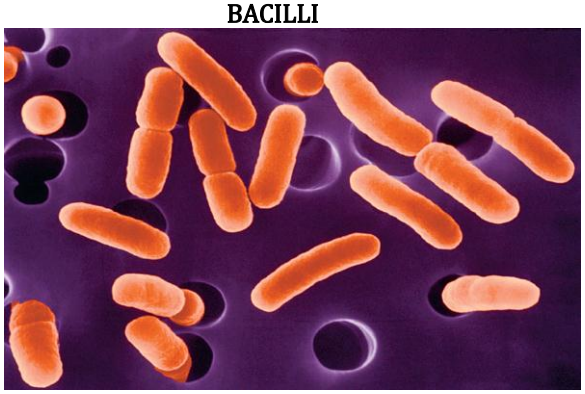
BACILLI



ANTIBIOTIC RESISTANCE

- One of the world's most significant public health problems
- Resistance occurs when an antibiotic is used inappropriately to treat an infection
  - Prescribe antibiotic therapy only when it will benefit the patient
  - Treat the patient with an antibiotic that is specific to the infecting pathogen
  - Prescribe the recommended dose and treatment duration of the medication

PROTOZOA

- Unicellular parasites that can replicate and multiply rapidly once inside host
- Frequently are seen in tropical climates

FUNGI

- Include such organisms as mushrooms, molds, and yeasts
- Grow best in warm, moist environments
- Treatment with antifungal agents

RICKETTSIAE

- Microorganisms that have characteristics of both bacteria and viruses
- Obligate parasites that must live within a host cell for growth
- Larger than viruses, so they can be viewed with a microscope
- Can be treated with antibiotics

RESERVOIRS

- Second link in chain of infection
- May be people, insects, animals, water, food, or contaminated instruments
- Must gain entrance into a host or else they will die
- Reservoir host supplies nutrition for organism, allowing it to multiply

PORTAL OF EXIT

- How pathogen escapes reservoir host
- Exits include mouth, nose, eyes, ears, intestines, urinary tract, reproductive tract, and open wounds

TRANSMISSION

- Direct transmission occurs from contact with infected person or discharges from infected person
- Indirect transmission occurs from:
  - Droplets in air expelled by coughing, speaking, or sneezing
  - Vectors that harbor pathogens
  - Contaminated food or drink
  - Contact with contaminated objects (called *fomites*)

PORTAL OF ENTRY

- How transmitted pathogen gains entry into a new host
- May be mouth, nose, eyes, intestines, urinary tract, reproductive system, or an open wound
- Anatomic defenses include integumentary system, cilia, mucous membranes, and pH of body fluids
- Second line of defense is immune system and inflammatory process
  - Humoral immunity
  - Cell-mediated immunity

ACUTE INFECTION

Rapid onset of symptoms but lasts a relatively short time

Prodromal period is time when patient first shows vague, nonspecific symptoms of disease

Symptoms appear after the tissue damage begins

CHRONIC INFECTION

- Persists for a long period, sometimes for life
- Some chronic infections are asymptomatic, but virus is transmissible

LATENT INFECTION

- Persistent infection in which symptoms cycle through periods of relapse and remission
  - Examples include cold sores, genital herpes, and varicella

OPPORTUNISTIC INFECTIONS

- Caused by organisms not typically pathogenic but occur in hosts with an impaired immune system response

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HEPATITIS B VACCINATION
- Must be available free of charge to all employees at risk for exposure
- Intramuscular injection in three doses

POSTEXPOSURE FOLLOW-UP
- Wash or flush exposed area and receive confidential medical evaluation
- File incident report and screen and test person for HBV, HCV, and HIV
- Receive copy of physician's written opinion within 15 days of evaluation
- Receive health counseling about risks and adverse outcomes

POSTEXPOSURE MANAGEMENT
- Healthcare students are at risk for blood-borne pathogen exposure
- Follow all OSHA guidelines designed to protect individuals from exposure

ASEPTIC TECHNIQUES
- Asepsis: freedom from infection or infectious material
- Medical asepsis: destruction of disease-causing organisms after they leave the body
- Surgical asepsis: destruction of organisms before they enter the body

