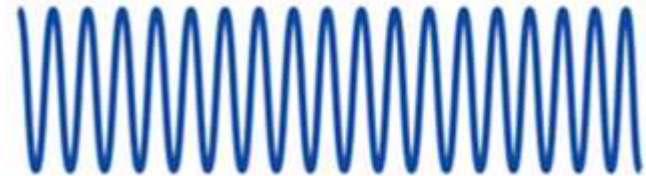
Slower than 12 breaths  
per minute

**Tachypnea**



Faster than 20 breaths  
per minute

**Hyperpnea**



Deep breathing, faster than  
20 breaths per minute

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# PATHOLOGY TERMINOLOGY: BREATHING

- Apnea
- Cheyne-Stokes respiration (CSR)
- Anoxia, hypoxia
- Hypoxemia vs. hyperoxemia
- Asphyxia, asphyxiation
- Acid-base balance
- Hyperventilation
  - Alkalosis, transient alkalosis, Alkalemia
  - Hypocapnia, acapnia
- Hypoventilation
  - Hypercapnia, acidosis, acidemia

# PATHOLOGY TERMINOLOGY: BREATHING

- Acute (or adult) respiratory distress syndrome (ARDS)
- Acute respiratory failure
- Phrenodynia (diaphragm pain), phrenitis

# STRUCTURAL DEFECTS



(A) From Lemmi FO, Lemmi CAE: *Physical assessment findings* CD-ROM, Philadelphia, 2000, Saunders.  
(B) From Seidel HM, Ball, JW, Dains JE, Benedict GV: *Mosby's guide to physical examination*, ed 6, St Louis, 2006, Mosby.

# WORD PARTS: RESPIRATORY PATHOLOGIES

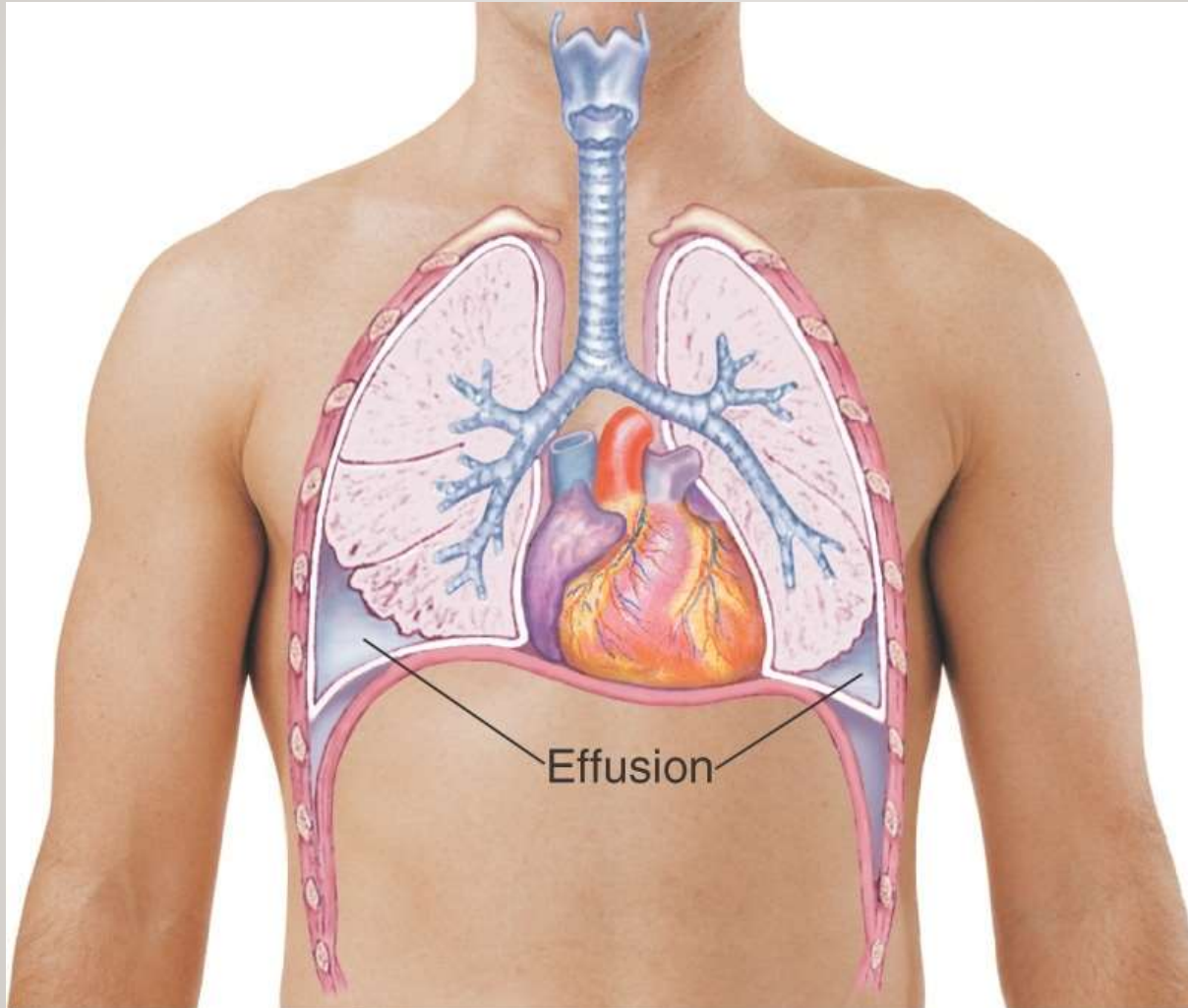
- Atel(o)                    imperfect or incomplete
- Anthrac(o)                coal
- Coni(o)                    dust
- Thromb(o)                thrombus
- Embol(o)                  embolus
- Fibr(o)                    fiber or fibrous
- Meta-                     change; next, as in a series
- -ation                    process
- -pnea                     breathing
- -ptosis                    prolapse
- -ptysis                    spitting
- -stenosis                 narrowing

