

# **ISOLATION PRECAUTIONS**

## **Abstract**

Healthcare facilities, such as hospitals, clinics, and long-term care facilities, are monitored and guided by national standards to prevent healthcare-associated infections, which are infections that occur during the course of healthcare delivery. They may also occur during home health aide services. A healthcare-associated infection that occurs in a hospital is referred to as a nosocomial infection, and hospitals have protocols to prevent the start and spread of a nosocomial infection. Standard Precautions are the foundation for preventing the spread of pathogens in healthcare settings. Infection control techniques that are also used include Airborne Precautions, Contact Precautions, Droplet Precautions, Respiratory Hygiene and Cough Etiquette. There are also circumstances where greater protections may be needed, such as Isolation Precautions to prevent the transmission of a particularly virulent disease. To prevent infection and the spread of infection all healthcare workers should be trained and required to practice safe infection control as an important part of their everyday practice.

## **Learning Objectives:**

1. Define nosocomial infection.
2. Describe the implementation of infection control techniques.
3. Describe how to properly and efficiently use Isolation Precautions.

## **Introduction**

Infection control is an important part of healthcare procedures and practices. Standard Precautions are the foundation for preventing the spread of pathogens in healthcare settings. In addition to the Standard Precautions, infection control techniques that are also used include Airborne Precautions, Contact Precautions, Droplet Precautions, Respiratory Hygiene and Cough Etiquette. There are also circumstances where greater protections may be needed. *Isolation Precautions* are implemented when the transmission of a particularly virulent disease cannot be prevented by Standard Precautions alone; for example, if a patient is known or suspected to be infected with a particularly virulent pathogen, such as severe acute respiratory syndrome (SARS), *Isolation Precautions* are needed. The following sections will discuss Isolation Precautions and other infection control techniques that Certified Nursing Assistants (CNAs) have a responsibility to learn and practice.

## **Healthcare Associated Infections**

Healthcare-associated infections (HAIs) are infections that occur during the course of healthcare delivery. The setting could be a hospital, a clinic, a long-term care facility, or in the home. A healthcare-associated infection that occurs in a hospital is called a *nosocomial infection*. In order to be classified as a nosocomial infection, the patient must 1) have been admitted for an illness other than the infection, and 2) did not have evidence of the infection before entering the hospital.

Healthcare-associated infections are a significant cause of illnesses. The CDC estimated that in 2011, there were over 700,000 nosocomial infections in U.S., hospitals, and more than 75,000 of these patients died. Table 1 lists some of the common HAIs.

**Table 1: Healthcare-Associated Infections**

<p><b>Bacteremia</b> <b>Central IV line infections</b> <b><i>Clostridium difficile</i> colitis</b> <b>Methicillin-resistant <i>S aureus</i> infections</b> <b>Surgical incision site infections</b> <b>Urinary catheter infections</b> <b>Ventilator-associated pneumonia</b></p>
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A pathogen is a microorganism such as a bacteria or a virus that is capable of causing a potentially harmful disease. Common pathogens are the methicillin-resistant *Staphylococcus aureus* (MRSA) bacteria, the influenza virus, the bacteria that cause pneumonia, the hepatitis B and C viruses, and the human immunodeficiency virus (HIV).

Healthcare-associated infections are relatively common but obviously they do not develop in a majority of patients. A healthcare-associated infection develops if there is a source for infection, there is a receptive host, and there is a mode for transmission of a pathogen that may lead to a healthcare-associated infection.

### **Source of Infection**

For a healthcare-associated infection to occur there must be a source of infection. Given the fact that many people are admitted to a hospital for treatment of an infectious disease, there will always be many sources of infection in healthcare settings.

The environment of a healthcare facility, the people who work there, and visitors can be sources for infection. Pathogen contamination of environmental surfaces such as bed rails, countertops and medical equipment is well-documented, making these potential sources of infection. Studies have shown that healthcare workers (HCWs) often carry potentially dangerous microorganisms. For example, the well-known bacteria methicillin-resistant *Staphylococcus aureus* bacteria (MRSA), has been estimated to be carried by as many as 15% of healthcare workers.

