Queensland Health

Infection prevention and control for the management of Viral Haemorrhagic Fevers

Version 1.2 | February 2024

Queensland Government

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An electronic version of this document is available at https://www.health.qld.gov.au/clinical-practice/guidelines-procedures/diseases-infection/diseases/vhf

Contents

1 Purpose

This Guideline provides evidence-based guidance for best practice infection prevention management of patients with suspected or confirmed Viral Haemorrhagic Fevers (VHF, herein referred to as patient/s with VHF) implicated in human-to-human transmission, including but not limited to:

- Ebola virus disease (EVD)
- Marburg virus disease
- Lassa fever
- Lujo Haemorrhagic Fever
- Crimean-Congo Haemorrhagic Fever.

Most of the clinical and research evidence and public health advice on VHF is based on EVD, due to the significant current and historical outbreaks associated with this disease. The above-mentioned VHF are being addressed collectively in this Guideline due to close similarities in transmission, clinical presentation and infection prevention and control requirements. Where available, evidence on all VHF has been used.

2 Scope

This Guideline is applicable to all Queensland Health healthcare workers (HCW) (permanent, temporary and casual) and all organisations and individuals acting as its agents (including Visiting Medical Officers and other partners, contractors, consultants and volunteers). In this context, HCW includes any employee required to enter the patient care zone, e.g. an electrician required to enter the patient care zone to repair a hazardous fitting. This Guideline is also applicable to HCW caring for a patient with VHF in private hospitals, and HCW of private pathology services, Forensic and Scientific Services (FSS).

This Guideline provides information regarding minimum recommended practices. Compliance with this guideline is not mandatory, but sound reasoning must exist for reducing recommended practices within this Guideline.

3 Supporting documents

This Guideline summarises advice from state and national guidance and must be read in conjunction with:

- Queensland Ebola Virus Disease Management Plan
- Queensland Health Guideline for Public Health Units – Viral Haemorrhagic Fevers (Quarantinable)
- Viral Haemorrhagic Fever (Not Elsewhere Classified) – Australian National Notifiable Disease Case Definition
- Ebola Virus Disease – CDNA National Guidelines for Public Health Units

- PHLN National High Security Quarantine Laboratory Guideline for Management of Quarantinable Viral Haemorrhagic Fevers
- Australian Guidelines for the Prevention and Control of Infection in Healthcare (2019)
- Guideline: Clinical and related waste

4 Key Principles

There are 2 quick reference guides available:

- Infection prevention and control recommendations in brief

  and
- Body fluid exposures, PPE breaches and spills

Transmission-based precautions including personal protective equipment (PPE) for enhanced contact and airborne precautions apply for the care of patients with VHF.

All hospitals must be prepared to manage unexpected presentations of suspected VHF cases.[1] Hospitals closest to an international airport or seaport have the highest likelihood for VHF case presentations. However, a presentation may occur in any Queensland hospital, considering the efficiency of international travel, particularly for fly-in fly-out work.

All hospitals with negative pressure isolation rooms must be prepared to collect the necessary pathology specimens to confirm diagnosis, and manage the patients using the recommendations in this guideline while the results are pending.

All HCW involved in the care of patients with VHF must receive appropriate, comprehensive training and have demonstrated competence in performing all VHF-related infection prevention and control practices and procedures, in particular the safe use of, and donning/doffing of PPE.

Contact with a patient with VHF must be limited to essential HCW only. A log of all HCW having contact with the patient with VHF must be maintained for contact tracing purposes.

The overall safe care of the patient with VHF in a facility must always be overseen by an experienced clinician who has had training and education in infection prevention and control (IPC) and PPE.

A risk assessment approach based on use of the hierarchy of controls should be used in decision making around infection prevention and control.

5 Background

5.1 VHF characteristics and clinical presentation

VHF are a group of diseases caused by several distinct families of viruses: filoviridae, arenaviridae, bunyaviridae and flaviviridae. Those that have been implicated in direct human-to-human transmission include:

- Crimean-Congo Haemorrhagic Fever
- Lassa fever
- Lujo Haemorrhagic Fever
- Marburg virus disease
- EVD.[2, 3]

VHF is an acute systemic illness of varying severity. Symptoms may include fever, myalgia, prostration, headache, pharyngitis, conjunctival infection, flushing and gastrointestinal symptoms, that can lead to life threatening haemorrhage and shock.[2-4] Infectivity is low during early phases of the disease and increases as symptoms progress.[5]

Refer to Appendix 3: Disease Summary of VHF and Appendix 4: Global Epidemiology, Pharmacological Agents and Vaccines for details on identified VHF, signs and symptoms, epidemiology, prevention and management.

Case definitions for VHF are comprehensively covered by the Viral Haemorrhagic Fever (Not Elsewhere Classified) – Australian National Notifiable Disease Case Definition and Ebola Virus Disease – CDNA National Guidelines For Public Health Units.

5.2 Transmission

VHF are transmitted from human-to-human via:

- direct contact with blood or body fluids of people with, or who have recovered from, or have died from VHF through:
  - breaches in skin integrity (uncovered wounds, percutaneous exposure)
  - mucous membranes (HCW contaminated hands)
  - ingestion
  - sexual contact
  - maternal transmission.
- direct contact with objects and environmental surfaces contaminated with the blood or body fluids of people with VHF or have died from VHF.[3,6-11]

There is no evidence of human-to-human transmission of VHF via droplet or aerosol transmission, however, aerosol-generating procedures and/or behaviours may present a risk to HCW due to environmental viral load.[3,6-12]

Viral ribonucleic acid (RNA), particularly EVD, may persist in immunologically privileged sites of survivors for extended periods. Immunologically privileged sites are those such as the central nervous system, eyes, testes, and placenta, that are less subject to immune responses than other parts of the body. Care should be taken during the post-acute phase of illness and education provided to patients prior to discharge regarding:

- semen: more than 12 months (EVD up to 531 days,[13] Crimean-Congo Haemorrhagic Fever up to 19 days), World Health Organization (WHO) recommends two consecutive negative semen samples, sexual health education essential
- CNS: unknown, caution for neurological interventions
- placenta: unknown, caution for obstetric and post-natal care
- inner eye: unknown, caution for ophthalmological interventions.[10, 12, 14]

EVD viral RNA has been detected in most body fluids, even after clinical recovery when clearance is noted in the blood, for up to 82 days.[15]

Lujo Haemorrhagic Fever may be excreted in urine and semen for weeks after recovery.[11] Lassa fever may be excreted in urine for 3 to 9 weeks from onset of illness.[16] Crimean-Congo Haemorrhagic Fever is known to persist in body fluids for up to 19 days.[17]

"It (EVD) is highly infectious, rapidly fatal, with a high mortality rate, ***but it can be prevented****."* [6]

5.3 Risk assessment for case identification

HCW, especially those responsible for triaging (hospital and pre-hospital) and admitting patients into facilities, should be alert and evaluate any patients that could have VHF. Early identification and assessment of suspected and confirmed cases of VHF is essential and depends on two factors:

- Epidemiological risk, e.g. Living, working or travelling to an endemic or epidemic area in the previous 21 days, more specifically:
  - recent contact with bodily fluids or clinical specimens from a patient or laboratory animal known or strongly suspected to have VHF
  - has travelled to an area known to have a current VHF outbreak
  - has participated in traditional burial ceremonies in affected areas in Africa
  - has lived or worked in basic rural conditions in an area where Lassa Fever is endemic
  - has visited caves or mines, or had contact with or eaten primates, antelopes or bats, in a Marburg Virus Disease/EVD endemic area
  - has travelled to a Crimean-Congo Haemorrhagic Fever endemic area and sustained a tick bite or crushed a tick with their bare hands
  - had close involvement with animal slaughter in affected areas.[14]
- Presence or history of fever in the past 24 hours.[1, 8-10, 12, 14, 18-20]

Refer to Appendix 16 Patient risk assessment advice for emergency departments for summarised advice on initial patient management.

In Queensland, all HCW who return after caring for VHF cases overseas are requested to enter into voluntary home restriction in Brisbane for 21 days from their last contact with a VHF case or their environment.[1, 42] Brisbane is preferred as a location for this voluntary home restriction because it allows proximity to the large metropolitan hospitals.

5.4 Endemic and epidemic information

For up-to-date information about outbreaks and endemic areas, refer to:

- WHO Disease Outbreak News
- Travel Health Pro Outbreak Surveillance page (UK National Travel Health Network and Centre)
- UK Health Security Agency Ebola and Marburg haemorrhagic fevers: outbreaks and case locations

Also refer to Appendix 3 for a VHF disease summary.

6 Infection prevention and control requirements

6.1 Notification

The local infection prevention and control team (IPC) must be involved as early as possible, in order to provide guidance on placement and precautions and support to the HCW directly providing care.

The medical practitioner responsible for the care of a patient with suspected or confirmed VHF must immediately notify their local Public Health Unit by phone, both within and outside office hours, to facilitate risk assessment, and expedite diagnostic testing and contact tracing.

6.2 Transfer or retrieval

Pre-hospital transport of the patient should be undertaken by Queensland Ambulance Service (QAS) where possible. Ensure communication with QAS includes notification of suspected VHF status.

For actions to be taken if patient transfer or retrieval is considered, refer to Appendix 13: Patient retrieval and transfer – Expert advisory group.

6.3 Patient placement

Patient must be isolated in a single room with an unshared ensuite, with negative pressure air handling and dedicated anteroom preferred.[21]

- Facilities with a class Q room should use this room. This is because of the additional isolation facilities associated with a Class Q room such as the airlock, dedicated dirty utility room, and electronic communication system between the isolation room and the airlock.

In addition to clear and prominent transmission-based precautions (TBP) signage, facilities may consider an exclusion zone to ensure that unauthorised HCW do not enter the VHF patient zone without appropriate PPE.

Donning and doffing of PPE is to be undertaken as per Recommended sequences for donning and doffing PPE (Appendix 9) in the anteroom with a clear separation between clean and potentially contaminated areas

- It is imperative that there is adequate space to allow separation between areas for patient care and safe donning and doffing of PPE. Where an isolation room does not have an anteroom, another suitable area (such as an adjacent patient room) must be set aside for donning and doffing PPE.

Patient care area must be restricted to essential HCW only.

There must be on-site senior clinician presence 24 hours per day to support staff in complex decision-making.

A log must be kept of all HCW who enter patient care area with a privacy notice outlining the purpose for collecting the information and stating that the information may be shared for the purpose of contact tracing. A template log is available at Appendix 14: Staff entry log template

Remove all non-essential items and those that cannot be effectively cleaned or discarded.

Consider communication needs both for the staff entering the room, and the patient. It may be helpful to ensure there are two telephone lines in the room – one for staff to communicate with the staff outside the room and one for patient use.

Refer to Appendix 5: Patient placement for details. TBP signage resources can be found at Australian Commission on Safety and Quality in Health Care - Standard and Transmission-Based Precaution Posters, or refer to your local infection prevention and control unit.

6.4 Standard and transmission based precautions

All patients with suspected and confirmed VHF should be cared for using standard and transmission-based precautions (TBP), specifically:

- Contact Precautions (enhanced) and
- Airborne Precautions.[21]

Donning and doffing of PPE must be monitored, checked and documented by a PPE trained observer (PPE TO)

- In exceptional situations where this does not occur (for example, an unexpected presentation to a single nurse clinic, or QAS single responder where a situation unfolds rapidly before a supervisor can attend) the HCW must be debriefed and assessed for any potential PPE breaches and occupational exposure immediately after the incident.

Refer to Appendix 6: Standard, contact and airborne precautions for details.

Refer to Appendix 9 PPE general guidance for PPE-specific guidance.

6.5 Transmission Based Precautions

Contact (enhanced) and airborne precautions are required for the management of patients under investigation for, or confirmed to have VHF.

There are 2 levels of PPE required, depending on the clinical status of the patient, and whether they are confirmed to have VHF or are under investigation.

As part of contact precautions, facility laundered surgical scrubs should be worn by HCW instead of their uniform or street clothes.

- Where it is not possible for HCW to wear scrubs the HCW must change out of their uniform or street clothes immediately after removing PPE.
- Clothing that is not visibly contaminated may be laundered as normal following visual inspection by PPE trained observer. If laundering is not feasible (i.e., dry clean only) the clothing must be discarded as clinical waste.
- Visibly contaminated clothing must be discarded as clinical waste. Visibly contaminated clothing indicates a PPE breach and in this case the HCW must be assessed by infection prevention and control for potential blood or body fluid exposure.

Aerosol generation via procedures or patient behaviours can be difficult to predict, especially in late stages of disease, and contingent PPE should be applied.

In decision making around PPE, patient factors must also be considered. For example, young children and patients with cognitive impairment or communication difficulties may not be able to anticipate vomiting or diarrhoea or communicate clearly about symptoms such as nausea or abdominal pain. Such factors may be a reason to choose a higher level of PPE.

Tier one PPE – **ONLY** for clinically stable patients with dry symptoms under investigation

Under investigation - clinically stable patient with dry symptoms only

For patients who are under investigation for VHF who are clinically stable, presenting with dry symptoms such as fever, aches, pains, sore throat, loss of appetite and fatigue, without bleeding, vomiting or diarrhoea the PPE required for transmission-based precautions is:

- long-sleeved single-use disposable fluid-resistant or impermeable gown[1] that extends to at least mid-calf and overlaps to cover the back
- two pairs of non-sterile long-cuff gloves (nitrile gloves are preferable over latex, inside gloves must not be removed while inside the patient care area)
- particulate filter respirator (PFR)[7, 20, 22]
- single-use full-length face shield (to be applied over any prescription glasses if worn).[7, 20, 22]

Tier two PPE

Under investigation – clinically unstable patients with wet symptoms

Confirmed – <u>ALL</u> confirmed VHF cases

For patients who are confirmed to have VHF, **OR** who are under investigation and are clinically unstable and presenting with wet symptoms such as bleeding, vomiting or diarrhoea the PPE required for transmission-based precautions is as above, PLUS:

- fluid-resistant or impermeable boot covers that extend to at least mid-calf
- hood that covers all hair and the ears and covers the exposed skin of the neck (such as surgical hood)[2]
- fluid-resistant shoes that can be wiped over are recommended.

While not essential, particularly if no PPE breach has occurred, HCW who have performed prolonged or high-risk patient care should be offered shower facilities and fresh scrubs (or own clothes at end of shift).[20]

Facilities may choose to use coveralls rather than gowns. If used, coveralls must be single use, disposable, fluid-resistant or impermeable, with or without an integrated head covering. If a coverall with an exposed zipper is used, a single-use, fluid resistant or impermeable apron should be used routinely to cover the zipper. A Cochrane Systematic Review performed in 2019 did not find evidence to preference either coveralls or gowns.[23] For the purposes of this statewide guidance, gowns are preferred to coveralls, as gowns are available as a standard item of PPE and available evidence supports their use. If a facility chooses to use coveralls, it is necessary for the facility to procure and store the coveralls locally.

Refer to Appendix 6: Standard, Contact and Airborne Precautions for more information about the rationale for transmission-based precautions, and recommendations about PPE training.

Refer to Appendix 9: PPE Guidance for more detailed information about PPE for VHF including checklists for donning and doffing.

6.6 Duration of transmission-based precautions

A person with confirmed VHF can be released from isolation following a negative test for the VHF, with the knowledge that viable virus persists in immunologically privileged sites for varying times.[3, 7, 22, 24]

Probable and confirmed cases may be released from isolation in consultation with an expert advisory group comprising of infectious diseases physicians, infection prevention and control professionals and public health authorities

Once the patient is deemed to be convalescent, they may be allowed to return home and advised:

- to be meticulous about personal hygiene due to the possibility of the presence of virus in all bodily fluids for three months after recovery
- to use safer sex practices, e.g. condoms and dental dams, or abstain from sex for 12 months or until the virus is not detected on two consecutive semen samples (at least one week apart) are achieved
- to refrain from donating blood or body fluids for 12 months from the date of recovery
- to advise any HCW who may perform invasive procedures on their immunologically privileged sites of the need to adequate PPE for until a risk assessment is performed and/or VHF testing is negative.[3, 7, 22, 24]

6.7 Standard Precautions

Standard precautions are applied to all healthcare activities. However, for VHF an emphasis on the following is essential:

- safe use and disposal of sharps safety devices (needleless and retractable devices used where practicable)
- minimise specimen collection
- 5 moments of hand hygiene
- appropriate spills management, waste and linen handling
- enhanced environmental cleaning of minimally and frequently touched surfaces
- patient-dedicated medical equipment (non-porous surfaces)
- reprocessing of medical equipment and instruments
- minimal in-room stock levels.[21]

6.7.1 Sharps Safety

The use of sharp devices exposes HCW to the risk of injury and to blood-borne infectious agents, therefore facilities must limit the use of phlebotomy procedures and laboratory testing to the minimum necessary for essential diagnostic evaluation and patient care.

All needles and sharps must be handled with extreme care and disposed of at the point of use in puncture-proof, sealed disposable containers that conform with Australian/New Zealand Standards (AS4031 and AS/NZS 4261).

Devices that incorporate safety engineered protection mechanisms must be used where available and practical (e.g. safety syringes, retractable cannula).

If single-use sharps cannot be used, HCW must use sharps removal systems (e.g. scalpel blade removers).

6.7.2 Specimen Collection

Limit pathology testing to the minimum necessary for safe patient management and utilise dedicated point-of-care testing equipment where available.

