

Introduction to PPE Use and Screening for Ebola Virus

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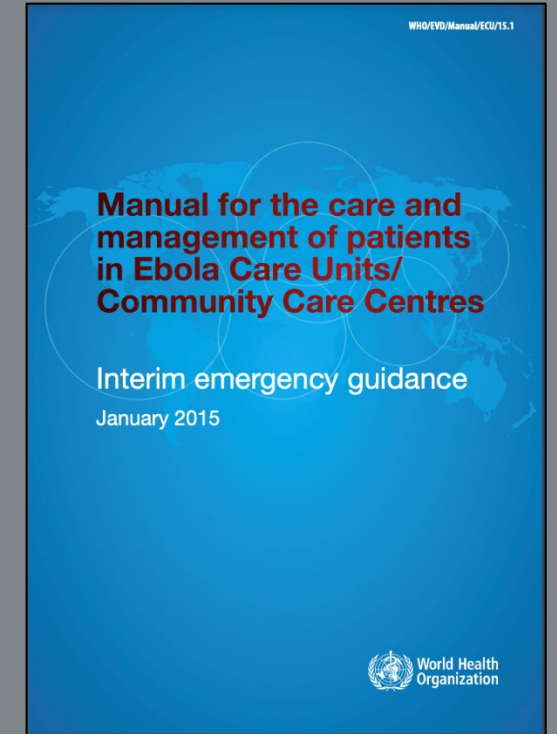
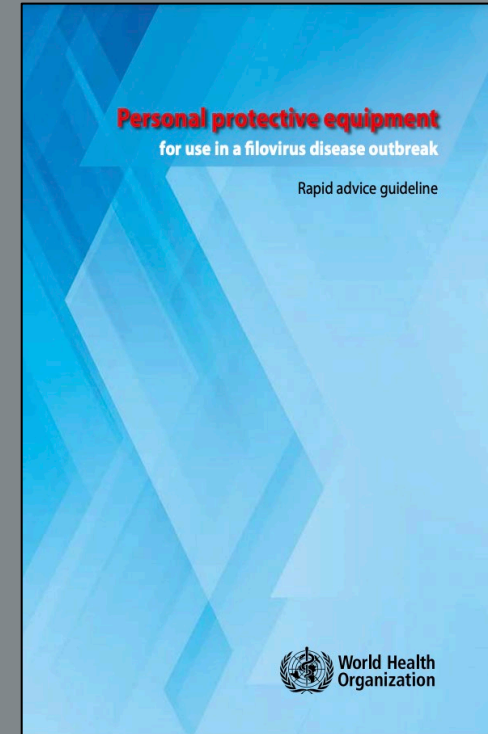
Introduction

- Interim guidelines on PPE use were **updated** several years ago (16 November 2016) with a current update in progress
- Being prepared is **essential** for the safety of healthcare workers and patients
- Competence with PPE use and clinic management needs **practice** and **repetition** with all those involved in patient care, as well as a **trained observer** present to assist and ensure safety



Presentation Outline

- Transmission
- Basic principles of PPE use
- Technical specifications of equipment
- Donning and doffing of PPE
- Key safe work practices
- Screening procedures
- Simulation exercise
- Questions



Note: Complete WHO guidelines for PPE use and triage procedures can be found here:

Personal protective equipment for use in a filovirus disease outbreak
<https://www.who.int/publications/i/item/9789241549721>
Manual for the care and management of patients in Ebola Care Units/Community Care Centres
https://apps.who.int/iris/bitstream/handle/10665/149781/WHO_EVD_Manual_ECU_15.1_eng.pdf

Transmission

- The Ebola virus replicates only within **living** cells
- Stable in the environment for between a **few hours** and a **few days**, depending on conditions such as viral load, presence of biological fluids, humidity and temperature
- The virus is **destroyed** by a variety of disinfectants





Transmission (cont.)


- Severity of disease is correlated with the **level of virus** in the blood and thus infectivity
- Virus load in an infected person is **highest in blood**
- Other body fluids, such as vomit, faeces, sweat, saliva, urine, amniotic fluid, breast milk, cerebrospinal fluid and semen, can also contain the virus and may be involved in **transmission**


HOW DOES ONE GET EBOLA?

BY COMING INTO DIRECT CONTACT WITH:



- 

1 Body fluids of a person who is sick with or has died from Ebola (blood, vomit, urine, faeces, sweat, semen, saliva, etc)
- 

2 Objects contaminated with the virus (needles, medical equipment)
- 

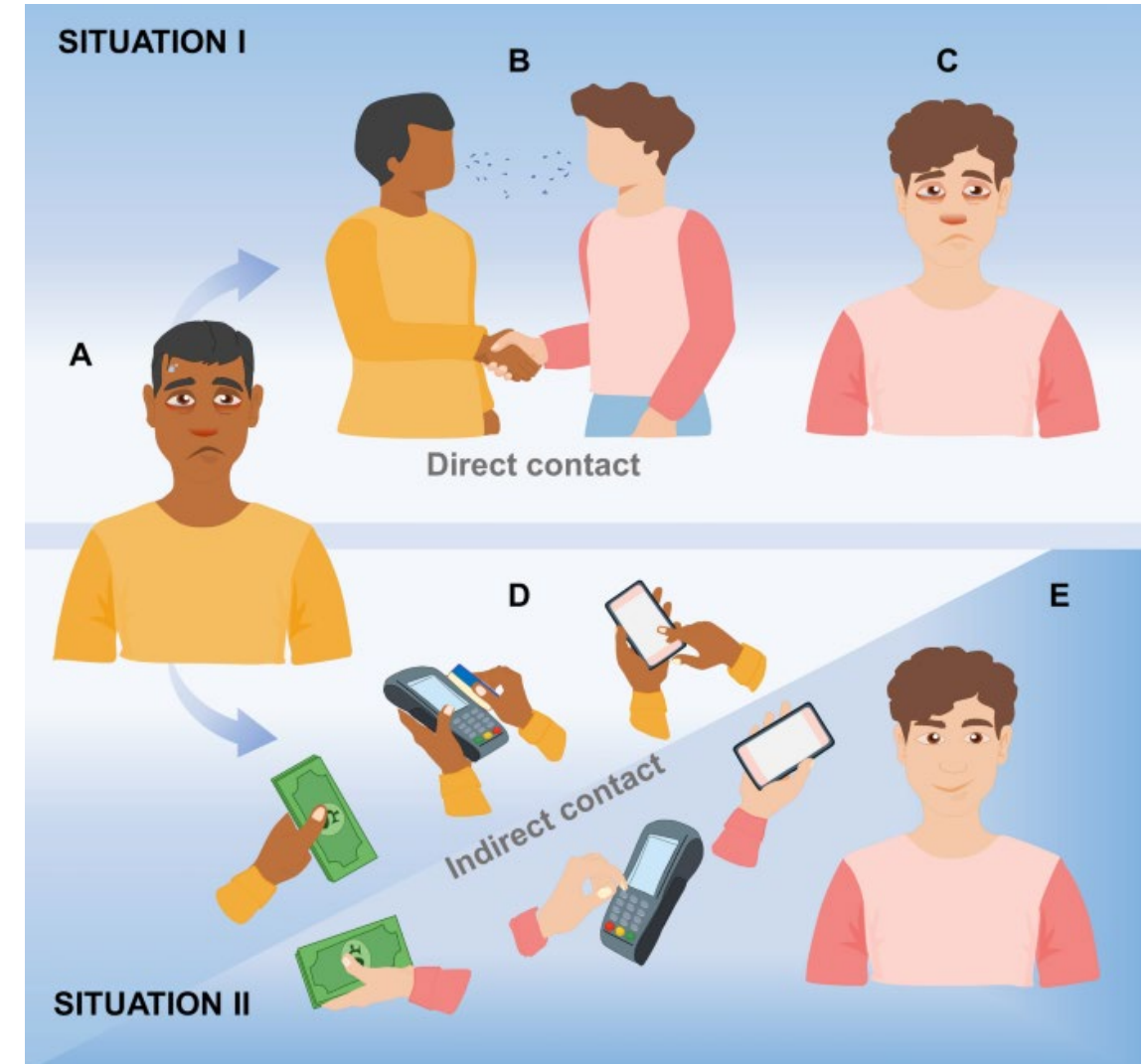
3 Infected fruit bats or primates
- 

4 Possibly from contact with semen from a man who has recovered from Ebola (by having oral, vaginal or anal sex)

 #PreventEbola  for every child

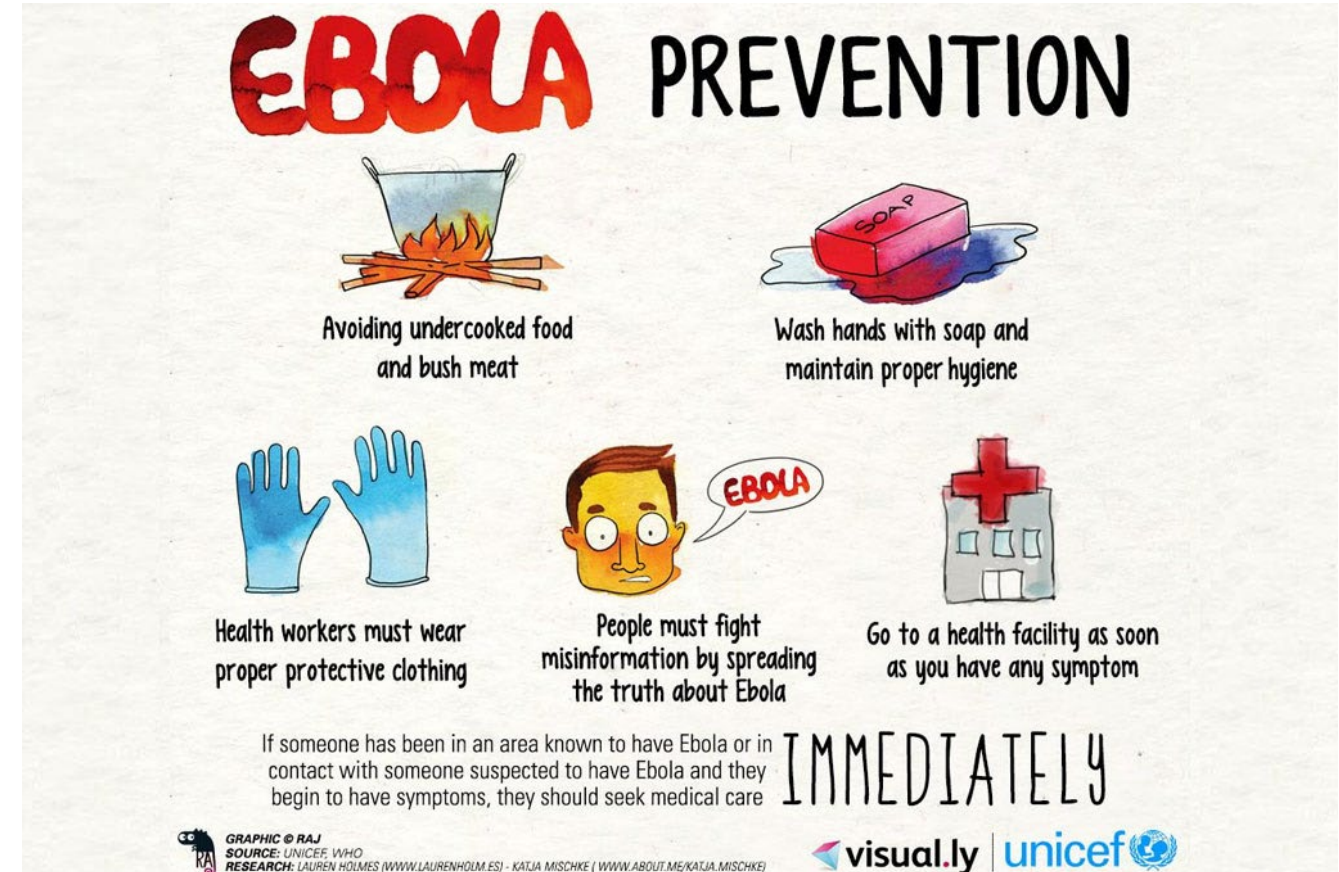
Transmission (cont.)

