
Infection control



Self-study course

Course objectives

By the end of this course you will be able to:

- 1) Define a germ
 - 2) Define the environment that a germ needs to live and grow
 - 3) Explain the chain of infection
 - 4) Understand when and how proper handwashing should be accomplished
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Infection control

Infections are a major safety and health hazard. Some infections are minor and cause short illnesses. Others are serious and can cause death. Infections can be especially serious for vulnerable infants and older persons. Caregivers and medical professionals have an important role in protecting patients, residents, visitors and themselves from infection.

Germs are small (micro) plants or animals (organisms) that can be seen only with a microscope. Germs are everywhere: in the air, food, soil, and water; and in the mouth, nose, respiratory tract, stomach, intestines, and skin of humans and animals.

Some germs cause infections and are harmful. These are called pathogens. Nonpathogens are germs that usually do not cause an infection.

There are three types of germs.

Bacteria – microscopic, one cell, plant life that multiply rapidly. Bacteria can cause infection in any body system.

Fungi – plants that live on other plants or animals. Mushrooms, yeasts and molds are common fungi. In humans, fungi can infect the mouth, vagina, skin, feet and other body areas.

Viruses – very small microscopic organisms that grow in living cells. They cause many diseases including the common cold, herpes, diarrhea, acquired immunodeficiency syndrome (AIDS) and hepatitis.

Germs

Germs require an environment (host) to live and grow. People, plants, animals, soil, food and water are common places where germs grow. Germs must get water, oxygen and nourishment from their host. A warm, dark environment is also needed.



Most germs grow best at body temperature and are destroyed by high heat and ultraviolet light.

Germs are found in most organs in the different human body systems, i.e., the lungs, the intestines and on the skin. These germs are called nonpathogens (normal flora) when contained within their own body systems. When a nonpathogen is transmitted from one system to another it becomes a pathogen.

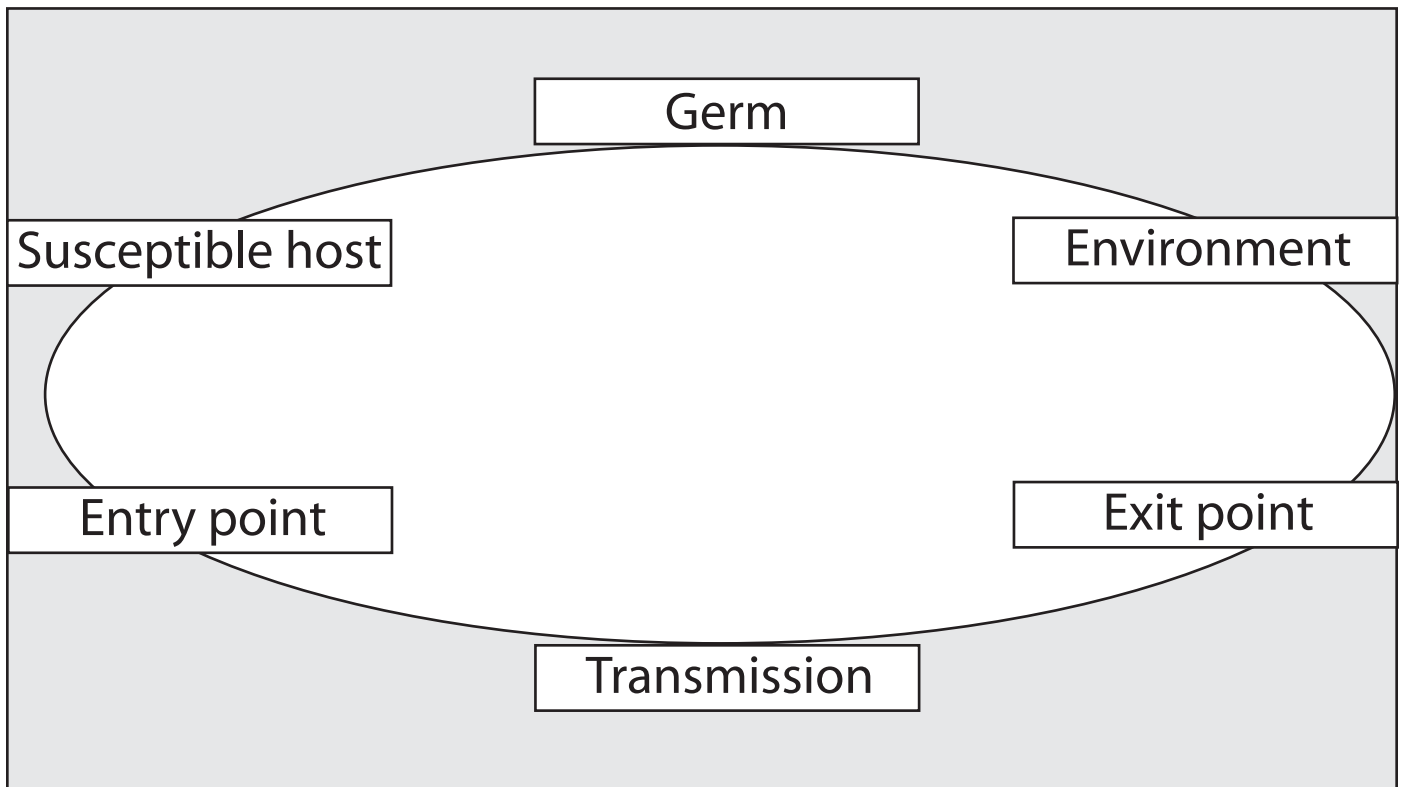
For example, *Escherichia coli* (*E. coli*) is normally found in the large intestine. Feces (bowel movements) contain *E. coli*. After bowel movements, always wiping from front to back will prevent *E. coli* from entering the urinary system and causing an infection. When we don't wash our hands after going to the bathroom, or if the handwashing is poor, the *E. coli* can also spread to anything those hands touch, i.e., door handles, food, etc. This is one example of how infections can be spread to other people.

