Viral Haemorrhagic Fever (VHF) - The correct order for donning and the safe order for removal and disposal of Personal Protective Equipment (PPE)

An educational resource for healthcare workers in NHS Scotland

October 2014
Aim of resource

The resource aims to update knowledge amongst healthcare workers when dealing with patients where there is a low possibility of Viral Haemorrhagic Fever (VHF) and for patients being clinically managed as a high possibility/confirmed case of VHF in relation to:

• The correct order for donning Personal Protective Equipment (PPE)
• The safe order for removal and disposal of PPE to avoid cross contamination to the healthcare worker and the environment
Learning outcomes

On completion of this resource healthcare workers (HCW) will be able to:

• Identify sources of (potential) infection
• Identify the PPE used in their own NHS Board area
• Source key guidance and policy documents relating to VHF
• Understand and be able to undertake the correct order for donning and the safe order for removal and disposal of PPE when dealing with patients at low possibility of VHF
• Understand and be able to undertake the correct order for donning and the safe order for removal and disposal of PPE when clinically managing patients where there is a high possibility or confirmed case of VHF
Key documents

• (Ebola) Viral Haemorrhagic Fever (VHF) Infection Prevention and control Precautions Summary Table based on the Dept. of Health/HSE, 2014 VHF Guidance

• Management of Hazard Group 4 viral haemorrhagic fevers and similar human infectious diseases of high consequence – Advisory Committee on Dangerous Pathogens, Dept. of Health / HSE, 2014

• National Infection Prevention and Control Manual For NHSScotland (with particular reference to Appendix 6)
VHF patient risk assessment options for PPE

It should be noted that:

• The Advisory Committee on Dangerous Pathogens (ACDP) management guidance recommends three different patient risk assessment options for PPE (low possibility; high possibility and confirmed VHF case)

• For the sake of clarity and to safeguard the healthcare worker this resource categorises patients in relation to PPE into two groups: those assessed as low possibility and those patients risk assessed and being clinically managed as a high possibility or confirmed case
Sources of infection

Sources of (potential) infection include:

• Blood and other body fluids secretions or excretions
• Non-intact skin or mucous membranes
• Equipment or items in the care environment that could have become contaminated
Local arrangements

Local arrangements

- The PPE used in NHS Boards may vary from those shown in this learning resource
- Healthcare workers should already be familiar with PPE available in their own board area
- Contact the board infection control team for further assistance

Respiratory Protective Equipment

- Must be worn when carrying out any aerosol generating procedures (AGPs) on patients with a known or suspected infectious agent spread wholly or partly by the airborne or droplet route

Remember, it is important to use safe work practices to protect yourself and limit the spread of infection
Scenario 1

The correct order for donning and the safe order for removal and disposal of Personal Protective Equipment (PPE)

Patient has been risk assessed as a low possibility for VHF
The correct order for donning and the safe order for removal and disposal of PPE

Patient has been risk assessed as a low possibility for VHF

- When there is a low possibility of VHF, PPE is used to prevent exposure to blood and/or body fluids and to prevent direct contact with the patient as per Standard Infection Control Precautions (SICPs)
The PPE required for caring for a patient with a low possibility of VHF

- A disposable plastic apron and non sterile, single use nitrile/latex, or neoprene gloves
- If splash or spray risk is possible/anticipated from blood or body fluids then one of the following options should be worn:
  - A full face visor; or
  - A half face visor with an attached fluid repellent surgical face mask; or
  - Goggles worn with a fluid repellent surgical face mask
- HCWs should already be familiar with the type, availability and location of PPE in their area
Patient has been risk assessed as low possibility of VHF

Donning the PPE
Before donning PPE

HCW should:

• Be wearing role appropriate uniform and footwear as per uniform policy
• Perform hand hygiene
• Cover all cuts or abrasions with a waterproof dressing
Step 1: PPE - To protect body area

- The HCW’s uniform should be covered with a disposable plastic apron
- The HCW pulls the apron over their head and ties at the back of their waist
- The disposable apron requires to be changed between patients and following completion of a procedure or task on the same patient
Step 2: PPE - To protect face, including mucous membranes of the eyes, mouth and nose

- If splash risk/contamination to the face (including mucous membranes of the eyes, mouth and nose) is not anticipated then the need for PPE to protect the face is not necessary.

