

Personal protection equipment

With the help of the lectures and this additional reading material, you will be able to:

- 1) Understand how and when to use particular Personal Protection Equipment (PPE).

The class field instructors will suggest the amount of PPE that is to be worn given the incident conditions. In some cases, less equipment will be required and in some cases, more. It is important that the following order is followed when putting on and taking off equipment

Order of donning (putting on) equipment:

- 1) *Wash hands thoroughly*
- 2) Tyvek suit (if required by the field situation)
- 3) Boot/shoe covers
- 4) Gloves
- 5) Goggles (eye protection)
- 6) N95 mask
- 7) Hood top (if tyvek suit has one)

Order of doffing (removing) PPE

- 1) Boot/shoe covers (*do not reuse*)
- 2) Gloves (*do not reuse*)
- 3) Goggles (eye protection) (*can be sterilized with bleach*)
- 4) Tyvek suit (hood first) (*can be sterilized with bleach*)
- 5) N95 mask (*do not reuse*)
- 6) *Wash hands thoroughly*

Personal Protective Equipment (PPE)

(PPE text and graphics adapted from CDC website)

The Center for Disease Control (CDC) has established universal precautions for personal safety for employees within hospital, laboratory, industry, construction, and all other work settings. The Occupational Safety and Health Administration (OSHA) is the part of the Department of Labor, which sets appropriate guidelines for employee health and safety. In order to protect employees from infection, it is important to follow the guidelines set by OSHA and the CDC for Avian Influenza, or more generally, those guidelines for blood-borne pathogens. Appropriate barrier precautions should be routinely used to prevent skin and mucous membrane exposure when contact with biological agents, blood or other potentially infectious materials are anticipated. Personal protective equipment (PPE) will be considered appropriate only if it does not permit biological agents, blood or other potentially infectious material to pass through or reach the worker provider clothing, skin, eyes, mouth, or other mucous membranes under normal conditions of use and for the duration of time that the protective equipment will be used. Personal protective equipment consists of many different types of barrier precautions.

- Gloves – protect hands
- Gowns/aprons – protect skin and/or clothing
- Masks and respirators– protect mouth/nose
- Respirators – protect respiratory tract from airborne infectious agents
- Goggles – protect eyes
- Face shields – protect face, mouth, nose, and eyes
- Boots and cover booties – protect the environment against the spread of contagion (viruses and bacteria) on footwear

Contaminated and clean areas of PPE

Contaminated areas of PPE are the OUTSIDE and FRONT of the equipment. The outside and front of the PPE have or are likely to have been in contact with bodies, sites, materials, or environmental surfaces where the infectious organisms may reside.

Clean areas of PPE are the INSIDE, OUTSIDE BACK, and TIES (or headstraps). The INSIDE, OUTSIDE BACK, and TIES are not likely to have been in contact with the infectious organism, unless cross-contamination has occurred.

Gloves

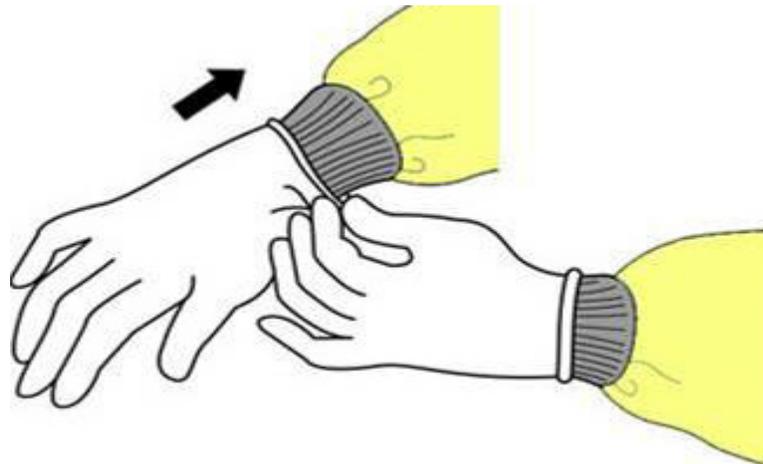
Gloves should be worn for touching biological agents (such as viruses and bacteria), blood and other potentially infectious materials, mucous membranes, or non-intact skin, or for handling items or surfaces soiled with biological agents, blood or other potentially infectious materials.

Additionally, the following precautions should be followed:

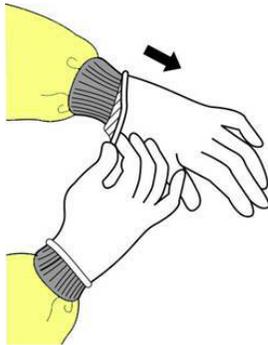
- Keep gloved hands away from face
- Avoid touching or adjusting other PPE
- Limit the number of surfaces and items touched
- Never wash or reuse disposable gloves
- Do not touch your mouth when wearing gloves
- Do not eat when wearing gloves
- Do not smoke, dip, or chew tobacco or betel nut when in PPE
- Remove gloves if they become torn; perform hand hygiene before donning new gloves
- Be careful to watch that long fingernails or sharp edged rings do not puncture the glove causing exposure to the hazardous material

How to properly “don” (put on) gloves:

- Don gloves last
- Select correct type and size
- Insert hands into gloves
- Extend gloves over tyvek suit cuffs



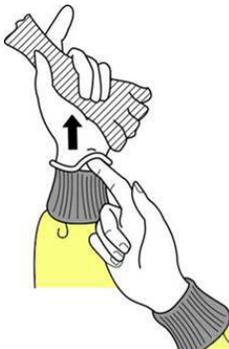
Don gloves by inserting hands into gloves, and extending gloves over cuffs of protective clothing (if worn).