Infections

An infection is a disease state resulting from the invasion and growth of germs in the body. A *local infection* is in a body part. A *systemic infection* involves the whole body.

Pathogens do not always cause infection. The development of an infection depends on the following conditions being present:

- germ (source)
- growth-producing environment
- exit point
- method of transmission
- entry point
- a susceptible host



The *source* is a germ. The germ must have an *environment* where it can grow and multiply. Humans and animals are common environments for germs.

Although they may not have any signs or symptoms of infection, humans and animals may be carriers and can pass germs to others. Where the germ leaves the host environment is called the *exit point*.

Exit points include the respiratory, gastrointestinal, urinary, and reproductive tracts; breaks in the skin, the blood, and body fluids secretions.

When a germ leaves the host, it must be *transmitted* to another host. Methods of transmission can be, but are not limited to:

- through contaminated food, water, animals, personal care items,
- by direct contact with blood and body fluids, wound dressings, “droplets” in the air from coughing or sneezing.

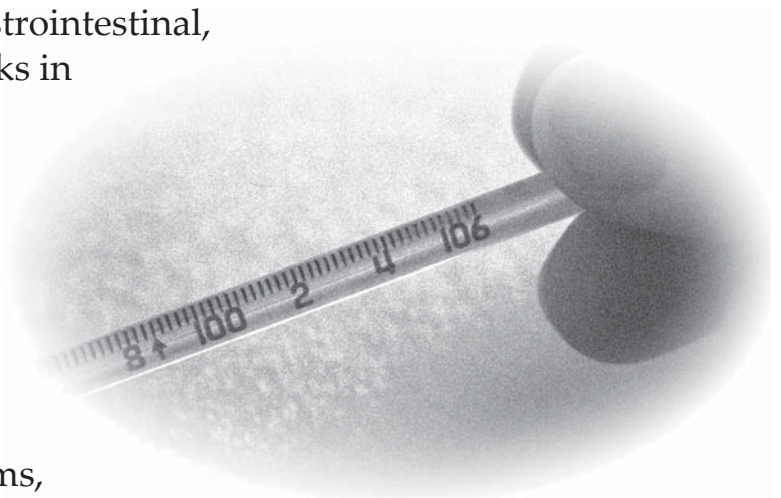
The germ must enter the body through an *entry point*. Points of entry and exit are the same. A *susceptible host* (a person at risk for infection) is needed for germs to grow and multiply.

The human body can protect itself from infection. A person’s ability to resist infection is affected by their age, nutritional status, stress, fatigue, general health, medications and the presence of disease or injury. Vaccinations also help to protect the body from certain infections.

