

PPE Selection



Guidance for the Selection and Use of
Personal Protective Equipment (PPE)

PPE Use : Program Goal



Improve personnel safety in the through
appropriate use of PPE.

The goal of this program is to improve personnel safety in the healthcare environment through appropriate use of PPE.

PPE Use : Program Objectives



- Provide information on the selection and use of PPE.
- Understand how to safely don and remove PPE
- Company Labs (Manufacturing) uses hearing protection, protective gloves, respirators, weights belts, goggles, and face shields routinely.

Personal Protective Equipment Definition



“specialized clothing or equipment worn by an employee for protection against dangerous materials” (OSHA).

Protective equipment, including personal protective equipment for eyes, face, head, and extremities, protective clothing, respiratory devices, and protective shields and barriers, shall be provided, used, and maintained in a sanitary and reliable condition wherever it is necessary by reason of hazards of processes or environment, chemical hazards, radiological hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical contact OSHA 29 CFR 1910.132–138

Personal protective equipment, or PPE, as defined by the Occupational Safety and Health Administration, or OSHA, is “specialized clothing or equipment, worn by an employee for protection against dangerous materials.”

Regulations and Recommendations for PPE



- OSHA issues workplace health and safety regulations. Regarding PPE, employers must:
 - Provide appropriate PPE for employees
 - Ensure that PPE is disposed, or reusable PPE is cleaned, laundered, repaired and stored after use.

OSHA & CDC



- OSHA issues regulations for workplace health and safety. These regulations require use of PPE in BBP settings to protect personnel from exposure to blood borne pathogens and Mycobacterium tuberculosis. However, under OSHA's General Duty Clause PPE is required for any potential dangerous disease exposure. Employers must provide their employees with appropriate PPE and ensure that PPE is disposed or, if reusable, that it is properly cleaned or laundered, repaired and stored after use.
- The Centers for Disease Control and Prevention (CDC) issues recommendations for when and what PPE should be used to prevent exposure to dangerous diseases. This presentation will cover those recommendations, beginning with the hierarchy of safety and health controls.

Hierarchy of Safety and Health Controls



- 1. Engineering controls**
- 2. Work practice controls**
- 3. Administrative controls**
- 4. Personal protective equipment (PPE)**

Exposure Controls



- The protection of personnel from dangerous disease exposures in the workplace requires a combination of controls, one of which is the use of PPE. It is important to recognize that your protection as a worker also involves other prevention strategies. There are four major components to worker safety programs. First are training, such as you're receiving today, and administrative controls, like isolation policies and procedures, and procedures for recognizing patients with a communicable disease before they expose workers. Second are engineering controls like negative pressure rooms for areas with potential airborne diseases such as TB; third are work practice controls such as not recapping needles, and finally personal protective equipment. While PPE is last in the hierarchy of prevention, it is very important for protecting healthcare workers from disease transmission.

Types of PPE Used



- Gloves – protect hands
- Gowns/aprons – protect skin and/or clothing
- Masks and respirators– protect mouth/nose
 - Respirators – protect respiratory tract from airborne dangerous agents
- Goggles – protect eyes
- Face shields – protect face, mouth, nose, and eyes

PPE Rationale



- All of the PPE listed here prevent contact with the dangerous agent, or body fluid that may contain the dangerous agent, by creating a barrier between the worker and the dangerous material. Gloves, protect the hands, gowns or aprons protect the skin and/or clothing, masks and respirators protect the mouth and nose, goggles protect the eyes, and face shields protect the entire face.
- The respirator, has been designed to also protect the respiratory tract from airborne transmission of dangerous agents. We'll discuss this in more detail later.