# TERMINOLOGY: RESPIRATORY PATHOLOGIES

- Pulmonary abscess – lung infection
- Pleural effusion – fluid in the pleural cavity
  - Pyothorax or empyema – fluid contains pus
    - Pulmonary fibrosis
- Pneumothorax, pneumohemothorax – gas in the pleural cavity
- Pulmonary edema, congestive heart failure
- Pleuritis or pleurisy
- Pleuropneumonia
  - pleurodynia, pleural adhesions
- Pulmonary embolus, embolism



# PLEURAL EFFUSION



From Wilson SF, Giddens JF: *Health assessment for nursing practice*, ed 2, St Louis, 2001, Mosby.

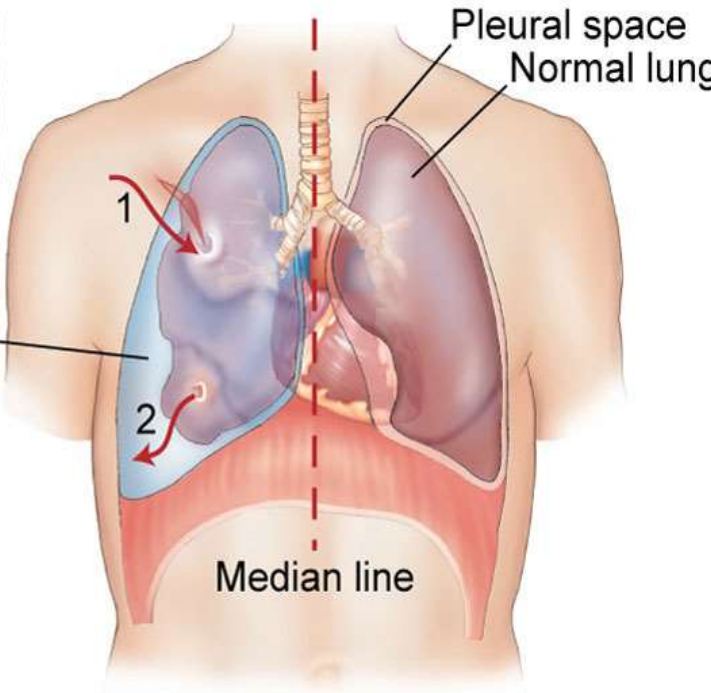
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# PNEUMOTHORAX AND HEMOTHORAX

Outside air rushes in due to disruption of chest wall and parietal pleura

Air

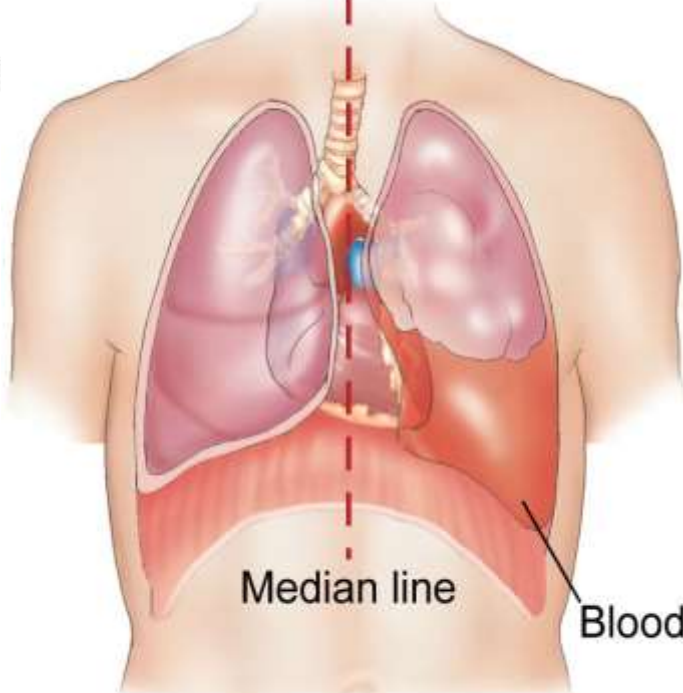
Lung air rushes out due to disruption of visceral pleura