Remember, an infection is a disease state resulting from the invasion and growth of germs in the body. When an infection occurs the body takes steps to fight it off. Some of the signs and symptoms of infection are:

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|---|---|
| -fever | -vomiting |
| -fast breathing or fast heart beat | -diarrhea |
| -pain or tenderness (can be specific to the infected area or generalized for systemic infections) | -rash |
| -loss of energy | -sores on mucus membranes |
| -loss of appetite | -redness and swelling of a body part |
| -nausea | -discharge or drainage from the infected area |

People are individual in their responses to infection. Not all people will experience all of these symptoms and some will experience these in varying degrees. Care providers need to know their client’s baseline health status and be able to recognize any of these signs and symptoms.



Asepsis (ā-sep-sis)

Asepsis is the process of removing disease-producing germs. Since germs are everywhere, certain practices are necessary to create asepsis. Medical asepsis, also known as clean technique, is the practice used to remove or destroy germs and to prevent their spread from one person or place to another.



Germs must not be present during surgery or when instruments are inserted into the body (i.e., a catheter). Open wounds (cuts, burns, surgical incisions) can provide entry points for germs. Contamination is the process of becoming unclean. In medical asepsis, an item or area is clean when it is free of germs. The item or area is contaminated if germs are present.

Aseptic practices break the chain of infection. You can prevent the spread of germs by adopting the following practices:

- 1) Wash your hands after urinating or having a bowel movement. Also wash your hands after changing tampons or sanitary pads, children's diapers or adult incontinence pads.
- 2) Wash your hands after contact with your own or another person's blood, body fluids, secretions or excretions. These include saliva, vomitus, urine, feces, vaginal discharge, mucus, semen, wound drainage, pus and respiratory secretions.
- 3) Provide all persons with their own toothbrush, drinking glass, towels, wash cloths and other personal care items.
- 4) Cover your nose and mouth when coughing, sneezing or blowing your nose.
- 5) Bathe, wash hair and brush your teeth regularly.
- 6) Wash your hands before and after handling, preparing or eating food.
- 7) Wash fruits and raw vegetable before eating or serving them.
- 8) Wash cooking and eating utensils with soap and water after use. Don't forget cutting boards, counters and anything touched by raw meat.
- 9) Using gloves when handling obviously soiled material and then performing good handwashing when finished.

Standard precautions

The Centers for Disease Control and Prevention (CDC) have updated their guidelines for protecting health care workers from exposure to infectious diseases. The guidelines include two tiers of precautions.

The first and most important tier contains those precautions designed to decrease the risk of transmission of disease to the health care worker through body fluids. This tier is called “Standard Precautions.” Standard precautions are used when caring for any person, regardless of the person’s diagnosis and whether the person is known to have an infectious disease.

The second tier is designed for use when caring for people who have been documented or are suspected to be carrying or be infected with germs that require extra precautions in addition to the “Standard Precautions.” This second tier is known as “Transmission-based Precautions” and will be discussed in an upcoming lesson.

Standard Precautions apply to situations when caregivers are in contact with:

- 1) Blood
- 2) All body fluids – secretions and excretions – except sweat, regardless of whether they contain visible blood
- 3) Broken skin (open sores, cuts, etc.)
- 4) Mucus membranes

Compliance

To comply with these standard precautions the following practice is expected.

Gloves — Must be worn when contact with blood or all body fluids, secretions and excretions (except sweat) regardless of whether they contain visible blood, broken skin, and mucous membranes.

Gowns or aprons — Must be worn during procedures or situations when you anticipate substantial soiling, exposure to body fluids, blood draining wounds, or mucous membranes.

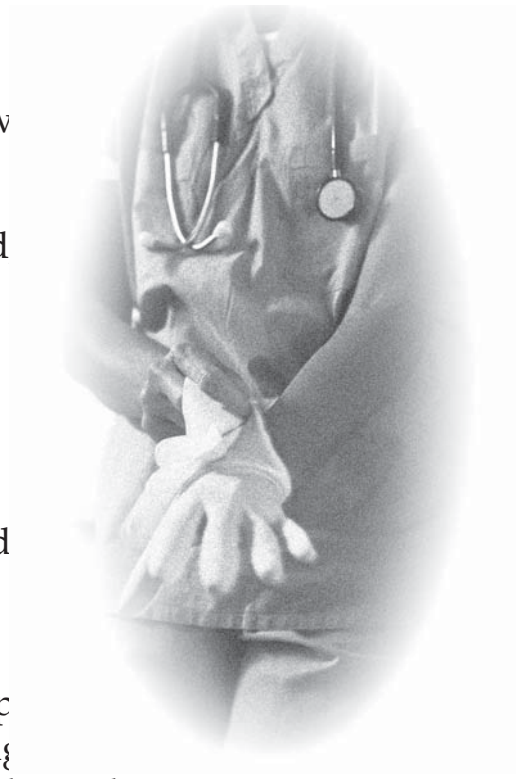
Mask and protective eyewear — Must be worn during procedures that are likely to generate droplets of body fluids or blood or when the person is coughing excessively. Must be worn when you are going to be within three feet of exposure to the anticipated droplets.