Notify local Pathology Queensland (PQ) laboratory and local PHU of planned testing in advance (VHF testing is undertaken at Queensland Health Forensic and Scientific Services (QHFSS).

VHF diagnosis requires: 3 x EDTA blood (mauve top tube), 1 x serum tube, 1 x urine sample or throat swab (dry or flocked) (label tubes prior to collection and make every effort not to contaminate outside of specimen containers).

Clearly label the container and pathology request form as “Suspected Viral Haemorrhagic Fever” prior to sending.

Use IATA compliant Category A packaging (urgently requested from local PQ laboratory) and indelibly mark the package “DO NOT OPEN IN CSR”.

Do not use pneumatic tube system to transport specimens, hand deliver only.

Do not use glass specimen containers.[1]

Refer to Pathology Queensland: Viral haemorrhagic fever testing and PHLN National High Security Quarantine Laboratory Guideline For Management Of Quarantinable Viral Haemorrhagic Fevers for further details.[25]

6.7.3 Hand Hygiene

The 5 Moments for Hand Hygiene (HH) apply inside the patient care area.

The inner pair of gloves must remain in place while in the patient care area.

Alcohol based hand rub (ABHR) or disinfectant wipes can be used on gloves in this context only.

Refer to Appendix 7: Hand Hygiene for details.

6.7.4 Patient Care Equipment

All equipment must be dedicated for the exclusive use on the patient.

Single-use disposable equipment is preferred.

Thorough decontamination is required of any equipment leaving the room.

Refer to Appendix 8: Patient Care Equipment for details.

6.7.5 Environmental Cleaning and Disinfection

General cleaning and disinfection is to be conducted with sodium hypochlorite disinfectants that are listed in the Australian Register for Therapeutic Goods (ARTG) as a hospital grade disinfectant.

Environmental cleaning and disinfection will be undertaken using either:

- A physical clean using combined detergent and 5000-ppm available chlorine solution (2-in-1 clean), made up daily from a concentrated solution

  OR

- A physical clean using detergent followed by disinfection with 5000-ppm available chlorine solution (2-step clean).[21, 26]

Spills management using spill kit requires a 5000-ppm sodium hypochlorite solution.[21]

All cleaning must be undertaken by HCW trained in the donning and doffing of PPE.

Refer to Appendix 10: Environmental Cleaning and Disinfection for details.

6.7.6 Waste Management

All waste generated must be managed as clinical waste in yellow biohazard bags.

Care must also be taken to avoid generating aerosols (e.g. do not compress the clinical waste bag to expel air).

Waste must be double bagged and transported in solid sided containers.

Facilities must consult with local waste contractor on VHF waste disposal arrangements.[28]

Refer to Guideline: Clinical and Related Waste for comprehensive guidance on Waste Management.

6.7.7 Personal Protective Equipment

Each facility must have processes and procedures in place for access to PPE, training for use, and updated instructions for donning and doffing appropriate for that facility.

Each facility must ensure adequate supply of PPE for their requirements, as per Queensland Health process for accessing Ebola virus disease PPE stockpile.

All HCW involved in the care of patients with VHF must be trained and supervised in the use of VHF-specific PPE.

PPE for HCW must:

- be chosen according to the patient's condition and diagnosis, as per Tier one and Tier two PPE in Transmission Based Precautions
- be easy to don and doff and disposed of while minimising the risk for self-contamination
- provide maximal comfort to prevent HCW's fatigue
- be confined to patient care and PPE doffing area.[21]

Refer to Appendix 9: PPE General Guidance for further detail.

6.8 Patient Care Considerations

Patient movement outside the isolation room must only be for essential reasons and planned to avoid potential contamination.

A surgical mask should be applied to the patient during transfer.[20, 21]

Early discussions and decisions regarding extent of care and resuscitation efforts should be held and documented and communicated to all care HCW.

Use single-use disposable equipment wherever possible, including for food and beverages (i.e. use disposable cutlery and crockery).

Avoid ABGs wherever possible.[2]

Ensure toilet lids are closed before flushing.

Refer to Appendix 11: Patient Care Considerations for further detail.

Refer to Appendix 12: Care of the Deceased for further detail.

6.9 Management of HCW having contact with patients with VHF

In an Australian clinical setting, HCW who have taken recommended IPC precautions, including the use of appropriate PPE, while caring for patients with VHF are not considered to have had low or high-risk exposures to VHF. The risk of occupational transmission of VHF is very low when following the recommended IPC measures as outlined in this Guideline.

Given that not all breaches in PPE are obvious and work conditions may elevate anxiety levels, the following is recommended for the Queensland clinical setting.

HCW providing care to patients with probable or confirmed VHF should:

- be familiar with the signs and symptoms of VHF
- monitor their own health and wellbeing, including monitoring and recording their temperature twice daily, commencing 48 hours after initiating care period and concluding 21 days after their last VHF patient contact
- notify their employer and PHU immediately, and isolate themselves, if they develop a temperature of 38°C or higher, or any other signs or symptoms of VHF.

This approach means that HCW are managed as low-risk contacts even in the absence of known lower risk exposures, however no restriction in movement or work duties is necessary while the HCW is asymptomatic.

All facilities must:

- implement their own occupational health and safety policies related to HCW caring for patients with suspected and confirmed VHF
  - this includes the psychological safety of HCW through the engagement of existing employee assistance services.
- in the event of an exposed healthcare worker, convene a panel of clinical experts comprising Expert Advisory Group members (refer to Appendix 13)
- ensure that the HCW providing care to patients with probable or confirmed VHF are aware of recommended restrictions following a occupational exposure
- consider the need for availability of accommodation for staff caring for patients with suspected and confirmed VHF if the HCW wishes to remain isolated from household members, or following an exposure
- maintain security of the patient care area and keep a log of all those involved in the management of patients with suspected and confirmed VHF
- appoint a key contact person for HCW to report to on their daily health and wellbeing during the care period and for 21 days after that period has ceased.

6.10 Exposed HCW

HCW who sustain a percutaneous or mucocutaneous exposure to the blood, body fluids, secretions, or excretions from a patient with suspected VHF must:

- Immediately leave the patient care area.[2]
- Doff PPE under the direction of the PPE trained observer. The PPE trained observer may assist in the rapid removal of PPE to facilitate prompt washing or irrigation of the affected skin surfaces or mucous membranes.
- Immediately wash affected skin surfaces with soap and water.[2]
- Irrigate any involved mucous membranes (e.g. conjunctiva) with copious amounts of water or eyewash solution.[2]
- After the HCW has washed or irrigated the involved skin or mucous membranes, items or surfaces used or splashed (such as sinks, basins, or floors) may be contaminated with the patient's blood or body fluids. These items or surfaces require immediate cleaning and disinfection using the principles in Appendix 10: Environmental cleaning and disinfection
- Immediately after skin surfaces or mucous membranes have been washed/irrigated contact infection prevention and control/occupational health/supervisor for assessment and access to post exposure management services for all appropriate pathogens (including blood borne viruses).[2]
- Infection prevention and control/occupational health/supervisor must arrange an emergency consultation with an infectious disease physician.
- The local PHU must be notified of the exposure.

- Counselling should also be made available as needed (e.g. employee assistance program).
- Enter and remain in voluntary home restriction for 21 days after the exposure, monitor their temperature twice daily (48 hours after exposure). HCW should isolate from household members during this time.
- Report observations to the facility's designated person daily or immediately if they become unwell or febrile (temperature greater than or equal to 38°C).
- Be intensively supported by the facility's designated person and other identified support people during their home restriction.

The above 3 points relating to home restriction and monitoring will no longer apply for exposed HCW if a suspected case is not a case of VHF (i.e. pathology testing is negative for VHF).

It is recommended to display the Viral haemorrhagic fever quick reference guide: Body fluid exposures, PPE breaches and spills prominently in the clinical area.

6.11 Monitoring, Management and Training of Visitors

Visitors to patients with VHF should be heavily restricted. Visitors should only be considered in exceptional circumstances and decisions made on a case-by-case basis in consultation with hospital infectious diseases and infection prevention and control teams and local PHU.[2]

It is important to balance patient well-being, human rights, and the public health principle of preventing transmission of a controlled notifiable condition.

Facilities must establish procedures for monitoring, managing and training visitors, including maintaining a separate log of all visitors (visitor log should include a privacy notice outlining the purpose for collecting the information, and stating that the information may be shared with the PHU). A template log is available at appendix 15

Any approved visitor must:

- be a well adult (screened for status as a contact of the case)
- maintain a non-contact distance of more than one metre
- wear recommended PPE and be trained and observed in its donning and doffing, and in their hand hygiene, by a PPE trained observer
- restricted to the patient care area and an immediately adjacent waiting area.

Any direct contact by visitors with the patient should only be allowed under exceptional circumstances (e.g. parent supporting a child).

Interaction by virtual means (e.g. phone calls, video calls) with family and friends should be facilitated to promote patient well-being.[42]

7 Legislation

Public Health Act 2005
https://www.legislation.qld.gov.au/view/html/inforce/current/act-2005-048

Biosecurity Act 2015
https://www.legislation.gov.au/C2015A00061/latest/versions

Waste Reduction and Recycling Regulation 2011
https://www.legislation.qld.gov.au/view/html/asmade/sl-2023-0127#

Transportation is governed by National Transport Commission Dangerous Goods Code:
https://www.ntc.gov.au/heavy-vehicles/safety/australian-dangerous-goods-code/

Queensland Guideline Clinical and related waste available at:
https://www.des.qld.gov.au/policies?a=272936:policy_registry/pr-gl-clinical-and-related-waste.pdf

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Appendix 1: Infection prevention and control recommendations in brief

This quick reference guide is intended to provide the key elements for infection prevention and control in relation to viral haemorrhagic fevers (VHF).

VHF Quick Reference Guide

Issue	Recommendation/advice
Mode of transmission	Direct contact with blood or body fluids of people infected with VHF. Direct contact with objects and environmental surfaces contaminated with the blood or body fluids of people with VHF. There is no evidence of human-to-human transmission of VHF via droplet or aerosol, however, aerosol-generating procedures and/or behaviours may present a risk to healthcare workers (HCW) due to environmental viral load.
Patient placement Refer Appendix 3 of guideline	Single room with unshared ensuite, negative pressure and dedicated anteroom preferred. Door to remain closed. Use signage on door of room to advise non-essential staff not to enter and denote transmission-based precautions required. Adequate space must be allocated outside the room for safe PPE donning and doffing. An additional area may be required for staff to change into/out of surgical scrubs, and to shower in case of body fluid exposure.
Personal protective equipment (PPE) Refer Appendix 7 of guideline	Two tiers of PPE: **Tier 1** – For patients under investigation, with **DRY** symptoms **ONLY** (fever, aches, pains, sore throat, loss of appetite, fatigue) • Gown/coverall, two pairs gloves, particulate filter respirator (P2/N95), face shield. **Tier 2** – For patients with confirmed VHF, and patients under investigation with **WET** symptoms (vomiting, diarrhoea, bleeding) • As for Tier 1, PLUS: boot covers to mid-calf, hood covering hair, ears and neck. ALL staff entering patient room **MUST** be trained in donning and doffing, and have donning and doffing supervised by a trained observer at all times. Doffing PPE is high risk for self-contamination. Doffing MUST be guided and supervised and done slowly and carefully. Hand hygiene must be performed between each step of doffing. Donning and doffing checklists are included in Appendix 7 of VHF guideline.
Hand hygiene Refer Appendix 5 of guideline	While in the patient room, hand hygiene must be performed between different patient care tasks. This is to be performed using alcohol-based hand rub (ABHR) on the outer gloves. Do not routinely remove gloves to clean hands inside the patient room (this is different from the advice for all other patients). If the outer gloves become visibly soiled, under the direction of the trained observer, HCW is to inspect integrity of gloves, wipe outer gloves using disinfectant wipes, doff outer gloves, use ABHR on inner gloves, and replace outer gloves before continuing patient care activities. If the inner gloves are impacted this is a PPE breach and the HCW must be removed from the patient care area.
Notification and Expert Advisory Group	Notify the suspected VHF case, as soon as possible: local infection prevention and control team and local public health unit. If patient transfer or retrieval from one hospital to another is considered, an Expert Advisory Group should be convened as per Appendix 11 of VHF guideline.

Issue	Recommendation/advice
Diagnostic testing	Notify laboratory and local public health unit in advance of any planned testing. Limit use of phlebotomy, injection and laboratory procedures to the minimum necessary for essential diagnostic testing and patient care. Use point of care testing when available. Handle sharps with extreme care and dispose at point of use. VHF diagnostic testing requires: • 3 x EDTA blood (mauve top tube) • 1 x serum tube • 1 x urine sample or throat swab (dry or flocked). Label tubes prior to collection and make every effort not to contaminate outside of specimen containers. Do not use pneumatic tube system to transport specimens. For road or air transport of specimens use IATA compliant Category A packaging (urgently requested from local PQ laboratory) and indelibly mark the package "DO NOT OPEN IN CSR". Clearly label the container and pathology request form as "Suspected Viral Haemorrhagic Fever" prior to sending. Refer to Viral haemorrhagic fever (VHF) testing Pathology Queensland
Environmental cleaning Refer Appendix 8 of guideline	General cleaning is to be conducted with listed disinfectants in the Australian Register for Therapeutic Goods (ARTG) or a chlorine-based product containing sodium hypochlorite. Environmental cleaning and disinfection will be undertaken using either: • a 2-step clean, which involves a physical clean using detergent solution followed by use of a chemical disinfectant • a 2-in-1 clean in which a combined detergent/disinfectant wipe or solution is used, and mechanical/manual cleaning action is involved. Spills management using spill kit requires a 5000-ppm sodium hypochlorite solution.
Patient care equipment	All equipment must be dedicated for the exclusive use on the patient. Single-use disposable equipment is preferred. Thorough decontamination is required of any equipment leaving the room.
Staff considerations	A log of all staff having contact with the patient must be maintained. Contact with a patient with VHF must be limited to essential personnel only. Staff must be familiar with the signs and symptoms of VHFs. They must monitor their health, including monitoring and recording their temperature twice daily, commencing 48 hours after initiating care period and concluding 21 days after their last VHF patient contact. Staff must isolate themselves and notify their employer and public health unit immediately if they develop signs or symptoms of VHF.

Appendix 2: Body fluid exposures, PPE breaches and spills

This quick reference guide is intended to provide the key elements for infection prevention and control in relation to body fluid exposures, PPE breaches or spills from a patient with viral haemorrhagic fever (VHF). For detailed guidance and further advice please refer to the Queensland Health guideline for management of exposures to blood and body fluids.

VHF Quick Reference Guide

Issue	Recommendation/advice
Blood or body fluid exposures	Immediately following any blood or body fluid exposure: • Immediately leave the patient care area. • Doff PPE under the direction of the PPE trained observer. The PPE trained observer may assist in the rapid removal of PPE to facilitate prompt washing or irrigation of the affected skin surfaces or mucous membranes. • Immediately wash affected skin surfaces with soap and water. • Irrigate any involved mucous membranes with copious amounts of water or eyewash solution. • Immediately after affected skin surfaces or mucous membranes have been washed/irrigated contact occupational health/supervisor for assessment and access to post-exposure management services. • Occupational health/infection control/supervisor must arrange an emergency consultation with an Infectious Diseases Physician. Contact your infection control unit for local advice. Refer to Section 6.10 Exposed HCW section for ongoing actions.
PPE Breach	A PPE breach is any failure of PPE, regardless of whether an actual body fluid exposure occurs: • Any failure of PPE while in the patient care area or during doffing, for example; a tear, rip, or slippage of an item of PPE, exposing the skin, mucous membranes or clothing. • Failure of the outer gloves without impact on the inner gloves is not considered a PPE breach, unless there is visible blood or body fluid on the inner gloves. Actions to be taken in the event of a PPE breach: • Immediately leave the patient care area. • Doff PPE under the direction of the PPE trained observer. Implement blood and body fluid exposure protocol to assess the potential exposure.

Issue	Recommendation/advice
Body fluid spill	Implement usual protocol for body fluid spill management, ensuring: • PPE is worn as for patient care (current Tier). • Isolate area, using signage if necessary. • Avoid cleaning and disinfecting the spill directly with gloved hands. Use tongs or similar items. • Cleaning materials must be discarded as clinical waste. • Large spills must be confined and contained using absorbent matter. If spill kit is not available, paper towel may be used. Apply absorbent matter to spill. • Directly apply disinfectant solution* to saturate the absorbent material/paper towel. Leave for the recommended contact time for the disinfectant used (see manufacturer's instructions). • Clean spill area with neutral detergent solution. • Cover spill site again with disinfectant solution* for a further contact time (see manufacturer's instructions). • Perform a final clean with a neutral detergent solution. *Disinfectant solution containing 5000-ppm available chlorine, or other ARTG-listed disinfectant. For further details refer to Appendix 8 Patient Care Equipment

Appendix 3: Disease summary of VHF

		Disease	Geographic Distribution/ Reservoir or Vector	Incubation Period/ Human transmission	Onset	Bleeding	Rash	Jaundice	Heart	Lung	Kidney	CNS	Eye	Clinical management/ Vaccine/ Clinical IPAC/ Public health measures	Annual Estimated Cases/ Human-to-Human Transmissibility/ Case-Fatality Ratio
FILOVIRADAE	Ebolavirus: Five subtypes recognised	Ebola virus disease (EVD)	Endemic to sub-Saharan Africa, except Reston Ebola virus (Philippines)/ Fruit bat, chimpanzees, gorillas, monkeys, forest antelope or porcupines	2–21 days/ Direct contact with blood/body fluids of infected person or animal **OR** Direct contact with an object contaminated with blood/body fluids of infected person or animal **OR** via placenta/ breastmilk **OR** sexual partners of recovered cases	Variable	++	+	+	+	+	+	+	++	Supportive care, preparations of monoclonal antibodies (e.g. Inmazeb and Ebanga) for Zaire species/ Two vaccines: Ervebo (single dose live attenuated recombinant vax) for Zaire species, Zabdeno-and-Mvabea (two dose regimen) / SP + CP + AP, special precautions for obstetric care and care of the deceased	1 - 14,124/ HIGH/ Average: 50% (Range 25–90%)
	Symptoms of EVD	ONSET: fever, fatigue, myalgia, headache, pharyngitis, hiccups, conjunctivitis. THEN: vomiting, diarrhoea, rash, impaired renal and hepatic function, haemorrhage, leukopaenia, thrombocytopaenia, elevated LFTs. Potentially sight-threatening uveitis, early cataracts and ocular sequelae noted in one-third of survivors.													

