
Use of Personal Protective Equipment in EVD

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Introduction

The principle is to **Ensure safety of health workers:**

- Avoid contamination from patient's body fluids
- Avoid your contaminated hands touching your mouth, nose or eyes
- Avoid contamination when you take off PPE

Who should Wear Personal Protection Equipment (PPE)?

- All doctors, nurses, and health workers who provide direct patient care
- All support staff: cleaners, handle contaminated supplies and equipment, laundry, and dispose of infectious waste
- All laboratory staff
- Laboratory support staff
- Burial teams
- Family members who care for EVD patients

Recommended PPE

- ❑ Should give maximum protection while ensuring minimum discomfort to the wearer
 - Impermeable to fluids and provides droplet protection
 - Skin, hands and full face protection

- ❑ Available in different brands and types
 - TYVEK-WHO

 - TYCHEM-MSF

Personal Protective Equipment



Different approaches for PPE?

- USA and CDC recommendations for US hospitals are THE SAME as WHO's i.e TYVEK.
- Some field NGOs use TYCHEM (the yellow suit)
 - Not wrong, but not necessarily better either. It does cover all skin, but this includes skin at extremely low risk of being splashed (neck)
 - Problem 1: More complicated to remove(may have higher risk of touching mucus membranes if any break in technique)
 - Problem 2: HCW becomes very hot and dehydrated – can't provide care for >45 minutes vs 3-4 hours)

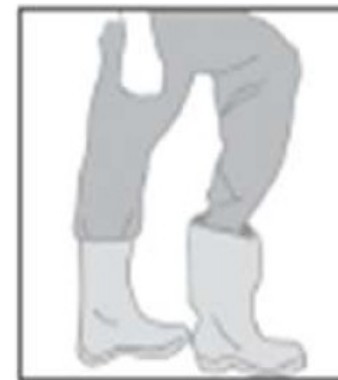
When would I use a TYCHEM (yellow) suit?

- ❑ **Not** considered essential by WHO

- ❑ If available, can be **considered** for very high risk situations with anticipated exposure to blood and body fluid
 - Autopsy
 - Handling of human remains

PPE for EVD

- Gloves
- Disposable gown to cover clothing and exposed skin
- Waterproof apron if undertaking strenuous activity (e.g., carrying a patient)
- Facial protection to prevent splashes to the nose, mouth and eyes
 - Face shield and mask (preferred) OR
 - Mask and eye visor/goggles
- Gum boots (preferred) or shoe covers



PPE for EVD

Medical vs. hemisphere N95 mask

- Both are safe and provide protection from droplets
- The hemisphere N95 mask will last longer (will not become deformed) for long periods in humid conditions

Goggles vs. face shield

- Both are safe and provide eye protection
- Face shield less likely to get fogged / wet
- May be harder to provide care in treatment centre with goggles

Donning PPE

- ❑ Always put on essential required PPE when handling either a suspect, probable or confirmed case of EVD. Gather all necessary items of the PPE beforehand
- ❑ Charts providing instructions on dressing and undressing of PPE should be displayed on the wall in the dressing and undressing room
- ❑ Do not use street clothes in the treatment center, Put on scrub suit in the changing room

Wearing PPE with a full body suit

1. Wear first layer of protective clothing
2. Put on rubber boots
3. Put on the coverall
4. Perform hand hygiene
5. Put on first pair of gloves and [head gear if available]
6. Put on the mask
7. Put on the goggles
8. Put on the hood of the coverall
9. Put on the plastic apron
10. Put on the second pair of gloves

Steps to Donning PPE

Wear first layer of protective clothing



**Put on the coverall
Select the right size**



Making thumb hole in suit



Inner gloves



Steps to Donning PPE

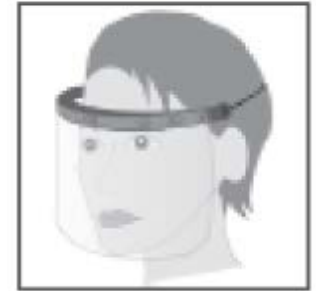
☐ Put on face protection:

. N95 Particulate Respirator

- Pay attention to size (S, M, L)
- Place over nose, mouth and chin
- Fit flexible nose piece over nose bridge
- Secure on head with elastic
- Do not cross the elastic
- Adjust to fit and check for fit: Inhale – respirator should collapse Exhale – check for leakage around face



. Put on a Goggles OR face shield (preferred)



Steps to Donning PPE[apron]

Put on Plastic Apron



Steps to Donning PPE

10. Put on Second Pair of Gloves
Pull gloves over the cuff of the
body suit



Outer gloves



Recognizing Persons Providing Care in Treatment Center



- ❑ Add name of the person in PPE to easily recognize the person inside the treatment center
- Important for buddy system
- Distinguish who is clinician, hygienist/cleaner, etc