Factors Influencing PPE Selection



- Type of exposure anticipated
 - Splash/spray versus touch
 - Category of isolation precautions
- Durability and appropriateness for the task
- Fit

PPE Selection



- When you are selecting PPE, consider three key things.
- First is the type of anticipated exposure. This is determined by the type of anticipated exposure, such as touch, splashes or sprays, or large volumes of blood or body fluids that might penetrate the clothing. PPE selection, in particular the combination of PPE, also is determined by the category of isolation precautions a patient is on.
- Second, and very much linked to the first, is the durability and appropriateness of the PPE for the task. This will affect, for example, whether a gown or apron is selected for PPE, or, if a gown is selected, whether it needs to be fluid resistant, fluid proof, or neither.
- Third is fit. (optional question) How many of you have seen someone trying to work in PPE that is too small or large? PPE must fit the individual user, and it is up to the employer to ensure that all PPE are available in sizes appropriate for the workforce that must be protected.
- (Segue to next slide) With this as background, let's now discuss how to select and use specific PPE. After that we'll talk about which PPE is recommended for Standard Precautions and the various Isolation Precaution categories.

Gloves



- Purpose – environmental services, hazards of processes or environment, other
- Glove material – **vinyl, latex, nitrile**, other
- Sterile or **non-sterile**
- **One** or two pair
- **Single use** or reusable



- Most patient care activities require the use of a single pair of nonsterile gloves made of either latex, nitrile, or vinyl. However, because of allergy concerns, some facilities have eliminated or limited latex products, including gloves, and now use gloves made of nitrile or other material. Vinyl gloves are also frequently available and work well if there is limited patient contact. However, some gloves do not provide a snug fit on the hand, especially around the wrist, and therefore should not be used if extensive contact is likely.
- Gloves should fit the user's hands comfortably – they should not be too loose or too tight. They also should not tear or damage easily. Gloves are sometimes worn for several hours and need to stand up to the task.
- Who uses the other glove options? Sterile surgical gloves are worn by surgeons and other healthcare personnel who perform invasive patient procedures. During some surgical procedures, two pair of gloves may be worn. Environmental services personnel often wear reusable heavy duty gloves made of latex or nitrile to work with caustic disinfectants when cleaning environmental surfaces. However, they sometimes use patient care gloves too.

Do's and Don'ts of Glove Use



- Work from “clean to dirty”
- Limit opportunities for “touch contamination” - protect yourself, others, and the environment
 - Don't touch your face or adjust PPE with contaminated gloves
 - Don't touch environmental surfaces except as necessary during patient care

Do's and Don'ts of Glove Use (cont'd)



- Change gloves
 - During use if torn and when heavily soiled (even during use on the same product)
 - After use in each area
- Discard in appropriate receptacle
 - Never wash or reuse disposable gloves

Glove Use



- Change gloves as needed. If gloves become torn or heavily soiled and additional patient care tasks must be performed, then change the gloves before starting the next task. Always change gloves after use on each patient, and discard them in the nearest appropriate receptacle. Patient care gloves should never be washed and used again. Washing gloves does not necessarily make them safe for reuse; it may not be possible to eliminate all microorganisms and washing can make the gloves more prone to tearing or leaking.

Gowns or Aprons



- Purpose of use
 - Define the type needed
- Material –
 - Natural or man-made
 - Reusable or disposable
 - Resistance to fluid penetration

Face Protection



- Masks – protect nose and mouth
 - Should fully cover nose and mouth and prevent fluid/solids penetration
 - Respirators- protect pathways to the throat and lungs
- Goggles – protect eyes
 - Should fit snugly over and around eyes
 - Personal glasses not a substitute for goggles
 - Antifog feature improves clarity

Proper Application of PPE



- A combination of PPE types is available to protect all or parts of the face from contact with potentially dangerous material. The selection of facial PPE is determined by the isolation precautions required for the patient and/or the nature of the patient contact. This will be discussed later.
- Masks should fully cover the nose and mouth and prevent fluid penetration. Masks should fit snugly over the nose and mouth. For this reason, masks that have a flexible nose piece and can be secured to the head with string ties or elastic are preferable.
- Goggles provide barrier protection for the eyes; personal prescription lenses do not provide optimal eye protection and should not be used as a substitute for goggles. Goggles should fit snugly over and around the eyes or personal prescription lenses. Goggles with antifog features will help maintain clarity of vision.