Peel away from hand, turning glove inside-out

How to properly “doff” (remove) gloves:

- Grasp outside edge near wrist
- Peel away from hand, turning glove inside-out
- Hold in opposite gloved hand
- Slide ungloved finger under the wrist of the remaining glove
- Peel off from inside, creating a bag for both gloves
- Discard
- Immediately perform hand hygiene



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

Respirators and masks

Respirators are designed as protection for the mouth, nose, and lungs. Respirators and masks come in a variety of sizes, and shapes, each with a specific purpose or task. Air purifying respirators can filter dangerous chemical vapors, or biological matter, such as infectious aerosols, spores, or airborne bacteria.

It is necessary to match the respirator type with the task you want to accomplish. Respirator or mask types include:

- Particulate respirators
- Half- or full-face elastomeric respirators
- Powered air purifying respirators (PAPR)



Discard gloves properly

All respirators require the following precautions:

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



Different styles of N95 respirator

The Center for Disease Control (CDC) recommends an N95 Particulate Respirator, or better, for all activities where the employee will potentially be exposed to HPAI H5N1. The picture above displays in subtle differences in style and design across several brands.

How to properly put on (don) a 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 –
 - o Inhale – respirator should collapse
 - o Exhale – check for leakage around face



Procedure for donning a respirator

What is a “fit test”

N95 masks need to fit properly to reduce risk of inhaling dangerous substances and biological contamination. Fit tests should be performed under local regulations. For an example of how a fit test can be performed, see this website: <http://www.ehso.emory.edu/indhygiene/Respirator/FitTest-N95.html>



Procedure for fit testing a respirator

How to properly take off (doff) a respirator:

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

Face shields and goggles

Eye and face protection must be utilized where there is potential for injury to the eyes or face from flying particles, molten metal, liquid chemicals, vapors or gases, potentially injurious light radiation or a combination of these. Eye and face protection is available for protection against a variety of hazards. Additionally, the following precautions should be followed:

- Eye protection should fit snugly over and around eyes
- Personal glasses not a substitute for goggles
- Face shields should cover forehead, extend below chin and wrap around side of face

How to properly don goggles or eye protection:

- Position goggles over eyes and secure to the head using the ear pieces or headband
- Goggles should fit securely and comfortably across the face
- Face shield should fit over face and secure on brow with headband
- Adjust to fit comfortably using ratcheting headband, or elastic straps.

How to properly doff goggles or eye protection:

- Grasp ear or head pieces with un-gloved hands
- Lift away from face
- Place in designated receptacle for reprocessing/sanitizing or disposal



Remove the mask by pulling up the straps from the back.



Dispose of the mask - DO NOT REUSE.



Procedure for removing eye protection or goggles



Aprons and tyvek suits

Aprons and tyvek suits are used to protect your skin and clothing from contamination.

How to properly don a tyvek suit:

- Unfasten ties / unzip zipper
- Scrunch up the legs of the suit, making a space for your feet to go through to touch the ground
- Step into the suit one leg at a time
- Gently pull the suit over your legs and to your waist
- One arm at a time, put on the upper portion of the suit
- Zip the zipper



How to properly doff a tyvek suit:

- Unfasten ties / unzip zipper
- Peel gown away from neck and shoulder
- Turn contaminated outside toward the inside
- Fold or roll into a bundle
- Discard



Booties and boots

Your bare feet can be entry points for biological and chemical contamination. Therefore, it is important that you cover your feet/shoes/boots/flip flops with disposable plastic booties before entering the site of a possible incidence.

Procedure for removing tyvek suit

Proper storage of Personal Protective Equipment

Do not store Personal Protective Equipment in the sun. Clean, unopened PPE should be stored in a cool, shaded, clean, and dry place such as inside an air-conditioned office away from direct sunlight.

Do not store personal protective equipment in a motor vehicle. The interior temperature of a motor vehicle can get very hot. Extreme heat can cause micro tears, and a general deterioration of personal protective equipment.

Eye protection, respirators, (and hearing) protection require clean dust tight containers. These could be zip lock bags, pouches or cabinets. Reusable goggles, and face shields should never be left hanging unprotected and dirty! If goggles and face shields were designed to be reusable, clean flash face shields and hood windows by washing them with warm water, rinsing, and drying them off with a soft towel.

**DO NOT REUSE DISPOSABLE PERSONAL
PROTECTIVE EQUIPMENT THAT CANNOT BE
STERILIZED**

Proper disposal of Personal Protective Equipment

The best way to safely dispose of PPE is by using an approved medical incinerator. Burning plastics and other materials can create smoke that can cause harm to humans.

Disinfectants

Disinfectants are cleaning compounds designed to kill fungus, bacteria, and/or viruses. It is important that the disinfectant you use is appropriate for the job. Due to the chemical and biological make-up of the fungus, bacteria, or virus, disinfectants come in a variety of concentrations. For the task of disinfecting a surface of HPAI H5N1, you can use a simple household bleach solution. If you choose to use another disinfectant, you want to be sure to check the label for its ability to neutralize blood-borne pathogens.

Procedure for preparing disinfectant

1. With permanent marker, label spray bottle with content and dilution information.

CAUTION: Water and Bleach Solution. 10:1 ratio at 5% sodium hypochlorite. Wear your goggles when mixing this solution.

2. Mix 10 parts of clean water with 1 part of household bleach.
3. Measure water and pour into spray bottle.
4. Measure household bleach (5.25% sodium hypochlorite stock solution) and carefully add to the water.

For sanitizing goggles and other products that can be safely reused if sanitized, mix a bucket full of water/bleach solution and soak a minimum of 20 minutes.

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