### **Receptive Host**

A receptive host can be anyone who is exposed to an infectious pathogen. Patients most at risk for an HAI are elderly patients, patients who are immunocompromised, and patients who have entry points in which a pathogen may enter their body. The last example would include patients who have an open wound, patients who have an in-dwelling urinary catheter, a central intravenous (IV) line, or any other any significant break in the normal integrity of the skin or in the body's defense mechanisms.

### **Mode of Transmission**

There are three ways that pathogens are transmitted and cause HAIs: *contact transmission*, *droplet transmission*, and *airborne transmission*. Mode of transmission will be discussed at length because reducing or stopping HAIs is done by preventing transmission of pathogens. Preventing transmission of pathogens is done in part by proper use of infection control techniques.

## **Contact Transmission**

Contact transmission is the primary way pathogens are spread in healthcare settings. Contact transmission can be *direct* or *indirect*. Direct transmission occurs when pathogens are spread by direct contact of an infected person to someone else. There is no intermediary. This can happen if a person is splashed with an infected body fluid like blood or sputum, or suffers a needlestick injury. Indirect transmission occurs when a pathogen is transmitted from an infected source to another person by a contaminated object or a contaminated person, and this is a common occurrence in healthcare.

The pathogen transmission may be from patient to healthcare worker, and then to another patient. It may be from an infected object or surface to a healthcare worker and then to a patient; or it may be from an infected object worn or used by a healthcare worker. A typical example of indirect transmission of a pathogen is changing a surgical dressing. A CNA, Registered Nurse (RN), or Medical Doctor (MD) has direct contact with a patient or contaminated bandages while changing a surgical dressing. If infection control techniques are not followed, *for example*., proper handwashing is not done, a bacterium that was present on the surgical incision or the old dressing material can be transmitted to the person's hand and then be transmitted to another patient.

## **Droplet Transmission**

Droplet transmission is the spread of relatively large infected droplets from the one person's respiratory tract to another person's respiratory tract, mouth, nasal passages, or the conjunctival surfaces of the eyes. Droplet transmission can happen if a person is in close contact (approximately three feet or less) of an infected person. It can occur

when someone coughs, sneezes, or talks. It can also occur during cardiopulmonary resuscitation, suctioning, inserting an endotracheal tube, or during chest physical therapy.

There is some evidence that droplet transmission can occur at distances of six feet or more and the current recommendations for droplet precautions take this into account. In most cases infected droplets do not travel far and do not remain suspended in the air for a long period of time.

### **Airborne Transmission**

Airborne transmission occurs when small infectious particles (smaller than infected droplets) are spread from an infected person to someone else. Face-to-face contact or close proximity is not necessary for airborne transmission to occur because these infectious particles can travel long distances and they remain airborne for long periods of time. Preventing airborne transmission requires special air and ventilation systems and special consideration for patient placement.

Health-associated infections such as *Clostridium difficile* colitis, MRSA infections, and surgical incision site infections are very common and they can be quite serious. These infections happen when pathogens are spread by contact transmission (direct and indirect), droplet transmission, or airborne transmission. Patient to patient transmission by way of a healthcare worker is a common cause of HAIs. Conscientious and consistent use of infection control techniques is the primary way that HAIs can be prevented.

## **The Importance of Infection Control**

Healthcare facilities help patients heal and recover but along with the benefits, there is a risk of infection being transmitted within the healthcare settings. Infection control is defined *as the focused efforts to reduce the transmission of pathogens in healthcare settings*, and to prevent and reduce infections that can occur during the delivery of healthcare.

There are three defined areas in the practice of infection control:

1. Determining the specific infection control techniques that are needed for each patient care situation.
2. Educating the healthcare staff in the proper use of infection control techniques
3. Monitoring to see if infection control techniques *are* being properly used and if they are preventing the occurrence of infections.

Certified Nursing Assistants are expected to know and independently use Standard Precautions. This is considered part of a CNA's professional responsibilities. Certified Nursing Assistants are not expected to determine whether or not Isolation Precautions are needed. This decision is made by an infection control specialist. However, CNAs *are* expected to follow the Isolation Precautions protocols.