	Disease	Geographic Distribution/ Reservoir or Vector	Incubation Period/ Human transmission	Onset	Bleeding	Rash	Jaundice	Heart	Lung	Kidney	CNS	Eye	Clinical management/ Vaccine/ Clinical IPAC/ Public health measures	Annual Estimated Cases/ Human-to-Human Transmissibility/ Case-Fatality Ratio
	Marburgvirus	Marburg virus disease (MVD)	sub-Saharan Africa/ Fruit bat: Egyptian fruit bat, perhaps others	2–21 days Direct contact with blood, body fluids or organs of infected people or animals, and with surfaces and materials contaminated with these fluids Transmission has occurred via semen. No evidence of sexual transmission from a woman who has had MVD.	Abrupt	++	+	+	+	+	+	+	++	Supportive care, no antivirals approved, though Rx for EVD may be tested/ No vaccines approved, though two EVD vax may be considered/ IPAC and PH as per EVD	0 – 374 / HIGH/ Average: 50% (Range 24–88%
	Symptoms of MVD	ONSET: high fever, severe headache and severe malaise, myalgia. THEN: severe watery diarrhoea, abdominal pain and cramping, nausea and vomiting can begin on day 3, persisting for one week, “ghost-like” drawn features, deep-set eyes, expressionless faces, and extreme lethargy. Non-itchy rash between 2 and 7 days. SEVERE CASES: severe haemorrhagic manifestations between day 5 and 7, and fatal cases usually have some form of bleeding, often from multiple area, sustained high fevers, CNS involvement: confusion, irritability, and aggression. Orchitis can occur during late phase of disease (15 days). Death most often occurs between day 8 and 9 and is usually preceded by severe haemorrhage and shock.												

		Disease	Geographic Distribution/ Reservoir or Vector	Incubation Period/ Human transmission	Onset	Bleeding	Rash	Jaundice	Heart	Lung	Kidney	CNS	Eye	Clinical management/ Vaccine/ Clinical IPAC/ Public health measures	Annual Estimated Cases/ Human-to-Human Transmissibility/ Case-Fatality Ratio
ARENAVIRIDAE	Lassa	Lassa fever	West Africa/ Rodent: Natal mastomys or multimammate rat	2–21 days/ Direct contact with food or household items contaminated with rodent urine/faeces OR direct contact with blood/body fluids of infected person NOT: Airborne human-to-human	Gradual	+	+	0	++	+	++	+	0	Supportive care, IV or PO ribavirin (may be considered/ No vaccine for people or animals/ SP + CP + AP/ Rodent control and hygiene indoors	50,000–100,000 MODERATE/ Overall: 1% (15% in hospitalised patients with severe disease)
	Symptoms of Lassa fever	ONSET: fever, general weakness, and malaise. THEN: headache, pharyngitis, myalgia, chest pain, nausea, vomiting, diarrhoea, cough, and abdominal pain. SEVERE CASES: facial swelling, pulmonary oedema, bleeding from the mouth, nose, vagina or gastrointestinal tract and hypotension may develop. ALSO: Morbilliform/ maculopapular only apparent in fair-skinned persons. Proteinuria, shock, seizures, tremor, disorientation, and coma may be seen in the later stages. Deafness (may be transient) occurs in 25%. Transient hair loss and gait disturbance may occur during recovery. Death usually occurs within 14 days of onset in fatal cases. Disease is especially severe late in pregnancy, with maternal death and/or foetal loss occurring in more than 80% of cases during the third trimester.												

	Disease	Geographic Distribution/ Reservoir or Vector	Incubation Period/ Human transmission	Onset	Bleeding	Rash	Jaundice	Heart	Lung	Kidney	CNS	Eye	Clinical management/ Vaccine/ Clinical IPAC/ Public health measures	Annual Estimated Cases/ Human-to-Human Transmissibility/ Case-Fatality Ratio
	Lujo	Lujo HF (LUHF)	Zambia/ Unknown, presumed rodent	7–13 days/ Direct contact with or inhalation of aerosolised virus from rodent urine/faeces OR direct contact with blood/body fluids of infected person OR possible placental OR sexual partners of field workers NOT: Airborne human-to-human	Abrupt	++	+	0	?	+	+	+	0	Supportive care, IV or PO ribavirin (may be considered/ No vaccine for people or animals/ SP + CP + AP/ Rodent control and hygiene indoors	Only 5 cases (in 2008)/ MODERATE to HIGH/ 80%
	Symptoms of LUHF	ONSET: non-specific febrile illness accompanied by headache and myalgia. THEN: increases in severity, morbilliform rash of the face and trunk, face and neck swelling, pharyngitis, diarrhoea. Bleeding not a prominent feature during the illness. Other features: leukopaenia, thrombocytopaenia, elevated LFTs and miscarriage. In the fatal cases (4/5 patients), a transient improvement was followed by rapid deterioration with respiratory distress and neurological signs and circulatory collapse.												

		Disease	Geographic Distribution/ Reservoir or Vector	Incubation Period/ Human transmission	Onset	Bleeding	Rash	Jaundice	Heart	Lung	Kidney	CNS	Eye	Clinical management/ Vaccine/ Clinical IPAC/ Public health measures	Annual Estimated Cases/ Human-to-Human Transmissibility/ Case-Fatality Ratio
BUNYAVIRIDAE	Crimean-Congo HF	Crimean -Congo Haemorrhagic Fever	Africa, Balkans, southern Russia, Middle East, India, Pakistan, Afghanistan, western China/ Wild and domestic vertebrates (including ostriches)/tick	1–13 days/ Tick bite OR direct contact with blood/body fluids of infected person or animal OR hospital-acquired due to improper IPAC	Abrupt	+++	+	++	+?	+	+	+	+	Supportive care, IV or PO ribavirin/ No vaccine for people or animals/ SP + CP + AP/ Tick control, IPAC abattoir practices	100–100,000/ HIGH/ 10–40%
	Symptoms of Crimean-Congo Haemorrhagic Fever	ONSET: fever, myalgia, dizziness, neck pain and stiffness, backache, headache, sore eyes and photophobia, with nausea, vomiting, diarrhoea, abdominal pain and sore throat. THEN: sharp mood swings and confusion. THEN: the agitation may be replaced by fatigue, and the RUQ abdominal pain (hepatomegaly). Other clinical signs include petechial rash which evolves into ecchymoses, tachycardia, lymphadenopathy, and a petechial rash (progresses to ecchymoses) on internal mucosal surfaces, and other haemorrhagic phenomena.												

Table reference: Adapted from Tables 357-1 and 2 in Bausch [3]. [8-12, 14, 18, 29]

Viruses with moderate to high human-to-human transmissibility included; there are no known Flaviviridae species with documented human-to-human transmissions.

Abbreviations: Haemorrhagic fever (HF), Infection Prevention and Control (IPAC), Standard Precautions (SP), Contact Precautions (CP), Airborne Precautions (AP)

Notes: no reliable differentiating signs and symptoms between listed VHF, though epidemiological features may assist diagnosis.[12]

Clinical definitions:

- Morbilliform rash: measles-like eruptions, fine erythematous macules and papules are distributed over the trunk
- Ecchymoses: purpuric flat patches on the skin, commonly known as bruises

Supportive care: maintenance of hydration, management of shock, sedation, analgesia, usual precautions for patients with bleeding disorders, transfusions (when necessary) – see Appendix 4: Global Epidemiology, Pharmacological Agents and Vaccines for further detail.

Appendix 4: Global epidemiology, pharmacological agents and vaccines

Global context

Given the broad range of VHF, compiling a complete chronology of the global context is complex, though the following provides an overview of the current situation (2021–2023).

EVD outbreaks have been consistently reported most years since 2000, the most significant of these being 2014–2016 in West Africa.[10] Most cases of EVD have been detected in sub-Saharan African countries, with isolated cases in USA and European countries in 2014.[10] Outbreaks of EVD occurred in Guinea and Democratic Republic of the Congo in 2021, and case numbers were low comparative to the 2014–2016 outbreak, though case fatalities remained high.[10] Uganda experienced an outbreak of Sudan Ebolavirus (SUDV) in late 2022 to early 2023.

Lassa fever is endemic to several West African countries, and outbreaks were declared in Nigeria and Guinea in 2022 following many laboratory confirmed cases, including 40 deaths (in Nigeria).[30, 31]

Marburg virus (two fatal cases) were identified in 2022 in Ghana, which may pose a 'serious public health threat' as the virus has only been reported once previously in West Africa and the severity is high.[32]

Crimean-Congo Haemorrhagic Fever is endemic in Africa, the Balkans, the Middle East and Asian countries south of the 50th parallel north, and an outbreak was most recently reported in Iraq of 212 cases reported in 2022.[33]

The Australian Government Office of Health Protection and Response provides situation reports to key stakeholders as required regarding global outbreaks that may have implications for Australia as required. Previous preparedness in Australia and Queensland has focused EVD following the major outbreak that occurred in West Africa in 2014-2016.[10, 16]

Pharmacological agents

Two monoclonal antibodies (mAbs) are strongly recommended by WHO for patients (including infants and children) with RT-PCR confirmed EVD and for neonates of unconfirmed EVD status, 7 days or younger, born to mothers with confirmed EVD treatment with either:

- mAb114 (Ebanga)

  OR

- REGN-EB3 (Inmazeb) **NOT TO BE GIVEN TOGETHER**.[35]

Currently, mAbs treatment is only recommended by WHO for EVD.[35] Further, WHO recommends against treatment of EVD with remdesivir and ZMapp.[35]

Ribavirin may be an effective treatment for Lassa fever, Lujo Haemorrhagic Fever and Crimean-Congo Haemorrhagic Fever if given in the early stages of illness but is not considered effective as prophylaxis.[2, 8, 11, 33]

There are no recommended antivirals to treat MRV, however, Remdesivir and Favipiravir developed for EVD, may be considered under compassionate access to treat MRV.[18]

Vaccines

The Ervebo vaccine has been effective in protecting people from the Zaire ebolavirus and was approved by the US Food and Drug Administration and WHO for those over 18 years and older, except pregnant and breastfeeding women.[10] A global stockpile is available for dissemination to outbreak and endemic areas.

A two-dose combination vaccine, Zabdeno-and-Mvabea has been granted marketing authorisation by the European Medicines Agency, given eight weeks apart. This regimen is suitable for prophylaxis and may be considered for EVD and MRV prevention, but is not recommended for outbreak response.[10]

A vaccine for Crimean-Congo Haemorrhagic Fever derived from inactivated virus obtained from mouse brain is used in Bulgaria, though its efficacy has not been well established and further studies are needed.[36]

There are no vaccines that protect against other VHF currently.

Access to the above mAbs and vaccines is limited in Australia. If treatment with these agents is to be considered for a case or contact/s, contact the Communicable Diseases Branch on (07) 3328 9754 or after-hours through the Hospital and Health Service Public Health Physician on-call.

Appendix 5: Patient placement

Placement of suspected or confirmed cases of VHF in single isolation rooms (negative pressure if available) with adjoining dedicated ensuite facilities is essential.[6, 7, 20] It is highly unlikely that Australia will have large numbers of suspected or confirmed cases of VHF, due to geographical isolation and returned traveller screening and quarantine processes.[1, 37] However, in the highly unlikely event that single room facilities were exhausted, cohorting is not recommended and suspected and confirmed cases should be kept separate.[6] During the COVID-19 global pandemic, the use of portable air purifiers in single rooms without negative pressure air handling systems to reduce airborne contaminants has been demonstrated as effective. In the unlikely event that a patient with VHF required placement in a single isolation room without negative pressure air handling capabilities, the use of a portable air purifier may be considered.[38-40]

The biocontainment capacity of Q class negative pressure isolation rooms provide favourable security, in-room capacities and geographical space to decrease inadvertent staff and patient exposure to a patient with suspected or confirmed VHF, for example:

- large anteroom for linen, equipment, waste and PPE storage, and safe PPE donning and doffing
- telecommunication system to communicate with patient remotely
- enhanced air handling capacity in the event that AGPs/Bs required or present.

A local risk assessment of capacity must be undertaken, and a written plan developed to enable appropriate action to be followed so that all patients meeting the case definition of suspected, probable or confirmed VHF are managed in a single room under VHF specific precautions.

Patient placement options are listed below. The options must be considered in ascending order in consideration of available facility resources. That is, if option 1 is available it must be used. If option 1 is not available, option 2 must be considered next, followed by option 3.

Note: It is imperative that the overall safe care of VFH patients in a facility is overseen by an on-site senior clinician, at all times.

Option 1

Single room with ensuite facilities, negative pressure air handling and dedicated anteroom:

- Patients must be placed in a single room containing a private bathroom and an anteroom with a negative pressure air handling system and managed under standard and transmission-based enhanced contact and airborne precautions with the addition of enhanced PPE.
- There are to be separate areas designated for donning and doffing of PPE, with a clear separation between clean and potentially contaminated areas.

Option 2

Single room with ensuite facilities without negative pressure air handling:

- When option 1 is not available, patients must be placed in a single room containing a private bathroom. The door to the patient's room must be closed and the patient managed under standard and transmission-based enhanced contact and airborne precautions with the addition of enhanced PPE.
- An adjacent room or area immediately outside the room must be cordoned off to create designated areas for donning and doffing PPE.
- Clear separation between clean and potentially contaminated areas must be identified within the areas designated for donning and doffing PPE.
- Consider the use of portable air purifiers inside the patient care area and in the PPE donning and doffing area.

Option 3

Single room without ensuite facilities and without negative pressure air handling:

- When options 1 and 2 are not available, patients must be placed in a single room with the door closed.
- In addition to the recommendations outlined within option two, a toilet commode chair must be designated to the patient for the duration of care and must remain in the patient's room.
- Consider the use of portable air purifiers inside the patient care area and in the PPE donning and doffing area.

Note: When ensuite facilities are not available the use of a 'single patient use' disposable bedpan is preferred over reusable bedpans and commodes. When reusable bedpans and commodes are used, these must be allocated to the patient and safely disposed after discharge. A high-absorbency product, such as those used for blood and body fluid spills, may be used in the pan to reduce the risk of splash.

General placement considerations

Regardless of the patient placement option, it is essential that the number of HCW who have contact with patients with VHF be limited.

Personnel must be restricted to those who are essential for patient care and management of the environment.

When considering patient placement options, it must be ensured that space and layout allow for a clear separation between clean and potentially contaminated areas. It is critical that physical barriers (e.g. plastic enclosures) along with visible signage (e.g. floor marking) be used where necessary to separate distinct areas and ensure a one-way flow of care moving from clean areas (e.g. area where PPE is donned, and unused equipment is stored) to the patient room and to the PPE doffing area and waste disposal.

These areas must be designated with appropriate signage.

PPE storage and donning area

This area must be designated outside the patient's room (e.g. a nearby vacant patient room or a marked area in the hallway outside the patient room) where clean PPE is stored and where HCW can put on PPE before entering the patient's room.

Potentially contaminated equipment, used PPE, or waste removed from the patient's room **must not** be stored in the PPE donning area. If waste must pass through this area, it must be properly contained.

PPE doffing area

This area must be designated in immediate proximity to the patient's room and separate from the donning area (e.g. anteroom or adjacent vacant patient room that is separate from the clean area). Alternatively, some steps of the PPE doffing process may be performed in a clearly designated area of the patient's room near the door. This can only be undertaken if:

- the doffing of PPE can be seen and supervised by the PPE trained observer (TO) (e.g. through a window where the HCW doffing PPE can still hear the instructions of the trained observer)
- the area is clearly designated within the room (e.g. via partition or floor marking tape)
- the area within the patient room does not put the HCW at risk of contamination from contaminated flooring or other environmental surfaces (e.g. if the patient has had projectile vomiting or diarrhoea that may have caused potential contamination of the floor and environmental surfaces near the door)
- the area within the patient room is not used for any other purpose. Gloves must be stocked in a clean section of the PPE doffing area which is accessible to the HCW while doffing PPE.

The area must allow for adequate space to doff PPE, including a place where the HCW can sit to doff boot covers. This area must be easily cleaned and disinfected.

Required supplies for the PPE doffing area include:

- chair or stool
- alcohol-based hand rub (ABHR)
- disinfectant wipes to be used for the disinfection of reusable PPE and the removal of gross contaminants from PPE before doffing (wipes must be included in the Australian Register for Therapeutic Goods (ARTG))
- supply of long-cuff gloves
- large clinical waste receptacle
- large absorbent mat secured to the floor (this should be changed daily and when visibly soiled).