- Main route for transmission is through direct contact between **blood** or other body fluids of infected individuals and the **mucous membranes** of the mouth, nose and eyes
- Transmission can also occur through indirect contact through **fomites** (infected inanimate objects and surfaces), such as the floor, utensils and bedlinen



Transmission (cont.)

- Transmission through intact skin has **not** been documented
- Infection can be transmitted through non-intact skin and through penetrating injuries of the skin, such as **needle-stick injuries**
- Transmission is **not** airborne



Basic Principles to Protect HCWs

Administrative (SOPs, patient flow)

Environmental and engineering (hand hygiene infrastructure, waste management, physical barriers)

Personal protective equipment (last line of defense)

Basic Principles to Protect HCWs (cont.)

- Successful implementation includes:
 - Follow technical **guidelines**
 - Provide thorough **training** to HCWs on PPE use
 - Ensure effective **resource management** (i.e., PPE stock management, early reporting of shortages, easily accessible stock, adequate quantity, availability of sizes)
 - **Written protocols** in place for PPE waste management, decontamination, and reuse per manufacturer
 - Have **cooling and rehydrating facilities** available for HCWs taking off PPE



Table 1. Standard precautions

Standard precautions	Key components	WHO reference documents
Hand hygiene	Use alcohol-based hand rub Wash with soap and water	<i>Hand hygiene in health care in the context of filovirus disease outbreak response</i> (10).
Personal protective equipment based on point-of-care risk assessment	Select appropriate PPE Remove PPE safely	The present document.
Prevention of needle-stick or sharps injuries	Never reuse syringes, needles and other similar equipment Dispose of syringes, needles and sharp objects at the point of care in appropriate, puncture resistant containers	Best practices for injections and related procedures toolkit (11).
Safe waste management	Develop a management plan for health care waste Disinfect materials with 0.5% chlorine solution Incinerate or autoclave health care waste, then dispose of in pits	Ebola virus disease: key questions and answers concerning health care waste (12).
Cleaning, disinfection and sterilization, where applicable, of equipment and linen used in patient care	Clean laundry and surfaces at least once a day Clean and disinfect areas contaminated with body fluids with 0.5% chlorine solution	Ebola virus disease: key questions and answers concerning water, hygiene and sanitation (13).
Cleaning and disinfection of the environment		

Basic Principles to Protect HCWs (cont.)

Contact time is crucial for efficacy


PERFORMING HAND HYGIENE FOR ONLY A FEW SECONDS WILL NOT PROTECT YOU

Procedure

Handrubbing with palmful of ABHR	Until dry (20-30 seconds)
Handwashing (soap and water)	40-60 seconds
Handwashing with 0.05% chlorine (free-running)	40-60 seconds

Technical Specifications of Equipment - Scrubs



Surgical scrubs (trousers and tops)
Tightly woven
Minimum linting
Non-sterile, reusable or single use
Top or tunic: short sleeves
Trousers: drawstring waist enclosure
Different sizes


Technical Specifications of Equipment - Eyewear

Goggles

Good seal with the skin of the face.

Flexible frame that easily fits all face contours without too much pressure.

Cover the eyes and surrounding areas and accommodate prescription glasses.

Fog- and scratch-resistant

Adjustable band that can be firmly secured and does not become loose during clinical activity.

Indirect venting to reduce fogging.

May be reusable (provided appropriate arrangements for decontamination are in place) or disposable.

Quality compliant with standards:

- EU standard directive 86/686/EEC, EN 166/2002, or
- ANSI/ISEA Z87.1-2010

or equivalent.



Face shield

Made of clear plastic and provides good visibility to both the wearer and the patient.

Adjustable band to allow good fit around the head and snug fit against the forehead.

Fog-resistant (preferable).

Completely covers the sides and length of the face.

May be reusable (made of material that can be cleaned and disinfected) or disposable.

Quality compliant with standards:

- EU standard directive 86/686/EEC, EN 166/2002, or
- ANSI/ISEA Z87.1-2010

or equivalent



of Equipment – Medical/Surgical Mask

Recommendation 3

Use a fluid-resistant medical or surgical mask with a structured design that does not collapse against the mouth (e.g. duckbill or cup shape).

Strong recommendation; low quality evidence comparing medical or surgical mask with particulate respirator

Fluid-resistant medical or surgical mask

High fluid resistance.

Good breathability.

Internal and external faces should be clearly identified.

Structured design that does not collapse against the mouth (e.g. duckbill or cup shape).

Quality compliant with standards, including for fluid resistance level and breathability (differential pressure):

- EN 14683 Type IIR performance, or
- ASTM F2100 level 2 or level 3, or equivalent.



Duckbill or pouch



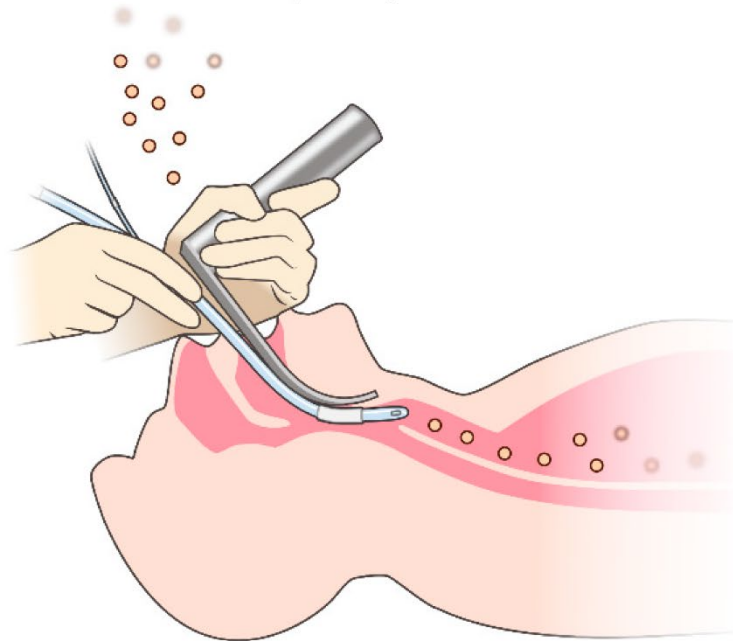
Moulded or non-collapsible, with a half-sphere or cup shape.

of Equipment – Aerosol Generating Procedures

Use a fluid-resistant particulate respirator during procedures that generate aerosols of body fluids.

Strong recommendation; moderate quality evidence, when evidence on protection against other pathogens during aerosol-generating procedures is also considered.

Induced aerosol generation in respiratory tract



Examples: Intubation, Bronchoscopy, CPR

Mechanical aerosol generation in respiratory tract



Examples: Ventilation, Suctioning

Technical Specifications of Equipment - Gloves



Recommendation 5

Use double gloves

Strong recommendation; moderate quality evidence comparing double gloves to single gloves.

Recommendation 6

Nitrile gloves are preferred over latex gloves.

Strong recommendation; moderate quality evidence on health worker tolerance of nitrile gloves compared with latex gloves

Gloves

Nitrile

Non-sterile

Powder-free

Outer gloves should preferably reach mid-forearm (minimum 280 mm total length)

Different sizes


Quality compliant with standards:


- EU standard directive 93/42/EEC Class I, EN 455
- EU standard directive 89/686/EEC Category III, EN 374
- ANSI/ISEA 105-2011
- ASTM D6319-10

or equivalent.



Technical Specifications of Equipment – Gown/Coverall

Disposable coverall
Single use
Avoid colours that are culturally unacceptable, e.g. black Prefer light colours to allow better detection of possible contamination
Thumb or finger loops to anchor sleeves in place
Different sizes available – large size especially important
Quality compliant with either of two international standards, depending on resistance of materials: <ul style="list-style-type: none"> option 1: tested for resistance to blood and body fluid penetration: meets or exceeds ISO 16603 class 3 exposure pressure, or equivalent; or <ul style="list-style-type: none"> option 2: tested for resistance to bloodborne pathogen penetration: meets or exceeds ISO 16604 class 2 exposure pressure, or equivalent. <p>Note: for each of the options mentioned above, different products may be available. The coverall material described in option 2 is associated with higher heat stress and less breathability; this reduces continuous wearing time and results in more frequent changes than option 1.</p>


Disposable gown
Single use
Mid-calf length, to cover the top of the boots
Avoid colours that are culturally unacceptable, e.g. black Prefer light colours to allow better detection of possible contamination
Thumb or finger loops to anchor sleeves in place
Quality compliant with either of two standards, depending on resistance of materials: <ul style="list-style-type: none"> option 1: tested for resistance to fluid penetration : EN 13795 high performance level, or AAMI level 3 performance, or equivalent; or <ul style="list-style-type: none"> option 2: tested for resistance to bloodborne pathogen penetration: AAMI PB70 level 4 performance, or equivalent


Technical Specifications of Equipment - Apron



Recommendation 9

The choice of apron should be, in order of preference:

1. a disposable, waterproof apron
2. if disposable aprons are not available, a heavy-duty, reusable waterproof apron, provided that it is appropriately cleaned and disinfected between patients.

Strong recommendation; very low quality evidence comparing disposable and reusable aprons.

Waterproof apron

Disposable or single use

Made of polyester with PVC-coating or other waterproof material

Straight apron with bib

Minimum basis weight: 250 g/m²

Covering size : approximately 70–90 cm width x 120–150 cm length, or standard adult size

Option 1: adjustable neck strap with back fastening at the waist

Option 2: neck strap allowing for tear-off with back fastening at the waist



Heavy-duty apron

Heavy-duty non-woven apron

Straight apron with bib

Fabric: 100% polyester with PVC coating, or 100% PVC, or 100% rubber, or other fluid-resistant material

Waterproof, sewn strap for neck and back fastening

Minimum basis weight: 300 g/m²

Covering size : approximately 70–90 cm width x 120–150 cm length

Reusable (provided that appropriate arrangements for decontamination are in place)



Technical Specifications of Equipment – Head Cover

Recommendation 11

Use a head cover that covers both head and neck.

Conditional recommendation; low quality evidence comparing head covers with no head cover.

Recommendation 12

It is suggested that the head cover is separate from the gown or coverall, so that it can be removed separately.

Conditional recommendation; low quality evidence comparing different types of head cover.

Head cover

Single use

Fluid-resistant

Adjustable, and should stay securely in place once adjusted

Facial opening constructed without elastic
Cover reaches the upper part of the gown or coverall



Head cover



Hood (reaching below the shoulders)

Technical Specifications of Equipment - Boots



Waterproof boots

Nonslip, with a PVC sole that is completely sealed

Knee-high, to be higher than the bottom edge of the gown

Optional light colour, for better detection of possible contamination

A variety of sizes, to improve comfort and avoid trauma to the feet



Steps to put on personal protective equipment (PPE) including coverall

1 Remove all personal items (jewelry, watches, cell phones, pens, etc.)



2 Put on scrub suit and rubber boots¹ in the changing room.

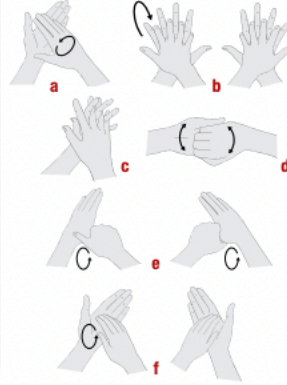


3 Move to the clean area at the entrance of the isolation unit.

4 By visual inspection, ensure that all sizes of the PPE set are correct and the quality is appropriate.

5 Undertake the procedure of putting on PPE under the guidance and supervision of a trained observer (colleague).

6 Perform hand hygiene.



7 Put on gloves (examination, nitrile gloves).



8 Put on coverall.²



9 Put on face mask.



10 Put on face shield OR goggles.



11 Put on head and neck covering surgical bonnet covering neck and sides of the head (preferable with face shield) OR hood.