### **Isolation Precaution Techniques**

Isolation Precautions are a combination of commonly used infection control techniques. All infection control techniques and procedures are intended to isolate caregivers and patients from harmful pathogens; however, isolation precautions are implemented when the transmission of a particularly virulent disease cannot be prevented by Standard Precautions alone. Isolation Precautions are relatively complex and

time-consuming to use. In order to protect patients and clinicians, Isolation Precautions must be used correctly and all of the time.

Isolation Precautions, also referred to herein as Transmission-Based Precautions, are infection control techniques that are used when Standard Precautions will not protect patients and caregivers from an infectious disease. These techniques include Contact Precautions, Droplet Precautions, and Airborne Precautions. Considered together these techniques are called *Transmission-Based Precautions*.

The most important source and the one that is directly quoted is the Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings. The Guideline is a comprehensive document produced by the Centers for Disease Control and Prevention (CDC), and it is available online at the *CDC Infection Control* website (<https://www.cdc.gov/infectioncontrol/index.html>).

### **Indications for Isolation Precautions**

The CDC recognizes two levels of precautions that are used to prevent transmission of infectious diseases, Standard Precautions and Transmission Precautions. If a patient is known or suspected to be infected with certain pathogens such as herpes zoster (shingles), varicella (chicken pox), severe acute respiratory syndrome (SARS), or tuberculosis, *Isolation Precautions* are needed.

The Guideline for Isolation Precautions published by the CDC noted that “Transmission-Based Precautions are for patients who are known or suspected to be infected or colonized with infectious agents, including

certain epidemiologically important pathogens, which require additional control measures to effectively prevent transmission. Transmission-Based Precautions are used when the routes of transmission are not completely interrupted using Standard Precautions alone.” Further, “Standard Precautions are intended to be applied to the care of all patients in all healthcare settings, regardless of the suspected or confirmed presence of an infectious agent. Implementation of Standard Precautions constitutes the primary strategy for the prevention of healthcare-associated transmission of infectious agents among patients and healthcare personnel.”

Isolation Precautions (Transmission-Based Precautions) are used when a patient is known or suspected to be infected with a specific pathogen and Standard Precautions are not sufficient. Isolation Precautions include one or more (or all) of the Transmission-Based Precautions *and* Standard Precautions.

The CDC Guideline for Isolation Precautions can be used as a guide for infection control techniques for any infectious disease except Ebola and measles. Infection control practices appropriate for patients infected with Ebola or measles are covered in separate CDC documents (not included here). Of course it is not always possible to know if an infection that requires the use of Isolation Precautions is present. Infections with herpes zoster, rubeola (measles), MRSA, tuberculosis, and other diseases may require laboratory tests to confirm they are present and the results of these tests are not immediately available. In some cases it may be clear that a patient is infected with one of these microorganisms. If not, clinicians will strongly consider initiating Isolation Precautions if a patient has one of the clinical syndromes listed

in Table 2. These syndromes indicate that a serious infection may be present and that Standard Precautions are not enough.

**Table 2: Clinical Syndromes Indicating a Need for Isolation Precautions**

<p style="text-align: center;"><b>Diarrhea</b> <b>Meningitis</b> <b>Skin or wound infections</b> <b>Respiratory infections</b></p>
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### **Airborne Precautions**

Airborne Precautions are used if a patient has or is suspected to have an infectious disease such as rubeola, tuberculosis, or varicella (commonly known as chickenpox). These diseases are spread by inhalation of infected respiratory particles that are suspended in the air. Airborne Precautions include the following specific measures. In some cases, Contact Precautions may be needed, as well.

The patient should be placed in an isolation room that has specific air circulation patterns, air exchange, and ventilation equipment. For example, an isolation room will have an air circulation system that completely exchanges the air in the room 6-12 times an hour and the air will be vented to the outside. If an isolation room is not immediately available the patient should be placed in a single room and the door should be closed. Caregivers should wear a fit-tested N95 or higher level respirator and the patient should wear a paper surgical mask.

Anyone providing patient care and anyone entering the room must wear a mask or a respirator. The choice of which one will depend on the illness; for example, if the patient has tuberculosis an N95 respirator should be worn. If substantial spraying of respiratory fluids is anticipated, gloves, a gown, and goggles or a face shield should be worn. Handwashing using soap and water or an alcohol-based hand rub must be done before entering and before leaving the room. The patient must wear a surgical mask when leaving the room. Visitors should be instructed to wear a mask while in the room.