Leak-proof clinical waste containers for discarding used PPE must be available within the PPE doffing area. Frequent environmental cleaning and disinfection of the floor (including replacement of the absorbent mat secured to the floor), all surfaces (with particular attention to high-touch surfaces), equipment and other items must be undertaken within this area.

If the hallway outside the patient room must be used as the PPE doffing area, physical barriers must be erected to close the hallway, thereby creating a dedicated space. In doing so, it must be ensured that this hallway space complies with fire codes. Access to this hallway must be restricted to essential personnel who are properly trained on recommended infection prevention practices for the care of patients with VHF.

Other points for consideration

Patients **must not** be placed in rooms that have carpet, and all soft upholstered furniture and decorative curtains must be removed from patient rooms before use or discarded as waste after discharge.

Patient notes and bedside charts must be placed outside the room.

Patient care related mobile electronic medical record devices must be placed outside the room.

Doors must be kept closed at all times.

Appropriate transmission-based precaution signage must be displayed to identify the isolation room and the necessary precautions to be adopted.

Showers must be available for use by HCW after doffing PPE as required.

Appendix 6: Standard contact and airborne precautions

This appendix contains further detail and rationale for recommendations in the IPAC principles for VHF.

Preface

Advice on PPE from national and international sources varies based on its intended audience, jurisdictional burden of disease and healthcare context.[2, 5, 21, 24] Factors that impact on transmission-based precautions (TBP) and PPE guidance are:

- the likelihood and number of local cases
- the resource capacity of the healthcare system,
- the severity and transmissibility of the disease, and
- the threshold for healthcare workplace health and safety risks.[37]

Due to the high consequence of VHF transmission to healthcare workers, Queensland Health adopts a high precautionary level of infection prevention and control, PPE and TBP recommendations in relation to the established transmission pathways for the viruses that cause VHF. HCW hesitancy to provide care to patients with VHF is considered, and where all other risk mitigation strategies are exhausted, additional PPE may provide reassurance and increase workforce capacity.

Enhanced PPE requirements, beyond what is recommended for other pathogens that are transmitted via direct and indirect contact, are designed to protect the HCW from contact with secretions such as those generated by aerosol generating procedures, patient generated aerosols during vomiting and diarrhoea, and aerosols due to toilet flushing. They are also designed to protect the HCW against the potential for contamination through non-intact skin or contamination of exposed skin and subsequent transfer to mucous membranes. Using two pairs of gloves provides an extra layer of safety during direct patient care and during the PPE doffing process.

Transmission-based precautions

1. Contact precautions are required to prevent direct and indirect transmission of VHF in healthcare settings. Direct transmission can occur when blood or body fluids of an infected person has contact with the mucous membranes or break in the skin of another person. Indirect transmission occurs where the transfer of an infectious agent occurs through a contaminated object or person, e.g. HCW clothing and hands, or contaminated environmental surfaces and medical equipment.[21]
2. Airborne precautions are required to prevent direct and indirect transmission of VHF in healthcare settings. VHF are not transmitted by inhalation of small particles in the healthcare context, however, patients undergoing aerosol generating procedures/behaviours (AGPs/Bs) or with severe bleeding, vomiting or diarrhoeal illness may present a risk to HCW.[3, 7, 12, 21]

IPAC and PPE training

All HCW involved in providing care to patients with VHF must complete VHF IPAC (including PPE) training. A register of VHF-competent HCW should be kept.

Just-in-time training materials are available from Communicable Diseases Branch (mailto:QIPCU@health.qld.gov.au), these include:

- pre-reading
- pre-reading evaluation (written quiz – 100%)
- PPE skills competency evaluation tool.

Targeted doffing training can significantly reduce HCW self-contamination, with an emphasis on:

- Multimodal training program – basic IPAC theory education (including PPE types and purpose), practical training with PPE, video demonstrating correct PPE use, importance of teamwork, written doffing instructions.
- 'Doffing team', which includes HCW, doffing assistant (optional) and trained observer (TO) is key to self-contamination prevention, and teamwork and communication should be practised and standardised.
- Other strategies are helpful, including, demarcation of clean and dirty spaces in doffing zone, mirrors to increase situational awareness.[12, 41]

Appendix 7: Hand hygiene

HCW must perform hand hygiene frequently, including before and after all patient contact, contact with potentially infectious material, and before putting on and after doffing each item of PPE, including gloves.

The choice of gloves must have demonstrated integrity following exposure to alcohol and other disinfectant products.

Note that in normal circumstances it is not acceptable to use ABHR or disinfectant wipes to decontaminate gloves. However, when caring for patients with VHF, HCW must continue to perform hand hygiene in line with the 5 Moments for Hand Hygiene. When caring for patients with VHF, HCW must avoid doffing of the inner glove and perform hand hygiene by using ABHR or disinfectant wipes on their gloves.

HCW must consider the inner pair of gloves to be their 'second skin' and the outer set of gloves as their 'working gloves'. Adopting this mindset helps the HCW differentiate between the special requirements essential for VHF management (i.e. applying ABHR or disinfectant wipes to gloved hands) and normal practice where this is not done.

When aseptic technique requiring handling of key sites or key parts is required, gloves should be disinfected using ABHR and then sterile gloves should be donned over the top.

If gloves become soiled with blood or body fluids, HCW must immediately do the following:

- Under the direction of the trained observer, HCW must inspect the integrity of gloves, then proceed to wipe the outer gloves using disinfectant wipes that are included in the Australian Register for Therapeutic Goods (ARTG), then doff outer gloves, use ABHR on inner gloves, and replace outer gloves before continuing patient care activities.
- If the inner gloves are impacted this is a PPE breach and the worker must be removed from the patient care area.

Appendix 8: Patient care equipment

Patient care equipment (e.g. electronic thermometers, sphygmomanometers, glucometers, pat slides etc.) may be a source of transmission when shared between patients. Therefore, to reduce the risk of transmission, equipment must be single patient use and disposable (preferable where possible), or at a minimum, dedicated to that patient for exclusive use for the duration of their hospitalisation.

As a general rule, facilities must limit personal items of the patient entering the room, especially if the items cannot be readily cleaned or disinfected (e.g. laptop computers, children's toys etc.).

HCW must not take personal items into the patient care area (e.g. jewellery, watches, mobile phones, pagers, pens).

As there is the likelihood of a positive patient requiring an extended stay (approx. 30–40 days), dedicated equipment/items should be allocated for that period which can be disposed of at discharge.

Patients may be too weak to walk to the bathroom in the acute phase of the illness. A bedside commode may be the preferred option. A 'single patient use' disposable bedpan is preferred over reusable bedpans and commodes. When reusable bedpans and commodes are used, these must be allocated to the patient and safely disposed after discharge. A high-absorbency product, such as those used for blood and body fluid spills, may be used in the pan to reduce the risk of splash.

Linen is to be discarded as clinical waste.

All items leaving the patient room must be moved to the PPE doffing area and placed in a space designated for the decontamination of equipment.

Refer to Appendix 10: Environmental cleaning and disinfection for details on the cleaning of these items.

Appendix 9: PPE guidance

The following guidance on the types of personal protective equipment (PPE) to be used and the processes for donning and doffing PPE applies to all HCW entering the room of a patient hospitalised with VHF.

Checklists for donning and doffing processes are provided.

Key points

HCW caring for patients with VHF must have received comprehensive training and have demonstrated competency in performing VHF related infection prevention and control practices.

PPE must be chosen according to the patient's condition and diagnosis, as per Tier 1 and Tier 2 PPE in Transmission Based Precautions.

HCW providing care to patients with VHF must be always supervised by the PPE trained observer at all times.

Donning and doffing PPE must be undertaken slowly and methodically, according to an agreed sequence to ensure that each item is donned and doffed in the correct order and with the correct technique.

Individuals unable or unwilling to adhere to infection prevention and PPE use procedures must not provide care for patients with VHF.

Staff consideration

Certain health conditions may preclude HCW from providing direct care for patients with VHF and must be taken into consideration when allocating HCW. These may include:

- medical conditions that could affect their ability to exit the room quickly and safely, or may require another HCW to enter the room to provide urgent medical assistance (e.g. seizure disorder, hypoglycaemia)
- inability to safely don or doff recommended PPE (e.g. claustrophobia, significant anxiety, body morphology, mobility issues)
- non-intact skin (from dermatitis, abrasions, wounds, etc)
- underlying conditions that affect immune competence
- pregnancy (no evidence currently exists to suggest that pregnant women are more susceptible to infection from VHF than the general population. Pregnant women are likely to be at increased risk of severe illness and death when infected with VHF. Pregnant women with VHF also appear to be at an increased risk of foetal loss and pregnancy-associated haemorrhage).[3, 12]

Donning

PPE must be donned in the correct order before entry into the patient care area.

PPE should not be modified while in the patient care area (except for the outer pair of gloves).

The PPE trained observer must supervise each step of every PPE donning and doffing procedure to ensure correct completion. The trained observer must complete a checklist to monitor for compliance with the approved procedure for donning PPE.

During patient care

PPE must remain in place and be worn correctly for the duration of work in potentially contaminated areas.

The trained observer must monitor the HCW at all times while the HCW is in the patient's room for any breaches in PPE and be aware of the exposure management plan in the event of a PPE breach.

If during patient care any breach of PPE occurs (e.g. a tear develops in the inner and outer gloves, a needlestick injury occurs) the HCW must immediately leave the patient care area to assess the exposure. The HCW must doff PPE under the direction of the trained observer and the facility occupational exposure management procedure must be implemented.

Visibly contaminated outer gloves can be doffed in the patient room and disposed as clinical waste. The HCW must first decontaminate the outer gloves using a disinfectant wipe, doff the outer gloves, use an alcohol-based hand rub (ABHR) or disinfectant wipes on the inner gloves and don fresh gloves. Patient care can then continue.

HCW should perform frequent decontamination of gloved hands using an ABHR or disinfectant wipes.

Doffing

Doffing PPE is a high-risk process. The PPE trained observer must supervise each step of every PPE doffing procedure to ensure correct completion.

The trained observer must complete a checklist to monitor for compliance to the approved order and procedure for doffing PPE.

The trained observer must immediately alert the HCW to any actions that may lead to self-contamination.

It is recommended that a third trained HCW be available to assist the HCW during the process of doffing PPE, particularly when doffing a powered air-purifying respirator (PAPR).

Role of PPE Trained Observer (PPE TO)

The PPE TO must read aloud each donning and doffing step in the procedure checklist, visually confirm and document that the step has been correctly completed.

The PPE TO must be knowledgeable about all PPE required and the correct donning and doffing procedure, including disposal.

The PPE TO must provide immediate corrective instruction if the HCW is not following the recommended steps.

The PPE TO may assist with donning PPE as required e.g. fastening gown at the back.

The PPE TO must only provide physical assistance during PPE doffing if required to avoid self-contamination by the HCW.

The PPE TO must always monitor the HCW when they are in the patient's room for any breaches in PPE and be aware of the exposure management plan in the event of a PPE breach.

Upon exit from the patient care environment, the PPE TO should visually check all PPE worn by the HCW for damages or tears.

The PPE TO must wear PPE as listed in this Appendix.

The PPE TO must document the donning and doffing procedures according to the checklists, as well as any observed breaches to PPE and advice on further action.

Role of the PPE doffing assistant (as required)

A PPE doffing assistant role is optional and may be helpful in some circumstances, for example, if PAPR is used, or the HCW has difficulty doffing PPE safely due to physical limitations. If used, the PPE doffing assistant role must always be in addition to the PPE TO, that is, the PPE TO should not be involved in providing physical assistance with the doffing of PPE.

- The PPE doffing assistant must wear PPE as listed in this Appendix (same PPE as the PPE TO).
- The PPE doffing assistant may assist the HCW in doffing of PPE only under the direction of the PPE TO.
- The PPE doffing assistant must also be supervised in the donning and doffing of PPE by the PPE TO.

Required facilities and equipment

The facility must designate two separate areas for donning and doffing of PPE. These areas must be separate from the patient care area and there should be a predominantly one-way flow from the PPE donning area to the patient care area to the PPE doffing area. There must be sufficient space in the doffing area to allow freedom of movement for safe doffing of PPE.

The doffing area must also include a large clinical waste receptacle, a new glove supply, ABHR, detergent/disinfectant wipes, and a chair or stool. If PAPR are being used, there must also be a receptacle (labelled as INFECTION RISK) designated for collecting PAPR components for reprocessing. Facilities must ensure that clean and contaminated areas are clearly separated and signed. Signage must be used to clearly designate the patient care area, donning area, and the PPE doffing area.

PPE and attire For HCW

A facility must select and standardise the PPE to be used by all HCW who are caring for patients with VHF. Facilities must select standardised attire to be worn under PPE (e.g. disposable/facility laundered surgical scrubs, if fluid-resistant footwear is to be provided or if HCW are to wear their own fluid-resistant shoes).

Facilities must select one of the following impermeable garment options and apply this consistently across the facility:

- Long sleeved single-use disposable fluid resistant or impermeable gown that extends to at least mid-calf and overlaps to cover the back.

OR

- Single use disposable fluid resistant or impermeable coveralls with or without an integrated head covering.

A Cochrane Systematic Review performed in 2019 did not find evidence to preference either coveralls or gowns.[23] For the purposes of this statewide guidance, gowns are preferred to coveralls, as gowns are available as a standard item of PPE and available evidence supports their use. If a facility chooses to use coveralls, it is necessary for the facility to procure and store the coveralls locally.

PPE requirements

Contact (enhanced) and airborne precautions are required for the management of patients under investigation for, or confirmed to have VHF.

There are two levels of PPE required, depending on the clinical status of the patient, and whether they are confirmed to have VHF or are under investigation.

As part of contact precautions, it is recommended that facility laundered surgical scrubs are worn by HCW instead of their uniform or street clothes.

Aerosol generation via procedures or patient behaviours can be difficult to predict, especially in late stages of disease, and contingent PPE should be applied.

Tier one PPE – **ONLY** for clinically stable patients with dry symptoms under investigation

Under investigation - clinically stable patient with dry symptoms only

For patients who are under investigation for VHF who are clinically stable, presenting with dry symptoms such as fever, aches, pains, sore throat, loss of appetite and fatigue, without bleeding, vomiting or diarrhoea the PPE required for transmission-based precautions is:

- Long-sleeved single-use disposable fluid-resistant or impermeable gown[3] (AAMI fluid-resistant rating of Level 3 or Level 4) that extends to at least mid-calf and overlaps to cover the back.
- Two pairs of non-sterile long-cuff gloves (nitrile gloves are preferable over latex, inside gloves must not be removed while inside the patient care area).
- Particulate filter respirator (PFR).[7, 20, 22]
- Single-use full-length face shield (to be applied over any prescription glasses).[7, 20, 22]

*Facilities may choose to use coveralls rather than gowns. If used, coveralls must be single use, disposable, fluid-resistant or impermeable, with or without an integrated head covering. If a coverall with an exposed zipper is used, a single-use, fluid resistant or impermeable apron should be used routinely to cover the zipper. A Cochrane Systematic Review performed in 2019 did not find evidence to preference either coveralls or gowns.[23] For the purposes of this statewide guidance, gowns are preferred to coveralls, as gowns are available as a standard item of PPE and available evidence supports their use. If a facility chooses to use coveralls, it is necessary for the facility to procure and store the coveralls locally.

Tier two PPE

Under investigation - clinically unstable patients with wet symptoms

Confirmed - ALL confirmed VHF cases

For patients who are confirmed to have VHF, OR who are under investigation and are clinically unstable and presenting with wet symptoms such as bleeding, vomiting or diarrhoea the PPE required for transmission-based precautions is as above, PLUS:

- Fluid resistant or impermeable boot covers that extend to at least mid-calf.
- Hood that covers all hair and the ears and covers the exposed skin of the neck (such as a surgical hood[4])
- Fluid-resistant shoes that can be wiped over are recommended.

While not essential, particularly if no PPE breach has occurred, HCW who have performed prolonged or high-risk patient care should be offered shower facilities and fresh scrubs (or own clothes at end of shift).[20]

Refer to Queensland Health guidance on particulate filter respirators for detailed advice on respiratory protective equipment.

Additional recommendation

The HCW may consider the use of a single-use fluid-resistant or impermeable apron that covers the torso to the level of mid-calf if the patient is vomiting, has diarrhoea or is bleeding. **N.B.** If using a coverall with an exposed zipper or a gown that does not have a fluid-resistant rating of Level 3 or Level 4, a single-use fluid-resistant or impermeable apron should be used routinely.

If powered air-purifying respirators are to be used, refer to CleanSpace® HALO powered air-purifying respirator (PAPR) implementation guidance for advice.

Required PPE for PPE TO and PPE doffing assistant

Required PPE includes:

- Long-sleeved single-use disposable fluid-resistant or impermeable gown that extends to at least mid-calf.
- Single-use full-length face shield (to be applied over any prescription glasses).
- Single-use surgical mask.
- Two pairs of single-use non-sterile long-cuff gloves.
- Fluid-resistant or impermeable single-use ankle-high shoe covers.

Additional considerations for HCW, PPE TO and PPE assistant

If the PPE TO is required to enter the patient care environment, PPE as for the HCW must be worn, and the same donning and doffing process must be undertaken by an additional PPE TO.