A

Pneumothorax

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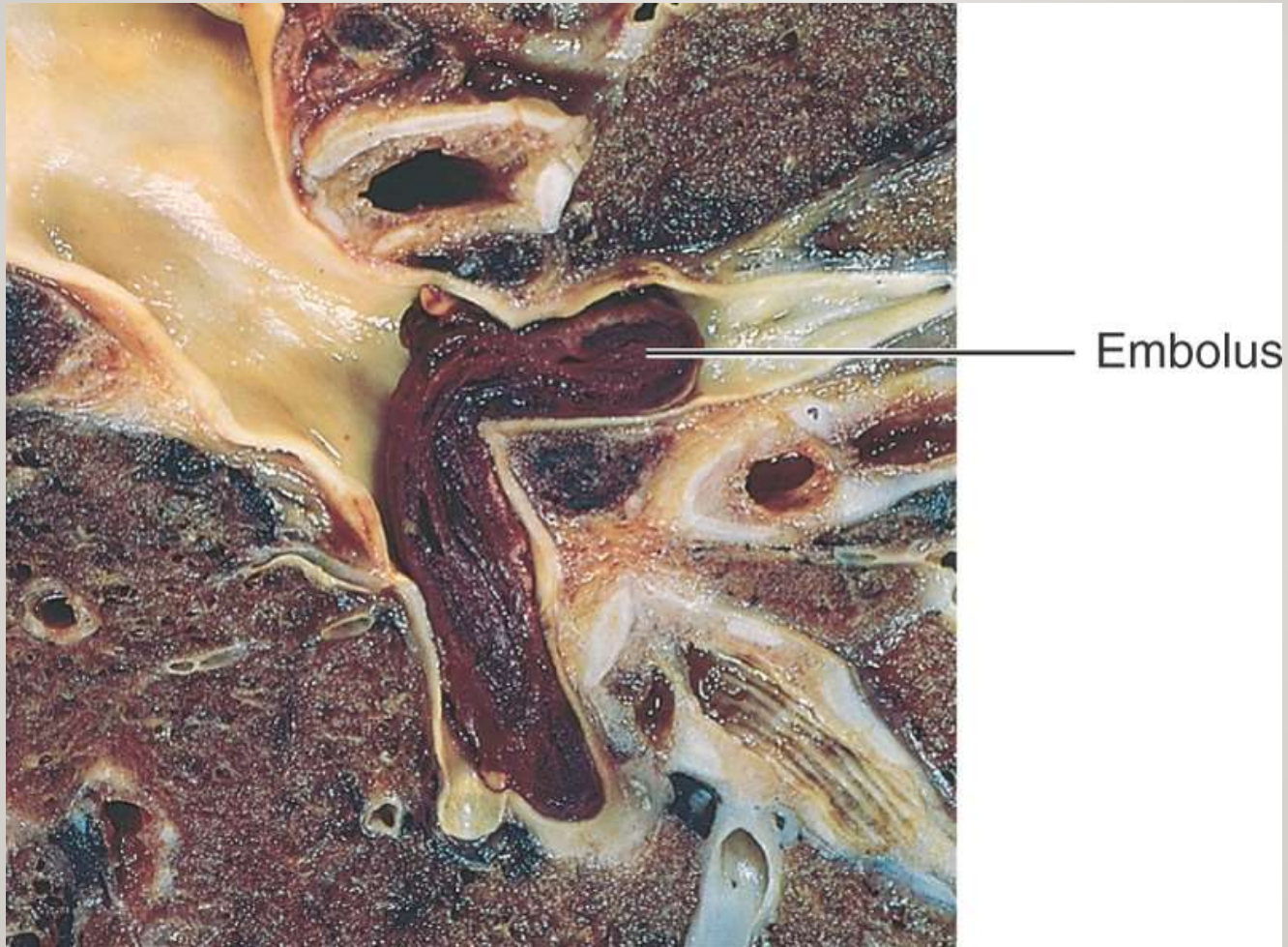


B

Hemothorax

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# PULMONARY EMBOLUS



From Kumar V, Robbins SL, and Cotran RS: *Pathologic basis of disease*, ed 9, Philadelphia, 2015, Saunders.

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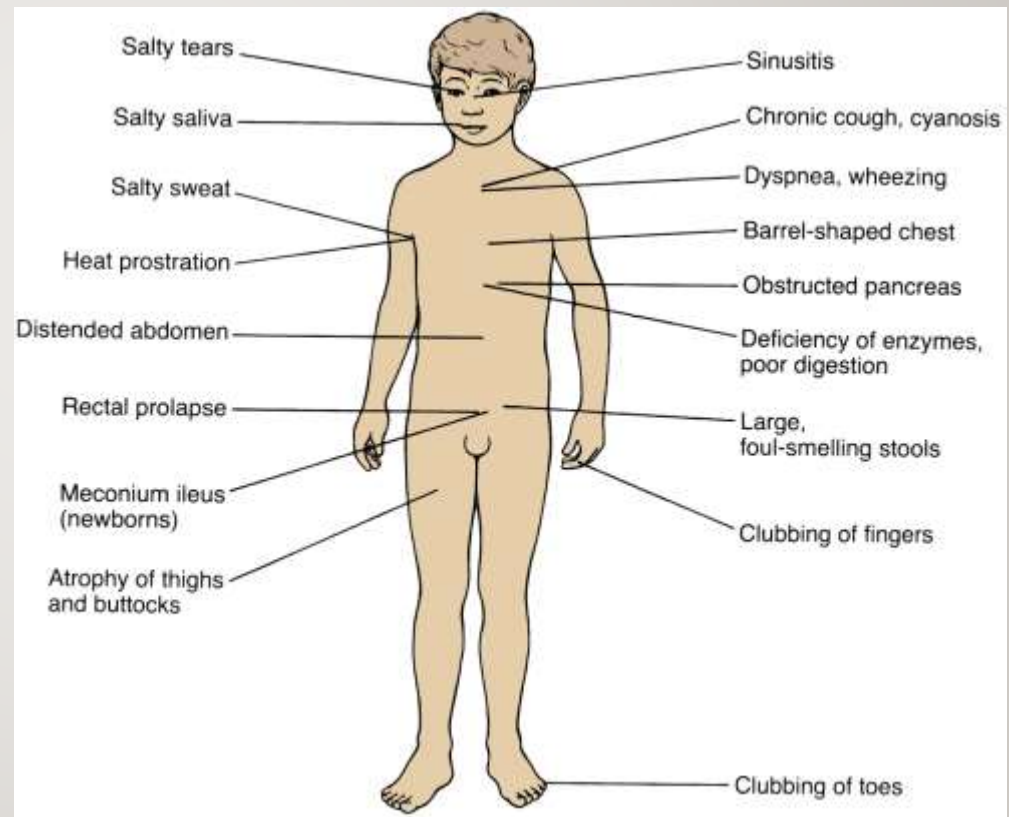