HAND WASHING
- Wash correctly before and after every patient
- Warm water, antimicrobial soap, friction
- Alcohol-based hand rubs may substitute unless hands are visibly contaminated

SANITIZATION
- Cleansing process that reduces number of microorganisms to a safe level
- Removes debris such as blood and other body fluids from instruments or equipment
- Wear gloves while performing sanitization

DISINFECTION
- Process of killing pathogenic organisms or of rendering them inactive
- Disinfecting agents vary in effectiveness and must be used according to instructions

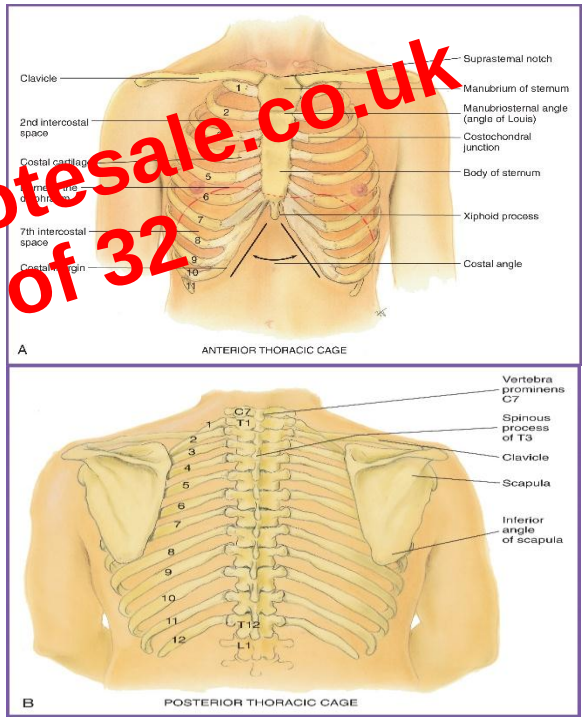
STERILIZATION
- Destruction of all microorganisms
- Essential for surgical asepsis
- Area should be set aside in each office for sterilization
- Clear, clean plastic bags in which to store sterile packs may be kept in sterile area

ROLE OF THE MEDICAL ASSISTANT IN ASEPSIS
- Spread of pathogens can be controlled only through application of the Bloodborne Pathogens Standard and by proper sanitization, disinfection, and sterilization of supplies, equipment, and work surfaces

CHAPTER 46: ASSISTING IN PULMONARY MEDICINE

FUNCTIONS OF THE RESPIRATORY SYSTEM
- Exchange oxygen from the atmosphere for carbon dioxide waste
- Maintain the acid-base balance in the body

RESPIRATORY SYSTEM



REQUIREMENTS FOR NORMAL RESPIRATION
- An open airway leading to the lungs
- Ability of the lungs to expand rhythmically
- Intact alveolar membranes
- Coordination of the intercostal muscles and the diaphragm
- Proper action of the central nervous system's respiratory control center