At the commencement of their shift HCW, PPE TO and PPE assistant must change into scrubs and be wearing fluid-resistant shoes that can be wiped over. IF fluid-resistant shoes are not available, fluid-resistant shoe covers must be applied over personal shoes, in addition to boot covers (for the HCW).

All personal items must be doffed and left outside the patient care area (e.g. jewellery, watches, mobile phones, pagers, pens).

Hair must be tied back out of the face and eyes; this should include fringes.

Recommended sequences for donning and doffing PPE

The checklists on the following pages provide procedures for donning and doffing PPE. The checklists may be used for both Tier 1 and Tier 2, as they specify the PPE items that are used for Tier 2 only. Checklists for both donning and doffing are available for the following combinations of PPE selections:

Gown and particulate filter respirator (PFR) option

Checklist 1a: Donning process

Checklist 1b: Doffing process

Gown and powered air-purifying respirator (PAPR) option

Checklist 2a: Donning process

Checklist 2b: Doffing process

Coverall and PFR option

Checklist 3a: Donning process

Checklist 3b: Doffing process

Coverall and PAPR option

Checklist 4a: Donning process

Checklist 4b: Doffing process

PPE trained observer (TO) and PPE doffing assistant

Checklist 5a: Donning process

Checklist 5b: Doffing process

Checklist 1a: Donning process, gown and PFR option

The donning procedure outlined below assumes the facility has elected to use long sleeved single-use disposable fluid resistant or impermeable gowns and PFRs.

The PPE trained observer (PPE TO) must check each step of the process is actioned in the listed order and complete this checklist.

Date	Time	Patient ID
Healthcare worker name		Initial
PPE TO name		Initial

Step		Description and further information	Check
1	HCW wellbeing check	Take a moment to check whether the HCW needs to have something to eat or drink or go to the toilet before donning PPE.	
2	Readiness check	All medication or other therapeutics and equipment required for patient care is ready to be taken into room.	
3	HCW is wearing scrubs and fluid-resistant shoes and all personal items are doffed.	HCW is wearing scrubs and fluid-resistant shoes. All personal clothing and items are doffed. This includes all jewellery (including wedding band), watch, ID tag, communication devices, pens. Hair is tied back and out of face and eyes (including fringes). Prescription glasses are secured to face or head, for example with medical/surgical tape.	
4	Engage PPE TO	The donning process must be guided and supervised by the PPE TO who confirms visually that all PPE is serviceable and has been donned correctly. The PPE TO reviews the donning sequence with the HCW before the HCW begins and reads aloud the following steps to the HCW step-by-step.	
5	Perform hand hygiene	HCW performs hand hygiene with alcohol-based hand rub (ABHR). Allow hands to dry before moving to next step.	
6	Visually inspect all PPE	All required items are available. All items are complete, intact and in a serviceable condition. Correct sizes are available for the HCW.	
7	Perform donning process in a designated area	The PPE donning designated area must be separate from the PPE doffing area. ABHR and a chair or stool are available in the donning area.	
8	Put on boot covers **(Tier 2 only)**	HCW sits on chair or stool and puts on boot covers that extend to at least mid-calf.	

9	Perform hand hygiene	HCW performs hand hygiene with ABHR. Allow hands to dry before moving to next step.	
10	Put on inner gloves	HCW puts on first pair of long-cuffed gloves.	
11	Put on gown	HCW puts on gown, ensuring the gown is large enough to cover back and allow unrestricted freedom of movement without gaping. Ensure cuffs of inner gloves are tucked under the sleeve of the gown. Secure gown at neck and waist.	
12	Put on PFR	HCW puts on PFR. Perform fit check according to manufacturer's instructions. Adjust, if necessary, until fit check is successful.	
13	Put on hood and ensure that the ears and neck are covered **(Tier 2 only)**	Over the PFR, place a hood that covers all of the hair and the ears. Ensure the hood extends past the neck to the shoulders. Ensure the hood completely covers the ears and neck.	
14	Put on outer apron (if used)	HCW puts on a disposable apron (if the patient has vomiting, diarrhoea or bleeding). The apron should be large enough to cover the front of the body and legs to mid-calf.	
15	Put on face shield	HCW puts on full face shield over the PFR and hood. The face shield must cover well below the chin.	
16	Perform hand hygiene	HCW uses ABHR on inner gloves. Allow hands to dry before moving to next step.	
17	Put on outer gloves	HCW puts on outer gloves (long cuff gloves) ensuring that the cuffs of the gloves are pulled over the cuffs of the gown.	
18	STOP and CHECK	PPE TO verifies the integrity of all items of PPE, and that all PPE items are appropriately placed and secured. HCW should be able to extend arms, bend at waist and perform appropriate ranges of motion for patient care.	

Checklist 1b: Doffing process, gown and PFR option

The doffing procedure outlined below assumes the facility has elected to use single use disposable fluid resistant or impermeable gowns and PFRs.

The PPE trained observer (TO) must check each step of the process is actioned in the listed order and complete this checklist.

The doffing process must be guided and supervised by the PPE TO who confirms visually that all PPE is doffed correctly.

Date	Time	Patient ID
Healthcare worker name		Initial
PPE TO name		Initial
PPE assistant name		Initial

Step		Description and further information	Check
PRIOR TO HCW EXITING PATIENT CARE AREA			
1	Ensure PPE doffing area is ready	Ensure required supplies are available in PPE doffing area: • Chair or stool • Alcohol-based hand rub (ABHR) • Disinfectant wipes • Supply of long-cuff gloves • Large clinical waste receptacle • Large absorbent mat secured to the floor.	
2	PPE TO and PPE doffing assistant don PPE	PPE TO and PPE doffing assistant must wear the below PPE: • Long sleeved single-use disposable fluid resistant or impermeable gown that extends to at least mid-calf • Single use full-length face shield (to be applied over any prescription glasses) • Single use surgical mask • Two pairs of non-sterile long cuff gloves • Fluid resistant or impermeable ankle-high shoes covers. PPE TO and PPE assistant must don and doff PPE using same process as HCW entering patient care area.	
3	Remind HCW to take care	Before the doffing of any PPE, the PPE TO must remind HCW to work slowly and deliberately in PPE doffing and to avoid touching their face. The PPE TO reviews the PPE doffing sequence with the HCW before the HCW begins and reads aloud the following actions to the HCW step-by-step.	
4	HCW to disinfect outer gloves	HCW to disinfect outer gloves with ABHR or disinfectant wipe. If used, discard disinfectant wipe into clinical waste receptacle in patient care area.	
5	HCW to doff apron	HCW to doff apron (if worn) prior to leaving patient care area.	

		Doff apron by rolling from the inside to outside. Discard apron into clinical waste in patient care area.	
6	HCW to disinfect outer gloves	If apron worn and doffed, HCW to disinfect outer gloves again with ABHR or disinfectant wipe. If used, discard disinfectant wipe into clinical waste receptacle in patient care area.	
7	HCW exit patient care area	HCW exits patient care area and steps into PPE doffing area.	
FOLLOWING HCW EXIT FROM PATIENT CARE AREA			
8	Inspect PPE	PPE TO to visually inspect HCW PPE for any cuts, tears, or visible contamination. If visible contamination is present, HCW or PPE doffing assistant must disinfect the affected area using a disinfectant wipe. The PPE TO must record any breaches of PPE and *further action is required* to assess for potential occupational exposure.	Further action required? Y /N If yes, record below
9	HCW to disinfect and doff outer gloves	Disinfect outer gloves using ABHR or disinfectant wipe. Doff and discard into clinical waste receptacle in PPE doffing area.	
10	Inspect and disinfect inner gloves	PPE TO to inspect inner gloves for cuts, tears or visible contamination. • If there is visible contamination, disinfect inner gloves using ABHR or disinfectant wipe, doff inner gloves, use ABHR on bare hands and don a new pair of gloves. • If a cut or tear is present on the inner gloves this is a PPE breach and further action is required for potential occupational exposure. • If there is no cut, tear, or visible contamination, disinfect inner gloves and leave gloves in place for next steps.	Further action required? Y /N If yes, record below
11	Doff face shield	HCW to doff face shield. Bend forward Grasp the rear strap of the face shield and undo/pull gently over head, allowing face shield to fall forward, then discard. Avoid touching the front of the face shield. Discard into clinical waste receptacle in PPE doffing area.	
12	Disinfect inner gloves	Use ABHR or disinfectant wipe to disinfect gloves and leave gloves in place for next steps.	
13	Doff hood **(Tier 2 only)**	HCW to doff hood: • Hood with ties: unfasten hood, gently doff and discard.	

		• Pullover hood: tilt head down, grasp the hood at the crown of the head and pull the hood over in a slow continuous movement. Take care not to drag outer surface of the hood over the face. Discard into clinical waste receptacle in PPE doffing area.	
14	Disinfect inner gloves	Use ABHR or disinfectant wipe to disinfect gloves and leave gloves in place for next steps.	
15	Doff gown	Unfasten gown: PPE assistant may unfasten the gown if required. Remove the gown by pulling it away from the body and rolling it in on itself. At all times, the HCW should take care to avoid contact with their clothing or skin during the gown removal. Discard into clinical waste receptacle in PPE doffing area.	
16	Disinfect inner gloves	Use ABHR or disinfectant wipe to disinfect gloves and leave gloves in place for next steps.	
17	Doff boot covers **(Tier 2 only)**	Sit on chair/stool. Avoid touching the boot covers with your forearms, while you untie the ties of both boot covers. Disinfect the inner gloves and remove these gloves. Perform hand hygiene on bare hands and apply a new pair of gloves for the next steps. Place both hands inside the top of one boot cover and grasp the inside of some of the material. Without touching the outer material of the boot cover, roll the top down to form a clean cuff. With both hands inside the clean cuff, push the boot cover down to the shoe, then push the boot cover off the foot, remaining careful to not touch the outside of the boot cover, or contaminate the leg or scrub pants. Discard into clinical waste receptacle in PPE doffing area. Disinfect the inner gloves and remove these gloves. Perform hand hygiene on bare hands and apply a new pair of gloves for the next steps. Repeat the process for the second boot cover.	
18	Disinfect and change inner gloves	Use ABHR or disinfectant wipe to disinfect gloves. Doff gloves and discard into clinical waste receptacle in PPE doffing area. Use ABHR on bare hands and don a new pair of gloves for next steps.	
19	Doff respirator	Doff the PFR by tilting head slightly forward, grasping first the bottom elastic strap, then the top elastic strap, and doff in one smooth motion without touching the front of the PFR. Discard into clinical waste receptacle in PPE doffing area	

20	Disinfect inner gloves	Use ABHR or disinfectant wipe to disinfect gloves and leave gloves in place for next steps.	
21	Disinfect fluid-resistant shoes	Use disinfectant wipe to disinfect all outer surfaces of fluid-resistant shoes.	
22	Disinfect and doff inner gloves	Use ABHR or disinfectant wipe to disinfect gloves. Doff and discard into clinical waste receptacle in PPE doffing area.	
23	Perform hand hygiene with ABHR	Use ABHR to perform hand hygiene on bare hands.	
24	Final inspection	Both the PPE TO and the HCW inspect the HCW for any indication of contamination of scrubs, shoes or person. If contamination is identified the garments should be doffed carefully and the HCW should immediately shower. *Further action is required* to assess for potential occupational exposure.	Further action required? Y /N If yes, record below
25	HCW can exit	HCW can leave the PPE doffing area wearing scrubs and plastic/rubber footwear.	
26	Is further action required?	If a PPE breach was identified, immediately follow local procedures for management of potentially exposed HCW. Guidance can be found in the *Guideline for Infection control and prevention for the management of Viral Haemorrhagic Fevers.*	Further action required? Y /N If yes, record below
Further action taken:			

Checklist 2a: Donning process, gown and PAPR option

The donning procedure outlined below assumes the facility has elected to use long sleeved single-use disposable fluid resistant or impermeable gowns and PAPR.

The PPE trained observer (TO) must check each step of the process is actioned in the listed order and complete this checklist.

Date	Time	Patient ID
Healthcare worker name		Initial
PPE TO name		Initial

Step		Description	Check
1	HCW wellbeing check	Take a moment to check whether the HCW needs to have something to eat or drink or go to the toilet before donning PPE.	
2	Readiness check	All medication or other therapeutics and equipment required for patient care is ready to be taken in to room.	
3	HCW is wearing scrubs and dedicated fluid-resistant shoes and all personal items are doffed.	HCW is wearing scrubs and dedicated plastic or fluid-resistant shoes. All personal clothing and items are doffed. This includes all jewellery (including wedding band), watch, ID tag communication devices, pens. Hair is tied back and out of face and eyes (including fringes). Prescription glasses are secured to face or head, for example with medical/surgical tape.	
3	Engage PPE TO	The donning process must be guided and supervised by the PPE TO who confirms visually that all PPE is serviceable and has been donned correctly. The PPE TO reviews the donning sequence with the HCW before the HCW begins and reads aloud the following actions to the HCW step-by-step.	
5	Perform hand hygiene	HCW performs hand hygiene with alcohol-based hand rub (ABHR). Allow hands to dry before moving to next step.	
6	Visually inspect all PPE	All required items are available. All items are complete, intact and in serviceable condition. Correct sizes are available for the HCW.	
7	Perform donning process in a designated area	The PPE donning designated area must be separate from the PPE doffing area. ABHR and a chair or stool should be available in the donning area.	
8	Put on boot covers **(Tier 2 only)**	HCW sits on chair or stool and puts on boot covers that extend to at least mid-calf.	
9	Perform hand hygiene	HCW performs hand hygiene with ABHR. Allow hands to dry before moving to next step.	
10	Put on inner gloves	HCW puts on first pair of long-cuffed gloves.	

11	Put on gown	HCW puts on gown, ensuring the gown is large enough to cover back and allow unrestricted freedom of movement without gaping. Ensure cuffs of inner gloves are tucked under the sleeve of the gown. Secure gown at neck and waist.	
12	Put on hood and ensure that the ears and neck are covered **(Tier 2 only)**	Put on a hood that covers all of the hair and the ears. Ensure the hood completely covers the ears and neck.	
13	Put on respirator	HCW puts on PAPR as per Guideline for CleanSpace HALO .	
14	Put on outer apron (if used)	HCW puts on a disposable apron (if the patient has vomiting, diarrhoea or bleeding). The apron should be large enough to cover the front of the body and legs to mid-calf.	
15	Put on face shield	HCW puts on full face shield over the PAPR and hood. The face shield must cover well below the chin.	
16	Perform hand hygiene	HCW perfoms hand hygiene with ABHR. Allow hands to dry before moving to next step.	
17	Put on outer gloves	HCW puts on outer gloves (long cuff gloves) ensuring that the cuffs of the gloves are pulled over the cuffs of the gown.	
18	STOP and CHECK	PPE TO verifies the integrity of all items of PPE, and that all PPE items are appropriately placed and secured. HCW should be able to extend arms, bend at waist and perform appropriate ranges of motion for patient care.	

Checklist 2b: Doffing process, gown and PAPR option

The doffing procedure outlined below assumes the facility has elected to use single use disposable fluid resistant or impermeable gowns and PAPR.

The PPE trained observer (TO) must check each step of the process actioned in the listed order and complete this checklist.

The doffing process must be guided and supervised by the PPE TO who confirms visually that all PPE is doffed correctly.

Date	Time	Patient ID
Healthcare worker name		Initial
PPE TO name		Initial
PPE assistant name		Initial

Step	Description		Check
PRIOR TO HCW EXITING PATIENT CARE AREA			
1	Ensure PPE doffing area is ready	Ensure required supplies are available in PPE doffing area: • Chair or stool • Alcohol-based hand rub (ABHR) • Disinfectant wipes • Supply of long-cuff gloves • Large clinical waste receptacle • Large receptacle designated for collection of reusable PAPR components for reprocessing • Large absorbent mat secured to the floor.	
2	PPE TO, and PPE doffing assistant don PPE	PPE TO and PPE doffing assistant must wear the below PPE: • Long-sleeved single-use disposable fluid-resistant or impermeable gown that extends to at least mid-calf • Single-use full-length face shield (to be applied over any prescription glasses) • Single-use surgical mask • Two pairs of non-sterile long cuff gloves • Fluid-resistant or impermeable ankle-high shoe covers. PPE TO and PPE assistant must don and doff PPE using same process as HCW entering patient care area.	