### **Contact Precautions**

The CDC recommends that Contact Precautions be used (or considered for use) if any of the following conditions or diseases are present.

- Draining wounds
- Generalized rash
- Ostomy bags or tubes that contain body fluids
- Pressure ulcers
- Stool incontinence
- Uncontrolled secretions

Stool incontinence is a common problem that requires contact precautions be used. One reason is for the prevention of nosocomial infections that can cause *Clostridium difficile* colitis. *Clostridium difficile* colitis is characterized by diarrhea and approximately 50% of susceptible patients who are hospitalized longer than four weeks will develop *C. difficile* colitis. The bacterium is transmitted by the fecal-oral route, often by the hands of healthcare workers, and the *C. difficile* microorganisms can be present anywhere in the patient care area.

There are two types of Contact Precautions. The first is Standard Precautions, and the second is Isolation Contact Precautions.

Standard Precautions include the following measures.

- Separation of the patient from other patients, if possible: a single room is preferred.
- If a single room is not available an infection control professional should be consulted about patient placement.
- In multi-patient rooms beds should be separated by three feet or more so that patients' personal items are not accidentally shared.
- Hands should be washed before putting on gloves and before touching the patient.
- Gloves should be worn whenever touching the patient or when touching the patient's belongings or immediate environment.
- A gown should be worn when having significant contact with the patient or the patient's belongings and the immediate environment around the patient.
- Hands should always be washed after removing personal protective equipment (PPE).
- If the patient has diarrhea, a bathroom separate from other patients and people should be used.

Isolation Contact Precautions include all of above plus the measures listed below. They should be used if a patient has a drug-resistant infection, a MRSA infection, an open wound, or a diarrheal illness.

- Wear a gown and gloves while in the patient's room.
- Remove the gown and gloves before leaving the room.
- Use hand hygiene with soap and water or an alcohol-based hand rub before entering and after leaving a patient's room.

- Visitors must check with the nurse before taking anything into or out of the patient's room.

### **Droplet Precautions**

Droplet Precautions are used when patients have or are suspected to have a respiratory illness caused by pathogens such as the influenza virus (commonly known as the flu), the bordetella pertussis bacterium (commonly known as whooping cough), or rhinovirus (the microorganism that cause the common cold). A single room is preferable for a person placed on droplet precautions. If a single room is not available an infection control professional should be consulted.

In multi-patient rooms beds should be separated by three feet or more so that patients' personal items are not accidentally shared. Bedside caregivers should wash their hands with soap and water or an alcohol-based hand rub before entering a patient's room. A paper surgical mask should be worn before entering the room. The mask must be worn at all times while in the room. If the mask becomes damaged or soiled then the caregiver should leave the room. The mask should be removed, hands washed, and another mask applied prior to re-entering the room.

Upon leaving the room, caregivers should remove their mask and discard it in an appropriate receptacle, and then wash the hands. Patients who must be transported outside of the room should wear a mask if tolerated and be instructed to use Respiratory Hygiene/Cough Etiquette.

### **Standard Precautions**

Standard Precautions evolved from Universal Precautions and Body Substance Isolation. The CDC considers Standard Precautions to be “the primary strategy for the prevention of healthcare-associated transmission of infectious agents among patients and healthcare personnel.”

Standard Precautions are based on the principle that all blood, body fluids, and secretions (except sweat), non-intact skin, and mucous membranes may contain pathogens that can be transmitted. The CDC states that the “application of Standard Precautions during patient care is determined by the nature of the [Healthcare Worker] HCW-patient interaction and the extent of anticipated blood, body fluid, or pathogen exposure.” Standard Precautions includes: 1) Hand hygiene, 2) Personal protective equipment, 3) Respiratory and cough etiquette, 4) Safe Injection Practices, and 5) The use of masks for insertion of catheters or injection of material into spinal or epidural spaces via lumbar puncture procedures.

