

Infection Prevention for CNAs

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Purpose and Objectives

The purpose of this self-study course is to improve CNA's knowledge and understanding of infection prevention practices.

After successful completion of this course, you will be able to:

1. Describe the benefit of using infection prevention practices and potential consequences of misuse.
2. Identify how infection is spread in healthcare settings.
3. Describe the correct method for hand washing.
4. Identify various personal protective equipment and describe associated functionality.

Introduction

Infection prevention is everyone's job.

Each day healthcare workers are on the front lines caring for patients while taking precaution to protect themselves, their patients, and the public, from infection.

This routine practice helps fight the spread of infectious disease and assists in combating the ever-growing number of antibiotic-resistant organisms.

1. TRUE or FALSE?

There is little that can be done to prevent infections that start in the hospital.

True

False

CORRECT

Yes, that's right! The correct answer is False.

Many infection prevention measures exist; by instituting your organizations guidelines you will assist in the prevention of healthcare-associated infections.

Healthcare Associated Infections (HAIs)

Healthcare-associated infections (HAIs) are devastating and may take years for a patient to completely recover. In addition to the human burden, HAIs take a toll on the economy; in 2004 an estimated \$6.5 billion dollars were spent on associated infection costs (WHO, 2013).

Magill (2014) reported that in 2011 there were 648,000 patients with 721,800 health care-associated infections in U.S. acute care hospitals. Experts believe the vast majority of these deaths are preventable if proper infection prevention guidelines are instituted.

Failure to follow infection prevention guidelines can lead to more than the loss of your job. Knowingly risking the lives of others is a crime punishable by law.

For the purposes of this course, a pathogen is a germ that causes a disease.

Preventing the Spread of Infection

Generally, the Registered Nurse is responsible for overseeing your standards of care. The RN will tell you when to use special infection prevention practices for individual patients.

You alone are responsible for carrying out routine infection prevention practices.

Established guidelines will tell you what type of infection prevention procedures to use. Additionally, it is your responsibility to report people who do not follow the guidelines.

2. TRUE or FALSE?

You can lose your job and be punished for a crime by not following infection prevention guidelines.

True

False

CORRECT

Yes, that's right! The correct answer is True.

Risking the lives of others through negligence is a serious offense.

The Chain of Infection

To understand infection, think of it as a chain with links (APIC, 2002).

Reservoirs are places where pathogens (microorganisms that cause disease) can live and multiply.

A reservoir could be a person, animal, arthropod, plant, soil, or another substance. In hospitals, reservoirs could be patients, hospital workers, visitors, equipment, food, or the hospital itself - the building, water supply, or ventilation system.

Bacteria, viruses, fungus, and parasites depend on reservoirs for their survival. From there they can go to susceptible hosts, such as a patient in a hospital.

Some patients are hospitalized because they have an infection. Others become infected while hospitalized for another reason. Some have chronic infections. You may know that patients are infected or you may not. Many patients don't know that they are chronically infected with viruses or parasites.

The Spread of Pathogens

Pathogens (germs) enter and leave the body in many different ways, such as through the skin, in a cough or sneeze, blood, stool or vomit. It depends on the type of infection.

Isolation precautions are based on how germs exit the body of an infected person and enter another.

For example, HIV can easily exit through blood, semen, cerebral spinal fluid, amniotic fluid, and fluids that surround organs or joints.

However, HIV cannot exit in a cough, sneeze, stool, urine, or tears.

3. TRUE or FALSE?

HIV is spread through coughing.

True

False

CORRECT

Yes, great job! The correct answer is False.

HIV is not spread through respiratory secretions.

The Spread of Pathogens (con't.)

Pathogens are most likely to enter a person's body when natural protective barriers, such as skin, are broken, although pathogens can enter the human body in many ways.

Click the mouse to see some of those ways.

- Mucous membranes
- Broken skin
- Gastrointestinal tract
- Respiratory tract
- Genitourinary tract

The Spread of Pathogens (con't.)

Some organisms cause disease more easily than others. For example, Hepatitis B is easier to contract than HIV.

The number of organisms (germs) you are exposed to increases the chance of infection. For example, exposure to tuberculosis is less likely in the setting of lots of fresh air, such as outside.

In the hospital, getting stuck by a used needle is more dangerous than getting stuck by a sterile needle. The number of exposures can make a difference too

Healthcare-Associated Infection

The World Health Organization (2013) defines a Healthcare-Associated Infection (HAI), also known as a 'nosocomial infection', as

"An infection occurring in a patient during the process of care in a health-care facility which was not present or incubating at the time of admission. This includes infections acquired in the hospital but appearing after discharge, and also occupational infections among staff."

