Chapter Twenty-seven: Body Defenses and Disease
Teacher Notes

Lesson One: Disease

-Causes of Disease

-Noninfectious Disease-a disease that cannot spread from one individual to another.

-can be caused by genetic disorders, smoking, lack of physical activity

-Infectious Diseases-a disease that is caused by a pathogen and that can be spread from one individual to another. Caused by pathogens

-Pathogens-A virus, microorganism, or other organism that causes disease.

-Pathways to Pathogens

-Air-sneeze can pass droplets of moisture that carry pathogens

-Contaminated Objects-object that has pathogens from a sick person on it and an uninfected person comes into contact with.

-Person to Person-shaking hands, kissing, or touching sores

-Animals-diseases like ringworm that are first on an animal and passed to humans

-Food and Water

-drinking water may contain microorganisms that can make you sick

-food may contain bacteria or parasites that can grow; to avoid getting sick foods need to be heated thoroughly

-Putting Pathogens in Their Place

-Pasteurization-using heat to kill most of bacteria (especially in milk)

-Vaccines and Immunity

-Immunity-the ability to resist or to recover from an infectious disease.

-vaccine-substance that helps your body develop immunity to a disease

-contain a pathogen that is killed or specially treated so they can't make you sick; but gives enough to protect you

-Antibiotics-a substance that ca kill bacteria or slow the growth of bacteria

-can be used to treat some fungi

-viruses are not affected by antibiotics because antibiotics only kill living things and viruses are not living

Lesson Two: Your Body's Defenses

-First Lines of Defense

-many pathogens try to enter eyes and mouth and are destroyed by special enzymes

-pathogens entering the nose are washed down the back of your throat and carried to your stomach and digested

-outer levels of skin are dead making it difficult for pathogens to find a living cell to get in your body

-Failure of First Lines

-pathogen can enter skin through a cut or puncture

-blood flow to the area to quickly seal the open wound

-Immune System-the cells and tissues that recognize and attack foreign substances in the body.

-not localized in one place; not controlled by any one organ

-Cells of the Immune System

-immune system consists of three kinds of cells

-Macrophage-an immune system cell that engulfs pathogens and other materials.

-T-cells-an immune system cell that coordinates the immune system and attacks many infected cells.

-B-cells-a white blood cell that makes antibodies

-Antibodies-a protein made by B-cells that binds to a specific antigen

-Antigens-are substances that stimulate an immune response

-Responding to a Virus

-Fevers

-occurs when macrophages activate the helper T-cells to send a chemical signal that tells brain to turn up the thermostat

-a moderate fever helps you get well faster because it slows the growth of some pathogens

-Memory Cells

-responds to a second encounter faster than the first

-Memory B Cells-a B-cell that responds to an antigen more strongly when the body is reinfected with an antigen than it does during its first encounter with the antigen.

-Challenges to the Immune System

-Allergies-a reaction to a harmless or common substance by the body's immune system.

-inappropriate reaction that the body sees as dangerous

-can be foods, pollens, medicines

-symptoms include runny nose, itchy eyes, asthma

-Autoimmune Disease-a disease in which the immune system attacks the organism's own cells.

-examples are rheumatoid arthritis, type 1 diabetes, multiple sclerosis, and lupus

-Cancer-a disease in which the cells begin dividing at an uncontrolled rate and become invasive.

-may invade nearby tissues and cardiovascular or lymphatic systems

-can lead to death

-surgery, radiation, and drugs can be used to remove or kill cancer cells or slow their divisions

-AIDS

-HIV infects the immune system itself using helper T-cells as factories to produce more viruses; this destroys the helper T-cells

-people with AIDS have few helper T-cells so nothing activates the B-cells and killer T cells; this makes it impossible for the immune system to attack the virus

-people with AIDS don't die from it but rather from other diseases they get because they can't fight them off