

Personal Protective Equipment

Section 1: Introduction

About this Course

Hazards exist in every work environment, and your work environment is no exception. They can take many forms: sharp objects such as needles or razors, toxic gases, radiation, harmful dusts and particles, infectious diseases like influenza, and contact with other potentially infectious materials, such as blood or saliva.

These are just a few of the hazards that can result in workplace related injuries or illness. Personal protective equipment, or PPE for short, is one of the first lines of defense against physical hazards of various sorts.

It is important to know the different types of PPE necessary for the job tasks you perform. You must also recognize the situations that require the use of PPE and know how to correctly put on (donning) and remove (doffing) the equipment you need.

Learning Objectives

When you complete this course, you should be able to:

- Recognize the importance of PPE.
- Identify when the use of each type of PPE is appropriate.
- Describe how to correctly put on and take off PPE.

Section 2: What Is Personal Protective Equipment?

Personal Protective Equipment

PPE is designed to protect you from illness, disease, or injury resulting from workplace related hazards. It also helps to prevent the spread of harmful pathogens to others.

The Occupational Safety and Health Administration, or OSHA for short, defines PPE as “equipment worn to minimize exposure to a variety of hazards.”

In a healthcare setting, the OSHA definition for PPE is “specialized clothing or equipment, worn by an employee for protection against infectious materials.” OSHA has specific regulations that require you to use PPE to protect yourself from exposure to infectious diseases.

Some types of PPE you may be familiar with in the healthcare setting include:

- The N95 and Powered Air Purifying Respirator (PAPR)
- Gowns and aprons
- Eye protection and face shields
- Lead apron, for radiation exposures

Many types of diseases are caused by microorganisms that cannot be seen with the naked eye. Some common diseases you may have heard of include:

- HIV, the virus that leads to AIDS
- Tuberculosis, a severe lung disease

Course Title

- Hepatitis A, B, and C, which are diseases of the liver
- The influenza virus

These are all communicable diseases, capable of being spread from one person to another through contact. Not only are these diseases invisible to the naked eye, but some can also live in body fluids like blood, feces, urine, saliva, semen, vaginal secretions, mucus, or vomit.

Standard Precautions

In addition to the guidelines provided by OSHA, the Centers for Disease Control and Prevention, or CDC, also issues recommendations for when and what type of PPE you should use to protect against exposure to infectious diseases. These recommendations are one component of a series of special infection control precautions the CDC calls standard precautions.

Standard precautions are intended to not only prevent the transmission of bloodborne pathogens, but also prevent the transmission of all infectious materials including all body fluids without regard to whether they contain visible blood. Standard precautions require the use of PPE anytime you may encounter blood, body fluids, non-intact skin, and mucous membranes. It also requires the use of PPE when transmission of infectious pathogens may occur through the air, such as with influenza.

Types of PPE

It is important for you to know what type of PPE is necessary for the tasks you perform. The most common types of PPE worn are gloves, gowns, masks, eye protection, and face shields. *Click on each type of PPE to learn about its purpose.*

In certain situations, you may need more PPE. These are guidelines, but you should follow your organization's policies.

Gloves: Gloves are the most commonly used type of PPE. Wearing gloves protects your hands from exposure to infectious materials. You must always wear gloves when at risk for exposure to blood, body fluids, secretions, excretions, and contaminated items. You must also wear gloves before touching mucous membranes and non-intact skin. If YOU have non-intact skin (such as cuts or scrapes) on your hands, you must wear gloves when making contact.

Before putting on gloves, inspect them for holes and tears that might allow hazardous substances to break through. Be certain to remove any rings, watches, bracelets, and any other items that can cut or tear the gloves.

Gowns: Gowns protect your skin and clothing from exposure to potentially infectious materials. You must wear a gown during procedures and care activities that are likely to generate splashes or sprays of blood, body fluids, secretions, or excretions. A clean, non-sterile gown is adequate for protection against these substances.

Masks, Face Shields, and Eye Protection: Masks, face shields, and eye protection (such as safety glasses) protect your face, including mucous membranes of the eyes, nose, and mouth. You must wear a mask and eye protection or a face shield during procedures and activities that are likely to generate splashes or sprays of blood, body fluids, secretions, and excretions.

Wearing a mask protects you from pathogens transmitted through the air. Common examples of diseases transmitted through the air or in droplets of saliva include tuberculosis, influenza,

Course Title

meningitis, and measles.

Let's Practice

Carl is responsible for helping his co-workers select the appropriate personal protective equipment for the task they are to perform. Listen to each person's scenario and help Carl determine if any pieces of PPE are required.

Wilbur: I've been working with Mr. Smith's for two months. He struggles with excessive drooling and requires full assistance when eating. Do I need to put on any PPE to feed Mr. Smith?

- a. Eye protection (safety glasses)
- b. Gloves**
- c. Mask
- d. Gown
- e. Generally none needed

Feedback: Contact with body fluids including saliva warrants the use of PPE.

Kathleen: A man just arrived and is coughing and grumbling of tiredness. He thinks he has the flu. Before I assess his condition, do I need to put on any PPE?

- a. Eye protection (safety glasses)
- b. Gloves, Mask, and Gown**
- c. Gloves and Mask
- d. Eye protection, Gloves, Mask, and Gown
- e. Generally none needed

Feedback: The potential for transmission of infectious disease through the air requires the use of a mask. Additionally, since Kathleen may have contact with surfaces that become contaminated with the flu virus, gloves and a gown are necessary.

Janis: I have to take the Sarah's blood pressure. Her record indicates she has HIV. Do I need to put on any PPE?

