**Lesson Objectives**

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| * + Students will identify pathogens and how they are transmitted.   + Students will describe symptoms of common communicable diseases.   + Students will apply methods of prevention and treatment for communicable diseases (e.g., personal hygiene, immunization, balanced diet, exercise, rest, natural body defenses, abstinence from high risk behaviors).   + Students will explain economic, physical, mental, social, and emotional effects of communicable diseases.   + Students will explain the importance of an annual physical examination as well as breast and testicular self-examinations. |

**How Do Communicable Diseases Spread?**

**Infectious** or **communicable diseases** are diseases that spread from one living thing to another or through the environment. They are spread by pathogens that invade the body and attack its cells and tissue. When pathogens enter the body they multiply and damage cells, and they create infections. The most common pathogens include viruses, bacteria, protozoans, fungi, and rickettsias. Antibiotics can be used to treat many bacterial diseases, but they do not work against viruses. Communicable diseases can spread through direct contact with infected persons or animals, or by indirect contact with contaminated objects, disease-carrying organisms called vectors, or through water and food. Some pathogens can be spread through airborne transmission. Practicing healthful behaviors based on good hygiene and common sense can help prevent infection. Washing your hands, handling food properly, avoiding contact with infected people, keeping your body healthy, preparing and storing foods in a safe manner, practicing abstinence from sexual activity, and managing stress will all help prevent infection by communicable diseases.

**Viruses and Infectious Diseases**

**Viruses**are pieces of genetic material surrounded by a protein coat. By themselves they are inactive, which means they need a living cell or host to reproduce. Viruses will invade all known forms of life, including mammals, birds, reptiles, insects, plants, and even bacteria. After invading a host, they will run their course and are eventually killed by the immune system. Antibiotics will not work against a virus.

**Examples of Viruses**

* + Common cold
  + Influenza (flu)
  + Viral pneumonia
  + Viral Hepatitis
  + Polio
  + Mononucleosis
  + Measles
  + AIDS
  + Viral Meningitis
  + Chicken Pox
  + Herpes
  + Rabies
  + Smallpox

West Nile Virus

**Bacteria**

Bacteria live almost everywhere on the Earth. **Bacteria** are single-celled microorganisms. Most bacteria are harmless and very essential for life. Your digestive system needs bacteria to digest food and make some of the necessary vitamins. When bacteria enter the body, they multiply through cell division. Some bacterial pathogens, such as tetanus, produce toxins, a substance that kills cells or interferes with their functions. Like most other microorganisms that enter the body, bacteria are usually destroyed by the immune system. If not, most bacteria can be treated with antibiotics.

**Diseases Caused by Bacteria**

* + Bacterial Foodborne Illness
  + Strep Throat
  + Tuberculosis
  + Diphtheria
  + Gonorrhea
  + Lyme Disease
  + Bacterial Pinkeye
  + Bacterial Pneumonia

Bacterial Meningitis

**Fungi**

**Fungi** are molds and yeast that are plantlike organisms. Some types of fungus can cause diseases of the skin, such as athlete’s foot, or diseases in the mucus membranes of the lungs.

**Diseases Caused by Fungi**

* + Athletes Foot (pictured on the right)
  + Ringworm

Vaginal Yeast Infection

**Protozoans**

**Protozoans** are single-celled organisms that are more complex than bacteria. Some can cause disease, especially in individuals who have a weakened immune system, but most are harmless.

**Diseases Caused by Protozoans**

* + Malaria
  + Amoebic Dysentery

Sleeping Sickness

**Rickettsias**

**Rickettsias** resemble bacteria and often enter a human through the bite of an insect such as a flea or lice. Similar to viruses, rickettsias multiply by invading the cells of another life form. Rocky Mountain Spotted Fever is the most frequently reported illness spread by rickettsias and this illness is spread by a wood tick.

The following are illnesses caused by rickettsias:

* + Typhus
  + Rocky Mountain Spotted Fever (pictured on the right)

**Ways Communicable Diseases Are Transmitted**

There are two ways that communicable diseases can be transmitted from one person to another: direct and indirect contact. In **direct contact**many pathogens are transmitted through direct contact with somebody that is infected or through contact with something in the environment.

The following are examples of direct contact that can lead to the spread of disease:

* + Touching
  + Biting
  + Kissing
  + Sexual Contact
  + Sneezing
  + Coughing
  + A pregnant woman may transmit an infection to her unborn child through the placenta.
  + A person can get tetanus from a puncture wound from a rusty nail.

Another way that communicable diseases can be transmitted is through indirect contact. This means that diseases can be spread without direct contact with an infected person.

The following are examples of indirect contact and how they can lead to the spread of disease:

* + **Contaminated objects** –Someone with a cold who sneezes into their hands and then touches a table. Later, you touch the same table and then rub your eyes.
  + **Vectors** –Vectors are organisms, usually an arthropod such as a mosquito or tick, that carry and transmit pathogens to a human or other animal.

**Water and food**–Careless handling and storage of food is a major source of contamination and illness. Water supplies can also become contaminated with animal or human feces and illnesses such as Hepatitis A can occur.

**Preventing Communicable Diseases**

Being informed and understanding the impact of personal health behaviors on the body system is important in preventing disease. The following are examples of how you can prevent the spread of disease:

* + **Washing hands** –Washing hands before you prepare food and after you go to the bathroom are ways to stop the spread of disease. Always wash your hands when in a home with a person that is ill or after you have handled animals, reptiles, or animal waste.

**Handling food properly** – Always wash your hands before and while you are handling food. It is always important to separate raw meat from other foods. Cook food to its proper temperature and chill cold and leftover foods quickly to the proper temperature.

**How to Keep Yourself and Others Healthy**

The following are other methods to prevent the spread of disease:

* + Avoid sharing eating utensils, make-up, combs, brushes, and other personal items.
  + Eat a balanced diet.
  + Avoid the use of tobacco, alcohol, and drugs.
  + Avoid unnecessary contact with people who are ill.
  + Take care of yourself when you are ill; cover your mouth when you cough or sneeze.
  + Use mosquito repellent when outside during warm months.
  + Practice abstinence from sexual activity.

Manage stress. You are more vulnerable to illness when you are stressed.

**Vaccines to Aid the Body’s Defense**

**Vaccines** help prevent the spread of communicable disease by reducing the number of people who may become infected. The flu, mumps, rubella, chicken pox, and measles are examples of diseases that took the lives of thousands of people at one time in history and are preventable today.