Handwashing and the use of PPE are familiar to experienced CNAs; those parts of Standard Precautions will not be reviewed here. Safe Injection Practices and lumbar puncture procedures are typically not a concern for CNAs, but CNAs should know how to handle and dispose of material and equipment that has been used for injections, venipunctures, and other invasive procedures.

### **Respiratory Hygiene and Cough Etiquette**

Respiratory Hygiene and Cough Etiquette should be used if a patient has signs and symptoms of a respiratory illness, for example, congestion, coughing, increased production of respiratory secretions, or rhinorrhea

(commonly known as a runny nose). Respiratory Hygiene and Cough Etiquette consists of the following measures.

- Education of healthcare facility staff, patients, and visitors on the techniques and importance of Respiratory Hygiene and Cough Etiquette.
- Posted signs that instruct patients, family members, and visitors on the techniques of Respiratory Hygiene and Cough Etiquette. The signs should be in language(s) appropriate to the population.
- Covering the mouth/nose with a tissue when coughing. Promptly dispose of used tissues in an appropriate receptacle.
- Anyone who is coughing should wear a paper surgical mask if this is possible and can be tolerated.
- Caregivers and anyone else who will be in close proximity (*i.e.*, less than three feet) to a patient who has signs and symptoms of a respiratory infection may consider wearing a paper surgical mask.
- Always wash the hands with soap and water or an alcohol-based hand rub if you have had contact with respiratory secretions.
- Covering the mouth and nose when coughing or sneezing and placing a mask of patients with signs/symptoms of a respiratory infection are proven methods for preventing the transmission of infected respiratory secretions.
- People who have a respiratory infection or signs and symptoms of a respiratory infection should be separated from other people by a distance of > three feet, if possible.

Keeping a distance of three feet between a patient who has or may have a respiratory infection is only considered to be a reasonable guideline. In some cases, a distance of greater than six to ten feet may be appropriate. The health team should consult with an infection control

specialist if there are questions about the correct distance. Droplet Precautions and Respiratory Hygiene and Cough Etiquette are both used if a patient has signs/symptoms of a respiratory illness.

Respiratory Hygiene and Cough Etiquette is part of Standard Precautions so it should be practiced in every patient care situation but when should the next step be taken and Droplet Precautions be used? There is no clear answer, but Droplet Precautions are part of Transmission Precautions and the need for Transmission Precautions is determined by an infection control expert or a physician. The healthcare worker should always practice Respiratory Hygiene and Cough Etiquette and if he/she suspects that Droplet Precautions may be needed, a supervisor should be contacted.

The Certified Nursing Assistant will need to regularly review and practice the principles of isolation precautions discussed in the previous sections. They will need to understand that infection control techniques are used when standard precautions will not protect patients and caregivers from an infectious disease. These techniques include Contact Precautions, Droplet Precautions, and Airborne Precautions, and depending on the situation one or more or all of them may be used. Considered together these techniques are called Transmission-Based Precautions.

Airborne Precautions are used if a patient has or is suspected to have an infectious disease such as rubeola, tuberculosis, or varicella that is transmitted by inhaling infected respiratory particles. Contact Precautions should be used if a patient has any of the following conditions.

- Draining wounds

- Generalized rash
- Ostomy bags or tubes that contain body fluids
- Pressure ulcers
- Stool incontinence
- Uncontrolled secretions

When observing Droplet Precautions the CNA will need to include patients who have or are suspected to have an illness that is transmitted by inhalation of infected respiratory particles. The CNA will need to bear in mind that pathogens, such as for influenza, rhinovirus, usually do not cause serious illnesses. Droplet Precautions are less involved than Airborne Precautions.

Respiratory Hygiene and Cough Etiquette should be used if a patient has signs and symptoms of a respiratory illness, for example, congestion, coughing, increased production of respiratory secretions, or rhinorrhea (commonly known as a runny nose). Respiratory Hygiene and Cough Etiquette is considered to be part of Standard Precautions.

Remembering the proper procedures required for these infection control techniques can seem challenging but tend to become second-nature after reviewing and practicing them several times. In addition, techniques such as Contact Precautions and Droplet Precautions are extensions of Standard Precautions, something every experienced CNA should know well. Finally, patients who have or are suspected to have an infectious disease and need Isolation Precautions should have written instructions on a sign outside the room: this is standard procedure and all the information that is important is right where it is needed for all to see.