Face Protection



- Face shields – protect face, nose, mouth, and eyes
 - Should cover forehead, extend below chin and wrap around side of face
 - Face shields should be worn with goggles for an elevated level of protection from chemical hazards.

Face Shields



- When skin protection, in addition to mouth, nose, and eye protection, is needed or desired, for example, when irrigating a wound or suctioning copious secretions, a face shield can be used as a substitute to wearing a mask or goggles. The face shield should cover the forehead, extend below the chin, and wrap around the side of the face.

Respiratory Protection



- Purpose – protect from inhalation of hazards of processes or environment
- PPE types for respiratory protection
 - Particulate respirators (N95)
 - Half- or full-face elastomeric respirators
 - Powered air purifying respirators (PAPR)

Respirator Specifications & Types



- PPE also is used to protect healthcare workers' from hazardous or dangerous aerosols, such as *Mycobacterium tuberculosis*. Respirators that filter the air before it is inhaled should be used for respiratory protection.
- The most commonly used respirators in healthcare settings are the N95, N99, or N100 particulate respirators. The device has a sub-micron filter capable of excluding particles that are less than 5 microns in diameter.
- Respirators are approved by the CDC's National Institute for Occupational Safety and Health.
- Like other PPE, the selection of a respirator type must consider the nature of the exposure and risk involved. For example, N95 particulate respirators might be worn by personnel entering the room of a patient with dangerous tuberculosis. However, if a bronchoscopy is performed on the patient, the healthcare provider might wear a higher level of respiratory protection, such as a powered air-purifying respirator or PAPR.

Elements of a Respiratory Protection Program



- Medical evaluation
- Fit testing
- Training
- Fit checking before use

Medical Evaluation



- Prior to your using a respirator, your employer is required to have you medically evaluated to determine that it is safe for you to wear a respirator, to fit test you for the appropriate respirator size and type, and to train you on how and when to use a respirator. **YOU** are responsible for fit checking your respirator before use to make sure it has a proper seal.

Resources for Information



- <http://www.OSHA.gov>
- <http://www.cdc.gov/niosh/npptl/respirators/respsars.html>
- <http://www.cdc.gov/niosh/99-143.html>
- <http://www.cdc.gov/niosh/topics/respirators>

Application of PPE



PPE Use :
How to Safely Don, Use, and Remove PPE

Key Points About PPE



- Don before contact with hazards of processes or environment, generally before entering the room
- Use carefully – don't spread contamination
- Remove and discard carefully, either at the doorway or immediately outside the area where hazards of processes or environment exist; remove respirator outside room
- Immediately perform hand hygiene

PPE Disposal



- When you have completed your tasks, remove the PPE carefully and discard it in the receptacles provided. Then immediately perform hand hygiene before going on to the next tasks.

Sequence for Donning PPE



- Gown first
- Mask or respirator
- Goggles or face shield
- Gloves

Gowning



- The gown should be donned first. The mask or respirator should be put on next and properly adjusted to fit; remember to fit check the respirator. The goggles or face shield should be donned next and the gloves are donned last. Keep in mind, the combination of PPE used, and therefore the sequence for donning, will be determined by the precautions that need to be taken.

How to Don a Frock/Jacket



- Select appropriate type and size
- Inspect the Frock to ensure cleanliness
- Wear the frock jacket
- Secure all buttons or snaps

How to Don a Surgical Mask



- Place over nose, mouth and chin
- Fit flexible nose piece over nose bridge
- Secure on head with ties or elastic
- Adjust to fit



Mask Application



- Some masks are fastened with ties, others with elastic. If the mask has ties, place the mask over your mouth, nose and chin. Fit the flexible nose piece to the form of your nose bridge; tie the upper set at the back of your head and the lower set at the base of your neck.
- If a mask has elastic head bands, separate the two bands, hold the mask in one hand and the bands in the other. Place and hold the mask over your nose, mouth, and chin, then stretch the bands over your head and secure them comfortably as shown; one band on the upper back of your head, the other below the ears at the base of the neck.
- Adjust the mask to fit. Remember, you don't want to be touching it during use so take the few seconds needed to make sure it is secure on your head and fits snugly around your face so there are no gaps.