12 Put on disposable waterproof apron (if not available, use heavy duty, reusable waterproof apron).



13 Put on second pair of (preferably long cuff)² gloves over the cuff.



¹ If boots are not available, use closed shoes (slip-ons without shoelaces and fully covering the dorsum of the foot and ankles) and shoe covers (nonslip and preferably impermeable)

² Do not use adhesive tape to attach the gloves. If the gloves or the coverall sleeves are not long enough, make a thumb (or middle finger) hole in the coverall sleeve to ensure that your forearm is not exposed when making wide movements. Some coverall models have finger loops attached to sleeves.



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Steps to take off personal protective equipment (PPE) including coverall

1 Always remove PPE under the guidance and supervision of a trained observer (colleague). Ensure that infectious waste containers are available in the doffing area for safe disposal of PPE. Separate containers should be available for reusable items.

2 Perform hand hygiene on gloved hands.¹

3 Remove apron leaning forward and taking care to avoid contaminating your hands. When removing disposable apron, tear it off at the neck and roll it down without touching the front area. Then untie the back and roll the apron forward.



5 Remove head and neck covering taking care to avoid contaminating your face by starting from the bottom of the hood in the back and rolling from back to front and from inside to outside, and dispose of it safely.

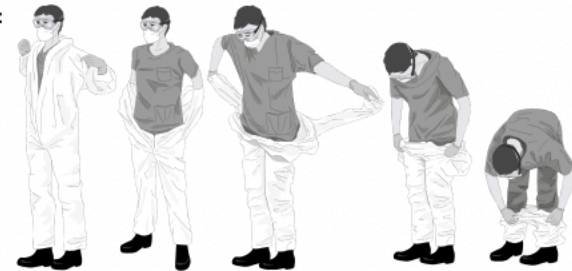


4 Perform hand hygiene on gloved hands.

6 Perform hand hygiene on gloved hands.

7 Remove coverall and outer pair of gloves:

Ideally, in front of a mirror, tilt head back to reach zipper, unzip completely without touching any skin or scrubs, and start removing coverall from top to bottom. After freeing shoulders, remove the outer gloves² while pulling the arms out of the sleeves. With inner gloves roll the coverall, from the waist down and from the inside of the coverall, down to the top of the boots. Use one boot to pull off coverall from other boot and vice versa, then step away from the coverall and dispose of it safely.



8 Perform hand hygiene on gloved hands.

9 Remove eye protection by pulling the string from behind the head and dispose of it safely.



11 Remove the mask from behind the head by first untying the bottom string above the head and leaving it hanging in front; and then the top string next from behind head and dispose of it safely.



12 Perform hand hygiene on gloved hands.

15 Remove gloves carefully with appropriate technique and dispose of them safely.



10 Perform hand hygiene on gloved hands.

13 Remove rubber boots without touching them (or overshoes if wearing shoes). If the same boots are to be used outside of the high-risk zone, keep them on but clean and decontaminate appropriately before leaving the doffing area.³

14 Perform hand hygiene on gloved hands.

16 Perform hand hygiene.

¹ While working in the patient care area, outer gloves should be changed between patients and prior to exiting (change after seeing the last patient)

² This technique requires properly fitted gloves. When outer gloves are too tight or inner gloves are too loose and/or hands are sweaty, the outer gloves may need to be removed separately, after removing the apron.

³ Appropriate decontamination of boots includes stepping into a footbath with 0.5% chlorine solution (and removing dirt with toilet brush if heavily soiled with mud and/or organic materials) and then wiping all sides with 0.5% chlorine solution. At least once a day boots should be disinfected by soaking in a 0.5% chlorine solution for 30 min, then rinsed and dried.



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Steps to put on personal protective equipment (PPE) including gown

1 Remove all personal items (jewelry, watches, cell phones, pens, etc.)



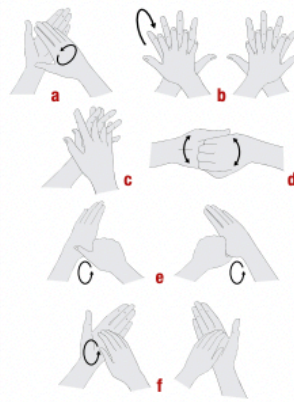
2 Put on scrub suit and rubber boots¹ in the changing room.



3 Move to the clean area at the entrance of the isolation unit.
4 By visual inspection, ensure that all sizes of the PPE set are correct and the quality is appropriate.

5 Undertake the procedure of putting on PPE under the guidance and supervision of a trained observer (colleague).

6 Perform hand hygiene.



7 Put on gloves (examination, nitrile gloves).



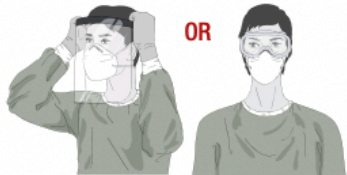
8 Put on disposable gown made of fabric that is tested for resistance to penetration by blood or body fluids
OR to blood-borne pathogens.



9 Put on face mask.



10 Put on face shield OR goggles.



OR



OR

11 Put on head and neck covering surgical bonnet covering neck and sides of the head (preferable with face shield) **OR** hood.

12 Put on disposable waterproof apron (if not available, use heavy duty, reusable waterproof apron).



13 Put on second pair of (preferably long cuff) gloves over the cuff.



¹ If boots are not available, use closed shoes (slip-ons without shoelaces and fully covering the dorsum of the foot and ankles) and shoe covers (nonslip and preferably impermeable)



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Steps to take off personal protective equipment (PPE) including gown

1 Always remove PPE under the guidance and supervision of a trained observer (colleague). Ensure that infectious waste containers are available in the doffing area for safe disposal of PPE. Separate containers should be available for reusable items.

2 Perform hand hygiene on gloved hands.¹

3 Remove apron leaning forward and taking care to avoid contaminating your hands. When removing disposable apron, tear it off at the neck and roll it down without touching the front area. Then untie the back and roll the apron forward.

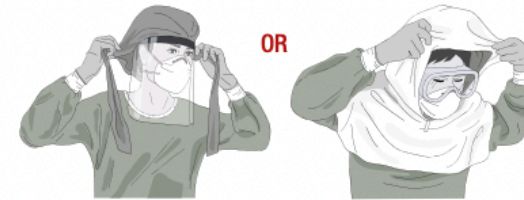


4 Perform hand hygiene on gloved hands.

5 Remove outer pair of gloves and dispose of them safely. Use the technique shown in Step 17

6 Perform hand hygiene on gloved hands.

7 Remove head and neck covering taking care to avoid contaminating your face by starting from the bottom of the hood in the back and rolling from back to front and from inside to outside, and dispose of it safely.



OR

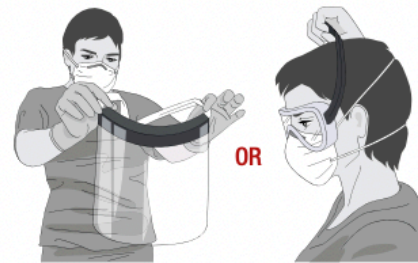
9 Remove the gown by untying the knot first, then pulling from back to front rolling it from inside to outside and dispose of it safely.



8 Perform hand hygiene on gloved hands.

10 Perform hand hygiene on gloved hands.

11 Remove eye protection by pulling the string from behind the head and dispose of it safely.



OR

13 Remove the mask from behind the head by first untying the bottom string above the head and leaving it hanging in front; and then the top string next from behind head and dispose of it safely.



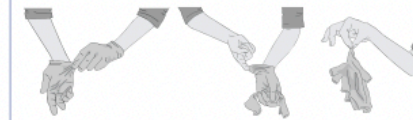
14 Perform hand hygiene on gloved hands.

12 Perform hand hygiene on gloved hands.

15 Remove rubber boots without touching them (or overshoes if wearing shoes). If the same boots are to be used outside of the high-risk zone, keep them on but clean and decontaminate appropriately before leaving the doffing area.²

16 Perform hand hygiene on gloved hands.

17 Remove gloves carefully with appropriate technique and dispose of them safely.



18 Perform hand hygiene.

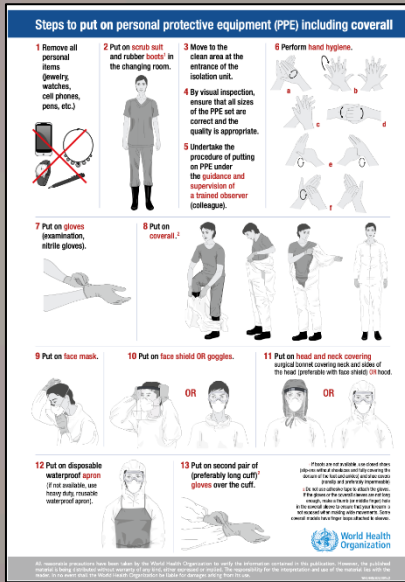
¹ While working in the patient care area, outer gloves should be changed between patients and prior to exiting (change after seeing the last patient)

² Appropriate decontamination of boots includes stepping into a footbath with 0.5% chlorine solution (and removing dirt with toilet brush if heavily soiled with mud and/or organic materials) and then wiping all sides with 0.5% chlorine solution. At least once a day boots should be disinfected by soaking in a 0.5% chlorine solution for 30 min, then rinsed and dried.



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**DONNING
POSTER WITH
INSTRUCTIONS**



ABHR

MIRROR

**PPE IN
DIFFERENT
SIZES**

CHAIR

TABLE

SETUP OF DONNING AREA

Putting on Your PPE

- 1 Remove all personal items (jewelry, watches, cell phones, pens, etc.)**



2 Put on **scrub suit** and rubber **boots**¹ in the changing room.

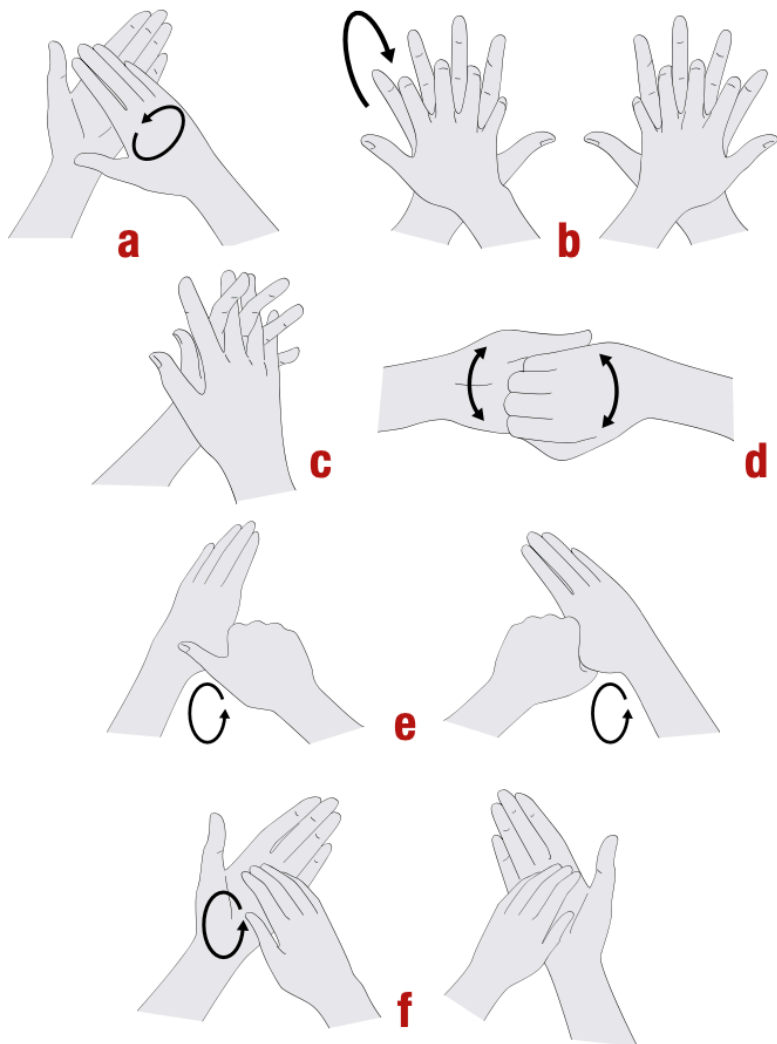
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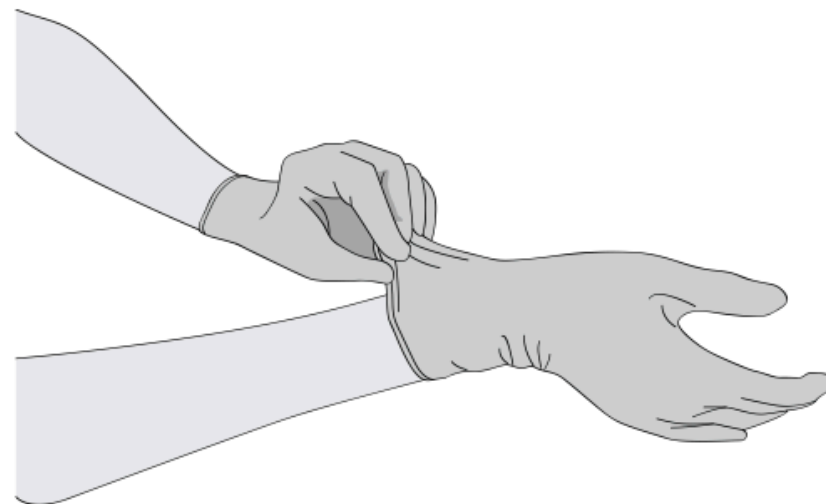
- 3** Move to the clean area at the entrance of the isolation unit.
- 4** By visual inspection, ensure that all sizes of the PPE set are correct and the quality is appropriate.
- 5** Undertake the procedure of putting on PPE under the **guidance and supervision of a trained observer** (colleague).