# TERMINOLOGY: RESPIRATORY PATHOLOGIES

- Laryngotracheal, laryngotracheitis, laryngotracheobronchitis
- Tracheomalacia, tracheostenosis, trachealgia
- Bronchopulmonary, bronchogenic, broncholithiasis
- Bronchitis, bronchopathy, bronchiectasis
- Bronchiolectasis, bronchiolitis
- Bronchospasm, bronchoconstriction, asthma
- Pneumonia, pneumonitis, pneumococcal pneumonia
- Bronchopneumonia

# TERMINOLOGY: RESPIRATORY PATHOLOGIES

- Cystic fibrosis
  - Inherited
  - Exocrine gland disorder
  - Mucus clogs bronchi
  - Sweat test diagnostic

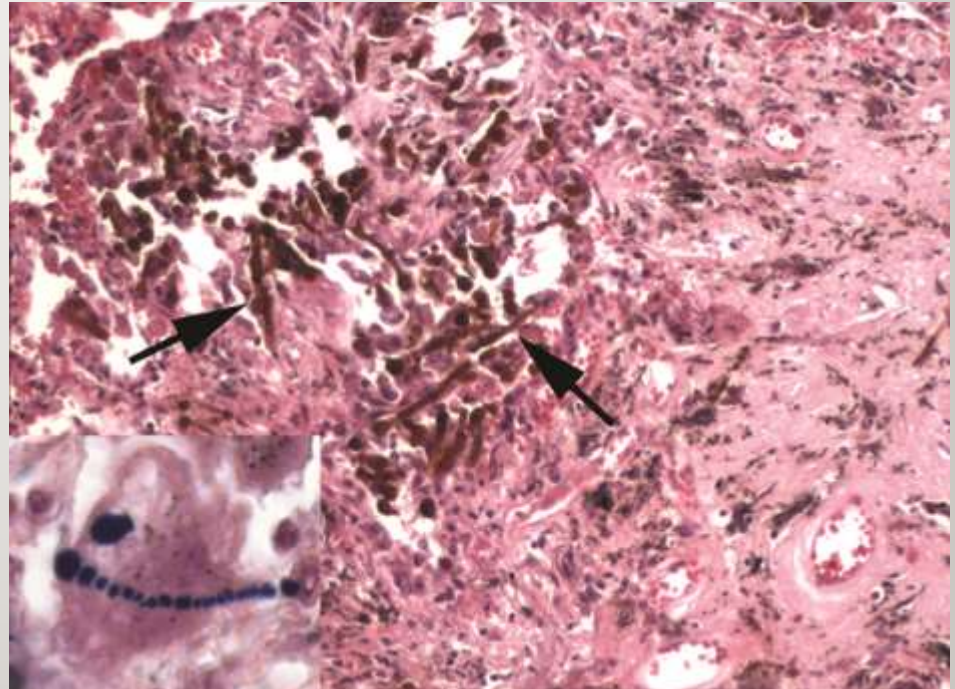




# TERMINOLOGY: RESPIRATORY PATHOLOGIES

- Pneumoconiosis
  - Anthracosis
  - Asbestosis, mesothelioma
  - Silicosis

## ASBESTOSIS

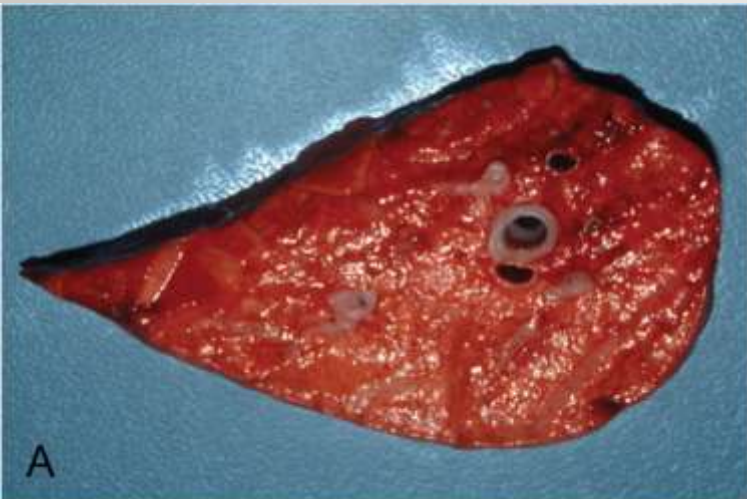


# TERMINOLOGY: RESPIRATORY PATHOLOGIES

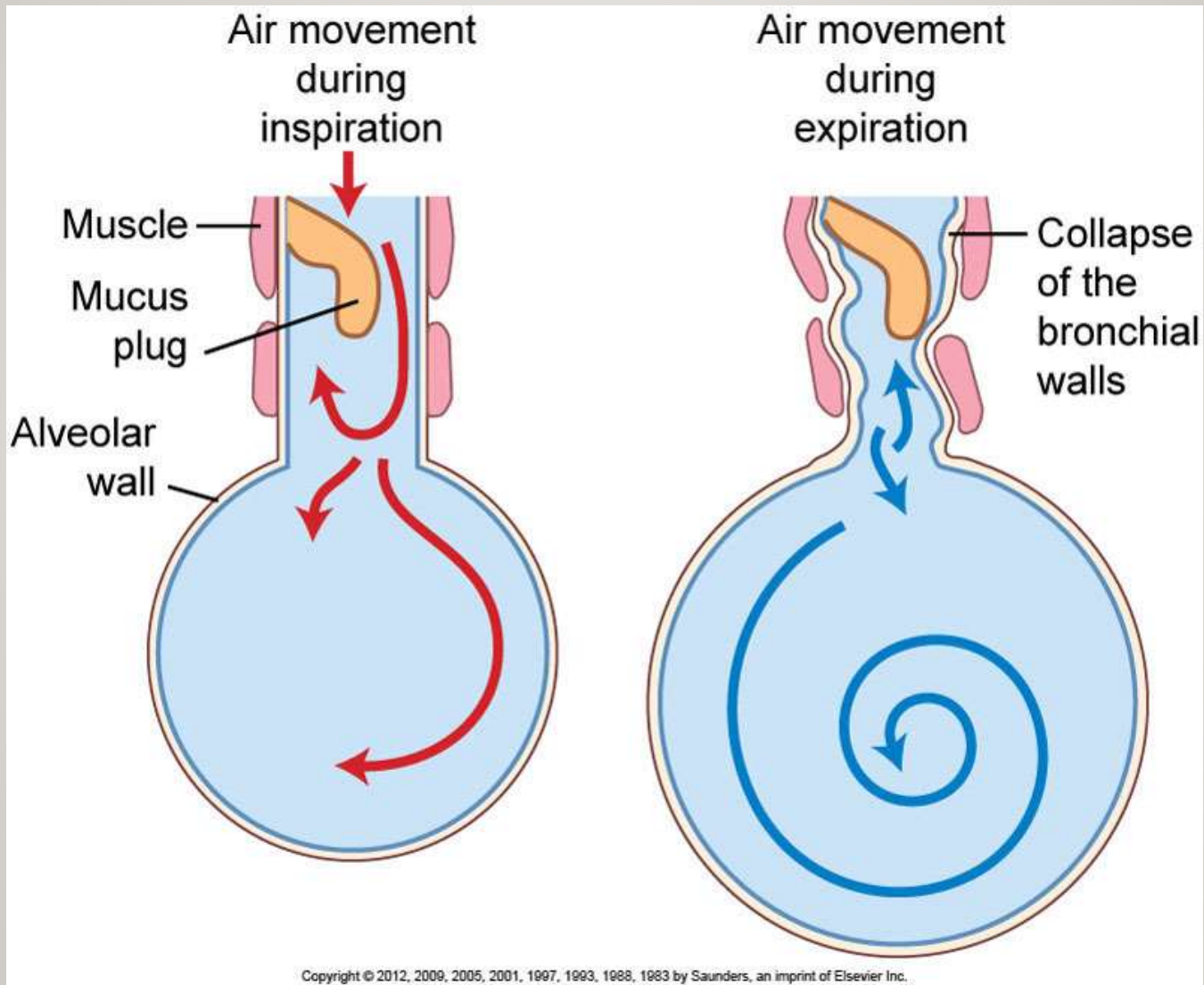
- Chronic obstructive pulmonary disease, chronic obstructive lung disease
- Emphysema



## CLUBBING



# COPD



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# TERMINOLOGY: RESPIRATORY PATHOLOGIES

- Atelectasis – collapse of a lung
- Tuberculosis, pulmonary tuberculosis, tubercles
  - Expectorate
  - Hemoptysis



# Lesson 5.3

## SURGICAL AND THERAPEUTIC INTERVENTIONS, HEALTH CARE REPORTING, PHARMACEUTICS, ABBREVIATIONS, AND REVIEW

8. Match terms for surgical and other therapeutic interventions for respiratory system pathologies with descriptions of the interventions, or write the names of the interventions when given their descriptions.
9. Build terms from word parts to label illustrations.
10. Use word parts to define terms in a health care report.



# Lesson 5.3

## SURGICAL AND THERAPEUTIC INTERVENTIONS, HEALTH CARE REPORTING, PHARMACEUTICS, ABBREVIATIONS, AND REVIEW

11. Spell the terms accurately.
12. Pronounce the terms correctly.
13. Recognize or use abbreviations presented in this chapter.
14. Categorize terms as anatomy, a diagnostic test or procedure, pathology, surgery, or nonsurgical therapy.
15. Recognize the meanings of general pharmacology terms used in this chapter as well as the drug classes and their uses.

