

## EXERCISE 1: STANDARD PRECAUTIONS AND ISOLATION TECHNIQUES

Textbook: Chapter 5: Infection Control

Skills: 10 points

- Objectives:
1. Describe and perform proper hand washing, gowning, gloving and masking techniques.
  2. Describe Universal Precautions, Standard Precautions and Transmission Based Precautions
  3. State the purpose of soap, running water, and friction in the handwashing procedure.
  4. List the three routes of transmission upon which Standard Precautions apply and give an example of a disease/condition for each route.
  5. State what the acronym "PPE" stands for.
  6. List 6 times when hands should be washed during a routine work day.
  7. Define nosocomial infections and state the .
  8. State the agency responsible for development of blood-borne pathogens recommendations.

### Discussion

As phlebotomists perform their routine daily activities there is the potential for coming in contact with body fluids potentially capable of containing pathogenic organisms. As a result a phlebotomist's hands are capable of spreading infectious agents to coworkers, patients and other health care workers. **Nosocomial infections** are those that are acquired by a patient after admission to a health care facility. Approximately 5-10 percent of hospitalized patient in the United States acquire nosocomial infections which are often harmful to the patient and costly to both patients and insurers. Frequent, proper hand washing is the single best way to prevent the spread of infection, both to the phlebotomist and to any patients the phlebotomist may encounter.

Hands should be washed at the following times:

1. When visibly contaminated with blood, body fluids, or tissues.
2. After every patient contact.
3. After removal of gloves and other protective wear or equipment.
4. Before eating, drinking, smoking, applying makeup, or changing contact lenses outside of the lab, and after using the lavatory facilities.
5. Before all other activities that entail hand contact with mucous membranes or a break in the skin.
6. Periodically during the day when routinely handling and testing bloody fluid.

For general purposes handwashing usually removes potential pathogens. Good technique involves soap, warm running water and friction. Soap removes oils that may hold bacteria to the skin. Warm running water washes away loosened debris and lathers the soap. Friction from rubbing ones hands together loosens and removes dead skin, oil and microorganisms. After rinsing, the faucet should be turned off **using paper towels** so as to avoid reinoculation of microorganisms onto the hands.

Many diseases can be transmitted from to patients to health care workers. The Centers for Disease Control (CDC) developed guidelines and recommendations called **Universal Precautions**. These guidelines were recommended because individuals with blood-borne pathogens such as HIV and Hepatitis B cannot always be readily detected, *and dictate that all patients should be considered to be infectious.*

The CDC recommended additional precautions in dealing with patients with potentially infectious diseases. *Category specific precautions* described the PPE to be utilized for different infections based on the route of infection, ie, enteric, respiratory, etc. A small poster for the appropriate category would be posted on the patient's door which illustrated the appropriate PPE to use prior to entering the patient's room. An even more extensive *disease-specific precaution* list was available which listed the PPE required by disease.

To reduce confusion, the CDC has published a new isolation guide to help clarify infection control policies to be used in addition to Universal Precautions. There are two tiers of isolation precautions. In the first, and most important, tier are those precautions designed for the care of all patients in hospitals, regardless of their diagnosis or presumed infection status. Implementation of these "**Standard Precautions**" is the primary strategy for successful nosocomial infection control. In the second tier are precautions designed only for the care of specified patients. These additional "**Transmission-Based Precautions**" are for patients known or suspected to be infected by epidemiologically important pathogens spread by airborne or droplet transmission or by contact with dry skin or contaminated surfaces.

**Standard Precautions** for moist and potentially infectious body substances are to be used for all patients. The focus is on applying a single set of precautions to be utilized for all non-intact skin, mucous membranes and potentially infectious moist body substances such as: blood, urine, saliva, feces, sputum, wound drainage and other body fluids. Standard Precautions synthesize the major features of Universal Precautions (Blood and Body Fluid Precautions), which was designed to reduce the risk of transmission of blood borne pathogens, and Body Substance Isolation (BSI), designed to reduce the risk of transmission of pathogens from moist body substances, and applies them to all patients receiving care in hospitals, regardless of their diagnosis or presumed infection status. Standard Precautions apply to 1) blood; 2) all body fluids, secretions, and excretions *except sweat*, regardless of whether or not they contain visible blood; 3) nonintact skin; and 4) mucous membranes. Standard Precautions are designed to reduce the risk of transmission of microorganisms from both recognized and unrecognized sources of infection in hospitals.

The CDC recommends the procedure called **StandardPrecautions** which includes the following:

1. All health care workers should routinely use appropriate barrier protection to prevent skin and mucous membrane exposure when contact with blood or body fluids is anticipated. Gloves must be worn during phlebotomy and changed after contact with each patient. Masks, protective eyewear, face shields, and/or gowns should be worn as indicated when there is a potential for splashing or splattering of blood and/or body fluids.
2. Wash hands immediately if contaminated with blood or body fluids and after removing gloves.
3. Take the necessary precautions to prevent injuries caused by needles, scalpels and other sharp instruments. Sharp items must be placed in a puncture-resistant container.
4. Mouth pieces, resuscitation bags, or other ventilation devices should be available for use in areas in which the need for resuscitation is predictable.
5. Health care workers with exudative lesions or weeping dermatitis should cover those areas with an occlusive bandage.
6. Pregnant health care workers are not known to be at any greater risk of contracting HIV infection than those who are not pregnant. Because the infection can be transmitted perinatally pregnant health care workers should be especially familiar with and strictly adhere to precautions to minimize the risk of acquiring HIV or Hepatitis B.
7. Immunization of employees is required for infectious agents (measles, mumps, rubella) transmitted by air.