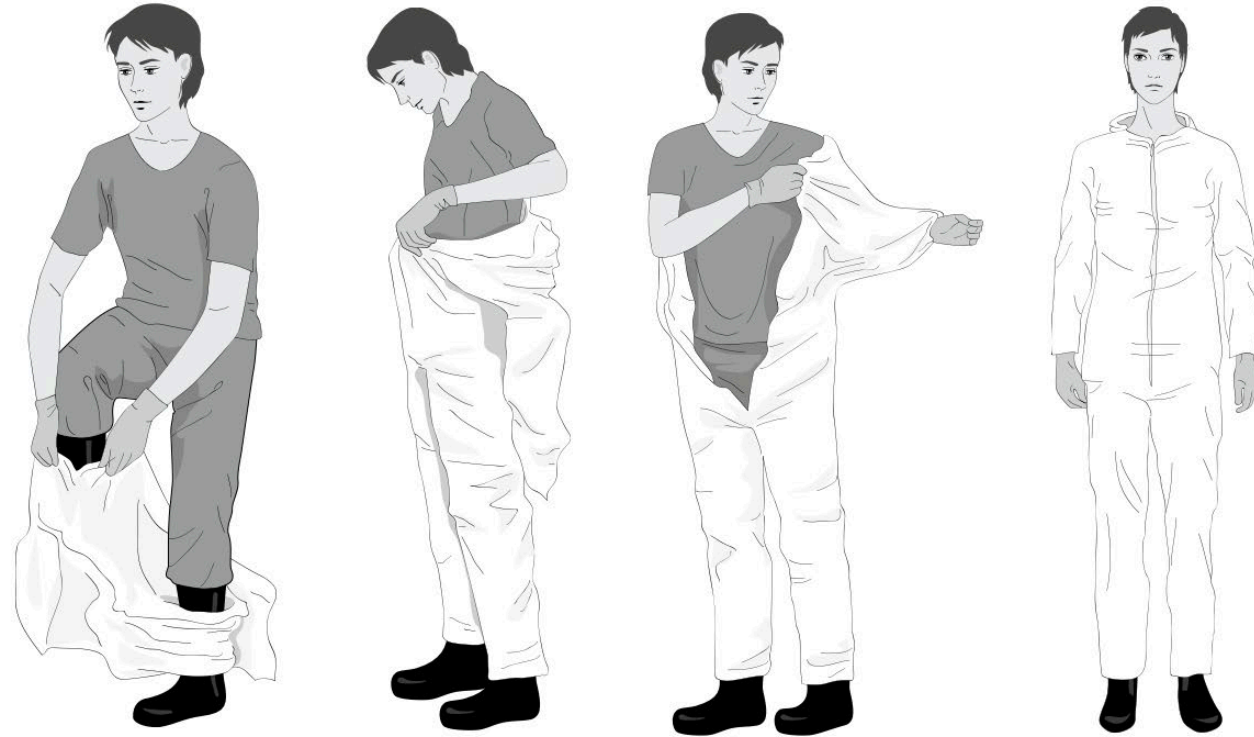
6 Perform hand hygiene.



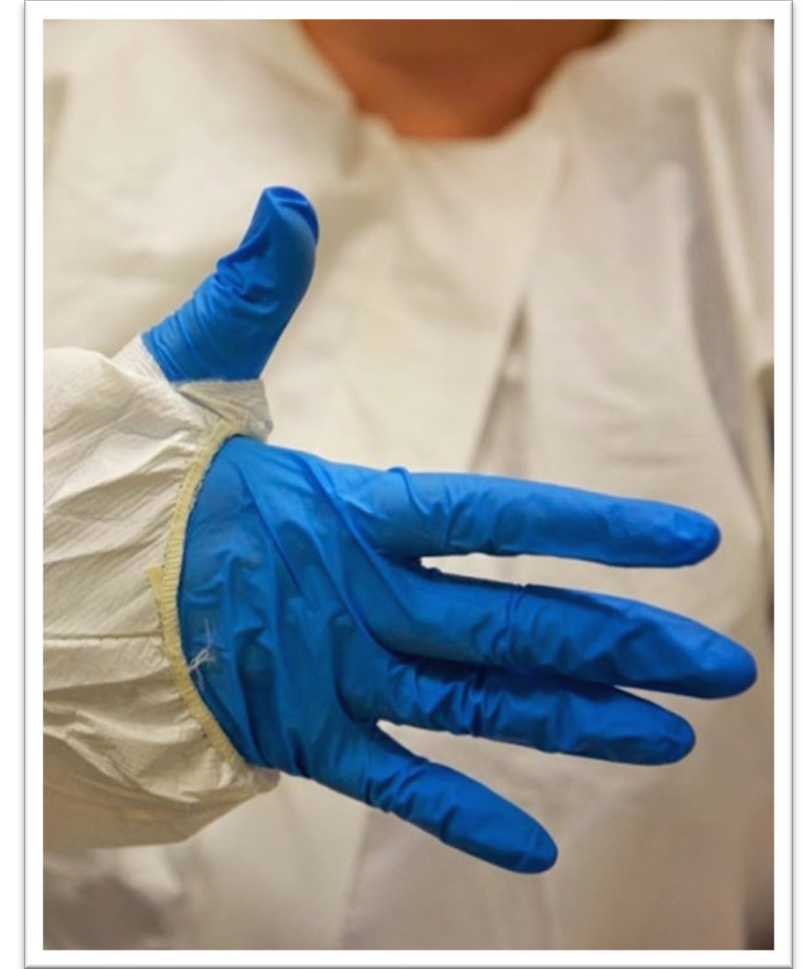
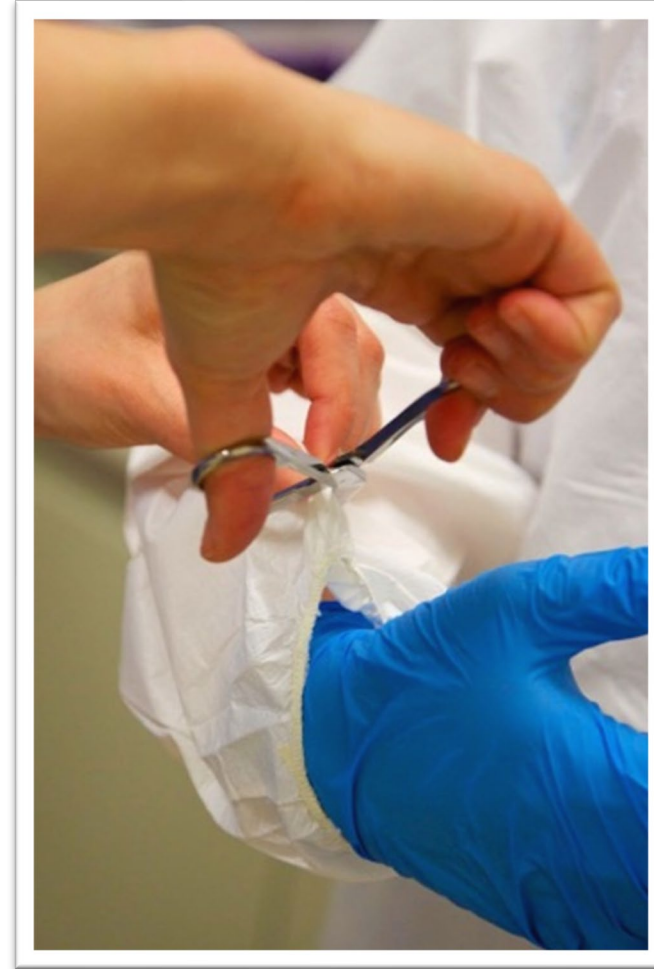
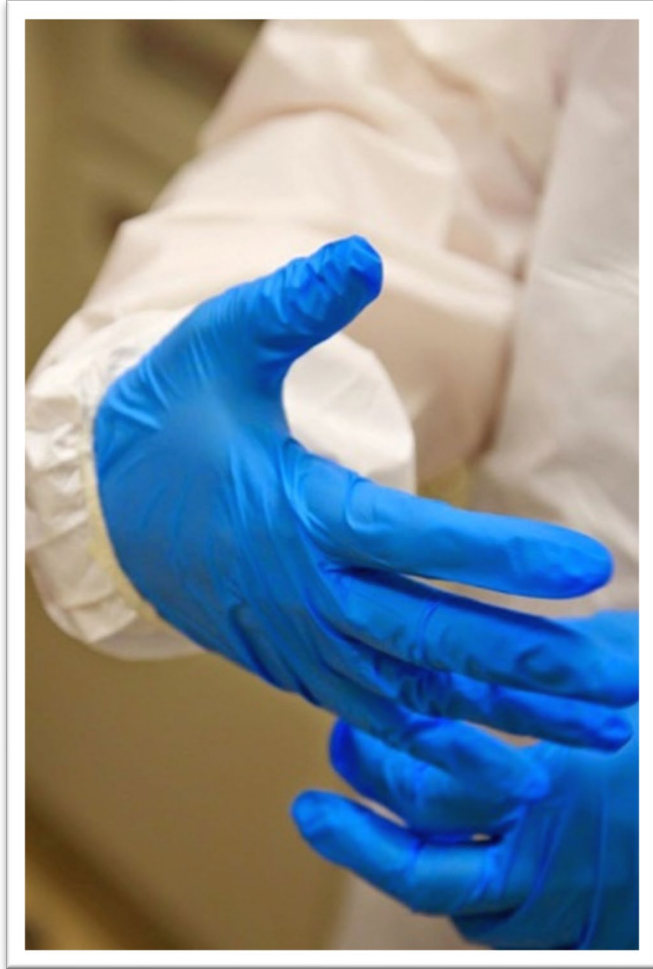
7 Put on gloves (examination, nitrile gloves).



**8 Put on
coverall.²**



2 Do not use adhesive tape to attach the gloves. If the gloves or the coverall sleeves are not long enough, make a thumb (or middle finger) hole in the coverall sleeve to ensure that your forearm is not exposed when making wide movements. Some coverall models have finger loops attached to sleeves.