## **Isolation Precautions for Patient Transport**

If Isolation Precautions are being used and a patient must be transported, some basic preparations are needed. The CDC recommends that patient transport should be done only when it is necessary, such as for diagnostic and therapeutic procedures that cannot be done in the room. The CDC states:

- If the patient must be transported, use the level of Transmission-Based Precautions that are in place.
- Notify the staff at the destination to which the patient is going that Transmission-based Precautions are in use for the patient; they may need time to prepare.

## **Patient Care During Isolation Precautions**

Healthcare workers are required to be vaccinated against certain communicable diseases or to have proof that they were vaccinated or that they are immune: these diseases would include hepatitis B, influenza, measles, mump and rubella, varicella, and others. Before caring for someone who needs Isolation Precautions the healthcare worker's immune status for certain diseases should be determined. The CDC notes that whenever possible "... non-immune HCWs should not care for patients with vaccine-preventable airborne diseases (measles, chickenpox, and smallpox)."

The following patient care scenarios assume that the CNA is using Standard Precautions.

## **Airborne Precautions**

A CNA is assigned to care for a patient who is strongly suspected to have pulmonary tuberculosis. Pulmonary tuberculosis affects the lungs and it is spread by inhalation of infected drops that dispersed into the air when an infected patient cough, sneezes, and talks. Pulmonary tuberculosis can be treated with antibiotics but it takes several weeks of drug therapy before a patient can be considered non-contagious.

The Airborne Precautions are:

1. Wash the hands before entering the room.
2. Put on an N95 respirator (or the type of respirator that has been provided) *that has been fit-tested for you* and then enter the room. Do not use a paper surgical mask.
3. Provide the patient care that had been planned and then exit the room.
4. if the N95 respirator becomes damaged or soiled, exit the room, remove it, wash the hands, and put on a new one.
5. After leaving the room, remove the N95 respirator, discard it in the appropriate trash receptacle, and wash the hands. Always remove the respirator and then wash the hands. If washing the hands and then removing the respirator, there could be a potential contamination of the hands.

Paper surgical masks can block large airborne particles and protect the healthcare worker against splashes but these masks will *not* prevent the wearer from inhaling small, airborne infectious particles like the type that are exhaled from someone who has tuberculosis. Single use respirators like the N95 and paper surgical masks look quite similar but they are not interchangeable. Paper surgical masks can be used by

anyone. N95 respirators are made in different styles and models and they must be fit tested for each individual.

### **Contact Precautions – Isolation**

Case Scenario: Patient with a draining wound has been identified as being infected with MRSA.

The patient has occasional episodes of diarrhea and has been hospitalized for almost four weeks. In addition, the patient has an occasional cough but the physician has determined that there is no respiratory infection.

The healthcare worker will:

- Wash the hands. Put on a gown and gloves.
- If the patient can tolerate it, have the patient wear a paper surgical mask when in the room with the patient. If this is not possible instruct the patient to cover his/her mouth with a tissue when needing to cough and discard the tissue in an appropriate receptacle.
- Provide the patient care that had been planned. In this situation the healthcare worker is going to perform a dressing change and urinary catheter care. Change gloves between these tasks.
- Always wash the hands after removing personal protective equipment (PPE).
- Remove the gloves and gown in the opposite order from putting them on: apply the gloves first then the gown. Remove the gown and gloves before leaving the room.
- Wash the hands.

If the healthcare worker needs to wear a gown and gloves, the gown should be applied first and then the gloves. Placing the ends of the gloves over the cuffs of the gown provides more protection than having the gloves under the cuffs; it makes for a better seal. When contact with the patient is done, the healthcare worker should remove the gloves first as this prevents accidental contamination of skin when the gown is removed. When taking a gown off it should always be removed in a way so that the outside - the potentially contaminated side - cannot touch the skin.

### **Droplet Precautions**

Case Scenario: A CNA is caring for a patient who was diagnosed with the flu.