- If there is a possible splash risk from blood or body fluids there are 3 options for PPE to prevent contamination of the face:
  
  a) A full face visor; or
  
  b) A half face visor with an attached fluid repellent surgical face mask; or
  
  c) Goggles with a fluid repellent surgical face mask.
Donning full face visor or half face visor with surgical face mask attached

• The disposable full face visor is placed in front of the face and secures the headband around the top of the head ensuring that the visor sits below the chin; or

• The half face visor with the surgical face mask attached is secured by tying at the back of the neck and head
Donning surgical mask and goggles

• If goggles with a fluid repellent surgical face mask are worn, the fluid repellent surgical face mask should be donned first:

Surgical mask
• Secure the ties at the back of the head and neck
• Fit the flexible nose band to the contour of the nose bridge to ensure the mask fits snug to face and below chin
• The surgical face mask must fully cover the mouth and nose and be removed or changed:
  - At the end of a procedure/task

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Donning surgical mask and goggles (cont.)

- If the integrity of the mask is breached e.g. from moisture build-up after extended use or from gross contamination with blood or body fluids

Goggles

• The goggles should be placed over the head, covering the eyes and adjusted to fit securely and comfortably with the surgical face mask
Step 3: PPE - To protect hands

- To protect hands non sterile single use latex, nitrile or neoprene gloves should be worn
- Gloves should be selected according to hand size and should extend to cover the wrist
- Gloves must be:
  - Worn when exposure to blood and/or other body fluids is anticipated or likely
  - Changed immediately after each patient and/or following completion of a procedure or task
Integrity of equipment

• If at any stage during the donning of PPE a breach is noticed in the integrity of the equipment then that item of PPE should be disposed of immediately and new PPE donned

The HCW is now ready to care for those patients risk assessed as a low possibility of VHF.
Safe order for the removal and disposal of PPE

Patient has been risk assessed as low possibility of VHF
Safe order for the removal and disposal of PPE

Patient has been risk assessed as low possibility of VHF

- PPE should be safely removed and disposed of before leaving the patient’s room
- As PPE may be contaminated with blood or body fluids it is important that care is taken by the HCWs not to contaminate themselves or the surrounding area during PPE removal
Step 1: PPE Removal and disposal of gloves

The outside of gloves are contaminated. To safely remove the gloves the HCW:

• Pinches the outside of the glove with the opposite gloved hand
• Peels off
• Holds the removed glove in the gloved hand
• Slides the fingers of the ungloved hand under the remaining glove at the wrist
• Peels the second glove over the first glove
• Discards directly into the designated waste receptacle
Step 2: PPE Removal of apron

- It should always be assumed that the apron front is contaminated
- The HCW break the ties at the waist and neck by pulling the apron away from neck and shoulders touching the inside only
- Folds or rolls the apron inside out into a bundle
- Discard directly into designated waste receptacle
Step 3: PPE Removal of face protection - full face visor

- The outside of the face protection should be considered contaminated.
- Before face protection is removed hand hygiene using an alcohol based hand rub (ABHR) should be performed.
- When a **full face visor** is removed the following steps should be taken:
  - The HCW handles the visor by the headband or sides only and lifts the visor forward from the face.
  - The HCW discards the visor directly into the designated waste receptacle.
Step 3: Removal of face protection - half face visor with an attached fluid repellent surgical face mask

• The outside of the face protection should be considered contaminated
• Before face protection is removed hand hygiene using an alcohol based hand rub (ABHR) should be performed

When a half face visor with an attached fluid repellent surgical face mask is removed the following steps should be taken:

• The HCW unfastens the ties: first the bottom (at the back of the neck) and then the top (at the back of the head)
• Pulls the visor and mask away from the face without touching the front of the mask
• Discards directly into the designated waste receptacle
Step 3: Removal of face protection - goggles with a fluid repellent surgical face mask

- The outside of the face protection should be considered contaminated
- Before face protection is removed hand hygiene using an alcohol based hand rub (ABHR) should be performed

If goggles with a fluid repellent surgical face mask are worn then the following steps are undertaken:

- Goggles should be removed first:
  - The HCW handles the goggles by the headband or sides only and lifts the goggles forward from the face
  - Discards directly into the designated waste receptacle

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Step 3: Removal of face protection - goggles with a fluid repellent surgical face mask (cont.)

- Removal of surgical mask:
  - Unfastens the ties: first the bottom (at the back of the neck) and then the top (at the back of the head)
  - Pulls the face mask away from the face without touching the front of the mask
  - Discards directly into the designated waste receptacle

If reusable PPE items, e.g. non-disposable goggles or face visors are used they must have a decontamination schedule with responsibility assigned
After PPE removal - hand hygiene

- Perform hand hygiene immediately after PPE removal and before leaving the patient’s room
Scenario 2

The correct order for donning and the safe order for removal and disposal of Personal Protective Equipment (PPE)

Patient has been risk assessed and is being clinically managed as high possibility of VHF or is a confirmed VHF case
The correct order for donning and the safe order for removal and disposal of PPE

Patient has been risk assessed and is being clinically managed as high possibility of VHF or is a confirmed VHF case