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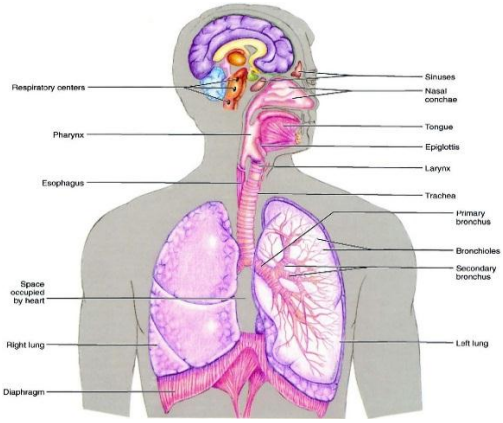
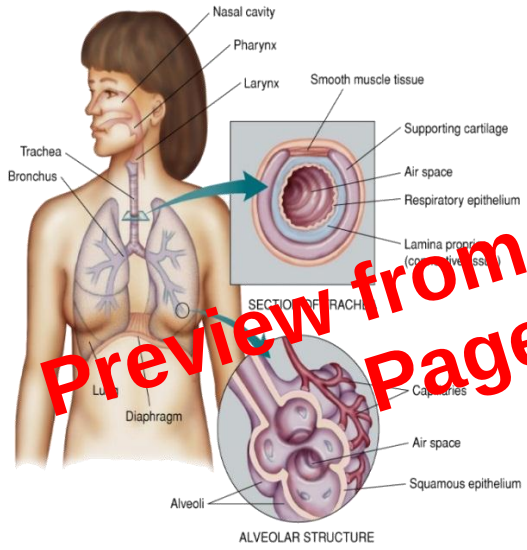
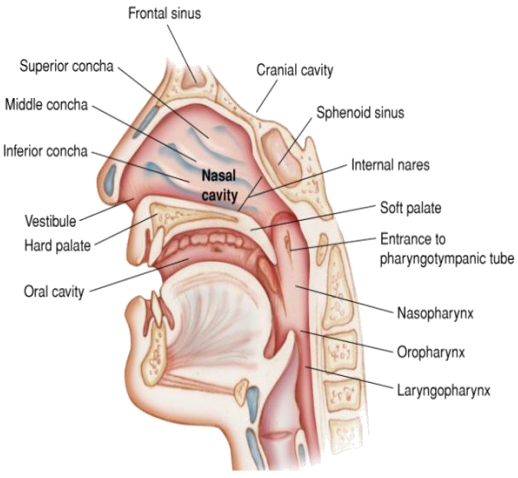
ANATOMIC STRUCTURES OF THE RESPIRATORY SYSTEM



ANATOMIC STRUCTURES OF THE RESPIRATORY SYSTEM



ANATOMIC STRUCTURES OF THE UPPER RESPIRATORY SYSTEM



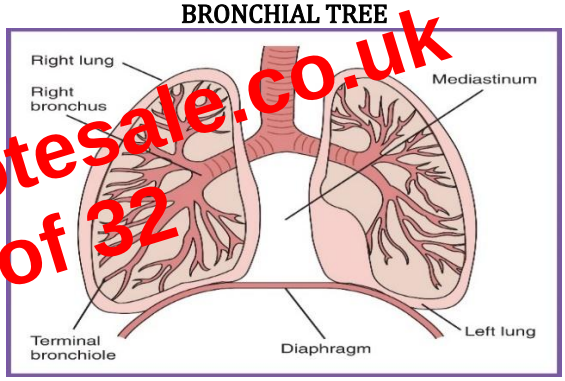
LARYNX

- Incoming air passes through the pharynx and then through a narrow opening, the glottis, which is surrounded and protected by the larynx, or voice box
- Contains nine cartilages that are stabilized by ligaments and/or skeletal muscles.
- Two largest cartilages are the epiglottis and the thyroid cartilage

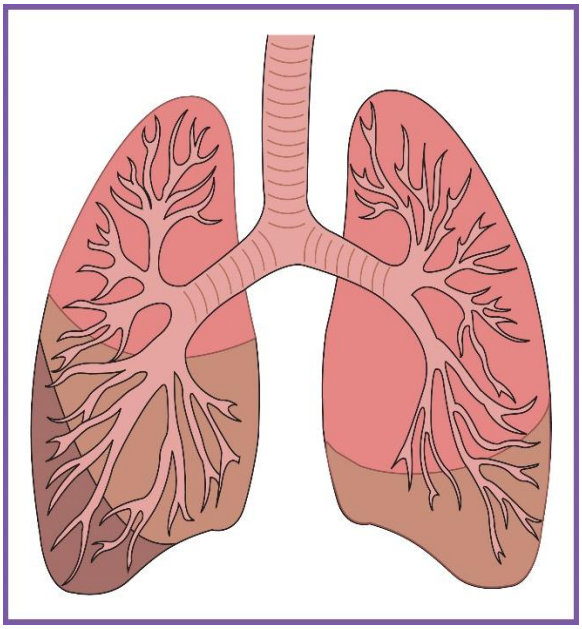
TRACHEA

- Also called the windpipe is a tough flexible tube about 2.5 cm (1 in.) in diameter and 11 cm (4.0 in.) long.
- The walls are supported by about 20 tracheal cartilages.
- The diameter of the trachea is adjusted by the ANS, which controls contractions of smooth muscle in the walls.