3	Remind HCW to take care	Before the doffing of any PPE, the PPE TO must remind HCW to work slowly and deliberately in PPE doffing and to avoid touching their face. The PPE TO reviews the PPE doffing sequence with the HCW before the HCW begins and reads aloud the following actions to the HCW step-by-step.	
4	HCW to disinfect outer gloves	HCW to disinfect outer gloves with ABHR or disinfectant wipe. If used, discard disinfectant wipe into clinical waste receptacle in patient care area.	
5	HCW to doff apron	HCW to doff apron (if worn) prior to leaving patient care area. Doff apron by rolling from the inside to outside. Discard apron into clinical waste in patient care area.	
6	HCW to disinfect outer gloves	If apron worn and doffed, HCW to disinfect outer gloves again with ABHR or disinfectant wipe. If used, discard disinfectant wipe into clinical waste receptacle in patient care area.	
7	HCW exits patient care area	HCW exits patient care area and steps into PPE doffing area.	
FOLLOWING HCW EXIT FROM PATIENT CARE AREA			
8	Inspect PPE	PPE TO to visually inspect HCW PPE for any cuts, tears, or visible contamination. If visible contamination is present, HCW or PPE doffing assistant must disinfect the affected area using a disinfectant wipe. The PPE TO must record any breaches of PPE and *further action is required* to assess for potential occupational exposure.	Further action required? Y /N If yes, record below
9	HCW to disinfect and doff outer gloves	Disinfect outer gloves using ABHR or disinfectant wipe. Doff and discard into clinical waste receptacle in PPE doffing area	
10	Inspect and disinfect inner gloves	PPE TO to inspect inner gloves for cuts, tears or visible contamination. • If there is visible contamination, disinfect inner gloves using ABHR or disinfectant wipe, doff inner gloves, use ABHR on bare hands and don a new pair of gloves. • If a cut or tear is present on the inner gloves this is a PPE breach and further action is required for potential occupational exposure. Disinfect inner gloves using ABHR or disinfectant wipe, doff inner gloves, use ABHR on bare hands and don a new pair of gloves. • If there is no cut, tear, or visible contamination, disinfect inner gloves and leave gloves in place for next steps.	Further action required? Y /N If yes, record below

11	Doff face shield	HCW to doff face shield. • Bend forward • Grasp the rear strap of the face shield and undo/pull gently over head, allowing face shield to fall forward, then discard. Avoid touching the front of the face shield. Discard into clinical waste receptacle in PPE doffing area.	
12	Disinfect inner gloves	Use ABHR or disinfectant wipe to disinfect gloves and leave gloves in place for next steps.	
13	Doff respirator	Doff PAPR as per Guideline for CleanSpace HALO	
14	Disinfect inner gloves	Use ABHR or disinfectant wipe to disinfect gloves and leave gloves in place for next steps.	
15	Doff hood **(Tier 2 only)**	HCW to doff hood: • Hood with ties: unfasten hood, gently doff and discard. • Pullover hood: tilt head down, grasp the hood at the crown of the head and pull the hood over in a slow continuous movement. Take care not to drag outer surface of the hood over the face. Discard into clinical waste receptacle in PPE doffing area.	
16	Disinfect inner gloves	Use ABHR or disinfectant wipe to disinfect gloves and leave gloves in place for next steps.	
17	Doff gown	Unfasten gown: PPE assistant may unfasten the gown if required. Remove the gown by pulling it away from the body and rolling it in on itself. At all times, the HCW should take care to avoid contact with their clothing or skin during the gown removal. Discard into clinical waste receptacle in PPE doffing area.	
18	Disinfect inner gloves	Use ABHR or disinfectant wipe to disinfect gloves and leave gloves in place for next steps.	
19	Doff boot covers **(Tier 2 only)**	Sit on chair/stool. Avoid touching the boot covers with your forearms, while you untie the ties of both boot covers. Disinfect the inner gloves and remove these gloves. Perform hand hygiene on bare hands and apply a new pair of gloves for the next steps. Place both hands inside the top of one boot cover and grasp the inside of some of the material. Without touching the outer material of the boot cover, roll the top down to form a clean cuff. With both hands inside the clean cuff, push the boot cover down to the shoe, then push the boot cover off the foot, remaining careful to not touch the outside of the boot cover, or contaminate the leg or scrub pants. Discard into clinical waste receptacle in PPE doffing area.	

		Disinfect the inner gloves and remove these gloves. Perform hand hygiene on bare hands and apply a new pair of gloves for the next steps. Repeat the process for the second boot cover.	
20	Disinfect inner gloves	Use ABHR or disinfectant wipe to disinfect gloves and leave gloves in place for next steps.	
21	Disinfect fluid-resistant shoes	Use disinfectant wipe to disinfect all outer surfaces of fluid-resistant shoes.	
22	Disinfect and doff inner gloves	Use ABHR or disinfectant wipe to disinfect gloves. Doff and discard into clinical waste receptacle in PPE doffing area.	
23	Perform hand hygiene with ABHR	Use ABHR to perform hand hygiene on bare hands.	
24	Final inspection	Both the PPE TO and the HCW inspect the HCW for any indication of contamination of scrubs, shoes or person. If contamination is identified the garments should be doffed carefully and the HCW should immediately shower. *Further action is required* to assess for potential occupational exposure.	Further action required? Y /N If yes, record below
25	HCW can exit	HCW can leave the PPE doffing area wearing scrubs and footwear.	
26	Is further action required?	If a PPE breach was identified, immediately follow local procedures for management of potentially exposed HCW. Guidance can be found in the *Guideline for Infection control and prevention for the management of Viral Haemorrhagic Fevers*	Further action required? Y /N If yes, record below
Further action taken:			

Checklist 3a: Donning process, coverall and PFR option

The donning procedure outlined below assumes the facility has elected to use single-use disposable fluid-resistant or impermeable coveralls with or without an integrated head covering and PFRs.

The PPE trained observer (TO) must check each step of the process is actioned in the listed order and complete this checklist.

Date	Time	Patient ID
Healthcare worker name		Initial
PPE TO name		Initial

Step		Description	Check
1	HCW wellbeing check	Take a moment to check whether the HCW needs to have something to eat or drink or go to the toilet before donning PPE.	
2	Readiness check	All medication or other therapeutics and equipment required for patient care is ready to be taken in to room.	
3	HCW is wearing scrubs and fluid-resistant shoes and all personal items are doffed.	HCW is wearing scrubs and fluid-resistant shoes. All personal clothing and items are doffed. This includes all jewellery (including wedding band), watch, ID tag, communication devices, pens. Hair is tied back and out of face and eyes (including fringes). Prescription glasses are secured to face or head, for example with medical/surgical tape.	
4	Engage PPE TO	The donning process must be guided and supervised by the PPE TO who confirms visually that all PPE is serviceable and has been donned successfully. The PPE TO reviews the donning sequence with the HCW before the HCW begins and reads aloud the following actions to the HCW step-by-step.	
5	Perform hand hygiene	HCW performs hand hygiene with alcohol-based hand rub (ABHR). Allow hands to dry before moving to next step.	
6	Visually inspect all PPE	All required items are available. All items are complete, intact and in serviceable condition. All sizes available are correct for the HCW.	
7	Perform donning process in a designated area	The PPE donning designated area must be separate from the PPE doffing area. ABHR and a chair or stool should be available in the donning area.	
8	Put on boot covers **(Tier 2 only)**	HCW sits on chair or stool and puts on boot covers that extend to at least mid-calf.	
9	Perform hand hygiene	HCW performs hand hygiene with ABHR. Allow hands to dry before moving to next step.	
10	Put on inner gloves	HCW puts on first pair of long-cuffed gloves.	

11	Put on coverall	HCW puts on coverall, ensuring the coverall is large enough to allow unrestricted freedom of movement. Ensure cuffs of inner gloves are tucked under the sleeve of the coverall. Secure coverall zipper.	
12	Put on PFR	HCW puts on a PFR. Perform fit check according to manufacturer's instructions. Adjust, if necessary, until fit check is successful.	
13	Put on hood and ensure that the ears and neck are covered **(Tier 2 only)**	Over the PFR, place a hood that covers all of the hair and the ears. Ensure the hood extends past the neck to the shoulders. Ensure the hood completely covers the ears and neck.	
14	Put on outer apron (if used)	HCW puts on a disposable apron if the patient has vomiting, diarrhoea or bleeding, or if the coverall has an exposed zipper. The apron should be large enough to cover the front of the body and legs to mid-calf.	
15	Put on face shield	HCW puts on full face shield over the PFR and hood. The face shield must cover well below the chin.	
16	Perform hand hygiene	HCW performs hand hygiene with ABHR. Allow hands to dry before moving to next step.	
17	Put on outer gloves	HCW puts on outer gloves (long cuff gloves) ensuring that the cuffs of the gloves are pulled over the cuffs of the gown.	
18	STOP and CHECK	PPE TO verifies the integrity of all items of PPE, and that all PPE items are appropriately placed and secured. HCW should be able to extend arms, bend at waist and perform appropriate ranges of motion for patient care.	

Checklist 3b: Doffing process, coverall and PFR option

The doffing procedure outlined below assumes the facility has elected to use single use disposable fluid-resistant or impermeable coveralls and PFRs

The PPE trained observer (TO) must check each step of the process is actioned in the listed order and complete this checklist.

The doffing process must be guided and supervised by the PPE TO who confirms visually that all PPE is doffed correctly.

Date	Time	Patient ID
Healthcare worker name		Initial
PPE TO name		Initial
PPE assistant name		Initial

Step		Description	Check
PRIOR TO HCW EXITING PATIENT CARE AREA			
1	Ensure PPE doffing area is ready	Ensure required supplies are available in PPE doffing area: • Chair or stool • Alcohol-based hand rub (ABHR) • Disinfectant wipes • Supply of long-cuff gloves • Large clinical waste receptacle • Large absorbent mat secured to the floor.	
2	PPE TO, and PPE doffing assistant don PPE	PPE TO and PPE doffing assistant must wear the below PPE: • Long sleeved single-use disposable fluid resistant or impermeable coverall • Single use full-length face shield (to be applied over any prescription glasses) • Single use surgical mask • Two pairs of non-sterile long cuff gloves • Fluid resistant or impermeable ankle-high shoe covers. PPE TO and PPE assistant must don and doff PPE using same process as HCW entering patient care area.	
3	Remind HCW to take care	Before the doffing of any PPE, the PPE TO must remind HCW to work slowly and deliberately in PPE doffing and to avoid touching their face. The PPE TO reviews the PPE doffing sequence with the HCW before the HCW begins and reads aloud the following steps to the HCW step-by-step.	
4	HCW to disinfect outer gloves	HCW to disinfect outer gloves with ABHR or disinfectant wipe. If used, discard disinfectant wipe into clinical waste receptacle in patient care area.	
5	HCW to doff apron	HCW to doff apron prior to leaving patient care area. Doff apron by rolling from the inside to outside.	

		Discard apron into clinical waste in patient care area.	
6	HCW to disinfect outer gloves	If apron worn and doffed, HCW to disinfect outer gloves again with ABHR or disinfectant wipe. If used, discard disinfectant wipe into clinical waste receptacle in patient care area.	
7	HCW exit patient care area	HCW exits patient care area and steps into PPE doffing area.	
FOLLOWING HCW EXIT FROM PATIENT CARE AREA			
8	Inspect PPE	PPE TO to visually inspect HCW PPE for any cuts, tears, or visible contamination. If visible contamination is present, HCW or PPE doffing assistant must disinfect the affected area using a disinfectant wipe. The PPE TO must record any breaches of PPE and *further action is required* to assess for potential occupational exposure.	Further action required? Y /N If yes, record below
9	HCW to disinfect and doff outer gloves	Disinfect outer gloves using ABHR or disinfectant wipe. Doff and discard into clinical waste receptacle in PPE doffing area.	
10	Inspect and disinfect inner gloves	PPE TO to inspect inner gloves for cuts, tears or visible contamination. • If there is visible contamination, disinfect inner gloves using ABHR or disinfectant wipe, doff inner gloves, use ABHR on bare hands and don a new pair of gloves. • If a cut or tear is present on the inner gloves this is a PPE breach and further action is required for potential occupational exposure. Disinfect inner gloves using ABHR or disinfectant wipe, doff inner gloves, use ABHR on bare hands and don a new pair of gloves. • If there is no cut, tear, or visible contamination, disinfect inner gloves and leave gloves in place for next steps.	Further action required? Y /N If yes, record below
11	Doff face shield	HCW to doff face shield. • Bend forward • Grasp the rear strap of the face shield and undo/pull gently over head, allowing face shield to fall forward, then discard. Avoid touching the front of the face shield. Discard into clinical waste receptacle in PPE doffing area.	
12	Disinfect inner gloves	Use ABHR or disinfectant wipe to disinfect gloves and leave gloves in place for next steps.	
13	Doff hood (if separate from coverall) **(Tier 2 only)**	HCW to doff hood: • Hood with ties: unfasten hood, gently doff and discard. • Pullover hood: tilt head down, grasp the hood at the crown of the head and pull the hood over in a slow continuous movement. Take care not to drag outer surface of the hood over the face.	

		Discard into clinical waste receptacle in PPE doffing area.	
14	Disinfect inner gloves	Use ABHR or disinfectant wipe to disinfect gloves and leave gloves in place for next steps.	
15	Doff coverall	For coverall with hood attached: • To unfasten coverall, tilt head back to reach zipper. Unzip completely. • Doff hood by grasping it with both hands, lift up and away from the head turning it inside out. • Roll coveralls down, turning them inside out. For coveralls used with a separate hood: • (Hood already doffed) • To unfasten coverall, tilt head back to reach zipper. Unzip completely. • Roll coveralls down, turning them inside out. Avoid contact of skin or scrubs with outer surface of coveralls during doffing. Discard into clinical waste receptacle in PPE doffing area	
16	Disinfect inner gloves	Use ABHR or disinfectant wipe to disinfect gloves and leave gloves in place for next steps.	
17	Doff boot covers **(Tier 2 only)**	Sit on chair/stool. Avoid touching the boot covers with your forearms, while you untie the ties of both boot covers. Disinfect the inner gloves and remove these gloves. Perform hand hygiene on bare hands and apply a new pair of gloves for the next steps. Place both hands inside the top of one boot cover and grasp the inside of some of the material. Without touching the outer material of the boot cover, roll the top down to form a clean cuff. With both hands inside the clean cuff, push the boot cover down to the shoe, then push the boot cover off the foot, remaining careful to not touch the outside of the boot cover, or contaminate the leg or scrub pants. Discard into clinical waste receptacle in PPE doffing area. Disinfect the inner gloves and remove these gloves. Perform hand hygiene on bare hands and apply a new pair of gloves for the next steps. Repeat the process for the second boot cover.	
18	Disinfect and change inner gloves	Use ABHR or disinfectant wipe to disinfect gloves. Doff gloves and discard into clinical waste receptacle in PPE doffing area. Use ABHR on bare hands and don a new pair of gloves for next steps.	
19	Doff respirator	Doff the PFR by tilting head slightly forward, grasping first the bottom elastic strap, then the top elastic strap, and doff in one smooth motion without touching the front of the PFR. Discard into clinical waste receptacle in PPE doffing area.	

20	Disinfect inner gloves	Use ABHR or disinfectant wipe to disinfect gloves and leave gloves in place for next steps.	
21	Disinfect fluid-resistant shoes	Use disinfectant wipe to disinfect all outer surfaces of fluid-resistant shoes.	
22	Perform hand hygiene with ABHR	Use ABHR to perform hand hygiene on bare hands.	
23	Final inspection	Both the PPE TO and the HCW inspect the HCW for any indication of contamination of scrubs, shoes or person. If contamination is identified the garments should be doffed carefully and the HCW should immediately shower. *Further action is required* to assess for potential occupational exposure.	Further action required? Y /N If yes, record below
24	HCW can exit	HCW can leave the PPE doffing area wearing scrubs and footwear.	
25	Is further action required? Y / N If yes, record action taken below	If a PPE breach was identified, immediately follow local procedures for management of potentially exposed HCW. General guidance for management of potentially exposed HCW can be found in the *Guideline for Infection control and prevention for the management of Viral Haemorrhagic Fevers*	Further action required? Y /N If yes, record below
Further action taken:			

Checklist 4a: Donning process, coverall and PAPR option

The donning procedure outlined below assumes the facility has elected to use single-use disposable fluid-resistant or impermeable coveralls with or without an integrated head covering and PAPR.

The PPE trained observer (TO) must check each step of the process is and actioned in the listed order and complete this checklist.

Date	Time	Patient ID
Healthcare worker name		Initial
Trained observer name		Initial

Step	Description		Check
1	HCW wellbeing check	Take a moment to check whether the HCW needs to have something to eat or drink or go to the toilet before donning PPE.	
2	Readiness check	All medication or other therapeutics and equipment required for patient care is ready to be taken in to room.	
3	HCW is wearing scrubs and fluid-resistant shoes and all personal items are doffed.	HCW is wearing scrubs and fluid-resistant shoes. All personal clothing and items are doffed. This includes all jewellery (including wedding band), watch, ID tag communication devices, pens. Hair is tied back and out of face and eyes (including fringes). Prescription glasses are secured to face or head, for example with medical/surgical tape.	
4	Engage trained observer	The donning process must be guided and supervised by the PPE TO who confirms visually that all PPE is serviceable and has been donned successfully. The PPE TO reviews the donning sequence with the HCW before the HCW begins and reads aloud the following actions to the HCW step-by-step.	
5	Perform hand hygiene	HCW performs hand hygiene with alcohol-based hand rub (ABHR). Allow hands to dry before moving to next step.	
6	Visually inspect all PPE	All required items are available. All items are complete, intact and in serviceable condition. Correct sizes are available for the HCW.	
7	Perform donning process in a designated area	The PPE donning designated area must be separate from the PPE doffing area. ABHR and a chair or stool should be available in the donning area.	
8	Put on boot covers **(Tier 2 only)**	HCW sits on chair or stool and puts on boot covers that extend to at least mid-calf.	