How to Don a Particulate Respirator

- Select a fit tested respirator
- Place over nose, mouth and chin
- Fit flexible nose piece over nose bridge
- Secure on head with elastic
- Adjust to fit
- Perform a fit check –
 - Inhale – respirator should collapse
 - Exhale – check for leakage around face



Respirator Application



- The technique for donning a particulate respirator, such as an N95, N99 or N100, is similar to putting on a pre-formed mask with elastic head bands. Key differences, however, are 1) the need to first select a respirator for which you have been fit tested and 2) fit checking the device, as you have been instructed, before entering an area where there may be airborne dangerous disease. Be sure to follow the manufacturer's instructions for donning the device. In some instances, the manufacturer's instructions may differ slightly from this presentation.
- You may also be asked to wear an elastomeric or powered air purifying respirator, or PAPR. Guidance on how to use these devices is not included in this presentation. You will need instruction locally to properly use these devices.

How to Don Eye and Face Protection

- Position goggles over eyes and secure to the head using the ear pieces or headband
- Position face shield over face and secure on brow with headband
- Adjust to fit comfortably



Eye Protection



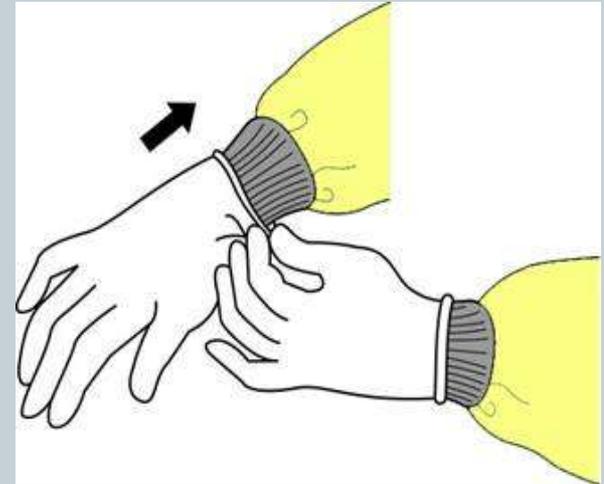
- If eye protection is needed, either goggles or a face shield should be worn. Position either device over the face and/or eyes and secure to head using the attached ear pieces or head band. Adjust to fit comfortably. Goggles should feel snug but not tight.



How to Don Gloves



- Don gloves last
- Select correct type and size
- Insert hands into gloves
- Extend gloves over isolation gown cuffs (if applicable). Where skin would be exposed to an irritant wear protective sleeves.



Gloves



- The last item of PPE to be donned is a pair of gloves. Be sure to select the type of glove needed for the task in the size that best fits you. Insert each hand into the appropriate glove and adjust as needed for comfort and dexterity. If you are wearing an isolation gown, tuck the gown cuffs securely under each glove. This provides a continuous barrier protection for your skin.

How to Safely Use PPE



- Keep gloved hands away from face
- Avoid touching or adjusting other PPE
- Remove gloves if they become torn; perform hand hygiene before donning new gloves
- Limit surfaces and items touched

Work Practices



- In addition to wearing PPE, you should also use safe work practices. Avoid contaminating yourself by keeping your hands away from your face and not touching or adjusting PPE. Also, remove your gloves if they become torn and perform hand hygiene before putting on a new pair of gloves. You should also avoid spreading contamination by limiting surfaces and items touched with contaminated gloves.

PPE Removal



PPE Use

How to Safely Remove PPE

“Contaminated” and “Clean” Areas of PPE



- **Contaminated – outside front**
 - Areas of PPE that have or are likely to have been in contact with body sites, materials, or environmental surfaces where the contamination may reside
- **Clean – inside, outside back, ties on head and back**
 - Areas of PPE that are not likely to have been in contact with the contamination

Sequence for Removing PPE



- Gloves
- Face shield or goggles
- Gown
- Mask or respirator

PPE Removal



- The sequence for removing PPE is intended to limit opportunities for self-contamination. The gloves are considered the most contaminated pieces of PPE and are therefore removed first. The face shield or goggles are next because they are more cumbersome and would interfere with removal of other PPE. The gown is third in the sequence, followed by the mask or respirator.