9 Put on face mask.



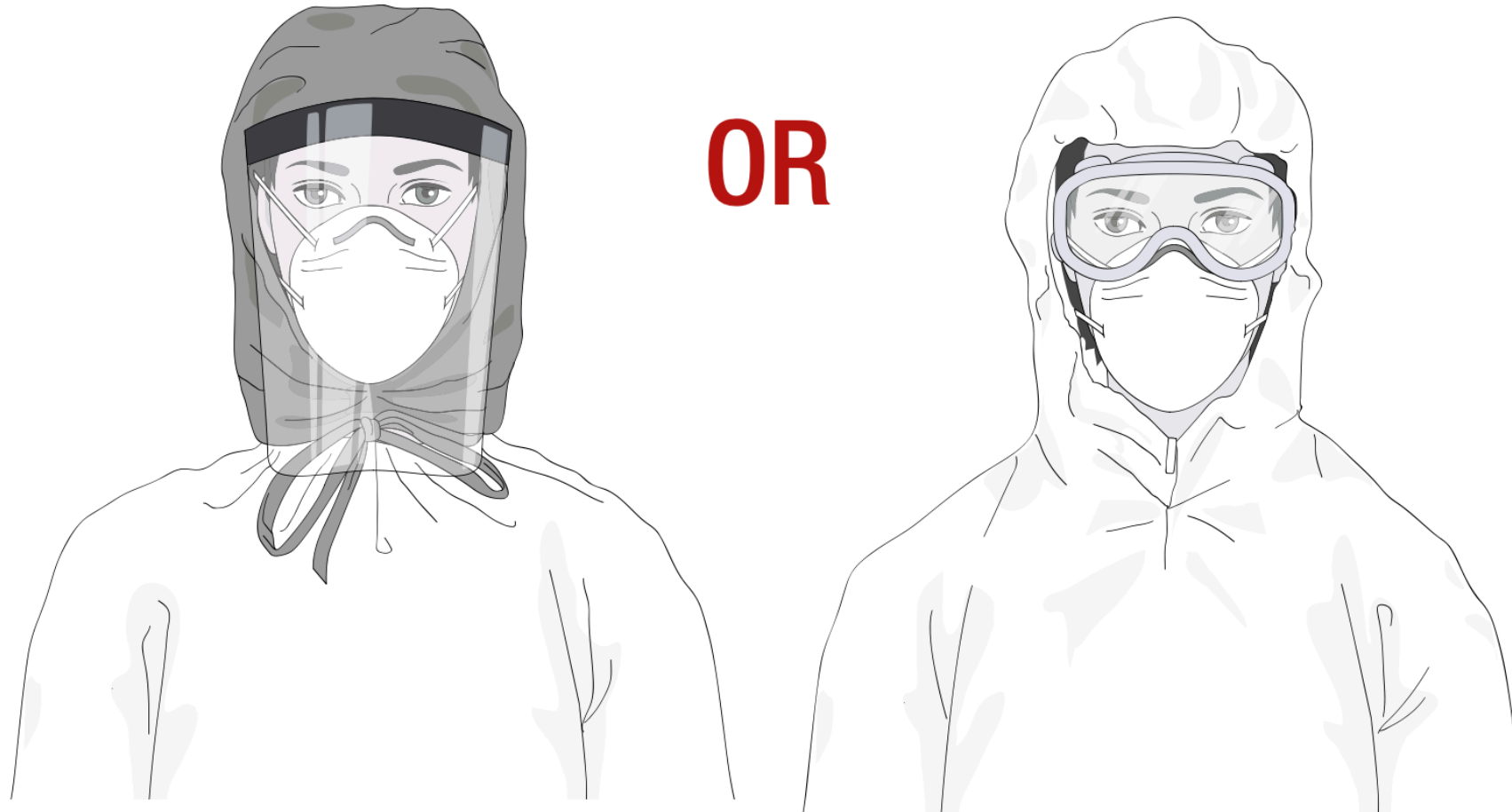
10 Put on face shield OR goggles.



OR



11 Put on **head and neck covering** surgical bonnet covering neck and sides of the head (preferable with face shield) **OR** hood.

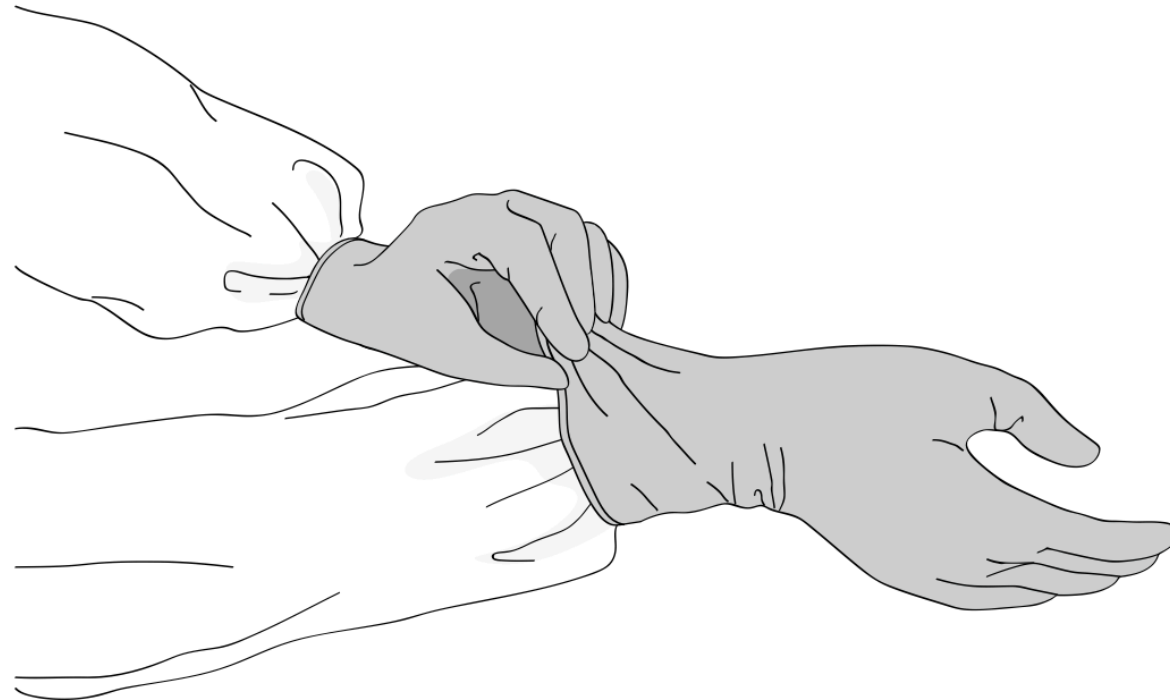


12 Put on disposable waterproof **apron**

(if not available, use
heavy duty, reusable
waterproof apron).



13 Put on second pair of (preferably long cuff)² gloves over the cuff.



² Do not use adhesive tape to attach the gloves.



While Wearing PPE

- **Avoid** touching or adjusting the PPE
- Keep gloved hands **away** from face
- Work in **pairs** whenever possible
- Have a detailed **plan** for your duties
- Try to ensure **cleanliness** and **orderliness** of the worksite



Taking Off Your PPE

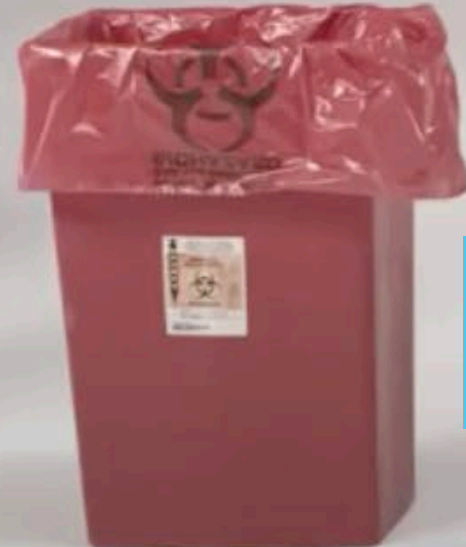
- Ensure **adequate** space
- **Equipment** includes:
 - Mirror
 - Hand hygiene facilities
 - Bowls containing chlorine solution for the decontamination of boots
 - Bins lined with infectious waste bags and a lid
 - Containers for the collection of reusable equipment to be decontaminated
 - Step-by-step instructions on the wall



DOFFING POSTER WITH INSTRUCTIONS



SETUP OF DOFFING AREA



**TRASH
RECEPTICLE**



ABHR



CHAIR



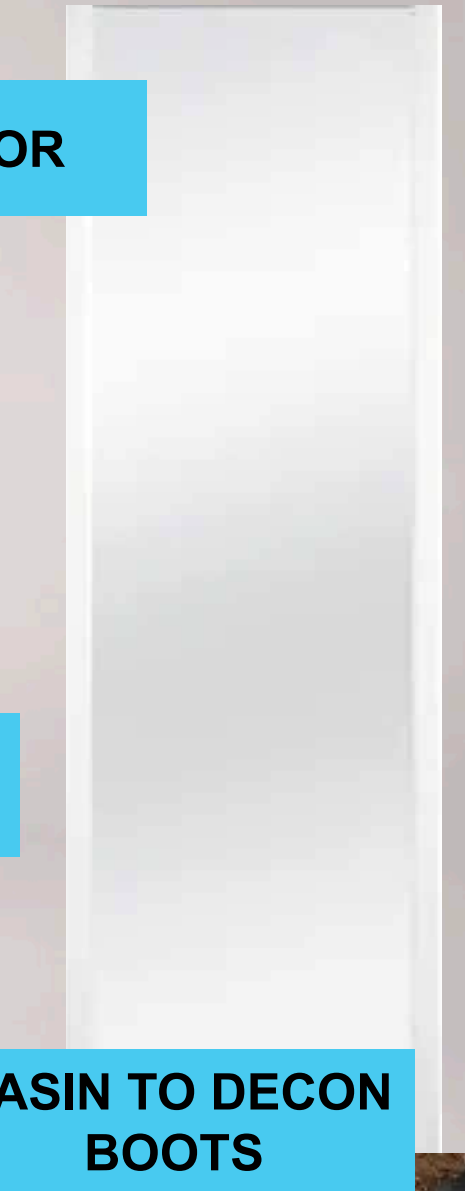
**BLEACH
WIPES**

TABLE

**NITRILE
GLOVES**



MIRROR



**BASIN TO DECON
BOOTS**

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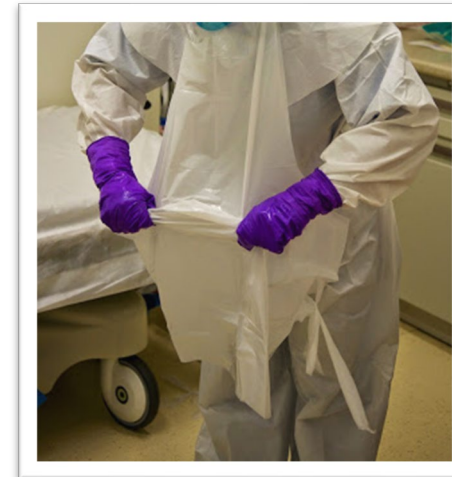
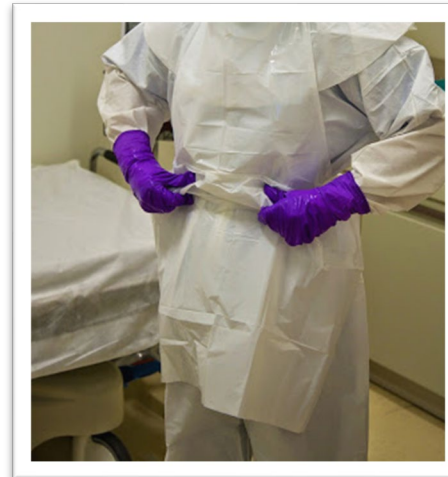
2 Perform **hand hygiene** on gloved hands.¹



¹While working in the patient care area, outer gloves should be changed between patients and prior to exiting (change after seeing the last patient)