9	Perform hand hygiene	HCW performs hand hygiene with ABHR. Allow hands to dry before moving to next step.	
10	Put on inner gloves	HCW puts on first pair of long-cuffed gloves.	
11	Put on coverall	HCW puts on coverall, ensuring the coverall is large enough to allow unrestricted freedom of movement. Ensure cuffs of inner gloves are tucked under the sleeve of the coverall. Secure coverall zipper.	
12	Put on hood and ensure that the ears and neck are covered **(Tier 2 only)**	Put on a hood that covers all of the hair and the ears. Ensure the hood extends past the neck to the shoulders. Ensure the hood completely covers the ears and neck.	
13	Put on respirator	HCW puts on PAPR as per Guideline for CleanSpace HALO	
14	Put on outer apron	HCW puts on a disposable apron if the patient has vomiting, diarrhoea or bleeding, or if the coverall has an exposed zipper. The apron should be large enough to cover the front of the body and legs to mid-calf.	
15	Put on face shield	HCW puts on full face shield over the PAPR and hood. The face shield must cover well below the chin.	
16	Perform hand hygiene	HCW performs hand hygiene with ABHR. Allow hands to dry before moving to next step.	
17	Put on outer gloves	HCW puts on outer gloves (long cuff gloves) ensuring that the cuffs of the gloves are pulled over the cuffs of the coverall.	
18	STOP and CHECK	PPE TO verifies the integrity of all items of PPE, and that all PPE items are appropriately placed and secured. HCW should be able to extend arms, bend at waist and perform appropriate ranges of motion for patient care.	

Checklist 4b: Doffing process, coverall and PAPR option

The doffing procedure outlined below assumes the facility has elected to use single use disposable fluid resistant or impermeable coveralls and PAPR.

The PPE trained observer (TO) must check each step of the process is actioned in the listed order and complete this checklist.

The doffing process must be guided and supervised by the PPE TO who confirms visually that all PPE is doffed correctly.

Date	Time	Patient ID
Healthcare worker name		Initial
Trained observer name		Initial
PPE assistant name		Initial

Step		Description	Check
PRIOR TO HCW EXITING PATIENT CARE AREA			
1	Ensure PPE doffing area is ready	Ensure required supplies are available in PPE doffing area: • Chair or stool • Alcohol-based hand rub (ABHR) • Disinfectant wipes • Supply of long-cuff gloves • Large clinical waste receptacle • Large receptacle designated for collection of reusable PAPR components for reprocessing • Large absorbent mat secured to the floor.	
2	Trained observer, and PPE doffing assistant don PPE	Trained observer and PPE doffing assistant must wear the below PPE: • Long sleeved single-use disposable fluid resistant or impermeable coverall • Single use full-length face shield (to be applied over any prescription glasses) • Single use surgical mask • Two pairs of non-sterile long cuff gloves • Fluid resistant or impermeable boot covers that extend to at least mid-calf. Trained observer and PPE assistant must don and doff PPE using same process as HCW entering patient care area.	
3	Remind HCW to take care	Before the doffing of any PPE, the trained observer must remind HCW to work slowly and deliberately in PPE doffing and to avoid touching their face. The trained observed reviews the PPE doffing sequence with the HCW before the HCW begins and reads aloud the following steps to the HCW step-by-step.	

4	HCW to disinfect outer gloves	HCW to disinfect outer gloves with ABHR or disinfectant wipe. If used, discard disinfectant wipe into clinical waste receptacle in patient care area.	
5	HCW to doff apron	HCW to doff apron (if worn) prior to leaving patient care area. Doff apron by rolling from the inside to outside. Discard apron into clinical waste in patient care area.	
6	HCW to disinfect outer gloves	If apron worn and doffed, HCW to disinfect outer gloves again with ABHR or disinfectant wipe. If used, discard disinfectant wipe into clinical waste receptacle in patient care area.	
7	HCW exits patient care area	HCW exits patient care area and steps into PPE doffing area.	
FOLLOWING HCW EXIT FROM PATIENT CARE AREA			
8	Inspect PPE	Trained observer to visually inspect HCW PPE for any cuts, tears, or visible contamination. If visible contamination is present, HCW or PPE doffing assistant must disinfect the affected area using a disinfectant wipe. The trained observer must record any breaches of PPE and *further action is required* to assess for potential occupational exposure.	Further action required? Y /N If yes, record below
9	HCW to disinfect and doff outer gloves	Disinfect outer gloves using ABHR or disinfectant wipe. Doff and discard into clinical waste receptacle in PPE doffing area.	
10	Inspect and disinfect inner gloves	Trained observer to inspect inner gloves for cuts, tears or visible contamination. • If there is visible contamination, disinfect inner gloves using ABHR or disinfectant wipe, doff inner gloves, use ABHR on bare hands and don a new pair of gloves. • If a cut or tear is present on the inner gloves this is a PPE breach and further action is required for potential occupational exposure. Disinfect inner gloves using ABHR or disinfectant wipe, doff inner gloves, use ABHR on bare hands and don a new pair of gloves. • If there is no cut, tear, or visible contamination, disinfect inner gloves and leave gloves in place for next steps	Further action required? Y /N If yes, record below
11	Doff face shield	HCW to doff face shield. • Bend forward • Grasp the rear strap of the face shield and undo/pull gently over head, allowing face shield to fall forward, then discard. Avoid touching the front of the face shield. Discard into clinical waste receptacle in PPE doffing area.	
12	Disinfect inner gloves	Use ABHR or disinfectant wipe to disinfect gloves and leave gloves in place for next steps.	

13	Doff respirator	Doff PAPR as per Guideline for CleanSpace HALO	
14	Disinfect inner gloves	Use ABHR or disinfectant wipe to disinfect gloves and leave gloves in place for next steps.	
15	Doff coverall	For coverall with hood attached: • To unfasten coverall, tilt head back to reach zipper. Unzip completely. • Doff hood by grasping it with both hands, lift up and away from the head turning it inside out. • Roll coveralls down, turning them inside out. For coveralls used with a separate hood: • Hood with ties: unfasten hood, gently doff and discard. • Pullover hood: tilt head down, grasp the hood at the crown of the head and pull the hood over in a slow continuous movement • Disinfect inner gloves with ABHR or disinfectant wipe. • To unfasten coverall, tilt head back to reach zipper. Unzip completely. • Roll coveralls down, turning them inside out. Avoid contact of skin or scrubs with outer surface of coveralls during doffing. Discard into clinical waste receptacle in PPE doffing area.	
16	Disinfect inner gloves	Use ABHR or disinfectant wipe to disinfect gloves and leave gloves in place for next steps.	
17	Doff boot covers **(Tier 2 only)**	Sit on chair/stool. Avoid touching the boot covers with your forearms, while you untie the ties of both boot covers. Disinfect the inner gloves and remove these gloves. Perform hand hygiene on bare hands and apply a new pair of gloves for the next steps. Place both hands inside the top of one boot cover and grasp the inside of some of the material. Without touching the outer material of the boot cover, roll the top down to form a clean cuff. With both hands inside the clean cuff, push the boot cover down to the shoe, then push the boot cover off the foot, remaining careful to not touch the outside of the boot cover, or contaminate the leg or scrub pants. Discard into clinical waste receptacle in PPE doffing area. Disinfect the inner gloves and remove these gloves. Perform hand hygiene on bare hands and apply a new pair of gloves for the next steps. Repeat the process for the second boot cover.	
18	Disinfect inner gloves	Use ABHR or disinfectant wipe to disinfect gloves and leave gloves in place for next steps.	
19	Disinfect fluid-resistant shoes	Use disinfectant wipe to disinfect all outer surfaces of fluid-resistant shoes.	

20	Disinfect and doff inner gloves	Use ABHR or disinfectant wipe to disinfect gloves. Doff and discard into clinical waste receptacle in PPE doffing area.	
21	Perform hand hygiene with ABHR	Use ABHR to perform hand hygiene on bare hands.	
22	Final inspection	Both the trained observer and the HCW inspect the HCW for any indication of contamination of scrubs, shoes or person. If contamination is identified the garments should be doffed carefully and the HCW should immediately shower. *Further action is required* to assess for potential occupational exposure	Further action required? Y /N If yes, record below
23	HCW can exit	HCW can leave the PPE doffing area wearing scrubs and footwear.	
24	Is further action required?	If a PPE breach was identified, immediately follow local procedures for management of potentially exposed HCW. Guidance can be found in the *Guideline for Infection control and prevention for the management of Viral Haemorrhagic Fevers*	Further action required? Y /N If yes, record below
Further action taken:			

Checklist 5a: Donning process, trained observer and PPE assistant

The donning procedure outlined in Table 1 assumes the facility has elected to use long-sleeved single-use disposable fluid-resistant or impermeable gowns and PFRs for the trained observer and PPE assistant.

The trained observer (TO) and PPE assistant must both be trained in the correct procedures and safe donning and doffing of PPE. The TO and PPE assistant may observe each other in the donning process.

Date	Time	Patient ID
Trained observer/PPE assistant name		Initial
Observer name		Initial

Step		Description and further information	Check when complete
PRIOR TO HCW ENTERING PPE DONNING OR PPE DOFFING AREA			
1	HCW wellbeing check	Take a moment to check whether the HCW needs to have something to eat or drink or go to the toilet before donning PPE.	
2	Readiness check	All medication or other therapeutics and equipment required for patient care is ready to be taken in to room.	
3	HCW is wearing scrubs and fluid-resistant shoes and all personal items are doffed.	HCW is wearing scrubs and fluid-resistant shoes. All personal clothing and items are doffed. This includes all jewellery (including wedding band), watch, ID tag, communication devices, pens. Hair is tied back and out of face and eyes (including fringes). Prescription glasses are secured to face or head, for example with medical/surgical tape.	
4	Engage trained staff to observe (trained observer and PPE assistant will switch roles here for each other's donning process)	The donning process for the PPE assistant must be guided and supervised by the PPE TO who confirms visually that all PPE is serviceable and has been donned successfully. The trained observer reviews the donning sequence with the HCW before the HCW begins and reads aloud the following steps to the HCW step-by-step.	
5	Perform hand hygiene	HCW performs hand hygiene with alcohol-based hand rub (ABHR). Allow hands to dry before moving to next step.	
6	Visually inspect all PPE	All required items are available. All items are complete, intact and in serviceable condition. Correct sizes are available for the HCW.	
7	Perform donning process in a designated area	The PPE donning designated area must be separate from the PPE doffing area.	

		ABHR and a chair or stool should be available in the donning area.	
8	Put on shoe covers **(Tier 2 only)**	HCW sits on chair or stool and puts on ankle-high shoe covers.	
9	Perform hand hygiene	HCW performs hand hygiene with ABHR. Allow hands to dry before moving to next step.	
10	Put on inner gloves	HCW puts on first pair of long-cuffed gloves.	
11	Put on gown	HCW puts on gown, ensuring the gown is large enough to cover back and allow unrestricted freedom of movement without gaping. Ensure cuffs of inner gloves are tucked under the sleeve of the gown. Secure gown at neck and waist.	
12	Put on surgical mask	HCW puts on a surgical mask.	
13	Put on face shield	HCW puts on full face shield over the PFR and hood. The face shield must cover well below the chin.	
14	Perform hand hygiene	HCW performs hand hygiene with ABHR. Allow hands to dry before moving to next step.	
15	Put on outer gloves	HCW puts on outer gloves (long cuff gloves) ensuring that the cuffs of the gloves are pulled over the cuffs of the gown.	
16	STOP and CHECK	Trained observer verifies the integrity of all items of PPE, and that all PPE items are appropriately placed and secured. HCW should be able to extend arms, bend at waist and perform appropriate ranges of motion.	

Checklist 5b: Doffing process, trained observer and PPE assistant

The PPE doffing procedure outlined below assumes the facility has elected to use long sleeved single-use disposable fluid resistant or impermeable gowns and PFRs for the trained observer and PPE assistant.

The trained observer and PPE assistant must both be trained in the correct procedures and safe donning and doffing of PPE.

The trained observer must observe the PPE assistant doff PPE and then the PPE assistant may observe the trained observer.

Date	Time	Patient ID
Trained observer/PPE assistant name		Initial
Observer name		Initial

Step		Description	Check
PRIOR TO HCW EXITING PPE DOFFING AREA			
1	Ensure PPE doffing area is ready	Ensure required supplies are available in PPE doffing area: • Chair or stool • Alcohol-based hand rub (ABHR) • Disinfectant wipes • Supply of long-cuff gloves • Large clinical waste receptacle • Large absorbent mat secured to the floor.	
2	Remind HCW to take care	Before the doffing of any PPE, the observer must remind HCW to work slowly and deliberately in PPE doffing and to avoid touching their face. The observer reviews the PPE doffing sequence with the HCW before the HCW begins and reads aloud the following steps to the HCW step-by-step.	
3	Inspect PPE	Trained observer to visually inspect HCW PPE for any cuts, tears, or visible contamination. If visible contamination is present, HCW or PPE doffing assistant must disinfect the affected area using a disinfectant wipe. The trained observer must record any breaches of PPE and *further action is required* to assess for potential occupational exposure.	Further action required? Y /N If yes, record below
4	HCW to disinfect and doff outer gloves	Disinfect outer gloves using ABHR or disinfectant wipe. Doff and discard into clinical waste receptacle in PPE doffing area	

5	Inspect and disinfect inner gloves	Trained observer to inspect inner gloves for cuts, tears or visible contamination. • If there is visible contamination, disinfect inner gloves using ABHR or disinfectant wipe, doff inner gloves, use ABHR on bare hands and don a new pair of gloves. • If a cut or tear is present on the inner gloves this is a PPE breach and further action is required for potential occupational exposure. Disinfect inner gloves using ABHR or disinfectant wipe, doff inner gloves, use ABHR on bare hands and don a new pair of gloves. • If there is no cut, tear, or visible contamination, disinfect inner gloves and leave gloves in place for next steps.	Further action required? Y /N If yes, record below
6	Doff face shield	HCW to doff face shield. • Bend forward • Grasp the rear strap of the face shield and undo/pull gently over head, allowing face shield to fall forward, then discard. Avoid touching the front of the face shield. Discard into clinical waste receptacle in PPE doffing area.	
7	Disinfect inner gloves	Use ABHR or disinfectant wipe to disinfect gloves and leave gloves in place for next steps.	
8	Doff gown	Unfasten gown. Remove the gown by pulling it away from the body and rolling it in on itself. At all times, take care to avoid contact with clothing or skin during the gown removal. Discard into clinical waste receptacle in PPE doffing area.	
9	Disinfect inner gloves	Use ABHR or disinfectant wipe to disinfect gloves and leave gloves in place for next steps.	
10	Doff shoe covers **(Tier 2 only)**	Sit on chair/stool. Doff one shoe cover. Discard into clinical waste receptacle in PPE doffing area Use ABHR or disinfectant wipe to disinfect gloves and leave gloves in place for next steps Doff second shoe cover. Discard into clinical waste receptacle in PPE doffing area.	
11	Disinfect and change inner gloves	Use ABHR or disinfectant wipe to disinfect gloves. Doff gloves and discard into clinical waste receptacle in PPE doffing area Use ABHR on bare hands and don a new pair of gloves for next steps.	
12	Doff respirator	Doff the PFR by tilting head slightly forward, grasping first the bottom elastic strap, then the top elastic strap, and doff in one smooth motion without touching the front of the PFR. Discard into clinical waste receptacle in PPE doffing area	
13	Disinfect inner gloves	Use ABHR or disinfectant wipe to disinfect gloves and leave gloves in place for next steps.	
14	Disinfect fluid-resistant shoes	Use disinfectant wipe to disinfect all outer surfaces of fluid-resistant shoes.	

15	Disinfect and doff inner gloves	Use ABHR or disinfectant wipe to disinfect gloves. Doff and discard into clinical waste receptacle in PPE doffing area.	
16	Perform hand hygiene with ABHR	Use ABHR to perform hand hygiene on bare hands.	
17	Final inspection	Both the trained observer and the HCW inspect the HCW for any indication of contamination of scrubs, shoes or person. If contamination is identified the garments should be doffed carefully and the HCW should immediately shower. *Further action is required* to assess for potential occupational exposure.	Further action required? Y /N If yes, record below
18	HCW can exit	HCW can leave the PPE doffing area wearing scrubs and footwear.	
19	Is further action required?	If a PPE breach was identified, immediately follow local procedures for management of potentially exposed HCW. Guidance can be found in the *Guideline for Infection control and prevention for the management of Viral Haemorrhagic Fevers.*	Further action required? Y / N If yes, record below
Further action taken:			

Appendix 10: Environmental cleaning and disinfection

Disinfection and environmental cleaning are key components to control of VHF. Given the low infectious dose required for infection and the severity of the disease, high levels of precaution are warranted to reduce the potential risks posed by contaminated surfaces in the patient care environment. Cleaning with liquid disinfectants must be performed in a way that minimises splashes.

Environmental cleaning and disinfection of the patient care area must only be performed by HCW who have:

- received comprehensive training on, and are competent in, the donning and doffing of designated PPE
- demonstrated competency in performing all VHF related infection control practices and procedures.

Contact with patients with VHF or patient care environment must be limited to essential HCW only.

The PPE requirements for environmental cleaning are the same as those for patient care. PPE as per Appendix 9: PPE General Guidance must be worn for all environmental cleaning duties, including during the discharge and terminal clean of the patient care environment and equipment.

Key principles

Cleaning and disinfectant solutions must be prepared daily, and unused solution is to be discarded after 24 hours.

Floors and horizontal work surfaces are to be cleaned and disinfected at least once a day. Surfaces must be allowed to dry before using them again.

The PPE doffing area must be cleaned and disinfected at least daily and after the doffing of visibly contaminated PPE.

High-touch surfaces, such as bedrails, trolleys, bedside commodes, doorknobs, light switches, tap handles and ensuite facilities, must be cleaned and disinfected daily at a minimum.

Any visibly contaminated equipment must be immediately cleaned and disinfected using detergent and 5000-ppm available chlorine solution.