Handwashing — Hands must be washed before gloving and after gloves are removed. Hands and other skin surfaces must be washed immediately and thoroughly if contaminated with body fluids or blood and after all client care activities. Caregivers who have open cuts, sores or dermatitis on their hands must wear gloves for all client contact or be removed from client contact until the hands are healed. Alcohol hand rinses may be used if:

- 1) the hands are not visibly soiled
- 2) a sink is not readily available

Transportation — When transporting any client, ensure that precautions are maintained to minimize the risk of transmission of microbes to other clients, the general public and contamination of environmental surfaces or equipment. Usually gloves, gowns and masks are not needed.

Multiple-use client care equipment — When using equipment or items that are shared by more than one client, such as a stethoscope or blood pressure cuff, it must be adequately cleaned and disinfected after use or whenever it becomes soiled with blood or other body fluids. You may wipe the personal care items with any disinfectant, including alcohol.



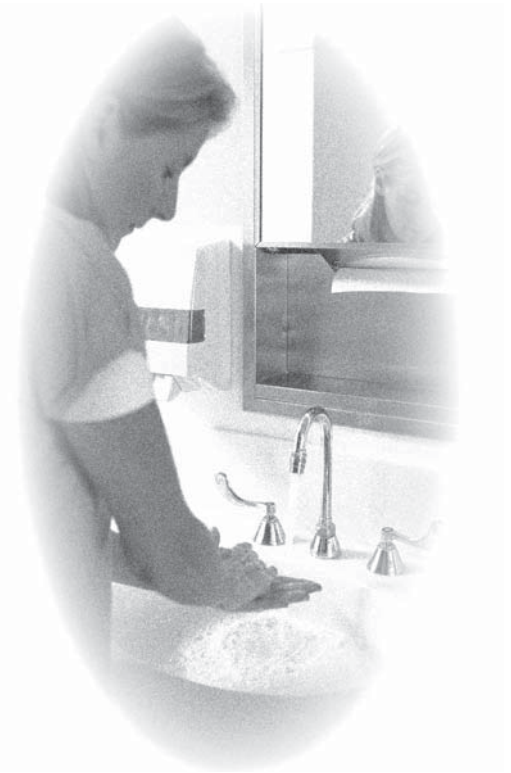
Health care professionals, including caregivers, are at increased risk of transmitting and hosting infections. However these risk can be greatly minimized or even eliminated by understanding simple infection control concepts.

It is your responsibility to do all you can to prevent infections in your clients and yourself.

Handwashing

Handwashing with soap and water is the easiest and most important way to prevent the spread of infection. You use your hands in almost every task. They are easily contaminated. Without handwashing, germs on the hands spread to other persons or items.

Wash your hands before and after giving care.



Handwashing how to —

- 1) Make sure you have soap, paper towels, orange stick or nail file and a wastebasket. Arrange to have all items easily available.
- 2) Push your watch or sleeves four to five inches up the arms.
- 3) Stand away from the sink so your clothes don't touch the sink. Stand so the soap and faucet are easy to reach.
- 4) Turn on the faucet. Adjust the water until it feels warm and comfortable.
- 5) Wet your wrists and hands thoroughly under running water.
Keep your hands lower than your elbows while washing.
- 6) Apply about a teaspoon of soap to your hands.
- 7) Rub your palms together and interlace your fingers to work up a good lather. This step should last 10-15 seconds.
- 8) Wash each hand and wrist thoroughly. Clean well between the fingers. Clean under the fingernails by rubbing the tips of your fingers against your palms.
- 9) Use a nail file or orange stick to clean under the fingernails if necessary.
- 10) Rinse your wrist and hands well. Water should flow from the arms to the hands.
- 11) Repeat steps six through ten if needed.
- 12) Dry your wrists and hands with paper towels. Pat dry starting at your fingertips.
- 13) Discard the paper towels.
- 14) Turn off faucets with clean paper towels to avoid contaminating your hands.
- 15) Discard paper towels.



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