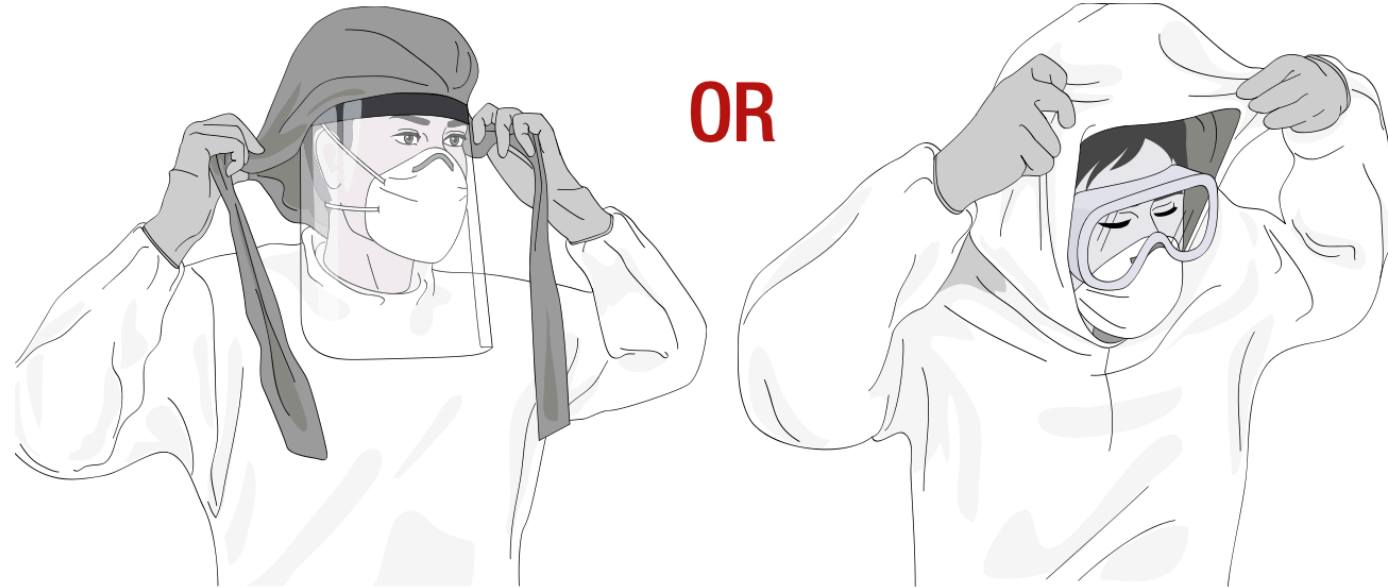
3 Remove **apron** leaning forward and taking care to avoid contaminating your hands.

When removing disposable apron, tear it off at the neck and roll it down without touching the front area. Then untie the back and roll the apron forward.



4 Perform **hand hygiene** on gloved hands.

5 Remove head and neck covering taking care to avoid contaminating your face by starting from the bottom of the hood in the back and rolling from back to front and from inside to outside, and dispose of it safely.



6 Perform hand hygiene on gloved hands.

7 Remove **coverall and outer pair of gloves:**

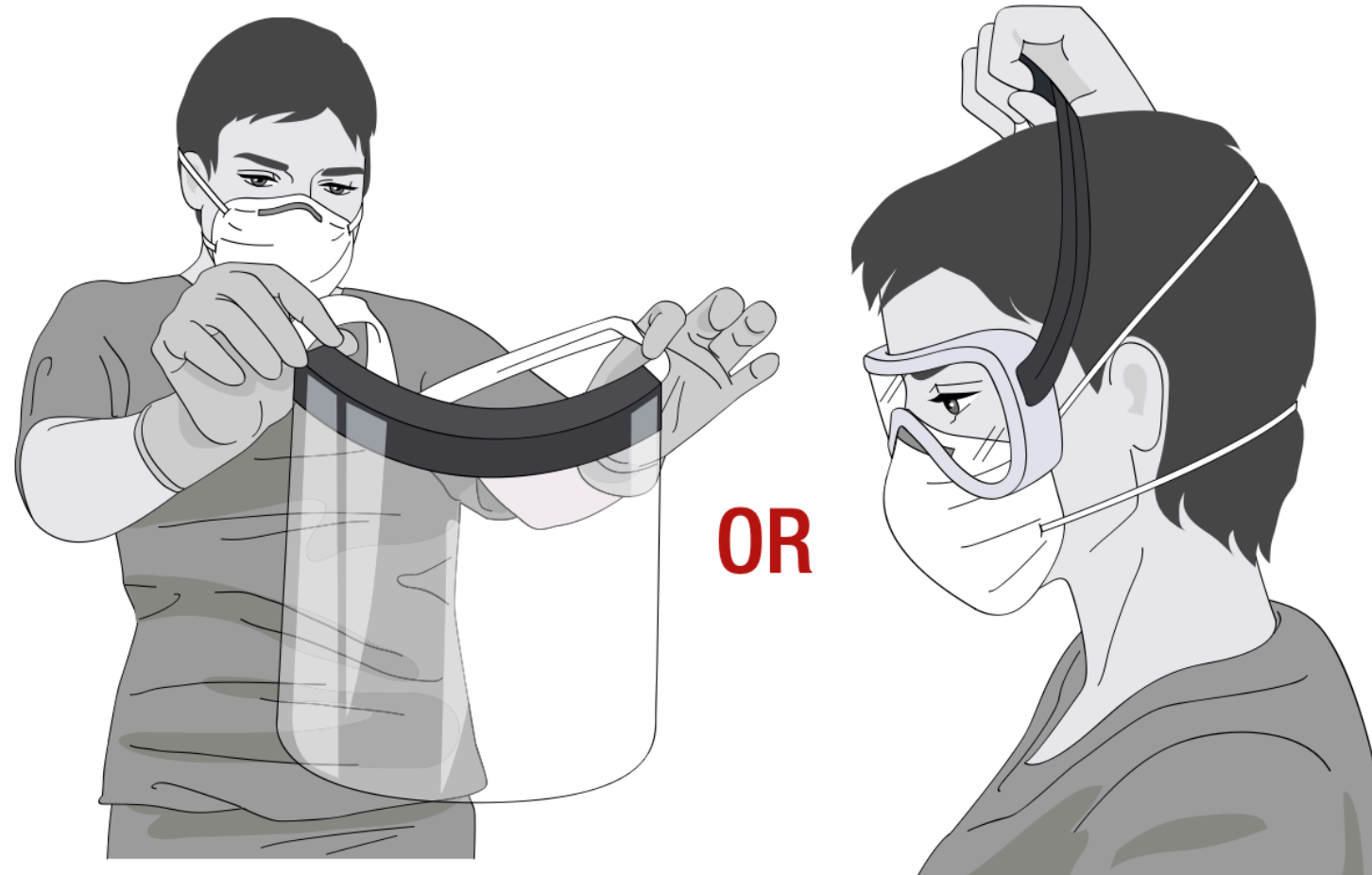
Ideally, in front of a mirror, tilt head back to reach zipper, unzip completely without touching any skin or scrubs, and start removing coverall from top to bottom. After freeing shoulders, remove the outer gloves² while pulling the arms out of the sleeves. With inner gloves roll the coverall, from the waist down and from the inside of the coverall, down to the top of the boots. Use one boot to pull off coverall from other boot and vice versa, then step away from the coverall and dispose of it safely.



8 Perform **hand hygiene** on gloved hands.

² This technique requires properly fitted gloves. When outer gloves are too tight or inner gloves are too loose and/or hands are sweaty, the outer gloves may need to be removed separately, after removing the apron.

9 Remove **eye protection** by pulling the string from behind the head and dispose of it safely.



10 Perform **hand hygiene** on gloved hands.

11 Remove the **mask** from behind the head by first untying the bottom string above the head and leaving it hanging in front; and then the top string next from behind head and dispose of it safely.



12 Perform **hand hygiene** on gloved hands.

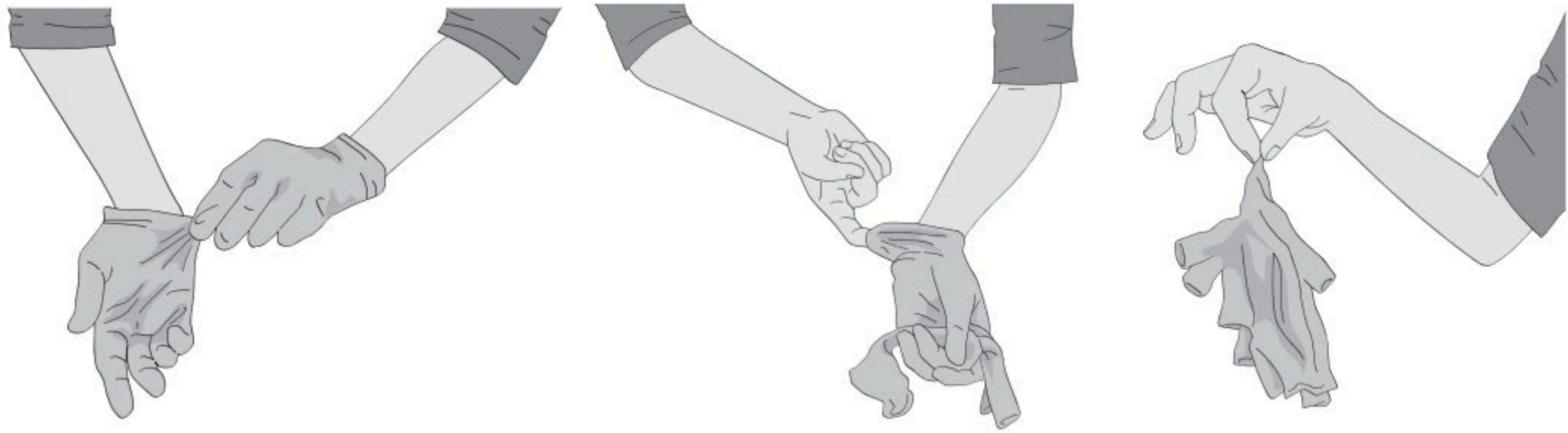
13 Remove rubber **boots** without touching them (or overshoes if wearing shoes). If the same boots are to be used outside of the high-risk zone, keep them on but clean and decontaminate appropriately before leaving the doffing area.³

14 Perform **hand hygiene** on gloved hands.

³ Appropriate decontamination of boots includes stepping into a footbath with 0.5% chlorine solution (and removing dirt with toilet brush if heavily soiled with mud and/or organic materials) and then wiping all sides with 0.5% chlorine solution. At least once a day boots should be disinfected by soaking in a 0.5% chlorine solution for 30 min, then rinsed and dried.



15 Remove **gloves** carefully with appropriate technique and dispose of them safely.



16 Perform **hand hygiene**.

Steps to take off personal protective equipment (PPE) including gown

1 Always remove PPE under the **guidance and supervision of a trained observer** (colleague). Ensure that infectious waste containers are available in the doffing area for safe disposal of PPE. Separate containers should be available for reusable items.

2 Perform **hand hygiene** on gloved hands.¹

3 Remove **apron** leaning forward and taking care to avoid contaminating your hands. When removing disposable apron, tear it off at the neck and roll it down without touching the front area. Then untie the back and roll the apron forward.

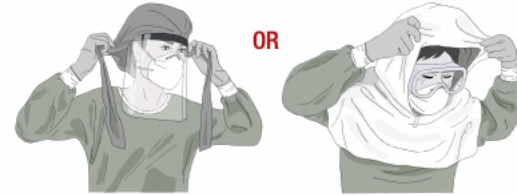


4 Perform **hand hygiene** on gloved hands.

5 Remove **outer pair of gloves** and dispose of them safely. Use the technique shown in Step 17

6 Perform **hand hygiene** on gloved hands.

7 Remove **head and neck covering** taking care to avoid contaminating your face by starting from the bottom of the hood in the back and rolling from back to front and from inside to outside, and dispose of it safely.