The table shown depicts the estimated number of HAIs occurring in Acute Care hospitals across the United States in 2011 (Magill, 2014).

DID YOU KNOW?

"Infection control" is now termed "infection prevention."

Site of Infection	Estimated Number
Pneumonia	157,500
Gastrointestinal Illness	123,100
Urinary Tract Infections	93,300
Primary Bloodstream Infections	71,900
Surgical site infections from any inpatient surgery	157,500
Other types of infections	118,500
Estimated total number of infections in hospitals	721,800

Infection and Immunity

The immune system fights invading pathogens through several responses.

Some patients may be at a greater risk of developing an infection if their immune system is weak.

Click the mouse icon to view groups of greater at risk patients.

- Infants
- The elderly
- Patients taking steroids
- Patients taking medications to change their immune response
- People infected with HIV
- People with cancer or receiving chemotherapy or radiation treatment
- People with end-stage renal disease
- People with diabetes mellitus

Preventing Transmission

Skin is a reservoir that may be loaded with bacteria which can cause an infection in other places of the body. Typically, we all carry between 10,000 and 10 million bacteria on each hand. Some patients carry staphylococcus on their skin.

All patients, regardless of their diagnoses, shed skin cells carrying microbes. You can pick up pathogens from skin, gowns, bed linens, bedside furniture, and other medical equipment in the patient's environment. The patient's environment is frequently contaminated with bacteria that survive despite drying (CDC, 2010).

Thus, frequent handwashing before, and after, all patient care activities is necessary to prevent the transmission of microbes.

4. TRUE or FALSE?

Handwashing is only necessary after handling body wastes.

True

False

CORRECT

Yes, that's right. The correct answer is False.
Bacteria lives on skin, clothing, and objects.

Handwashing

Handwashing is important because pathogens on your hands can easily spread from one patient to another, or from one healthcare worker to another. This can lead to deadly infections.

Of the 99,000 patients who die annually from HAIs, it is believed that proper antiseptic handwashing or alcohol-based hand rubs can save the lives of as many as 20,000 patients each year (Berens, 2002 and WHO, 2013).

Why Wash

Understanding why handwashing is important helps healthcare workers, and patients, adhere to CDC recommendations.

Click the mouse to see some reasons handwashing makes a difference.

- Reduces the number of people who get sick with diarrhea by 31%
- Reduces diarrheal illness in people with weakened immune systems by 58%
- Reduces respiratory illnesses, like colds, in the general population by 21%
- About 2.2 million children under the age of 5 die each year from diarrheal diseases and pneumonia, the top two killers of young children around the world.
- Handwashing with soap could protect about 1 out of every 3 young children who get sick with diarrhea and almost 1 out of 6 young children with respiratory infections like pneumonia.

(Liu, 2012 and Aiello, 2008)

Gloves and Alcohol Rubs

If I wash my hands, do I still need to wear gloves?

Gloves don't eliminate the need for hand hygiene. Likewise, handwashing does not eliminate the need for gloves. Gloves reduce hand contamination by 70% to 80% (CDC, 2002).

Are there times when I must wash my hands with soap and water instead of an alcohol-based rub?

Yes. Alcohol-based rubs are quicker and less irritating than soap and water but is not always the right choice.

The CDC recommends that you wash your hands with soap and water (vs. alcohol-based rub) when your hands are **visibly soiled** or when caring for a patient with known, or suspected C.Diff. Either anti-bacterial or non-anti-bacterial soap will work (CDC, 2002).

5. TRUE or FALSE?

Only handwashing with soap and water may be used after caring for a person with C.Diff.

True

False

CORRECT

Yes, that's right. The correct answer is True.

C.Diff spores may only be removed by use of soap and water.

When to Wash

Click the mouse icon to learn when you should wash your hands with soap and water or use alcohol-based hand rubs.

- Before and after direct contact with patients
- Before and after handling a catheter or any tube going into the patient's body
- Before and after any contact with a patient's skin or mucous membranes, body fluids or excretions
- Before and after moving from a contaminated-body site to a clean-body site during patient care
- After contact with medical equipment in the patient's room
- After removing gloves

(CDC, 2002)

How to Wash

Soap and Water

1. **Wet** your hands with clean, running water (warm or cold), turn off the tap, and apply soap.
2. **Lather** your hands by rubbing them together with the soap. Be sure to lather the backs of your hands, between your fingers, and under your nails.
3. **Scrub** your hands for at least 20 seconds. Need a timer? Hum the "Happy Birthday" song from beginning to end twice.
4. **Rinse** your hands well under clean, running water.
5. **Dry** your hands using a clean towel or air dry them.