- a. Eye protection (safety glasses)
- b. Gloves
- c. Mask
- d. Gown
- e. Generally none needed**

Feedback: Because the procedure Janis will be performing is not likely to involve contact with infectious materials, PPE is not required. You do not want to use PPE when it is not necessary.

Section 3: Proper Use of Personal Protective Equipment

Proper use of PPE includes not only knowing the type of PPE necessary for the task you are performing but also how to put on and take off your PPE.

Course Title

Putting On PPE

It is important for you to know where your organization stores PPE. If you do not know where to find PPE, ask your supervisor or co-workers.

When choosing PPE, make sure it fits properly. If you are required to use N-95 masks, or other related respirators, your employer will have you properly fitted. This ensures you are receiving the best possible protection. Most PPE comes in multiple sizes to ensure the proper fit. Remember, if your PPE doesn't properly fit, you won't be properly protected.

Once you have selected the appropriate PPE for the task you will be performing, it is important that you perform hand hygiene by washing your hands with soap and water or using an alcohol based hand rub.

You are now ready to put on your PPE. Put the gown on first followed by your mask. Then put on eye protection or face shield if using followed by your gloves. Once your PPE is in place, be careful to prevent the spread of contamination.

You should keep the basic principles of infection control in mind when putting on and taking off PPE. Always work from clean to contaminated areas. This means you should touch clean body sites before you touch contaminated areas. You should also limit opportunities for "touch contamination." For example, refrain from rubbing your eyes or touching your glasses or nose.

Let's Practice

Let's check in on Carl.

Cecil: Jordan has whooping cough and needs personal care. Which PPE items do I need?

- a. Eye protection (safety glasses)
- b. Gloves, Mask, and Gown**
- c. Gloves and Mask
- d. Eye protection, Gloves, Mask, and Gown
- e. Generally none needed

Cecil: Great. Thanks! I have one more question though. In what order should I put these on?

Gown
Mask
Gloves

When to Remove PPE

You must promptly remove your PPE after you are done with your task and before touching non-contaminated items and environmental surfaces like light switches or doorknobs.

You must change your PPE between tasks and procedures on the same individual and when moving from one individual to another. Change your PPE anytime it is visibly soiled or contaminated. Any gown, paper or cloth, is soiled if it becomes wet.

Course Title

Dispose of PPE in the nearest appropriate container according to your organization's policy. You should never wash and reuse gloves, paper gowns, or masks. They should always be thrown out. Always remember to perform hand hygiene after removing PPE.

PPE Removal

As with putting on PPE, taking off PPE requires a specific sequence to prevent contamination. PPE is removed in the opposite order it was put on; however, you should always remember to remove your gloves first and your mask last.

Start with your non-dominant hand, pull the outside of the glove near the wrist to slowly pull and peel the glove away from your hand. As you remove the glove, turn it inside out to contain any contamination. Hold the removed glove in your dominant gloved hand.

Next, remove the second glove by placing one or two fingers under the wrist of the remaining glove and peeling it off from the inside turning it inside out as you go. Discard the used gloves in the appropriate container. Remove your goggles or face shield by grabbing the handle or ear pieces.

Remove your gown in the same manner as gloves. Unfasten the ties then pull the gown away from the neck and shoulder. Turn the gown inside out as you remove from your arms. Roll or fold into a bundle. You should use caution when removing gowns to prevent the contaminated side from touching your unprotected hands or any other surface. Finally, remove your mask by untying the bottom strings then the top.

You should perform hand hygiene wash your hands immediately upon removal of any personal protective equipment and before moving on to another task. If your hands become visibly contaminated during the PPE removal process, stop what you are doing and wash your hands with soap and water. You can then continue to take off any remaining protective equipment.

The use of PPE when dealing with highly infectious materials may require the use of double-gloving, hazardous materials suits, etc. In these instances donning and doffing procedures will be different from what is described above. Please refer to your organization's exposure control plan, safety officer, or infection control officer for additional details.

The Return of Cecil

Cecil: Hi – It's me again. I've finished helping Jordan. In what order should I remove this PPE?

Gloves
Gown
Mask

Section 4: Conclusion

Summary

Now that you have finished reviewing the course content, you should have learned the following:

PPE is specialized clothing or equipment worn by an employee for protection against physical hazards or infectious materials. PPE provides a barrier against hazards and infectious materials

Course Title

and protects you from workplace related injuries or illness.

In the healthcare setting, the most common types of PPE include gloves, gowns, aprons, masks, eye protection, and face shields. You should always wear your PPE during care activities when contact with blood, body fluids, secretions, excretions, mucous membranes, non-intact skin, or contaminated items is a possibility.

After completing a task or caring for another individual, PPE should be removed and disposed of properly. Remember, immediately perform hand hygiene once you have removed your personal protective equipment.

Course Contributor

This course was reviewed by Anthony Barone. Mr. Anthony A. Barone is a driver of health, safety and security solutions in emergency management, business continuity management, public safety, public health, pre-hospital, hospital, and healthcare preparedness through uncompromising consultation, advisement, collaboration and service. He is committed to leading efforts that contribute to a healthier, safer and more secure world.

References

Centers for Disease Control and Prevention. (2013). Emergency response resources. Workplace Safety & Health Topics. Retrieved September 25, 2015, from <http://www.cdc.gov/niosh/topics/emres/ppe.html>

Occupational Safety & Health Administration. (n.d.). Personal protective equipment. Retrieved September 25, 2015, from <https://www.osha.gov/SLTC/personalprotectiveequipment/>

<https://www.osha.gov/Publications/osha3151.html>

<http://www.cdc.gov/vhf/ebola/hcp/ppe-training/>