Removing PPE

- ❑ Remove the most exposed/contaminated first
 - The Apron
 - The Outer Gloves

- ❑ Removal is from outside in

- ❑ Removal is done in a way to prevent contact of HCW with contaminated parts of PPE

Sequence for Removing PPE

1. Disinfect the outer pair of gloves
2. Remove the apron
3. Disinfect the outer pair of gloves
4. Remove the outer pair of gloves
5. Disinfect the inner pair of gloves
6. Remove the coverall
7. Disinfect the hands
8. Disinfect the inner pair of gloves
9. Remove the goggles
10. Disinfect the inner pair of gloves
11. Remove the mask
12. Disinfect the inner pair of gloves
13. Remove the inner pair of gloves
14. Perform hand hygiene

Sequence for Removing PPE

Remove plastic apron and dispose of safely, (if the apron is to be reused, place in container with disinfectant)



Sequence for Removing PPE

Remove the outer pair of gloves

- ❑ Grasp outside of one glove with other gloved hand and peel off
- ❑ Hold removed glove in hand still double gloved
- ❑ Slide a finger/thumb of hand with single glove between the two gloves on double-gloved hand at wrist (do not touch outside of outer glove with inner glove)
- ❑ Pinch and peel glove off from inside, turning glove inside out (over other glove), such that the two gloves are inside out and wrapped up inside each other in a single ball and discard both gloves

Sequence for Removing PPE

- ❑ **Remove coverall** and roll inside-out and dispose of safely

Sequence for Removing PPE

Removing a Mask

- Lift the bottom elastic over your head first(bend in front slightly)
- Then lift off the top elastic
- Discard
- Don't touch front of mask



Sequence for Removing PPE

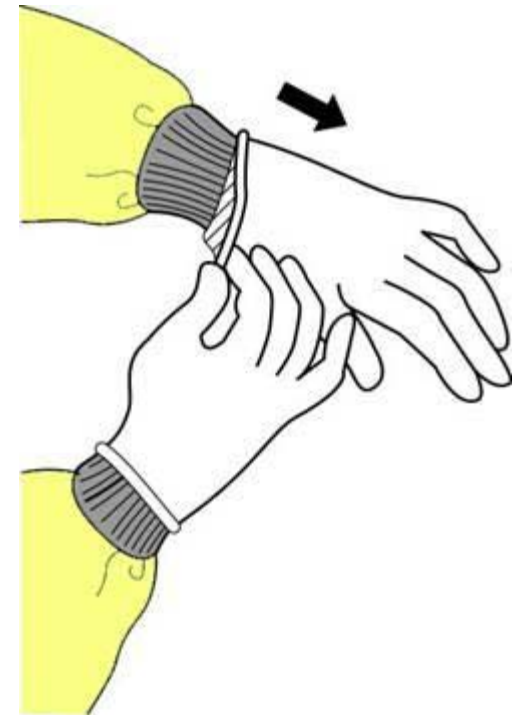
Removing Goggles or Face Shield

- (Goggles)Grasp the strap at the back behind the ear and bring it in front and let it fall
- Place in designated receptacle for disinfecting or disposal

Sequence for Removing PPE

Remove inner pair of gloves

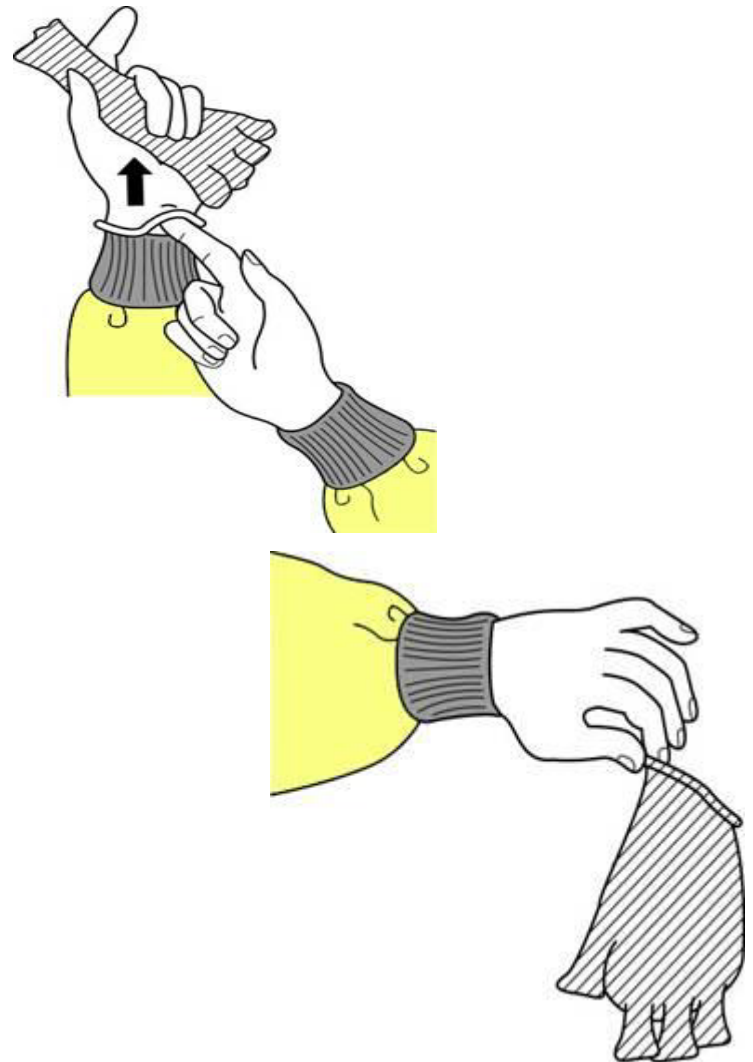
- Grasp outside edge near wrist
- Peel away from hand, turning glove inside-out
- Hold in opposite gloved hand



