

# In-Service Education Workbook 2

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# Table of Contents

Preventing Infection (2 credits)	1
Protecting Healthcare Workers and Others from Tuberculosis (2 credits)	11
Using Proper Body Mechanics (2 credits)	21
Preventing Falls in the Elderly (2 credits)	29
Preventing Accidents and Injuries (2 credits)	39
Understanding and Promoting Residents' and Clients' Rights (3 credits)	49
Maintaining Confidentiality (1 credit)	61



# Preventing Infection

(2 credits)

After completing this section, the student should be able to do the following:

1. Describe the chain of infection
2. Explain Standard and Transmission-Based Precautions
3. Explain hand hygiene and identify when to wash hands
4. Discuss the use of personal protective equipment (PPE)
5. List guidelines for handling equipment and linen

## 1. Describe the chain of infection

Infections occur when harmful microorganisms, called **pathogens**, invade the body and multiply. To understand how to prevent disease, it is helpful to first understand how it is spread. The **chain of infection** is a way of describing how disease is transmitted from one being to another (Fig. 1-1). Definitions and examples of each of the six links in the chain of infection follow.

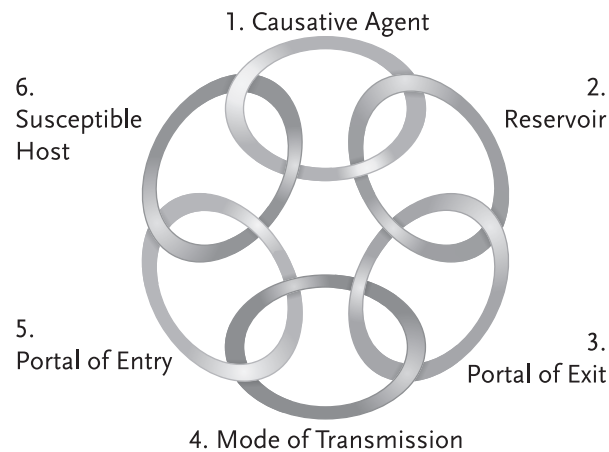


Fig. 1-1. The chain of infection.

**Chain Link 1:** The **causative agent** is a pathogenic microorganism that causes disease. Causative agents include bacteria, viruses, fungi, and parasites.

**Chain Link 2:** The **reservoir** is where the pathogen lives and grows. A reservoir can be a human, animal, plant, soil, or a substance. Microorganisms grow best in warm, dark, and moist places where food is present. Some microorganisms need oxygen to survive while others do not. Examples of reservoirs include the lungs, blood, and the large intestine.

**Chain Link 3:** The **portal of exit** is any body opening on an infected person that allows pathogens to leave (Fig. 1-2). These include the nose, mouth, eyes, or a cut in the skin.

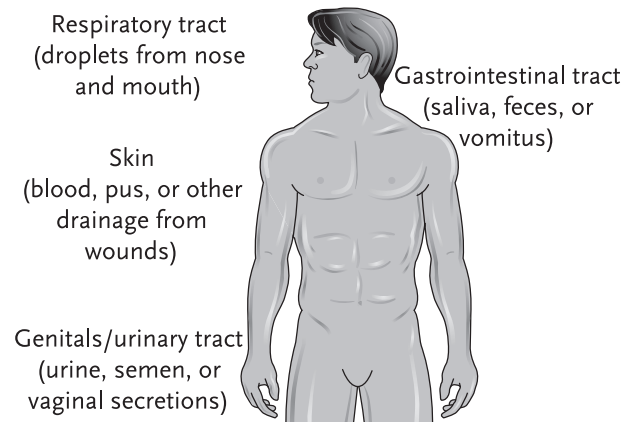


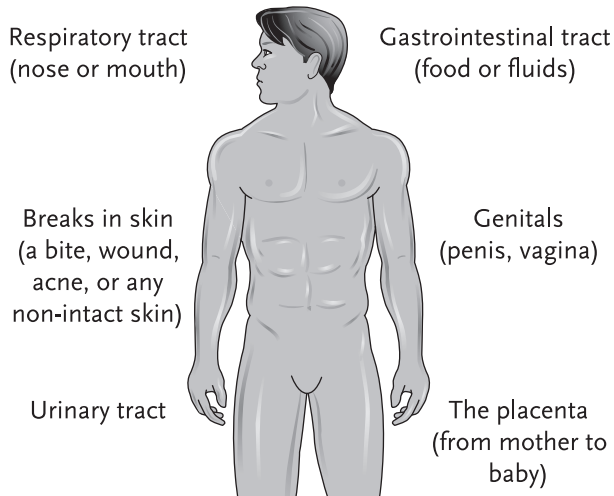
Fig. 1-2. Portals of exit.

**Chain Link 4:** The **mode of transmission** describes how the pathogen travels. Transmission can occur through the air or through direct or indirect contact. Direct contact happens by touching the infected person or his secretions. Indirect contact results from touching something contaminated by the infected person, such as a needle, dressing, or tissue. The primary route of disease transmission within the healthcare setting is on the hands of healthcare workers.