Where to Remove PPE



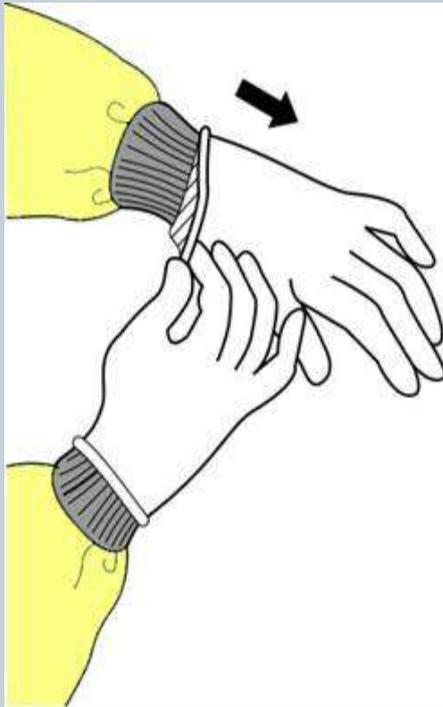
- At doorway, before leaving the area where hazards of processes or environment exist or exiting the manufacturing area
- Remove respirator outside room, after door has been closed

PPE Removal



- The location for removing PPE will depend on the amount and type of PPE worn and the category of isolation a patient is on, if applicable. If only gloves are worn as PPE, it is safe to remove and discard them in the patient room. When a gown or full PPE is worn, PPE should be removed at the doorway or in an anteroom. Respirators should always be removed outside the patient room, after the door is closed. Hand hygiene should be performed after all PPE is removed.

How to Remove Gloves (1)



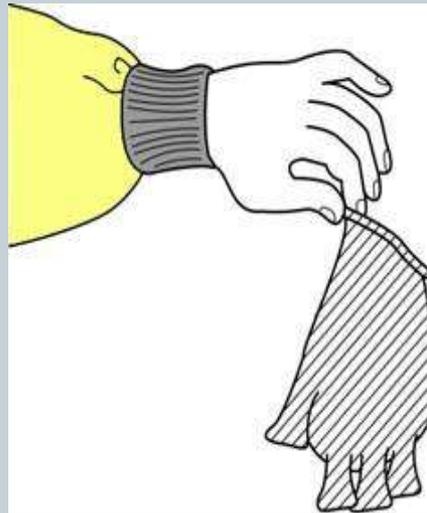
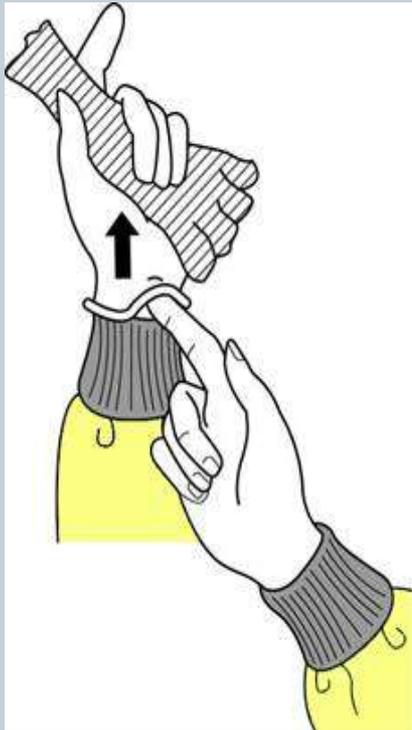
- Grasp outside edge near wrist
- Peel away from hand, turning glove inside-out
- Hold in opposite gloved hand

Glove Removal



- Using one gloved hand, grasp the outside of the opposite glove near the wrist. Pull and peel the glove away from the hand. The glove should now be turned inside-out, with the contaminated side now on the inside. Hold the removed glove in the opposite gloved hand.