BRONCHIAL TREE



LOBES OF THE LUNGS



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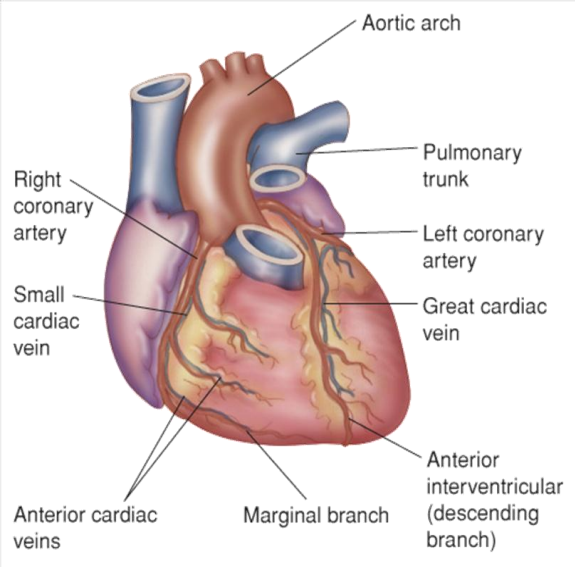
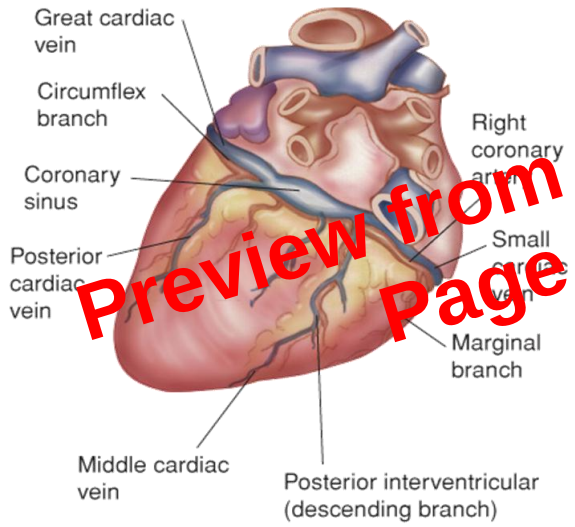
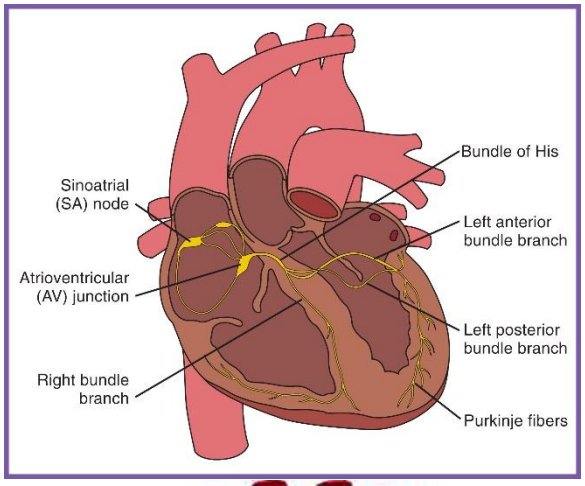
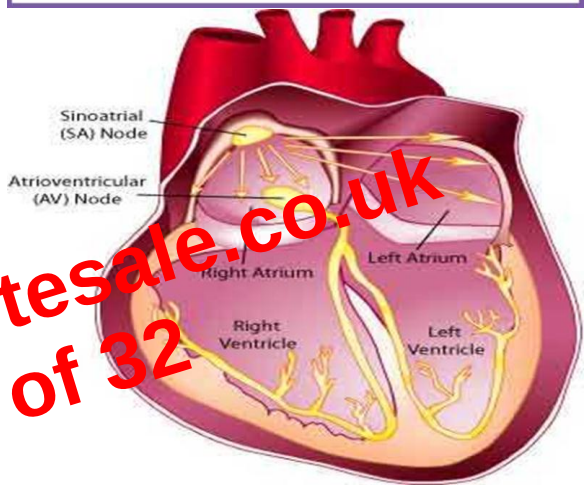
CORONARY ARTERIES