# TERMINOLOGY: SURGICAL AND THERAPEUTIC INTERVENTIONS

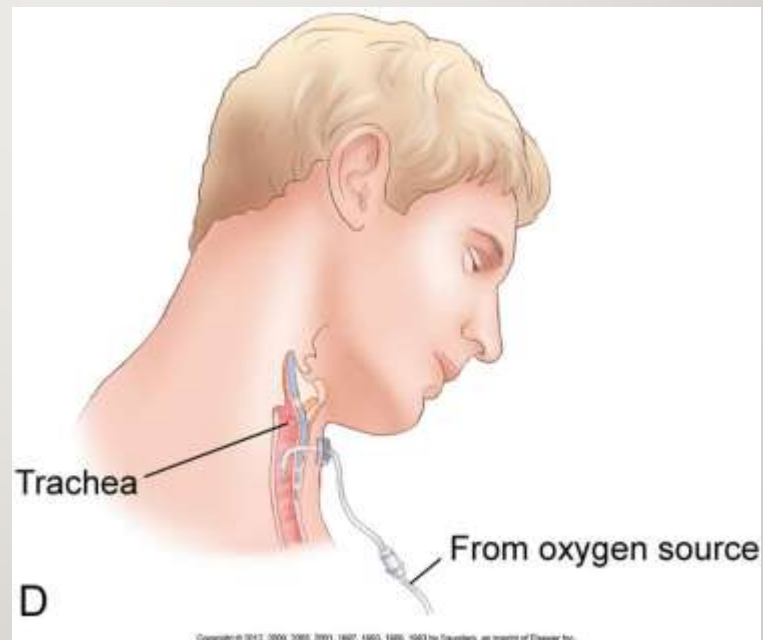
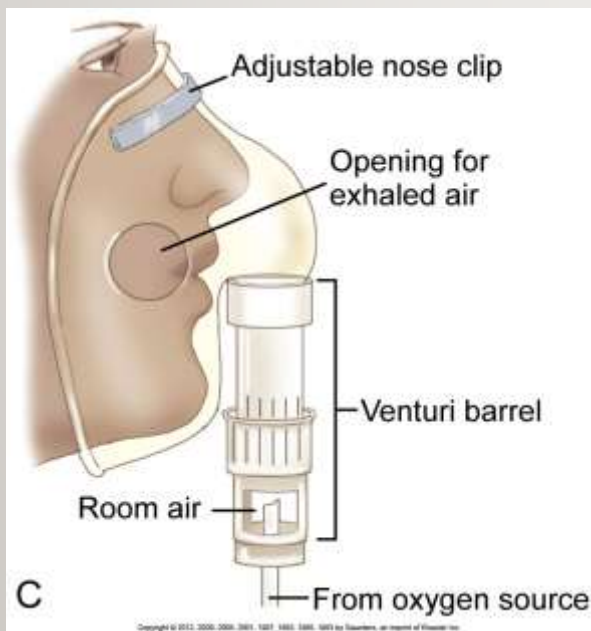
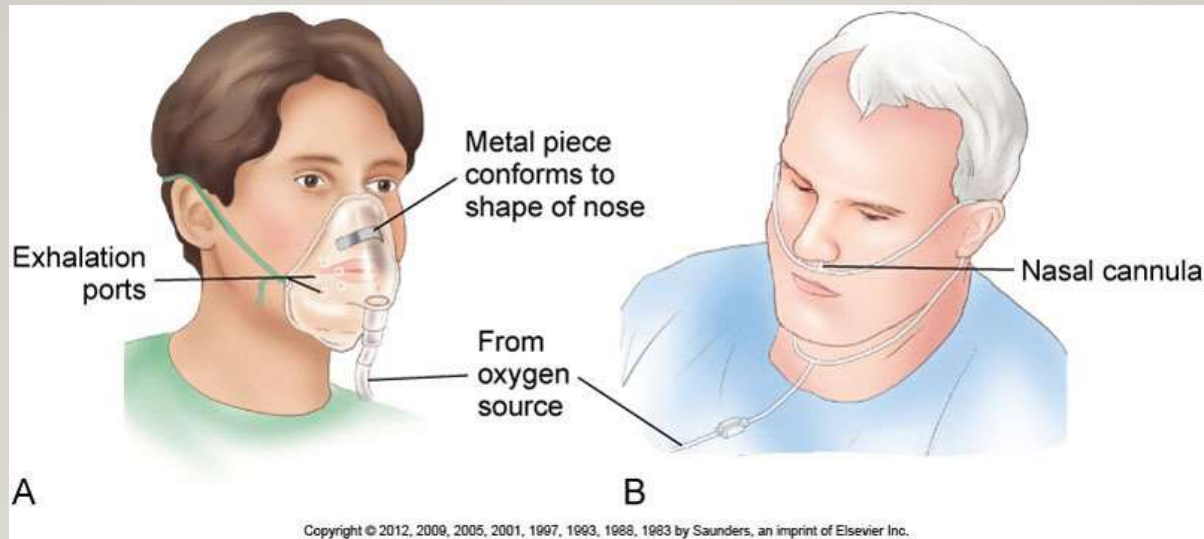
- Artificial respiration, cardiopulmonary resuscitation (CPR)
- Tracheostomy, tracheotomy
- Laryngectomy
- Extracorporeal membrane oxygenation (ECMO)
- Pneumonectomy, pneumectomy
- Lobectomy

# HEIMLICH MANEUVER

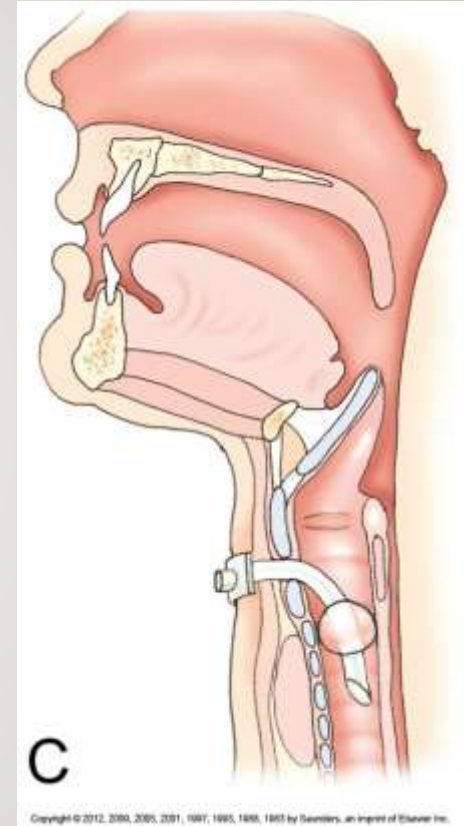
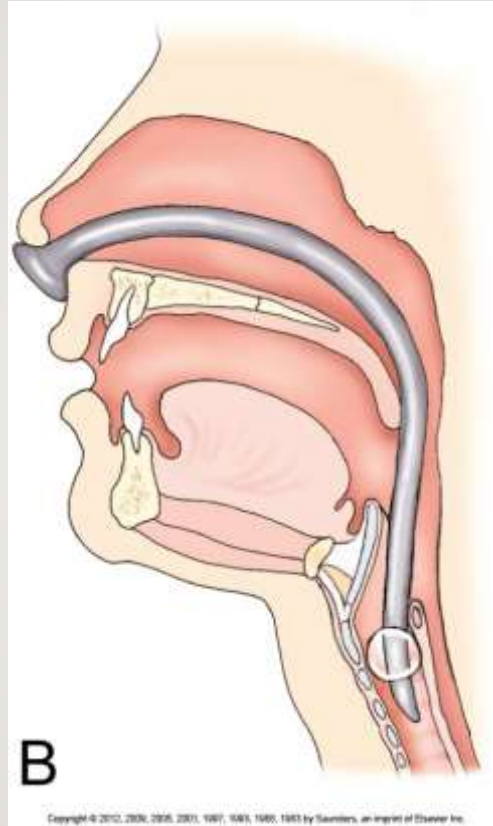
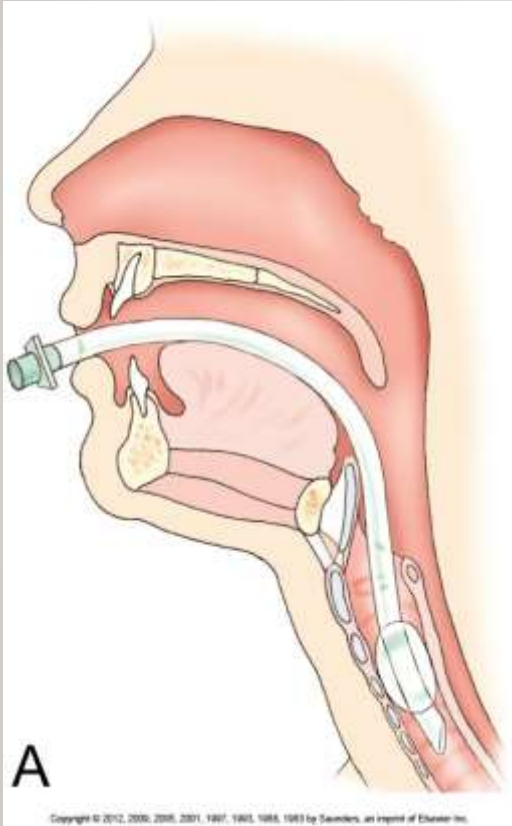