How to Remove Gloves (2)



- Slide ungloved finger under the wrist of the remaining glove
- Peel off from inside, creating a bag for both gloves
- Discard

Glove Removal Technique



- Slide one or two fingers of the ungloved hand under the wrist of the remaining glove. Peel glove off from the inside, creating a bag for both gloves. Discard in waste container.

Remove Goggles or Face Shield



- Grasp ear or head pieces with ungloved hands
- Lift away from face
- Place in designated receptacle for reprocessing or disposal

Goggle & Face shield Removal



- Using ungloved hands, grasp the “clean” ear or head pieces and lift away from face. If goggle or face shield are reusable, place them in a designated receptacle for subsequent reprocessing. Otherwise, discard them in the waste receptacle.

Removing Isolation Gown



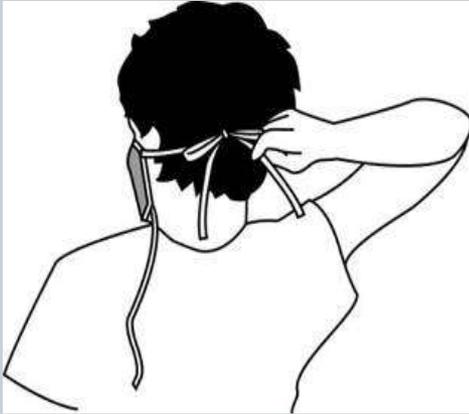
- Unfasten button or snaps
- Peel gown away from neck and shoulders
- Turn contaminated outside toward the inside
- Fold or roll into a bundle
- Discard in collection bin

Gown Removal



- Unfasten the gown ties with the ungloved hands. Slip hands underneath the gown at the neck and shoulder, peel away from the shoulders. Slip the fingers of one hand under the cuff of the opposite arm. Pull the hand into the sleeve, grasping the gown from inside. Reach across and push the sleeve off the opposite arm. Fold the gown towards the inside and fold or roll into a bundle. (Only the “clean” part of the gown should be visible.) Discard into waste or linen container, as appropriate.

Removing a Mask



- Untie the bottom, then top, tie
- Remove from face
- Discard



Mask Removal



- The front of the mask is considered contaminated and should not be touched. Remove by handling only the ties or elastic bands starting with the bottom then top tie or band. Lift the mask or respirator away from the face and discard it into the designated waste receptacle.

Removing a Particulate Respirator

- Lift the bottom elastic over your head first
- Then lift off the top elastic
- Discard



The bottom elastic should be lifted over the head first. Then remove the top elastic. This should be done slowly to prevent the respirator from “snapping” off the face.

Hand Hygiene



- Perform hand hygiene immediately after removing PPE.
 - If hands become visibly contaminated during PPE removal, wash hands.
- Wash hands with soap and water or use an alcohol-based hand rub

Hand Hygiene



- Hand hygiene is the cornerstone of preventing infection transmission. You should perform hand hygiene immediately after removing PPE. If your hands become visibly contaminated during PPE removal, wash hands before continuing to remove PPE. Wash your hands thoroughly with soap and warm water or, if hands are not visibly contaminated, use an alcohol-based hand rub.

PPE Use : When to Use PPE

PPE for Standard Precautions (1)



- **Gloves** – Use when hazards of processes or environment exists
- **Gowns** – Use during operation when contact of clothing/ exposed skin with hazards of processes or environment is anticipated

PPE for Standard Precautions (2)



- **Mask and goggles or a face shield** – Use during the potential exposure of hazards of processes or environment.

PPE Use :Final Thoughts



- PPE is available to protect you from exposure to contamination from drug product, raw materials, and chemicals.
- Know what type of PPE is necessary for the duties you perform and use it correctly

PPE



- You should remember that you are in charge of your own safety.
- Never perform a task if you think it is unsafe.
- Never ignore safety rules or precautions
- Obey all safety signage and SOP's.