Alcohol-based Hand Rub

The best way to use an alcohol-based hand rub is to apply the rub on the palm of one hand. Then rub your hands together covering all surfaces until your hands are dry. Use the amount of alcohol-based hand rub recommended by the manufacturer (CDC, 2015).

6. TRUE or FALSE?

There are times when an alcohol-based hand rub is not the right choice.

True

False

CORRECT

Yes, that's right! The correct answer is True.

Soap and water are necessary when hands are dirty from blood or body fluids.

Sensitive Skin

Sensitive skin can be irritated by the repeated use of harsh soaps and water. However, alcohol-based hand rubs might help.

You can also use hand lotions or creams approved and provided by your employer. Some hand lotions will defeat the protective benefit of some gloves, refer to the manufacturers guidelines or ask your infection prevention team.

If you have problems with sensitive skin, ask your supervisor for alternative ways to wash your hands.

If you have broken skin from cuts, scrapes, or a weeping rash, your chances of picking up an infection are high. Bring this to your supervisor's attention.

Needlestick Injuries

Each year more than 600,000 healthcare workers are injured with contaminated needles or other sharps and risk becoming infected with bloodborne pathogens, such as Hepatitis B or C or HIV (JCAHO, 2001). Most of these people are nurses but you need to be aware of this problem.

Some of the injuries occur during the clean-up after a procedure. You can protect yourself against needlestick injuries by **disposing of syringes and other sharps** as soon as possible to prevent injuries and risk of spreading infection. Always use a puncture resistant **sharps container**.

A used needle should *never* be recapped (NIOSH 2000).

As a CNA you need to be cautious about what is left lying around in your work areas. You should also **never transfer bodily fluid from one container to another** (NIOSH 2000).

Injuries and Infection

Some needlestick injuries may cause an infection. Infections are most likely to occur when (NIOSH, 1999):

- The needle or sharp is visibly contaminated with blood
- The needle comes from the patient's vein or artery
- The injury to the healthcare worker is deep
- A large amount of contaminated blood or body fluid is involved
- The patient is terminally ill

Hepatitis and HIV Infections

The number of work-related infections from **Hepatitis B** is lower than it used to be because of vaccinations. Without having a vaccination, your odds of getting Hepatitis B from a contaminated needlestick is about one in three.

If you are not vaccinated and get stuck, you can get a combination of passive and active immunization. This is 90% effective in preventing the disease (NIOSH, 1999).

The risk of **Hepatitis C** infection from a single contaminated needlestick is about 2%. Up to 1,000 healthcare workers are infected with this virus at work each year (Bockhold, 2000).

Injuries with needles and other sharps are the most common route of **HIV** transmission in healthcare settings. The risk of becoming infected after a single stick depends on the amount of blood or fluid injected. Your chance of getting HIV is 0.3% (less than 1%) for each exposure. That's about three times greater than the risk from getting splashed in the face with HIV-infected blood or body fluids (NIOSH, 1999).

7. TRUE or FALSE?

There is a one in three chance of getting Hepatitis B from a needlestick.

True

False

CORRECT

Yes, great answer!

This is the risk unless you have been immunized against Hepatitis B.

Care of Needlestick Injuries

Per CDC guidelines (2014), if you experienced a needlestick or sharps injury or were exposed to the blood or other body fluid of a patient during the course of your work, immediately follow these steps:

1. Wash needlesticks and cuts with soap and water
2. Flush splashes to the nose, mouth, or skin with water
3. Irrigate eyes with clean water, saline, or sterile irrigants
4. Report the incident to your supervisor
5. Immediately seek medical treatment

If you have questions about appropriate medical treatment for occupational exposures, assistance is available from the Clinicians' Post Exposure Prophylaxis (PEP) Line at 1-888-448-4911.

Personal Protective Equipment (PPE)

What equipment will protect me from infectious hazards?

Special equipment makes your job safer, and is known as Personal Protective Equipment (PPE).

Click the mouse icon to see what PPE includes:

- Gloves
- Gowns
- Masks
- Fluid shields
- Safety glasses
- Goggles

Selection and Use of Personal Protective Equipment

The selection of PPE will be done by the registered nurse who supervises you.