Sequence for Removing PPE

How to remove the inner glove

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



Sequence for Removing PPE

Perform hand hygiene



Proceed to the clean area of the isolation facility

Removing the rubber boots

- Need clean shoes in clean area of the PPE removal zone to step into

Common PPE Mistakes and Hazards

- Shoe covers (gum boots preferred)
 - Tripping on shoe covers
 - Losing shoe covers when walking in mud
- Sharp items: unsafe handling and disposal of needles
 - Recapping needles
 - Full sharp containers (Dispose of sharps containers before full)
 - Needles on the floor

Common PPE Mistakes and Hazards

- Uncovering wrists with wide movement, especially tall people
 - .
- Goggles
 - Touching goggles to adjust with contaminated gloves
 - Flies coming in through holes on the side of goggles
 - Early removal during doffing increasing risk of contaminating face
 - Increased risk of medical glasses falling when removing the goggles

PPE Supervisor

- **Dedicated**, trained person to supervise donning and taking off of PPE 24h/7days
- Supervisor should also periodically check PPE adhered to within the isolation ward
- New staff trained by experienced staff
- Then staff supervise each other every time when working.
- If in doubt, person with authority to stop/correct clinician and other staff

When taking off PPE- important to separate reusable from disposable

Reuseable

- Face shields
- Goggles
- Aprons- heavy duty
- Gum boots
- Gowns which can be laundered
- Scrubs

Disposable

- Gloves
- Disposable gowns
- Masks
- Shoe covers
- Single use aprons

Separate in containers, to be washed and disinfected with chlorine solution

Effectiveness of PPE Depends on:

- Adequate and regular supplies
- Adequate staff training
- Proper hand hygiene
- Appropriate human behavior/attitude
- Close supervision and support

Avoid touching your eyes, mouth, or face with gloved or ungloved hands.

Key Points to Remember

- ❑ Minimize exposures
 - Plan before entering room
- ❑ Avoid adjusting PPE after patient/body contact
 - Do not touch eyes, nose or mouth!
- ❑ Avoid spreading infection
 - Limit surfaces and items touched
- ❑ Change torn gloves
 - Wash hands before donning new gloves

Key Points to Remember

- ❑ Don't wash or reuse disposable gloves
- ❑ If you are concerned that you may have been exposed
 - Stop working and immediately wash affected skin surfaces with soap and water
 - Affected mucus membranes should be irrigated with copious amounts of water or eyewash solution
 - Contact your supervisor for additional follow-up

PPE DEMO PRACTICAL SESSION

For waste management materials:

- ❑ Leak-proof and puncture resistant sharps container
- ❑ Two leak-proof infectious waste bags: one for disposable material (destruction) and one for reusable materials (disinfection)

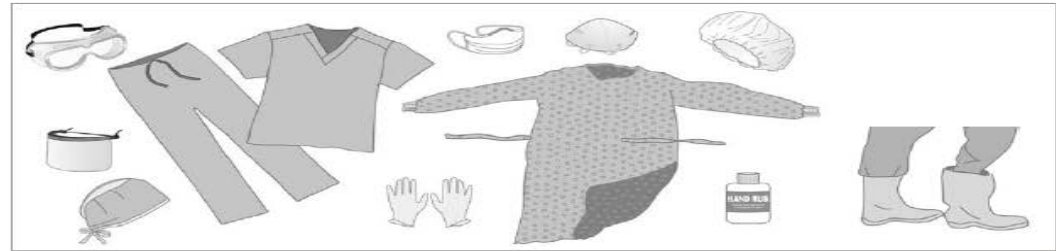


Steps to put on personal protective equipment (PPE)

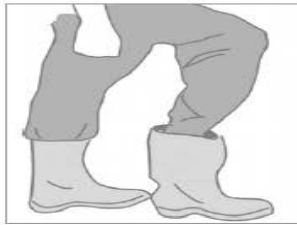
1 Always put on essential required PPE when handling either a suspected, probable or confirmed case of viral haemorrhagic fever.