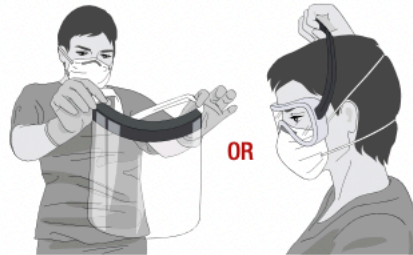
9 Remove the **gown** by untying the knot first, then pulling from back to front rolling it from inside to outside and dispose of it safely.



8 Perform **hand hygiene** on gloved hands.

10 Perform **hand hygiene** on gloved hands.

11 Remove **eye protection** by pulling the string from behind the head and dispose of it safely.



13 Remove the **mask** from behind the head by first untying the bottom string above the head and leaving it hanging in front; and then the top string next from behind head and dispose of it safely.



14 Perform **hand hygiene** on gloved hands.

12 Perform **hand hygiene** on gloved hands.

17 Remove **gloves** carefully with appropriate technique and dispose of them safely.

15 Remove **rubber boots** without touching them (or overshoes if wearing shoes). If the same boots are to be used outside of the high-risk zone, keep them on but clean and decontaminate appropriately before leaving the doffing area.²



16 Perform **hand hygiene** on gloved hands.

18 Perform **hand hygiene**.

¹ While working in the patient care area, outer gloves should be changed between patients and prior to exiting (change after seeing the last patient)
² Appropriate decontamination of boots includes stepping into a footbath with 0.5% chlorine solution (and removing dirt with toilet brush if heavily soiled with mud and/or organic materials) and then wiping all sides with 0.5% chlorine solution. At least once a day boots should be disinfected by soaking in a 0.5% chlorine solution for 30 min, then rinsed and dried.

Key Safe Work Practices

- Identify and promptly **isolate** the patient with Ebola in a single patient room with a closed door and a private bathroom or covered bedside commode
- **Limit room entry** to only those healthcare workers essential to the patient's care and restrict non-essential personnel and visitors from the patient care area
- **Monitor** the patient care area at all times, and, at a minimum, log entry and exit of all healthcare workers who enter the room of a patient with Ebola



Key Safe Work Practices (cont.)

- Be able to **safely** conduct routine patient care activities (e.g., obtaining vital signs, collecting and appropriately packaging laboratory specimens)
- Dedicate a **trained observer** to watch closely and provide coaching for each donning and each doffing procedure to ensure adherence to donning and doffing protocols
- Ensure that healthcare workers take **sufficient** time to don and doff PPE slowly and correctly without distraction



Key Safe Work Practices (cont.)

- Reinforce the need to **keep hands away from the face** during any patient care and to limit touching surfaces and body fluids.
- **Frequently** disinfect gloved hands by using an alcohol-based hand rub (ABHR), particularly after contact with body fluids.
- Prevent needlestick and sharps injuries by adhering to **correct sharps handling practices**
 - Avoid unnecessary procedures involving sharps
 - Use needleless IV systems whenever possible



Key Safe Work Practices (cont.)

- **Immediately** clean and disinfect any visibly contaminated PPE surfaces, equipment, or patient care area surfaces using a disinfectant wipe
- **Regularly** clean and disinfect surfaces in the patient care area, even in the absence of visible contamination
- **Only nurses or physicians** should clean and disinfect surfaces in the patient care areas to limit the number of additional healthcare workers who enter the room



Key Safe Work Practices (cont.)

- **Observe** healthcare workers in the patient room if possible (e.g., through a glass-wall, video link) to identify any unrecognized lapses or near misses in safe care
- Establish a **facility exposure management plan** that addresses decontamination and follow-up of healthcare workers in the case of any unprotected exposure
- **Training and follow-up** should be part of the healthcare worker training



Establish a Training Program (Example)

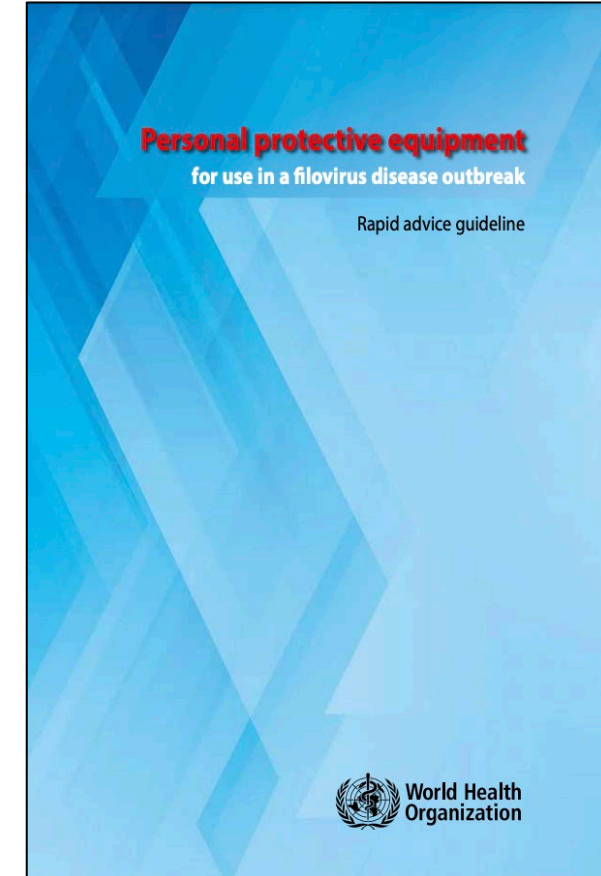


- Two levels:
 1. Trained Observer
 2. Safe Level of Proficiency
- The general time requirement for an individual to reach a safe level is:
 - Trained Observer: **10 sessions** (approximately 10 hours)
 - Safe Level of Proficiency: **4 sessions** (approximately 4 hours)



Questions on PPE – Best Resources

- Each clinic will have needs **unique** to their location based on their facilities, available supplies, etc.
- The WHO rapid advice guideline provides a wide depth of answers to common questions regarding equipment including **technical specifications**



Screening vs. Triage

- **Screening** - process of deciding if a patient has symptoms or not (ideally no touching of the patient)
 - **PPE required:** Eye protection (face shield or goggles), mask, single gloves
- **Triage** – process of deciding how to sort patients based on disease severity
 - **PPE required:** Full PPE for caring for Ebola patients

Screening Procedures

- All patients must enter the facility through **one common area** for screening
- **Clear signage** must direct all patients through this screening point
- Only **patients** should enter the triage area
 - Family members or companions should wait outside
- **Guards** should be assigned to watch the flow of people at the entrance of the screening area