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# OXYGEN ADMINISTRATION



# OROTRACHEAL VS. NASOTRACHEAL INTUBATION VS. TRACHEOSTOMY TUBE





# MECHANICAL VENTILATION

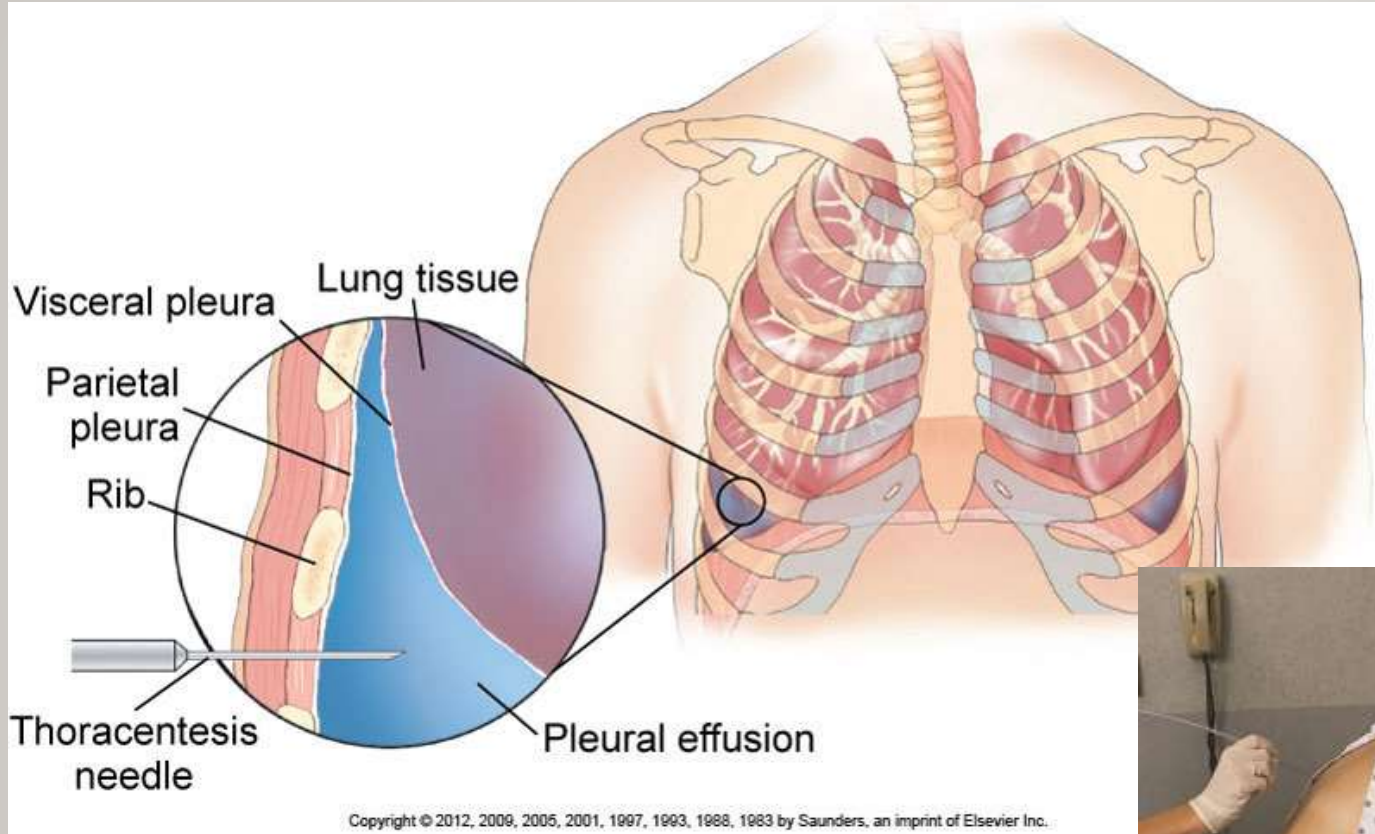
- **Negative pressure ventilation**
  - Pulls chest outward



