**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 tissues, cilia, mucous membranes, and pH 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
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

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
ANATOMIC STRUCTURES OF THE RESPIRATORY SYSTEM

LANEYX
- 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
CORONARY ARTERIES

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 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

CARDIAC CONDUCTION SYSTEM

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 build up 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
- 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
- B1 (thiamine) = nerve disorder, mental confusion
- B2 (riboflavin) = rash, anemia, cracks in the corners of the mouth
- B6 (pyridoxine) = dermatitis, convulsion
- B12 (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 are needed to be healthy
  - Water-electrolyte 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 B12 and D, along with iron and zinc