- When there is a high possibility or confirmed case of VHF PPE must establish a full barrier against contact with contaminated surfaces, splash, spray, bulk fluids and aerosol particles
PPE

Patient has been risk assessed and is being clinically managed as high possibility of VHF or is a confirmed VHF case

- PPE must cover all exposed skin with sufficient integrity to prevent any ingress or seepage of liquids or airborne particles
- To help ensure this the HCW should have a designated ‘buddy’ to assist with the correct donning, safe removal and disposal of PPE
PPE required when clinically managing a patient with a high possibility or confirmed case of VHF

This includes:

- A disposable fluid repellent coverall (with hood)
- Wellington style boots and disposable over boots
- A tight fitting FFP3 respirator, full face visor, surgical gloves (long cuff)
- A high grade disposable plastic apron that covers below knee level and fully covers the front of the coverall
PPE when clinically managing a patient with a high possibility or confirmed case of VHF

- The HCW must be familiar with the required PPE, and has had the opportunity to ensure the PPE is of a good fit before it is required to be worn for real.

- The HCW should don all required PPE prior to entering the patient room and it is suggested that before donning the PPE the HCW ensures they are adequately hydrated.
Donning PPE

• When donning the PPE it is essential to work as a team; the HCW is assisted into their PPE by a buddy
• The HCW should be wearing hospital scrubs
• Remember HCWs should don their PPE in a clean area

Before the HCW dons any PPE they are required to:
• Perform hand hygiene
• Ensure they cover all cuts or abrasions with a waterproof dressing
Donning the PPE

Patient has been risk assessed and is being clinically managed as a high possibility of VHF or confirmed VHF case

- The HCW steps into the fluid repellent coverall and pulls up only the lower portion first
- The HCW puts on the wellington boots, ensures the scrubs are tucked inside the boots, and adjusts the legs of the coverall over the wellington boots
- The HCW pulls the disposable over boots over the wellington boots and tucks the ties into the overboots behind the knee
- The HCW now zips the coverall up to the waist
PPE to protect the face including mucous membranes of the eyes, mouth and nose

- The purpose of this PPE is to protect the face including mucous membranes of the eyes, mouth and nose
- FFP3 Respirators are available in different sizes and designs and must be fitted correctly to provide the best protection to the HCW
- Manufacturer’s instructions should be followed by the HCWs

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PPE to protect the face including mucous membranes of the eyes, mouth and nose (cont.)

All tight fitting Respiratory Protective Equipment i.e. FFP3 respirators must:

- Ensure an adequate seal/fit according to the manufacturer’s guidance
- All HCWs that may be required to wear a respirator must have previously passed a Fit test
- This resource does not cover detailed information on how to fit test a respirator further information can be found on the NHS England website
Putting on a tight fitting FFP3 respirator

• The HCW inspects the respirator for damage prior to use
• The HCW separates the top and bottom panels to form a cup shape
• Bends slightly at the centre of the noseclip to ensure both panels are fully unfolded
• The HCW cups the respirator in one hand with open side towards face

(continued on slide 39)
Putting on a tight fitting FFP3 respirator (cont.)

Taking both straps in the other hand, the HCW:

- Holds the respirator under chin, with nosepiece up, and pulls the straps overhead
- Positioning the upper strap across the crown of the head and the lower strap below the ears. Straps must not be twisted.
- The HCW adjusts the top and bottom panels for a comfortable fit, ensuring panels and tab are not folded in
- Using both hands, the HCW moulds the noseclip to the shape of the nose to ensure a close fit and good seal
Fit checking FFP3 respirator

The HCW then fit checks the seal of the FFP3 respirator by performing a fit check. The HCW:

- Covers the front of the respirator with both hands, being careful not to disturb the position of the respirator on the face
- For an unvalved product – the HCW exhales sharply; for a valved product – the HCW inhales sharply
- If air is felt on the hands from around the nose, readjust the nose piece to eliminate the leakage. The HCW repeats the fit check

(continued on slide 41)
Fit checking FFP3 respirator (cont.)

- If air is felt on the hands from around the edges of the respirator, the HCW readjusts the straps back along the sides of the head to eliminate leakage. The HCW repeats the above fit check.

- A successful fit check is when no air is leaking from the edges of the respirator. The HCW must always perform a fit check before entering the patient room.

- If a successful fit check cannot be achieved, the HCW must remove and refit the respirator.

- If a successful fit check cannot be achieved the HCW must not enter the patient’s room.
Donning PPE

The HCW:

- Puts on the first set of surgical gloves
- Pulls on the remainder of the disposable coverall
- Puts arms into the coverall ensuring the thumb restraints are utilised
- The buddy will assist the HCW in fully covering the head and zipping up the coverall to the neck and applying the storm flap
Donning PPE (cont.)