**Transmission-Based Precautions** are designed for patients documented or suspected to be infected with highly transmissible or epidemiologically important pathogens for which additional precautions beyond Standard Precautions are needed to interrupt transmission in hospitals. *There are three types of Transmission-Based Precautions: Airborne Precautions, Droplet Precautions, and Contact Precautions.* They may be combined for diseases that have multiple routes of transmission. When used either singularly or in combination, they are to be used in addition to Standard Precautions.

*Airborne Precautions* are designed to reduce the risk of airborne transmission of infectious agents. Airborne transmission occurs by dissemination of either airborne droplet nuclei (small-particle residue [5  $\mu\text{m}$  or smaller in size] of evaporated droplets that may remain suspended in the air for long periods of time) or dust particles containing the infectious agent. Microorganisms carried in this manner can be dispersed widely by air currents and may become inhaled by or deposited on a susceptible host within the same room or over a longer distance from the source patient, depending on environmental factors; therefore, special air handling and ventilation are required to prevent airborne transmission. Airborne Precautions apply to patients known or suspected to be infected with epidemiologically important pathogens that can be transmitted by the airborne route.

*Droplet Precautions* are designed to reduce the risk of droplet transmission of infectious agents. Droplet transmission involves contact of the conjunctivae or the mucous membranes of the nose or mouth of a susceptible person with large-particle droplets (larger than 5  $\mu\text{m}$  in size) containing microorganisms generated from a person who has a clinical disease or who is a carrier of the microorganism. Droplets are generated from the source person primarily during coughing, sneezing, or talking and during the performance of certain procedures such as suctioning and bronchoscopy. Transmission via large-particle droplets requires close contact between source and recipient persons, because droplets do not remain suspended in the air and generally travel only short distances, usually 3 ft or less, through the air. Because droplets do not remain suspended in the air, special air handling and ventilation are not required to prevent droplet transmission. Droplet Precautions apply to any patient known or suspected to be infected with epidemiologically important pathogens that can be transmitted by infectious droplets.

*Contact Precautions* are designed to reduce the risk of transmission of epidemiologically important microorganisms by direct or indirect contact. Direct-contact transmission involves skin-to-skin contact and physical transfer of microorganisms to a susceptible host from an infected or colonized person, such as occurs when personnel turn patients, bathe patients, or perform other patient-care activities that require physical contact. Direct-contact transmission also can occur between two patients (e.g., by hand contact), with one serving as the source of infectious microorganisms and the other as a susceptible host. Indirect-contact transmission involves contact of a susceptible host with a contaminated intermediate object, usually inanimate, in the patient's environment. Contact Precautions apply to specified patients known or suspected to be infected or colonized (presence of microorganism in or on patient but without clinical signs and symptoms of infection) with epidemiologically important microorganisms than can be transmitted by direct or indirect contact.

## Synopsis of Types of Precautions and Patients Requiring the Precautions

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### Standard Precautions

Use Standard Precautions for the care of all patients

### Airborne Precautions

In addition to Standard Precautions, use Airborne Precautions for patients known or suspected to have serious illnesses transmitted by airborne droplet nuclei. Examples of such illnesses include:

Measles

Varicella (including disseminated zoster)<sup>††</sup>

Tuberculosis<sup>‡‡</sup>

### Droplet Precautions

In addition to Standard Precautions, use Droplet Precautions for patients known or suspected to have serious illnesses transmitted by large particle droplets. Examples of such illnesses include:

Invasive *Haemophilus influenzae* type b disease, including meningitis, pneumonia, epiglottitis, and sepsis

Invasive *Neisseria meningitidis* disease, including meningitis, pneumonia, and sepsis

Other serious bacterial respiratory infections spread by droplet transmission, including:

Diphtheria (pharyngeal)

Mycoplasma pneumonia

Pertussis

Pneumonic plague

Streptococcal (group A) pharyngitis, pneumonia, or scarlet fever in infants and young children

Serious viral infections spread by droplet transmission, including:

Adenovirus<sup>††</sup>

Influenza

Mumps

Parvovirus B19

Rubella

### Contact Precautions

In addition to Standard Precautions, use Contact Precautions for patients known or suspected to have serious illnesses easily transmitted by direct patient contact or by contact with items in the patient's environment. Examples of such illnesses include:

Gastrointestinal, respiratory, skin, or wound infections or colonization with multidrug-resistant bacteria judged by the infection control program, based on current state, regional, or national recommendations, to be of special clinical and epidemiologic significance