CARDIAC CONDUCTION SYSTEM





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HEART CONDUCTION

- Heart contractions stimulated by specialized cells in the sinoatrial (SA) node of myocardium that conduct electricity
- SA node starts impulses 60 to 100 times a minute; pacemaker of the heart
- Atrial contraction passes over into an area called the atrioventricular (AV) node, which pauses the impulse for fraction of a second
- The charge is then sent down through the bundle of His and into the Purkinje fibers of the ventricles, causing them to contract

RISK FACTORS FOR HEART DISEASE

- Advancing age
- Gender
- Family history and race

LIFESTYLE RISK FACTORS

- Smoking
- High blood cholesterol
- Hypertension
- Sedentary lifestyle
- Obesity and overweight
- Diabetes mellitus

CORONARY ARTERY DISEASE (CAD)

- Formation of atherosclerotic plaques narrows the arteries supplying the myocardium
- Plaque buildup mostly related to cholesterol blood levels
- Eventually, a clot (thrombus) can form, completely blocking the vessel supplying blood to the heart (ischemia)

CHOLESTEROL

- Dietary fats, or lipids, provide essential fatty acids and are needed for the absorption of fat-soluble vitamins, A, D, E and K
- Two types of cholesterol are high-density lipoproteins (HDL) and low-density lipoprotein (LDL)
- Hypercholesterolemia – low fat or fat-free milk products

PROTEINS

- Amino acids
  - Complete: come from animal sources and have a mixture of all eight essential amino acids
  - Incomplete: do not supply the body with all the essential amino acids
- Build and repair body tissue
- Provide energy when carbohydrate and fat stores are depleted
- Protein sources – meat, nuts, dairy products

VITAMINS

- Fat soluble and water soluble
- Needed for metabolic processes
- Known by letter designations
- Do not cure illnesses
- More beneficial in foods than supplements
- Can affect prescribed medications
- No calorie value, organic substance found in food
- Water Soluble Vitamins: Vitamin B and C
- Fat Soluble Vitamins: Vitamin A, D, E, K. Toxicity can occur when consumed in large quantities

VITAMIN A

- Carotene – yellow or orange fruits and vegetables, liver, dairy products
- Formation and maintenance of skin, mucous, membrane and aids in vision in dim lights
- Deficiency – dry skin, night blindness

VITAMIN B

- Whole grain, milk, eggs
- B_1 (thiamine) = nerve disorder, mental confusion
- B_2 (riboflavin) = rash, anemia, cracks in the corners of the mouth
- B_6 (pyridoxine) = dermatitis, convulsion
- B_{12} (cobalamin) = anemia, neuritis, brain degeneration

VITAMIN C

- Citrus fruits, berries and peppers
- Deficiency – scurvy (gum) bleeding, slow wound healing

VITAMIN D

- Dairy products (has Calcium), eggs, sunlight
- Deficiency – rickets, calcium loss in adult

VITAMIN K

- Vegetables, fruits, dairy, grain
- Deficiency – bleeding disorders

MINERALS

- Minerals are non-organic elements and compose 5% of the body
- No calorie value, help bones and teeth develop
- Water – most important item in diet, about 50-60% of the body weight is water
  - Na (sodium) – high sodium can lead to hypertension
  - Electrolytes imbalance can lead to heart problem (example potassium, calcium)
  - Thirteen needed to be healthy
  - Water-electrolyte balance
  - Acid-base balance
  - Regulate muscular and nervous activity
  - Help in blood clotting
  - Regulate heart rhythm

WATER

- Body is 60% water
  - Can go longer without food than water
- Involved in all body processes
- Electrolyte losses
  - Life-threatening imbalances
- Eight glasses a day

ANTIOXIDANTS

- Protect against oxidizing free radicals
- Must have sufficient amount in the body
- Found in vitamins C, E and beta carotene
- Protect against some cancers and macular degeneration

WHEN VITAMIN SUPPLEMENTS ARE NEEDED

- Vitamin or mineral deficiency
- Iron and folate for pregnant women
- Calcium for the lactose intolerant
- Vitamins for the elderly
- Postsurgical or burn patients
- Strict vegetarians – may need Vitamin B_{12} and D, along with iron and zinc

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