2 The dressing and undressing of PPE should be supervised by another trained member of the team.

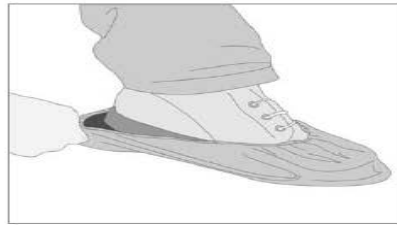
3 Gather all the necessary items of PPE beforehand. Put on the scrub suit in the changing room.



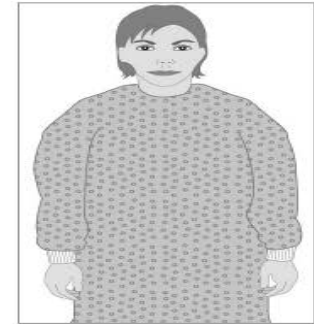
4 Put on rubber boots. If not available, make sure you have closed, puncture and fluid resistant shoes and put on overshoes.



OR, IF BOOTS UNAVAILABLE



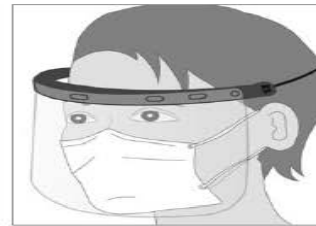
5 Place the impermeable gown over the scrubs.



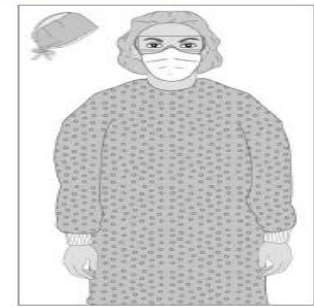
6 Put on face protection:
6a Put on a medical mask.



6b Put on goggles or a face shield.



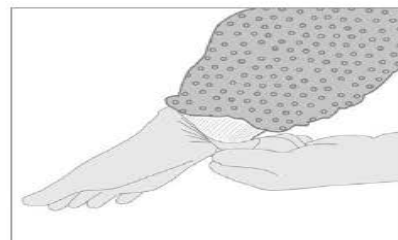
7 If available, put a head cover on at this time.



8 Perform hand hygiene.



9 Put on gloves* (over cuff).



10 If an impermeable gown is not available, place waterproof apron over gown.



Steps to remove personal protective equipment (PPE)

- 1** Remove waterproof apron and dispose of safely. If the apron is to be reused, place it in a container with disinfectant.



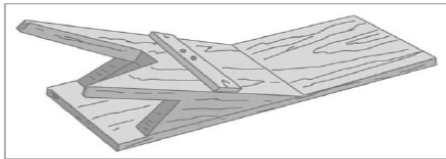
- 2** If wearing overshoes, remove them with your gloves still on (if wearing rubber boots, see step 4).



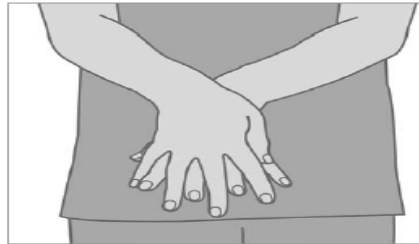
- 3** Remove gown and gloves and roll inside-out and dispose of safely.



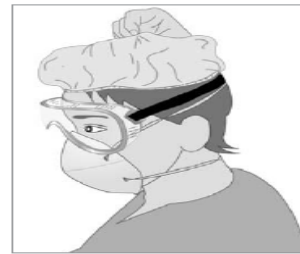
- 4** If wearing rubber boots, remove them (ideally using the boot remover) without touching them with your hands. Place them in a container with disinfectant.



- 5** Perform hand hygiene.



- 6** If wearing a head cover, remove it now (from behind the head).



- 7** Remove face protection:
7a Remove face shield or goggles (from behind the head). Place eye protection in a separate container for reprocessing.



- 7b** Remove mask from behind the head. When removing mask, untie the bottom string first and the top string next.



- 8** Perform hand hygiene.