In this case the CNA was vaccinated for influenza. The CNA works on a medical floor that treats many elderly patients and patients who are immunocompromised, which means that transmission of the influenza virus is a big risk. Droplet Precautions include the following:

- Wash hands with soap and water or an alcohol-based hand rub before entering a patient's room.
- Put on a paper surgical mask before entering the room. The mask must be worn at all times while in the room. Wash hands first, and then put on the mask.

While providing patient care (in this case taking vital signs) the patient coughs very forcefully. This happens while the CNA's face is very close to the patient and nothing is felt through the mask. However, in this situation the CNA should:

- Leave the room, remove the mask, and wash hands. Put on another mask and then go back in and finish the procedure.
- After leaving the room, remove the mask, discard it in an appropriate receptacle and then wash the hands.

### **Airborne Precautions and Contact Precautions - Isolation**

Case Scenario: The patient has been diagnosed as having chicken pox and has skin lesions that are still oozing.

This patient would need to be placed on Airborne Precautions and Contact Precautions - Isolation.

1. Wash your hands.
2. Put on a gown
3. Put on an N95 respirator (or the type of respirator that has been provided) *that has been fit-tested for you* and then enter the room. Do not use a paper surgical mask.
4. Put on gloves.
5. Provide the patient care that you had planned and then exit the room.
6. if the N95 respirator becomes damaged or soiled, exit the room, remove it, wash your hands, and put on a new one.
7. After you have left the room, remove the PPE in this order: gloves, gown, and then respirator.
8. Wash your hands.

### **Standard Precautions**

Standard Precautions is comprised of hand hygiene, the use of PPE, Safe Injection Practices, Respiratory Hygiene and Cough Etiquette, and the use of masks for the insertion of catheters or injection of material into spinal or epidural spaces via lumbar puncture procedures. Standard Precautions are second nature for experienced healthcare personnel, but a short review of selected parts of Standard Precautions will be helpful.

The basis of Standard Precautions is that all blood, body fluids, and secretions except sweat, non-intact skin, and mucous membranes may contain pathogens that can be transmitted. Consider all of these fluids to be potentially infectious. "The application of Standard Precautions during patient care is determined by the nature of the HCW-patient interaction and the extent of anticipated blood, body fluid, or pathogen exposure." A CNA must use sound professional judgment when deciding how to apply Standard Precautions. This is especially true concerning the use of PPE.

Face masks, paper surgical masks, and respirators are not interchangeable; each has its specific uses. Face masks are only used to protect the wearer from splash contact with body fluids; they do not protect against inhalation of infectious particles. Always discard anything that may be contaminated in an appropriate receptacle. These are usually bright red and are clearly marked "For Hazardous Waste Only" or with another warning.

Handwashing is the first and last step used during patient care. If a CNA knows or thinks that he/she may have come into contact with a potentially infectious body fluid, a supervisor should be notified as soon as possible. *A CNA should not try to determine the level of risk.* This is

especially important if a CNA has suffered a needlestick or had a splash with blood to a mucous membrane. In some cases, for example, exposure to blood that is contaminated with HIV, testing and drug therapy should be started as soon as possible.

### **Case Study: Hospital-acquired Infection**

The following case study was obtained from a PubMed search and discusses the case of a hospital-acquired infection.

The authors reported on a 50-year-old male who was admitted following a motor vehicle collision with primary damage to the driver's side of the vehicle. The patient was reported to be awake at the scene of the collision, and assessed as alert and oriented to person, complains of pain in the lower abdomen and left shoulder and arm.

When the emergency response team arrived, the patient was appropriately immobilized and then transported to a local emergency department (ED), in stable but guarded condition.

During the ED assessment, the following was documented:

- Vital signs stable with slight elevation in respiratory rate of 24
- Patient reports pain level of 8 on a scale of 10 (maximum level) with "pain all over my body"
- Patient scores awake and alert
- A dislocated left shoulder and fractures to the left hand, thumb and forefinger are identified
- Significant bruises are noted on the middle and lower abdomen consistent with seat-belt placement

- Patient's abdomen is tender on palpation with increased pain near bruised area

A computerized tomography (CT) scan was emergently ordered of the abdomen and showed possible free air bubbles in close proximity to the patient's colon, which suggested bowel perforation and leakage of bowel contents into the patient's free abdominal space.