Some of the considerations for selecting PPE are:	Picking the most protective glove for the job
	Finding alternatives when you or the patient has a latex allergy
	Using a strong shield or goggles if splashing of blood or fluids is possible
	Using a respirator if airborne pathogens are a danger

PPE Guidance

PPE Guidance

Do not wear personal protective equipment outside of the patients' room after entry.

Remember to remove your gloves and wash your hands after caring for a patient. Do this before charting, or touching other environment surfaces or equipment.

Do not use the same personal protective equipment while caring for more than one patient.

Put gloves, gowns, shields, and other personal protective equipment in the appropriate trash receptacle.

Find out what to do with reusable equipment that needs to be disinfected.

8. TRUE or FALSE?

Gloves and gowns have to be changed between patients.

True

False

CORRECT

Yes, great job! True is the correct answer.

Using the same protective equipment will carry pathogens from one patient to another.

Standard Precautions

Standard precautions apply to ***all*** patients.

They reduce the spread of infection by treating all patients as if they are infectious. Gloves, gowns, and face shields (PPE) are required.

Use PPE when working with:

- Blood
- All body fluids, except sweat, whether you can see blood in it or not
- Broken skin
- Mucous membranes

(Garner, 1996)

DID YOU KNOW

"Standard precautions" used to be called "universal precautions."

Isolation Precautions

There are three kinds of ***isolation precautions*** used in hospitals:

- Airborne precautions
- Droplet precautions
- Contact precautions

(Garner, 1996)

Isolation precautions (contact, airborne and droplet precautions) are employed when dealing with an infectious or communicable disease.

Airborne and Droplet Precautions

Some infectious diseases are spread by droplet infection. These are known as airborne disease, as the pathogens that cause disease are carried in the air from one person to another. In a hospital, there are two types of precautions we use to protect against the transmission of airborne pathogens. The choice depends on the size of the infectious particles that are of concern.

9. TRUE or FALSE?

A patient with pneumonia needs to be nursed in a specially ventilated room.

True

False

CORRECT

Yes, the correct answer is False.

Since the infective particle in pneumonia is large, only droplet precautions are needed, not special ventilation.

Contact Precautions

Patients infected with bacteria resistant to many drugs need contact precautions. These patients are usually in private rooms.

The site of the infection could be gastrointestinal, respiratory, skin, or wounds.

It could also include organisms that are easily spread by direct contact, such as scabies (Garner, 1996).

10. TRUE or FALSE?

The type of isolation used depends on whether or not the patient can afford a private room.

True

False

CORRECT

Yes, that's right. The correct answer is False.

The isolation type depends on the pathogen of concern and how it can be spread.

Immunizations

You are advised to be immunized for rubella, measles, mumps, varicella, Hepatitis B, and influenza.

Depending on the kinds of patients you care for, you may choose to be immunized for other infectious diseases, such as Hepatitis A. If there is an outbreak of something like smallpox your organization will offer you the best protection.

11. TRUE or FALSE?

Healthcare workers are NOT routinely recommended to get a smallpox immunization.

True

False

CORRECT

Yes, that's right! The correct answer is True.

Healthcare workers are NOT routinely recommended to get a smallpox immunization.

The standard recommendations for immunizations are for childhood diseases, Hepatitis B, and flu.

TB Testing

Everyone in a healthcare organization should be tested regularly.

The most common type of skin test is the **Mantoux TB skin test**. A small amount of (PPD) tuberculin is injected that raises a wheal (raised, reddened area) 6 to 10 mm in diameter (CDC, 2005). The test is read between 48 and 72 hours after it's injected. For most healthcare workers a raised area of 10 mm or over indicates a positive TB skin test. In some people a raised area of 5 mm or over indicates a positive result (CDC, 2005).

Positive results are usually found in people with:

- HIV infection
- Recent contact with people with TB
- Chest x-ray findings consistent with old healed TB
- Organ transplants
- Other forms of weakened immune responses

Safety and Reliability of the TB Skin Test

Question: Can I safely receive a Mantoux TB skin test if I'm pregnant?

Answer: Yes. The tests are safe and reliable during pregnancy (CDC, 2005).

Question: Can people who recently received live-virus vaccines be tested using Mantoux TB skin tests?

Answer: Live-virus vaccines may cause falsely negative TB skin tests. For live-virus measles vaccine, the most common live-virus vaccine, the Mantoux TB skin test should be given on the day of vaccination or 4 to 6 weeks after vaccination (CDC, 2005).