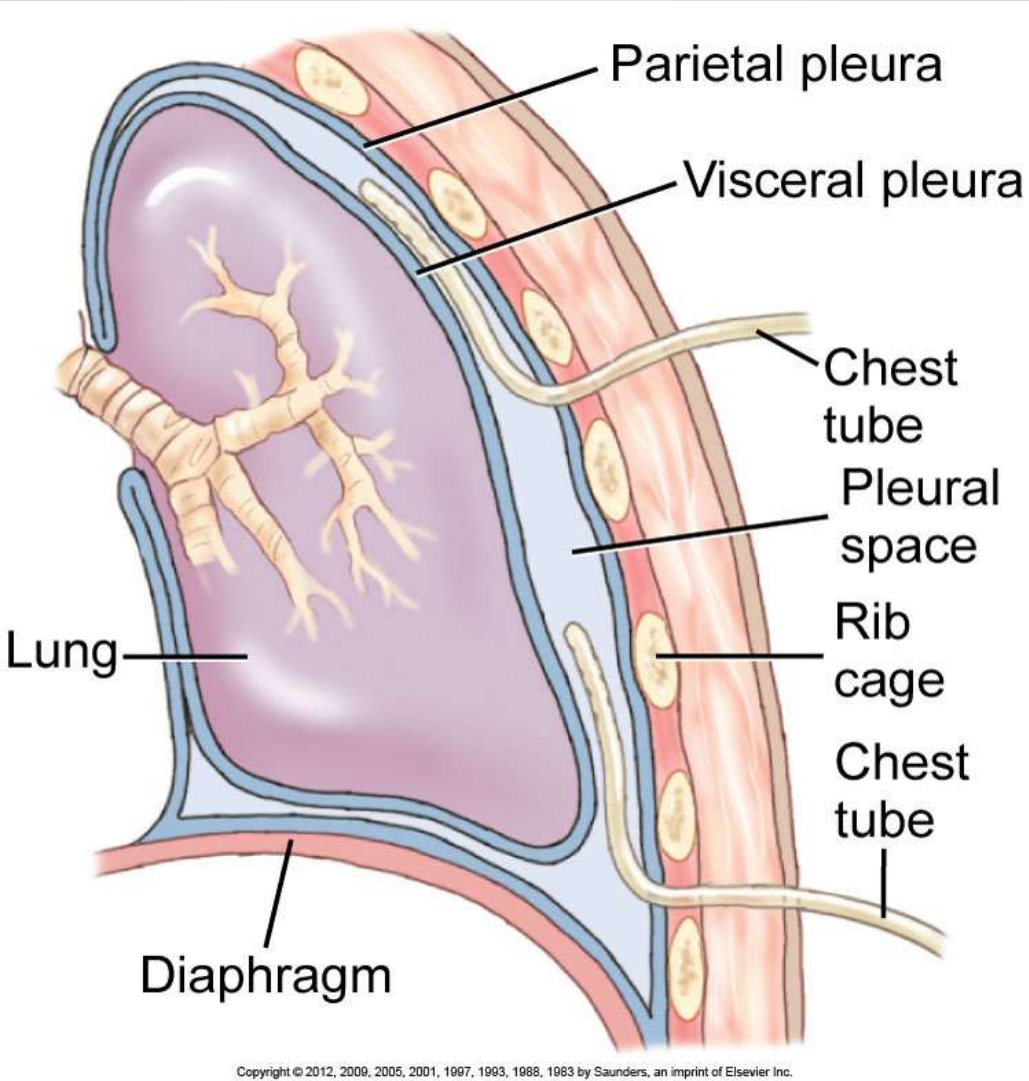
- **Positive pressure Ventilation**
  - Pushes air into lungs



# THORACENTESIS, THORACOCENTESIS



# THORACOSTOMY



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# TERMINOLOGY: SURGICAL AND THERAPEUTIC INTERVENTIONS

- Rhinoplasty, septoplasty, septorhinoplasty, palatoplasty, tracheoplasty, thoracoplasty
- Continuous positive airway pressure (CPAP)
- Adenoidectomy, uvulectomy
- Incentive spirometer

## SPIROMETRY



# CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP)



From Elkin MK, Perry AG, Potter PA: *Nursing interventions and clinical skills*, ed 6, St Louis, 2016, Mosby.



# TERMINOLOGY: SURGICAL AND THERAPEUTIC INTERVENTIONS

- Antineoplastic, anticancer treatment
- Nebulizers, antiasthmatics
- Bronchodilators, antihistamines
- Antibiotics, decongestants
- Antitussives, mucolytics

# PHARMACEUTICS

- Allergic reaction treatments
- Antiasthmatics
- Antihistamines
- Antitussives
- Bronchodilators
- Decongestants
- Expectorants
- Mast cell stabilizers
- Mucolytics
- Smoking cessation drugs

# ABBREVIATIONS

- ABG
- CO<sub>2</sub>
- O<sub>2</sub>
- PFT
- pH
- RPFT
- SOB
- VC
- CPAP
- CPR
- ECMO
- TTO

# ABBREVIATIONS

- Adult respiratory distress syndrome
- Chronic airflow limitation
- Chronic obstructive lung disease
- Chronic obstructive pulmonary disease
- Cheyne-Stokes respiration
- Herpes simplex virus
- Respiratory distress syndrome
- Severe acute respiratory syndrome
- Sudden infant death syndrome
- Tuberculosis
- Upper respiratory infection

# SELF-TEST