The patient is taken to the operating room (OR) for possible surgical repair of the colon. Patient was prepped and draped according to hospital protocol. When the abdomen was opened up in the operating room, fecal-contents were observed in the abdominal cavity and the area was copiously irrigated. Partial removal of the colon with anastomosis (bringing the colon together during repair) was performed to repair bowel perforation and the patient did not require a colostomy.

Surgical drains were inserted and secured. Sutures were appropriately inserted to close the abdomen after the colon was repaired. Dry gauze dressing was placed and the patient was transported to the recovery unit until he could be found to be in stable condition. Intravenous antibiotics were started in the recovery room.

Following surgery, the patient is noted to have a temperature of 100.7 °F and blood cultures are collected and reported positive for *Escherichia coli*. The patient's abdomen was distended and he reported severe pain on palpation. His surgeon suspected a surgical leak to the colon repair site, and a new antibiotic was started.

The patient was taken back to OR due to possible surgical complications. Upon opening the abdominal cavity a pus-filled intraabdominal abscess is noted adjacent to leak to the colon repair site. Surgical correction of the leak was done and the abdomen is again copiously irrigated but no cultures were collected. Drains were once again placed deep into the abdominal cavity and the abdomen was loosely closed at the skin. The patient was once again transported to the recovery room in stable condition.

Five days after surgical repair of the leakage, the patient complained of nausea and vomiting with a painful, distended abdomen. Temperature of 101 °F were reported and blood cultures were collected which later reported the patient had developed methicillin-resistant *Staphylococcus aureus* (MRSA).

Another radiology CT was performed, which revealed a fluid collection near the surgical repair of the colon. The surgeon needed to remove fluid from this area for culture which showed another type of bacterial infection.

Almost three weeks after the patient's initial surgery, he began to show signs of improvement with a maximum temperature of 99.5 °F for greater than 48 hours and was able to tolerate clear liquids. The patient was transferred to the inpatient rehabilitation unit for conditioning and strength training.

## **Discussion**

The author's reported that this case study was part of a series published by the Centers for Disease Control and Prevention/National Healthcare

Safety Network (NHSN)'s healthcare-associated infection (HAI) surveillance. The case reflected some of the complex patient scenarios that have been reported during daily surveillance of HAIs using the NHSN definitions and protocols.

When HAI cases are reported, answers to questions are obtained and immediate feedback is provided. Cases, answers, and explanations are reviewed and approved by NHSN. Hospitals are encouraged to participate.

The authors stated that ongoing challenges to HAI surveillance exist in surgical settings. In other reports of HAI, such as dialysis units, there is variability in the surveillance process that include how data quality is obtained, staff time and resources to obtain data. Use of existing electronic health records has helped to improve valid and reliable estimates of HAI frequency in acute care hospitals.

Hospital-acquired infection surveillance requires cooperation from the whole team. All personnel working in a hospital facility help to contribute to accurate collection of data to identify root cause of the HAI and to determine future prevention. The authors identify the enormous potential of HAI surveillance to focus and strengthen infection prevention activities in hospitals, and to effectively support improved outcomes for patients.

### **Summary**

Isolation Precautions are used to prevent the transmission of infectious diseases in situations where Standard Precautions are not sufficient. They are used when a patient is known to have or is suspected to have an infection such as a MRSA infection, tuberculosis, measles, or chicken

pox. Isolation Precautions do not replace Standard Precautions- they two are used together.

Isolation Precautions, which are also called Transmission-Based precautions, include Airborne Precautions, Contact Precautions (Standard and Isolation), and Droplet Precautions. The need for Isolation Precautions is determined by an infection control specialist or a physician. Isolation Precautions are more complex than Standard precautions but they are not difficult to learn and they are proven to prevent transmission of disease.

Certified Nursing Assistants are expected to know and independently use Standard Precautions. This is considered part of a CNA's professional responsibilities. Certified Nursing Assistants are not expected to determine whether or not Isolation Precautions are needed. This decision is made by an infection control specialist. However, CNAs and all members of the health team are required to follow the Isolation Precautions protocols.