Question: Does a negative Mantoux TB skin test always mean that the person is free of TB?

Answer: No. The test isn't always accurate. Between 10% to 25% of people with TB have negative TB skin tests (CDC, 2005). Healthcare workers usually get a two-step skin test on their first screening to be sure they are uninfected. A negative test is followed by a second test a few weeks later.

12. TRUE or FALSE?

A single Mantoux TB skin test is 100% accurate.

True

False

CORRECT

Yes, great job! The correct answer is False.

A second test is done later to be sure a person does not have TB.

Exposure to Communicable Diseases

If you are exposed to a communicable disease, such as whooping cough, measles, mumps or meningitis, you will need to be evaluated.

If necessary, you may receive treatment, such as prophylactic antibiotics after exposure to meningococcal meningitis.

You may be asked not to work until time proves you are not infectious.

HIV Exposure

If you are exposed to HIV in the course of caring for a patient, you will need to seek treatment as soon as possible.

Treatment must start within hours of exposure and lasts for four weeks. The specific medications you need depend on the kind of injury, the severity of the exposure, and the patient source.

Follow-up HIV antibody testing should be repeated during the first six months, if previous tests results are negative.

Click the mouse icon to learn what the CDC says exposed healthcare workers should do during the first six months (CDC, 2001):

- Abstain from sexual activity or use condoms
- Avoid pregnancy
- Discontinue breastfeeding
- Avoid donating blood, plasma, semen, tissue, or organs

HIV Exposure (con't.)

People infected with HIV can continue to work, but should be extremely diligent in following standard precautions, washing their hands, using gloves, and handling sharps carefully.

Those with advanced HIV disease, certain opportunistic infections, or HIV-related dementia may be retired from their jobs or practice with restrictions (CDC, 2001).

An individual cannot be forced to test for HIV. You must provide a written informed consent before a test for HIV. The results will remain confidential.

Hepatitis B Exposure

If you have been exposed to Hepatitis B while taking care of a patient, you will be asked if you have previously been immunized against Hepatitis B. If you have not been immunized against this, you can expect to receive Hepatitis B immune globulin within 24 hours of the exposure.

To provide long-term immunity, you may also receive a vaccine. You may be tested to see if a previous vaccine or infection left you with enough protective antibodies.

You will also get follow-up testing in three to six months to make sure you are infection-free.

DID YOU KNOW?

There is no need to change sexual activities, defer pregnancy, or stop breastfeeding. (CDC, 2001).

And usually, you can keep working, unless you develop symptoms of acute Hepatitis B.

Hepatitis C Exposure

If you have been exposed to Hepatitis C, expect immediate and follow-up testing over the next six months.

Since there is no specific treatment available for this infection, you will be monitored closely and receive treatment later if you develop chronic hepatitis.

DID YOU KNOW?

Just like with Hepatitis B exposure, there is no need to change sexual activities, defer pregnancy, or stop breastfeeding.

However, you should not donate blood, semen, or organs until shown to be free of this infection.

Also, you can continue working (CDC, 2001).

13. TRUE or FALSE?

There is no prophylactic treatment available to you if you become exposed to Hepatitis C.

True

False

CORRECT

Yes, that's right. The correct answer is True.

No treatment is available for this type of hepatitis.

Developing an Infectious Disease

As healthcare workers, we may worry about developing an infectious disease. Although there are hundreds of infectious diseases, we can protect ourselves and others.

If you suspect that you may have developed an infectious disease, ask your supervisor what your treatment options are and whether you should continue to work. In some instances, this is set by federal, state, and local public health guidelines. Some infectious diseases must be reported to your state department of health.

14. TRUE or FALSE?

Following common sense and always practicing good handwashing are enough to keep me from spreading any infections I might be carrying.

True

False

CORRECT

Yes, that's right! The correct answer is False.

Each infection needs a different treatment. Some are contagious and must be reported to the health department so they can be monitored.

Notification of Infectious Diseases

All infectious diseases need to be reported, but the healthcare worker's name and details of their health status are kept confidential.

If a patient is exposed to an infectious disease from a healthcare worker, this needs to be reported to the patient. The healthcare worker's name and details of their health status are kept confidential. The hospital will explain to the patient that precautions were taken to minimize the risk of transmission, but these are not always 100% effective.

Conclusion

Infection prevention is designed to protect you, other healthcare workers, and your patients.

Use what you have studied here to promote health by preventing the spread of infection.

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Infection Prevention for CNAs

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