**Chain Link 5:** The **portal of entry** is any body opening on an uninfected person that allows pathogens to enter (Fig. 1-3). These include the nose, mouth, eyes, and other mucous membranes, cuts in the skin, and cracked skin.

**Chain Link 6:** A **susceptible host** is an uninfected person who could get sick. Examples

include all healthcare workers and anyone in their care who is not already infected with that particular disease.



**Fig. 1-3.** Portals of entry.

If one of the links in the chain of infection is broken, then the spread of infection is stopped. Infection prevention practices help stop the pathogens from traveling (Link 4), and getting on a person's hands, nose, eyes, mouth, skin, etc. (Link 5). Immunizations (Link 6) reduce a person's chances of getting sick from diseases such as hepatitis B and influenza.

## 2. Explain Standard and Transmission-Based Precautions

In 1996, the Centers for Disease Control (CDC), [cdc.gov](http://cdc.gov), recommended a new infection prevention system to reduce the risk of contracting infectious diseases in healthcare settings. In 2007 some additions and changes were made to this system. There are two tiers of precautions within this system: Standard Precautions and Transmission-Based, or Isolation, Precautions.

**Standard Precautions** means treating blood, body fluids, non-intact skin (like abrasions, pimples, or open sores), and mucous membranes (linings of mouth, nose, eyes, rectum, and genitals) as if they were infected. Body fluids include saliva, sputum (mucus coughed up), urine, feces, semen, vaginal secretions, pus or other wound drainage, and vomit. They do not include sweat.

Standard Precautions must be used with every resident/client. Following Standard Precautions

is the only safe way that nursing assistants and home health aides can do their jobs. An NA/HHA cannot tell by looking at people or even by reading their medical charts if they have a contagious disease such as tuberculosis, hepatitis, or influenza.

Standard Precautions include the following measures:

- Wash hands before putting on gloves and immediately after removing gloves.
- Wear gloves if the person may come into contact with any of the following: blood; body fluids or secretions; broken skin, such as abrasions, acne, cuts, stitches, or staples; or mucous membranes. Such contacts occur during mouth care; toilet assistance; perineal care; helping with a bedpan or urinal; ostomy care; cleaning up spills; cleaning basins, urinals, bedpans, and other containers that have held body fluids; and disposing of wastes.
- Remove gloves immediately when finished with a procedure.
- Immediately wash all skin surfaces that have been contaminated with blood and body fluids.
- Wear a disposable gown that is resistant to body fluids if the person may come into contact with blood or body fluids or when splashing or spraying blood or body fluids is likely.
- Wear a mask and protective goggles if the person may come into contact with blood or body fluids or when splashing or spraying blood or body fluids is likely.
- Wear gloves and use caution when handling razor blades, needles, and other sharps. Sharps are needles or other sharp objects. Sharps should be placed carefully in a biohazard container for sharps. These containers are hard, leakproof, clearly labeled, and warn of the danger of the contents inside (Fig. 1-4). There are also biohazard bags that are used for biomedical waste that is not sharp, such as soiled dressings, contaminated tubing, and other items. Biomedical/biohazard waste should be disposed of at the point of origin, or where the waste occurs.
- Never attempt to recap needles or sharps after use.

## Preventing Infection

Exam

**Multiple Choice.** Circle the letter of the correct answer.

- Which of the following is true of wearing gloves?
  - Disposable gloves can be washed and reused.
  - Gloves should be changed before contact with mucous membranes.
  - After giving care, gloves are not contaminated.
  - Gloves can continue to be worn if they are torn as long as the hole is covered.
- Under Standard Precautions, the term *body fluids* includes
  - Sweat
  - Water
  - Juice
  - Urine
- Hand hygiene is
  - Washing hands with either plain or antiseptic soap and water or using alcohol-based hand rubs
  - Washing hands with soap and water only
  - Using alcohol-based hand rubs only
  - Wearing gloves when performing care procedures
- The following are necessary links in the chain of infection. When a caregiver wears gloves, which link is broken, thus preventing the spread of disease?
  - Reservoir (place where the pathogen lives and grows)
  - Mode of transmission (a way for the disease to spread)
  - Susceptible host (person who is likely to get the disease)
  - Causative agent (pathogenic microorganism that causes disease)
- With whom should an NA/HHA use Standard Precautions?
  - With people who have infectious diseases
  - With people he suspects might have infectious diseases
  - With every person in his care
  - With people who request that they be used
- Which of the following is the proper order to don PPE?
  - Put on mask and goggles, gown, and gloves.
  - Put on gloves, gown, and mask and goggles.
  - Put on mask and goggles, gloves, and gown.
  - Put on gown, mask and goggles, and gloves.
- Which of the following is true of Transmission-Based Precautions?
  - An NA/HHA does not need to practice Standard Precautions if he practices Transmission-Based Precautions.
  - They are exactly the same as Standard Precautions.
  - They are practiced in addition to Standard Precautions.
  - They will not be listed in the care plan so as not to alarm anyone.