• The HCW puts on the second pair of surgical disposable gloves, ensuring the cuffs of the coverall are covered.

• The buddy then assists in carefully placing the disposable high grade apron over the head of the HCW and ties this at the back. The disposable apron serves to minimise contamination of the coverall zip.

• The disposable full face visor is placed in front of the face and secures the headband around the top of the head.
Before entering patient’s room

- The buddy checks the entire PPE kit is fitted properly and adjusted as required ensuring the HCW is now ready to enter the patient’s room.
- The buddy should give clear instruction that the HCW must not touch their face or any part of their body while wearing this PPE.
- If the integrity of the PPE is breached in any way or the HCW does not feel comfortable then they should remove themselves from the patient’s room immediately.
Safe order for removal and disposal of contaminated PPE

Patient has been risk assessed and is being clinically managed as a high possibility of VHF or is a confirmed VHF case
Role of buddy- required PPE and preparation

The PPE that the buddy must wear when helping the HCW remove their contaminated PPE comprises of:

- Hospital scrubs
- Disposable overboots
- A fluid repellent disposable gown
- A disposable full face visor or half face visor with an attached fluid repellent surgical face mask and surgical gloves

The buddy has prepared a large open plastic sheet on the floor onto which the contaminated PPE will be placed.
Step 1: Removal of PPE

- The removal of PPE should be led by the buddy and should be done slowly, methodically and without interruptions.
- If the HCWs gloves and apron are heavily contaminated with blood or body fluids, then the HCW should remove these in the patient's room before entering the designated dirty area.
- The HCW leaves the patient area and steps into the dirty area being careful not to contaminate surrounding areas including door handles.
PPE removal dirty area

- The buddy carries out a 360 degree check of the HCW’s PPE for any blood and body fluid contamination
- This check should include the soles of the over boots. If there is gross contamination this should be removed using chlorine based disinfection wipes
- The buddy applies ABHR onto the HCW’s gloved hands
- The HCW removes the disposable plastic apron by bursting the neckties at shoulder level and at the waist
- The HCW pulls the apron away from neck and shoulders touching the inside only
- Folding or rolling the apron inside out into a bundle
- The HCW places the apron carefully onto the plastic sheet
PPE removal dirty area (cont.)

The HCW removes their outer pair of gloves by:

- Pinching the outside of the glove with the opposite gloved hand
- Peeling off
- Holding the removed glove in the gloved hand
- Pinching the remaining glove at the wrist
- Peeling the second glove over the first glove
- Discard carefully onto the plastic sheet
- The buddy applies ABHR to the remaining pair of gloves worn by the HCW
PPE removal dirty area (cont.)

- The HCW then removes the full face visor
- The HCW handles the visor by the headband or sides only and lifts the visor forward from the face
- The HCW places the visor onto the plastic sheet or into a designated receptacle for decontamination
- The buddy applies ABHR to the HCW’s gloved hands
- If reusable PPE items, e.g. non-disposable face visors are used they must have a decontamination schedule with responsibility assigned
PPE removal dirty area (cont.)

• The buddy then loosens the storm tape of the HCW’s coverall and unzips the coverall to waist

• The buddy applies ABHR to their gloved hands

• The HCW carefully takes down the hood of the coverall and the buddy then removes the coverall by rolling the suit down over shoulders and down the body turning the coverall inside out as it comes down

• The buddy helps the HCW to step out of the coverall and over boots, keeping wellingtons on and standing on the inside out coverall

• The buddy applies ABHR to the gloved hands of the HCW

• The buddy applies ABHR to their own gloved hands
PPE removal dirty area (cont.)

- The HCW removes the remaining pair of surgical gloves and places them onto the plastic sheet.
- Before the respirator is removed the buddy applies ABHR to the HCWs hands.
- The HCW removes FFP3 respirator by pulling top and bottom elastics together, up and away from the face without touching the front of the respirator and discards directly onto the plastic sheet.
- The HCW now steps off the plastic sheet (dirty area) and moves into the clean area.
- The buddy then ties up the disposable plastic sheet containing the contaminated PPE and places directly into the designated waste receptacle.
Step 2: Removal of PPE in clean zone

- The HCW on entering the clean area immediately performs hand hygiene
- The HCW can now remove their wellington boots
- The HCW washes their hands with soap and water
Safe order of removal and disposal of PPE by buddy

- At each stage of the PPE removal the buddy should apply ABHR to the hands
- The buddy removes their PPE in the following order:
  1. The removal of the over boots
  2. The disposable gown and gloves together
  3. The facial and respiratory protection
- All PPE items are placed directly into the designated waste receptacle
- The buddy then performs hand hygiene and moves to the clean area