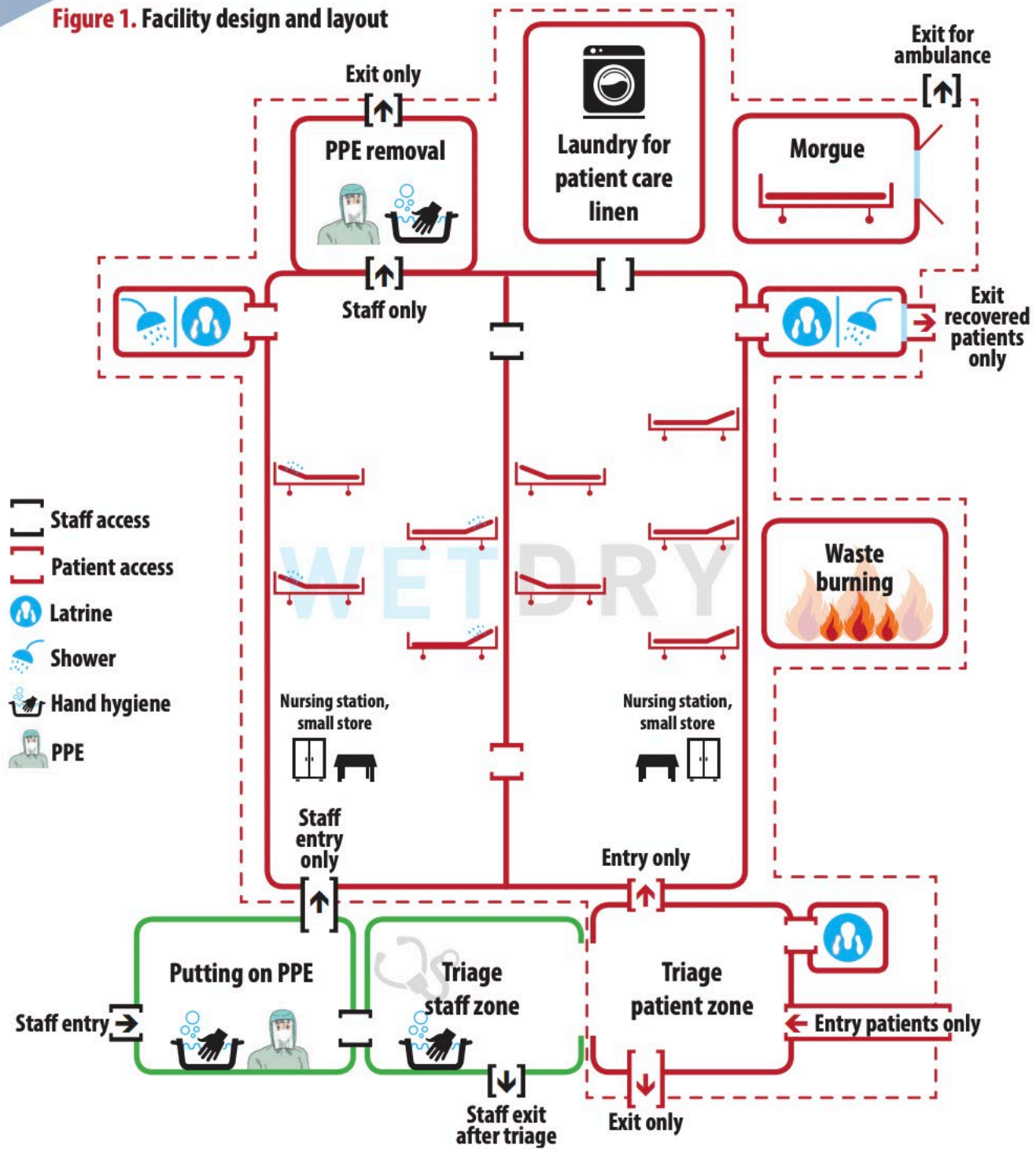


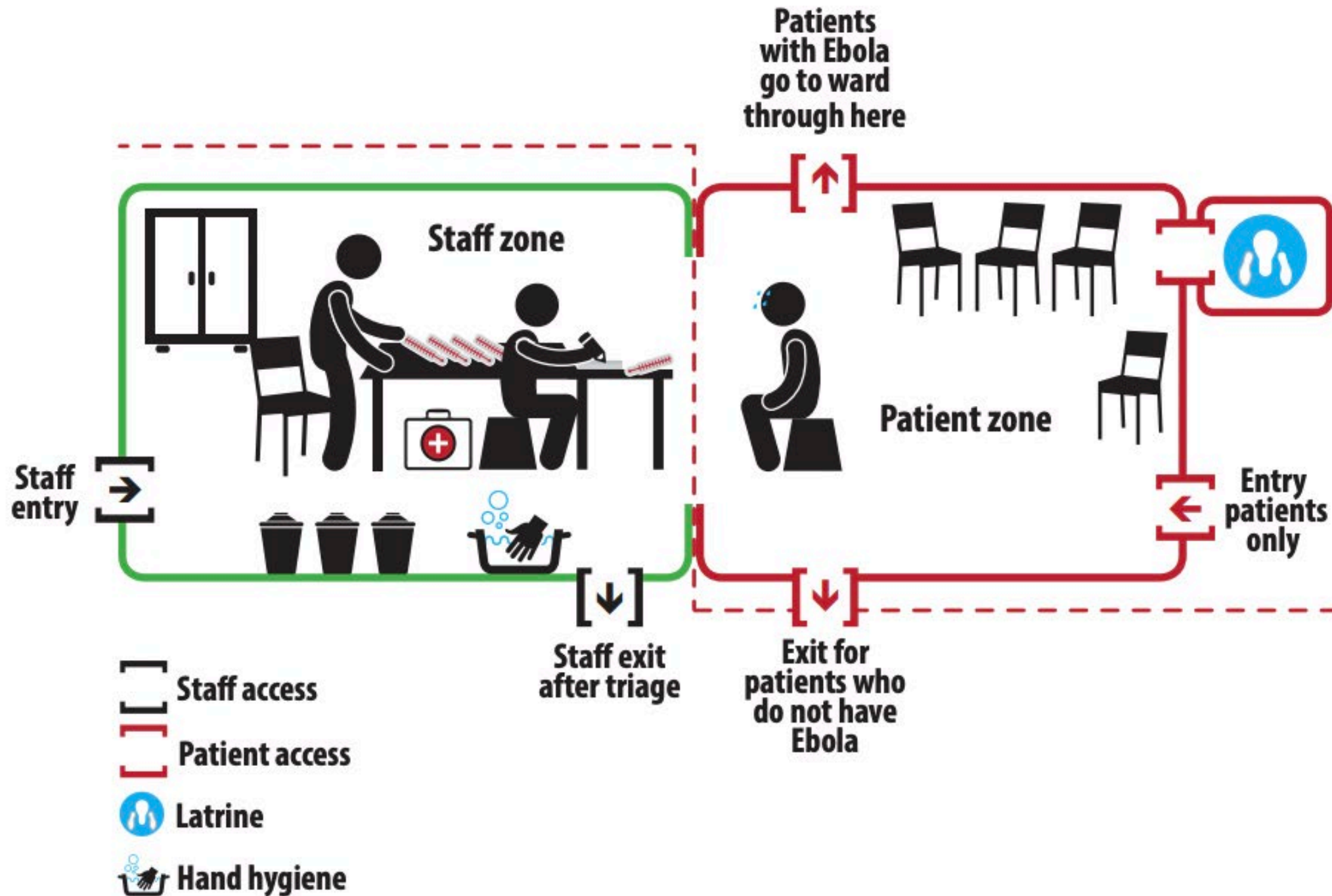
Screening Procedures (cont.)

Essential screening functions

- Protect healthcare workers (HCWs) from infection.
- Recognize and isolate suspected EVD cases to prevent further transmission.
- Alert public health authorities and healthcare workers when an Ebola case has occurred in their or an adjoining district.
- Set up isolation and safe referral of suspected cases to ETC.
- Manage contact tracing.
- Inform patient and family.

Figure 1. Facility design and layout





Screening Procedures (cont.)

Principles of the screening area

Source: Liberia ETU 2014



**Patient
entrance**

**Distance at
least 1 metre**

**Towards
wards**

- **Create physical barrier** between patient and health worker.
 - If barrier not possible, offset face-to-face position.
- **Maintain at least 1 metre between HCW and patient.**

Screening Procedures (cont.)

Screening: HCW activity (1/2)

- **Screening health workers use PPE** for interview (if within 1 metre of the patient)
 - Eye protection (face shield or goggles), mask, gown, single gloves (1 pair).
- **Take history**
 - Symptoms and duration
 - Contact history.



Screening Procedures (cont.)

Screening: HCW activity (2/2)

- **Collect temperature**
 - Use infrared thermometer.
 - Give patient digital thermometer after demonstration of use (do not reuse).
- **No touch policy**
 - Do not perform physical examination.
 - Maintain >1 metre distance.



Screening Procedures (cont.)

- The screening area should be open **only** during fixed hours
- Staff should be **instructed to call** before arriving to clinic (phone line should be operating **24/7**)
- The screening area should be divided into two zones:
 - One zone for **patients**
 - One zone for **staff** to conduct screening/medical evaluation



Screening Procedures (cont.)

- In the **staff zone**, there is a need for:
 - Infrared thermometers
 - Patient medical evaluation forms and pens
 - Hand hygiene facilities
 - Disposable gloves
 - 0.5% chlorine solution and disposable towels for table disinfection
 - Rubbish bin

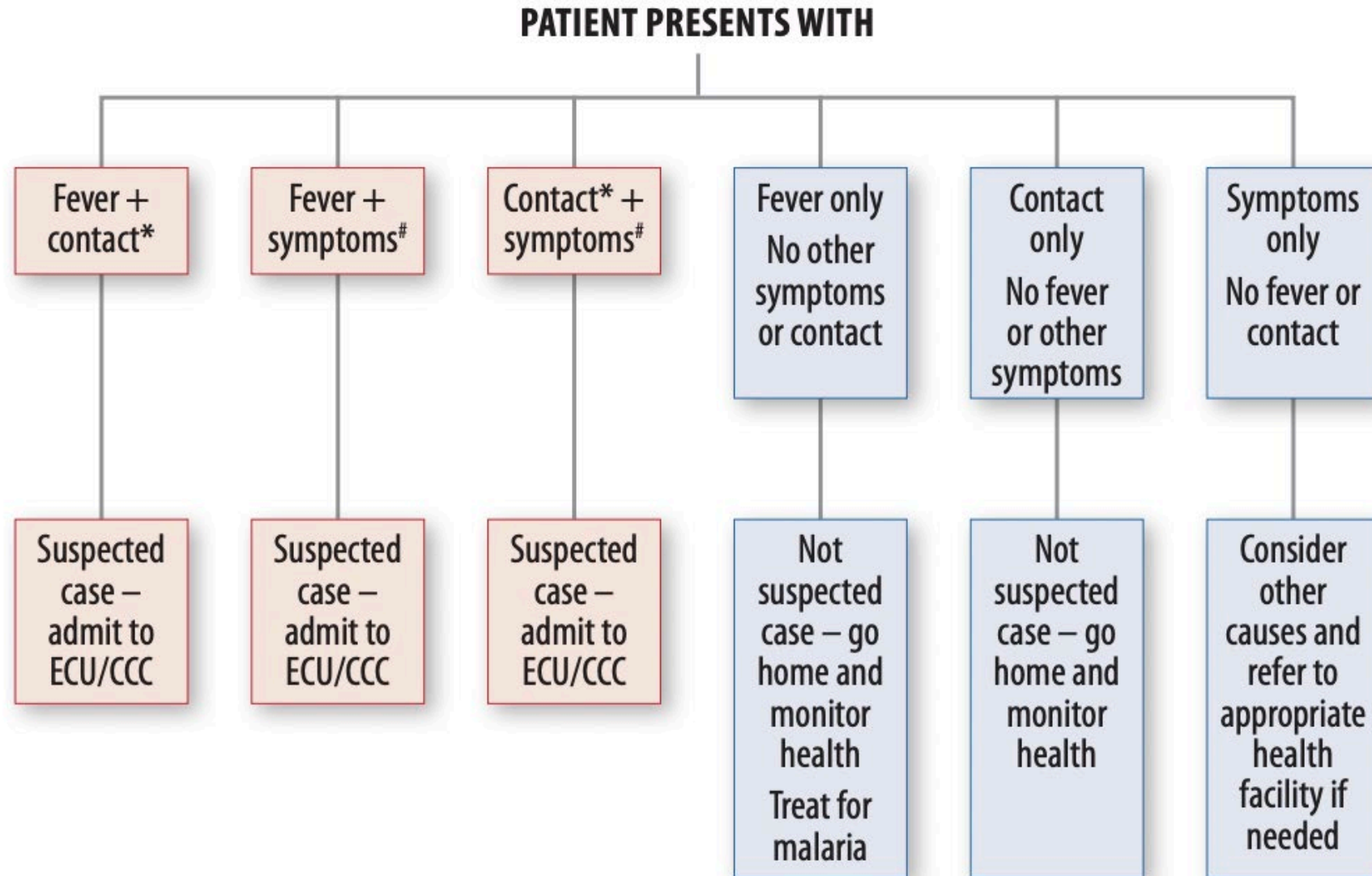


Screening Procedures (cont.)

- **Avoid** direct contact with patients as much as possible
- Low wooden fences (about 1m high) have been introduced in some screening areas to **separate** patients and staff
- In the patient zone, chairs should be at least **1 metre apart**



Screening Procedures (cont.)



Simulation Exercise

Situation: A 34M presents to your clinic without calling. They are waiting outside with c/o of fever and abdominal pain. They have come with their wife and two children. Patient states a cousin of his recently was diagnosed with Ebola.

- Run through this exercise as a **drill** from patient arrival to patient exit, including screening/triage, donning and doffing of PPE, communication with appropriate stakeholders, etc.
- **All staff** should have a chance to participate, and the simulation can be repeated with different staff in different roles

Simulation Exercise – Helpful Hints

- This is a **learning** exercise – be sure to introduce drill and explain reason for implementation
- Have someone with a **clipboard** and **checklist** to take notes
- **Debrief** following the exercise to discuss what went well and what could be improved
- **Repeat drill** regularly and anytime changes to patient flow, equipment, process are made



Next Steps

- **Review** resources
- **Complete** WHO online courses
- DHMOSH Public Health will reach out to **individual** missions / duty stations to provide support
 - Clinic setup
 - PPE training program
 - Review of preparedness plans
 - Answer questions
 - Provide additional resources
 - Provide 1:1 support

The screenshot shows the WHO ePROTECT Ebola (EN) course page on the OpenWHO platform. The page features a blue header with the WHO logo and navigation links: Home, About, Channels, Courses, Serving countries, Webinars, Find out more, English, and Log in. The main content area is titled "ePROTECT Ebola (EN)" with a link to "OpenWHO". Below the title is a navigation bar with icons for Learnings, Discussions, Progress, Certificates, Collab Space, Course Details (which is highlighted), Documents, and Announcements. The main content area includes a photograph of a group of people in a training session, with a man in a blue shirt and cap holding a document. To the right of the photo is a social sharing section with buttons for Facebook Share, Tweet, LinkedIn Share, and Mail. Below the sharing buttons is a text block describing the course: "ePROTECT is an occupational health and safety briefing that covers the basic information you need to protect yourself when deploying to countries with Ebola disease. Those of you who will carry out specialized tasks, such as working in direct contact with sick people, will need more advanced-level training and coaching." A note at the bottom states: "**Please note: These materials were developed in response to the 2018 Ebola outbreak in the Equateur Province of the Democratic Republic of the Congo and are currently under revision. For the latest updates on Ebola disease, refer to the WHO website: <https://www.who.int/health-topics/ebola>".

Resources

DHMOSH Ebola Resource Page	https://hr.un.org/page/ebola
UNMD Ebola Risk Mitigation Plan (July 2019)	https://hr.un.org/sites/hr.un.org/files/Ebola%20Checklist_DHMOSH HPH_2019-05_FINAL_Eng_2.pdf
Ebola Preparedness And Response: A Checklist for UN Health Facilities (May 2019)	https://hr.un.org/sites/hr.un.org/files/Ebola%20Checklist_DHMOSH HPH_2019-05_FINAL_Eng_2.pdf
PPE Calculator	https://www.cdc.gov/vhf/ebola/healthcare-us/ppe/calculator.html
Ebola Virus Disease: Standard Precautions and How to Use EVD PPE Calculator [Video]	https://www.youtube.com/watch?v=EyJqhhLwgX4
Personal protective equipment for use in a filovirus disease outbreak (November 2016)	https://www.who.int/publications/i/item/9789241549721
Optimized supportive care for Ebola virus disease: clinical management standard operating procedures (2019)	https://apps.who.int/iris/handle/10665/325000
Implementation and management of contact tracing for Ebola virus disease (July 2015)	https://www.who.int/publications/i/item/WHO-EVD-Guidance- Contact-15.1
Manual for the care and management of patients in Ebola Care Units/Community Care Centres (Jan 2015)	https://apps.who.int/iris/bitstream/handle/10665/149781/WHO_E VD_Manual_ECU_15.1_eng.pdf

WHO Online Courses

ePROTECT Ebola (EN)	https://openwho.org/courses/e-protect
Ebola: Clinical management of Ebola virus disease	https://openwho.org/courses/ebola-clinical-management
Ebola: GO 2.0	https://openwho.org/courses/GO-en