Enteric infections with a low infectious dose or prolonged environmental survival, including:

*Clostridium difficile*

For diapered or incontinent patients:  
enterohemorrhagic *Escherichia coli* O157:H7,  
*Shigella*, hepatitis A, or rotavirus

Respiratory syncytial virus, parainfluenza virus, or enteroviral infections in infants and young children

Skin infections that are highly contagious or that may occur on dry skin, including:

Diphtheria (cutaneous)

Herpes simplex virus (neonatal or mucocutaneous)

Impetigo

Major (noncontained) abscesses, cellulitis, or decubiti

Pediculosis

Scabies

Staphylococcal furunculosis in infants and young children

Zoster (disseminated or in the immunocompromised host)††

Viral/hemorrhagic conjunctivitis

Viral hemorrhagic infections (Ebola, Lassa, or Marburg)

†† Certain infections require more than one type of precaution.

(Reference: <http://www.cdc.gov/ncidod/hip/isolat/isopart2.htm>)

Refer to your textbook, pages 107-108 for examples of conditions for which Transmission Based Precautions are utilized.

## HANDWASHING

### Materials:

1. sink
2. antibacterial soap
3. paper towels

### Procedure:

1. Release some paper toweling from the dispenser.
2. Turn the water faucet on and adjust temperature.
3. Dispense a small amount of soap into the palm of the hand.
4. Vigorously lather hands and rub together for at least 15 seconds.
5. Wash well between fingers, paying special attention to the fingernails and nail beds, and up the wrists.
6. Rinse well with a moderate stream of water in a **downward** motion.
7. Use paper toweling to thoroughly dry the hands.
8. Using the **same piece of paper towel**, turn off the water. **DO NOT** touch the faucet handle with your hands once they have been washed.

## GOWNING/GLOVING/MASKING

### Materials:

1. disposable gown
2. disposable mask
3. gloves

### Procedure:

1. Wash hands.
2. Remove lab coat. Pick up the gown from the inside, near the openings for the arms. Let it fall open, but do not allow it to touch the floor. Put one arm in and then the other, so the opening is in the back.
3. Tie the neck strings and then the waistband.
4. Determine which side of the mask should be placed next to the face. Some masks have the inside marked "inside". Other masks are manufactured with the outside of the mask a different color than the inside. It is important that masks are donned with the appropriate side out so the filtering system of the mask is operational.
5. Put on the mask, making sure the outside of the mask is to the outside of your body. Masks usually have a piece of wire (similar to the twist ties used to fasten bags) at the top of the mask. Bend the wire to fit snugly over the bridge of your nose.
6. Tie the upper ties high on your head and above the ears, or if it is a mask with rubber bands, secure the rubber bands behind your ears. Be sure to tie them securely, so the mask does not slip off. The bottom set of ties should then be tied securely at the base of the neck.
7. Put on gloves. Be sure the cuff of the glove is pulled up over the sleeve of the gown.

## REMOVING ISOLATION CLOTHING

1. Untie the gown at the waist.
2. Slip a finger from one hand underneath the cuff of the glove on the opposite hand.
3. Pull the glove off, turning **inside out** as it is removed.
4. Deposit in the designated waste receptacle. Repeat the procedure on the opposite hand.
5. Remove the mask by untying the ties or slipping the rubber bands from behind the ears. Be careful not to touch the front of the mask. Holding the mask by the ties deposit in the designated waste receptacle.
6. Untie the tie at the neck of the gown. Using the ties, pull the gown down toward the front of the body.
7. Pull one arm out of its sleeve, turning the sleeve **inside out** as you proceed. repeat, using the other arm. Be sure the front of the gown does not contact your hands or uniform. Deposit the gown in the designated waste receptacle.
8. Wash hands. Put on lab coat.

## EXERCISE 1: STANDARD PRECAUTIONS

Name \_\_\_\_\_

	Performed Acceptably		Instructor's Initials
	Yes	No	
1. Handwashing			
2. Gowning/Gloving/Masking			
3. Removing Isolation Clothing			

### Circle your glove size:

Extra Small

Small

Medium

Large

Extra Large



4. What is the recommendation of the CDC for handling blood-borne pathogens **AND** what is the name of the guidelines which describe this recommendation (1.5 points)?
  
5. To reduce confusion, the CDC has published a new isolation guide to help clarify infection control policies to be used in addition to Universal Precautions. There are two tiers of isolation precautions. State the 2 tiers and briefly describe each one. (2 points)
  - A.
  
  - B.
  
6. **Transmission-Based Precautions** are designed for patients documented or suspected to be infected with highly transmissible or epidemiologically important pathogens for which additional precautions beyond Standard Precautions are needed to interrupt transmission in hospitals. List the 3 types of precautions. Briefly describe each one and list a condition which would be appropriate for the precaution. (3 points)
  - A.
  
  - B.
  
  - C.
  
7. Briefly describe the proper procedure for hand washing (3 points).

8. Briefly describe the proper procedure for gowning, gloving and masking (3 points).

9. Briefly describe the proper manner of removing isolation clothing (2 points).