All cleaning equipment, including buckets and cloths, mop handles and mop heads, must be dedicated to the specific patient room, cleaned and disinfected after use, and disposed of into the clinical waste after discharge.

Only mattresses and pillows with a plastic or other fluid impermeable covering are to be used.

Discard all linen, privacy curtains and non-impermeable pillows and mattresses into clinical waste.[1]

A large blood or body fluid spill must be cleaned with sodium hypochlorite made up to 5000-ppm available chlorine, refer below for details.

Routine cleaning

VHF are readily inactivated by disinfectants. At a minimum, daily cleaning and disinfection of the patient care environment must be undertaken. The recommended disinfectant solution for routine environmental cleaning and disinfection and for spills management is sodium hypochlorite made up to 5,000 parts per million (ppm) available chlorine. The sodium hypochlorite product should be a listed disinfectant in the Australian Register of Therapeutic Goods (ARTG).

The routine cleaning process must involve either:

- A physical clean using combined detergent and 5000 ppm available chlorine solution (2-in-1 clean), made up daily from a concentrated solution.

OR

- A physical clean using detergent followed by disinfection with 5000 ppm available chlorine solution (2-step clean). [21, 26]

Final disinfectant clean

A final disinfectant clean refers to the final clean of an isolation room once the patient has been discharged. As for routine cleaning, the cleaning process must involve either:

- A physical clean using combined detergent and 5000-ppm available chlorine solution (2-in-1 clean) made up daily from a concentrated solution.

OR

- A physical clean using detergent followed by disinfection with 5000-ppm available chlorine solution (2-step clean).

The final clean of VHF confirmed patient's room and disinfection of any reusable patient care equipment must not commence until the patient has left the area. Any item that cannot be completely and thoroughly cleaned and disinfected must be disposed as clinical waste.

HCW undertaking cleaning must wear recommended PPE as per Appendix 9: PPE general guidance at all times.

Where negative pressure air handling systems are being used, negative pressure must be maintained.

Where negative pressure is not available, the door must remain closed at all times. Surfaces must be allowed to air dry.

Make use of local heating, ventilation and air conditioning (HVAC) expertise to determine the minimum time required to enable airborne contaminant removal, where this is required due to aerosol-generating procedures or behaviours.

Management of blood and body fluid spills

When managing a blood or body fluid spill that may be contaminated with VHF, HCW must wear PPE in accordance with Appendix 9: PPE general guidance. A blood or body fluid spill must be managed through the following steps:

- If the spill has occurred in an area the public can access, the area needs to be safely and immediately isolated by appropriate personnel and signed accordingly.
- To prevent the potential for aerosolising the virus, cleaning techniques that may result in the generation of bio-aerosols (e.g. pressurised air or water sprays) must not be used.
- Tools, such as tongs from a spill kit, must be used as much as possible rather than cleaning and disinfecting directly with gloved hands. Tool/s used in this manner must be disposed of as clinical waste.
- The spill must be covered with an absorbent material (if a spill kit is not available, paper towel could be used).
- Directly apply a solution containing 5000 ppm available chlorine to saturate the absorbent material/paper towel. Leave for the recommended contact time for the specific disinfectant being used (see manufacturer's instructions); this will assist in deactivating any virus or other infectious agents that may be present.
- Remove the absorbed spill matter using tools such as tongs.
- The absorbent material/paper towels must be discarded into the clinical waste.
- Following the removal of the initial material, clean the spill area with neutral detergent solution.
- Cover spill site again with 5000 ppm available chlorine for a further contact time (see manufacturer's instructions).
- A final clean is then to be performed using a neutral detergent solution.
- In order to avoid transfer of contaminants, cleaning and disinfection must be carried out from clean to dirty areas.
- Any porous surfaces that are contaminated by the blood or body fluid spill must be disposed of as clinical waste.

All items used to clean the area (e.g. mop head, paper towels) and used PPE must be disposed of into dedicated clinical waste receptacle. Items contaminated with or containing body fluids are treated as clinical waste and must be double bagged as waste when leaving the room. Waste must be stored securely prior to collection. Refer to Section 6.7.6 Waste Management for further detail.

Appendix 11: Patient care considerations

Patient movement

Movement of patients with VHF must be strictly restricted to reduce the risk of transmission.

A transfer of the patient outside of the isolation room must be planned for, and only occur for essential, life-saving treatment that cannot be provided in the isolation room. Plan for early transfer to ICU if a patient is deteriorating. A transport route must be planned in advance and avoid busy areas. Additional personnel (consider security personnel) may be required to clear the path and lock lifts as required.

Contaminated PPE must be removed and disposed of, and hand hygiene must be performed before the patient is moved. Clean PPE must be donned before moving the patient, preferably by a 'receiving team' of HCW outside of the isolation unit.

Food services

HCW not involved in direct patient care or management of the environment must be restricted from entering VHF patient care area. Disposable crockery, bottles and cutlery must be used and placed into clinical waste in the patient room after use. Food and beverages must then be delivered into the patient room by HCW directly caring for the patient, who are wearing appropriate PPE.

Aerosol generating procedures

Whenever possible, AGPs should be avoided when caring for patients with VHF.

If an AGP is essential, the following steps must be undertaken:

- PPE must be worn as recommended and all exposed skin must be covered.
- Visitors must not be present during an AGP.
- The number of HCW present during the procedure must be limited to those essential for patient care.
- The procedure must be conducted in a single room, ideally with a negative pressure air handling system. The doors must be kept closed during the procedure, and entry and exit must be minimised for a short period after the procedure to allow for the appropriate number of air exchanges to occur.
- Environmental surface cleaning must be conducted following AGP. Examples of AGPs include but are not limited to:
  - intubation and extubation
  - open suctioning of airways
  - bilevel positive airway pressure (BiPAP)
  - bronchoscopy
  - sputum induction

Note: Patient generated aerosols can also occur during vomiting and diarrhoea, especially if projectile or explosive. Cleaning activities, e.g. flushing toilets and certain environmental

cleaning practices, can also generate aerosols. Ensure toilet lids are closed before flushing. Avoid use of spray bottles for cleaning.

Management plan

Early discussions regarding the extent of supportive and invasive care and resuscitation must be held with the patient and their family. A management plan for supportive therapy and resuscitation measures must be developed with clinical content experts (i.e. intensivists and infectious diseases physicians) in consultation with the patient and family.

Patients with late-stage VHF and multi-organ failure who experience a cardiac arrest are unlikely to survive. All HCW involved in resuscitation must don PPE safely prior to patient contact. This will delay resuscitation; therefore, a plan must be in place prior to any signs of deterioration. Local assessment of the risks and benefits of intensive/invasive patient management and HCW safety must be considered when deciding a treatment plan.

Some healthcare procedures have higher potential risks of exposure for the HCW performing the procedure. Examples of procedures presenting a higher risk of potential exposure are:

- aerosol-generating procedures, for example intubation and mechanical ventilation
- procedures involving use of sharp devices and contact with the bloodstream, for example: taking blood for pathology testing, insertion of intravenous devices, dialysis, circulatory support
- cleaning a heavily soiled environment.

Paediatric considerations

The principles of infection prevention of VHF in paediatric patients are similar to adult patients.

In decision making around PPE, patient factors must also be considered. For example, young children and patients with cognitive impairment or communication difficulties may not be able to anticipate vomiting or diarrhoea or communicate clearly about symptoms such as nausea or abdominal pain. Such factors may be a reason to choose a higher level of PPE.

Decisions about immediate family visiting the patient should be made on a case-by-case basis. All visitors must don appropriate PPE.

Pregnancy and obstetric considerations

VHF in pregnancy is associated with increased severity of illness, complications and mortality. There is a high risk of miscarriage, stillbirth and severe genital tract bleeding.

Infection prevention is similar to that for non-pregnant patients with VHF, with a few special considerations:

- Infection prevention precautions must be supplemented with planning for management of excessive peripartum blood loss.
- Planning must include adequate PPE and equipment for obstetric, anaesthetic and neonatal teams.

Infants born to mothers with VHF are reported to have high neonatal mortality rates. Viability of the foetus should be confirmed to avoid the risks associated with futile neonatal resuscitation.[2, 3, 12]

Appendix 12: Care of the deceased

Transmission of VHF from deceased patients has occurred frequently in Africa, as VHF may be found in high concentrations in blood, many body secretions and tissues. VHF is usually at its highest levels in people with progressive severe illness and at death. VHF may survive for several days in the body, and on surfaces contaminated with blood or other body fluids.

General IPAC requirements

The body of any person who has died from or suspected to have died from VHF must only be handled by the minimum number of HCW possible. All those handling the body must be trained in the appropriate donning and doffing of PPE (as per Appendix 9: PPE General Guidance).

Post-mortem care and examination

Autopsies must be avoided. An autopsy must only be done if directed by the coroner.

AGPs must be avoided.

Handling of human remains must be kept to a minimum.[7]

Preparation of the body for burial or cremation

The body of any person who has died from or suspected to have died from VHF must:

- be properly prepared at the site of death, which includes:
  - avoid cleaning the body
  - clothing, lines, sutures and other inserted treatment equipment should remain in place
  - cover wounds with occlusive dressings and lightly pack discharging body orifices
  - apply surgical mask covering the deceased person's face and nose.
- not be removed from a place (e.g. room, unit, ward, mortuary) unless the body:
  - has been placed and secured in a bag or wrapping in a manner that prevents the leakage of any bodily exudate or other substance
  - appropriately and indelibly identified on the top outer surface of the bag or wrapping,
  - be double bagged, with absorbent material placed between each bag, and the bag sealed and disinfected with a 1,000-ppm sodium hypochlorite solution or other appropriate disinfectant. and the outer body bag is clearly marked as **"highly infectious material"**.
- not be embalmed or made available for viewing
- be cremated or buried in a sealed casket as soon as possible.

It is acknowledged that these requirements may be in conflict with some cultural mourning practices, however, the infection risk increases after death and the health and safety of the family/loved ones and of mortuary and funeral providers is paramount.

Local HHSs may consider end of life practices prior to the preparation of the body that preserve and respect the intent of cultural practices, while maintaining HCW and visitor health and safety.

Local IPAC team should work closely with the relevant funeral director to ensure that all appropriate infection control measures are implemented.[7]

For more details refer to Appendix 14: Post-Mortem Care and Examination of the Ebola virus disease – CDNA National Guidelines for Public Health Units.

Appendix 13: Patient retrieval and transfer – Expert advisory group

If transfer/retrieval of a patient with suspected or confirmed VHF from one hospital to another is considered, an expert advisory group (EAG) must be convened. This process can be commenced by contacting Communicable Diseases Branch on (07) 3328 9754 or email QIPCU@health.qld.gov.au or after-hours through the Hospital and Health Service Public Health Physician on-call.

The purpose of the EAG is to inform decision-making around patient placement, transfer, and retrieval.

EAG co-chairs:

- Executive Director, Health Disaster Management Branch
- Executive Director, Communicable Diseases Branch, or a delegate.

EAG members could include:

- an infectious diseases physician
- a paediatric infectious diseases physician if the patient is a child
- a public health physician
- the treating physician
- a representative from the proposed treating team at the receiving HHS
- an infection prevention and control professional from the treating HHS and the proposed receiving HHS
- Executive Director Medical Services of the treating HHS and the proposed receiving HHS, or their delegate/s
- Chief Human Biosecurity Officer for Queensland
- Chief Health Officer (if available)
- Medical Director and/or CNC Infection Control, Queensland Ambulance Service
- Executive Director, Retrieval Services Queensland
- SHECC Executive Officer (if SHECC is stood up)
- Chief Infection Control Nurse, Queensland Infection Prevention and Control Unit, Communicable Diseases Branch
- core Laboratory Manager, Pathology Queensland.

The Chief Executives of the treating and proposed receiving HHS (or their delegate/s) should also be invited to attend.

For consideration of the EAG

A risk assessment should be undertaken as part of formulating a transfer/retrieval plan. The risk assessment should be undertaken in line with the principles of the hierarchy of controls. The risk assessment should consider (but not be limited to) factors such as:

- patient clinical status
- patient likely infectious status based on symptomology (i.e. active diarrhoea/vomiting/bleeding)
- availability of isolation facilities at originating hospital and proposed receiving hospital
- availability of specialist clinical expertise at originating and proposed receiving hospital
- safety of retrieval team considering patient likely infectious status and type/length of retrieval journey.

Appendix 14: Staff entry log template

Date	Employee name	Employee ID	Time IN	Time OUT	Initial

When sheet is full please return to Nurse Unit Manager.

Privacy notice: Personal information collected by <insert name of local HHS> Hospital and Health Service is handled in accordance with the Information Privacy Act 2009. The Hospital and Health Service is collecting the above information to allow for timely contact tracing. All personal information will be securely stored and only accessible by the Nurse Unit Manager. The personal information collected may be given to authorized contact tracing officers for the purpose of contact tracing. Personal information will not be disclosed to other third parties without consent, unless authorized under legislation. For information about how the Hospital and Health Service protects your personal information please refer to our Privacy Policy <insert link to HHS Privacy Policy>.

Appendix 15: Visitor log template

Visitor log Room no. _____						
Date	**Visitor name**	**Suburb of residence**	**Phone number**	**Time IN**	**Time OUT**	**Initial**

When sheet is full please return to Nurse Unit Manager.

Privacy notice: Personal information collected by <insert name of local HHS> Hospital and Health Service is handled in accordance with the Information Privacy Act 2009. The Hospital and Health Service is collecting the above information to allow for timely contact tracing. All personal information will be securely stored and only accessible by the Nurse Unit Manager. The personal information collected may be given to authorized contact tracing officers for the purpose of contact tracing. Personal information will not be disclosed to other third parties without consent, unless authorized under legislation. For information about how the Hospital and Health Service protects your personal information please refer to our Privacy Policy <insert link to HHS Privacy Policy>.

Viral haemorrhagic fever - patient risk assessment - advice for emergency departments.

1. Does the patient report:
- having a fever or history of fever in the past 24 hours? **AND**
- returning from a country or geographic area where there is a current viral haemorrhagic fever (VHF) outbreak, or a VHF is endemic, within 21 days of illness onset? (see Travel Health Pro <https://travelhealthpro.org.uk/outbreaks>) **OR**
- having had contact with a known or highly suspected case of VHF within 21 days of illness onset.

NO
- VHF test not indicated.

VHF HIGHLY UNLIKELY
- Transmission based precautions based on clinical condition.

YES
- No staff member to have contact with patient unless wearing VHF personal protective equipment (PPE)—see "infection control/PPE" to the right.
- Provide patient with a surgical mask (provide a vomit bag if vomiting).
- Escort to isolation room for assessment (single room with door closed, with own bathroom and negative pressure if available).
- Notify your immediate manager of the situation – local infection control unit to be notified
- Discuss immediately with a physician and a public health physician (PHP).

NO
- VHF test not indicated.

NO KNOWN EXPOSURE
- Standard plus contact and droplet precautions or as advised by infection control practitioner/infectious diseases physician.
- Laboratory precautions and procedures as advised by clinical microbiologist.

2. Has the patient:
- come into contact with body fluids (blood, urine, faeces, tissues, laboratory specimens) from an individual or animal known or strongly suspected to have VHF?
- participated in a funeral which involved direct contact with the deceased body?
- presented with vomiting OR diarrhoea OR bruising OR bleeding?
- Travelled to an area with a known current VHF outbreak?
- Lived or worked in basic rural conditions in an area where Lassa fever is endemic?
- Visited caves or mines, or had contact with or eaten primates, antelopes or bats in a Marburg Virus Disease or Ebola Virus Disease endemic area?
- Travelled to a Crimean-Congo haemorrhagic fever endemic area and sustained a tick bite, or crushed a tick with their bare hands?
- Had close involvement with animal slaughter in a VHF endemic area?
- Been assessed by infectious disease physician and/or PHP as having increased possibility.

ASSESS/TREAT FOR ALTERNATIVE DIAGNOSES
- Travel related (e.g. malaria) and other infections.

YES TO ANY
- VHF test indicated.

Alternate diagnosis or patient improving.

PUBLIC HEALTH ACTION
Public health unit follow-up as required.

Patient not improving and no alternate diagnosis.

PUBLIC HEALTH ACTION
- Work with the Public health unit to identify contacts
- Further actions depend upon results of VHF testing.

INCREASED POSSIBILITY OF VHF
(see "Infection control/PPE" to the right)
- Notify your immediate manager, HHS executive, local infection control unit and local public health unit.
- Convene Expert Advisory Group as required to inform local decision-making about testing, patient placement and transfer/retrieval. Urgent discussion between infectious diseases physician, public health physician (PHP), Director of the Emergency Department, Senior Director of the Communicable Diseases Branch (CDB), Forensic Scientific Services (FSS) to determine the need for patient transfer to designated hospital; Director of Retrieval Services/ Queensland Ambulance Service (depending on distance) specimen referral to FSS for EVD testing and other testing.

VHF OUTBREAK UPDATES

For updated information about VHF outbreaks please refer to the Travel Health Pro <https://travelhealthpro.org.uk/outbreaks>

INFECTION CONTROL/PPE

ENSURE STAFF ARE:
- Rigorously and repeatedly trained.
- Donning and removing PPE in designated area outside of the patient's room.
- Monitored by a trained PPE observer for donning and removing compliance.

Recommended PPE includes:
- P2/N95 fluid-resistant respirator
- full-length face shield
- two pairs non-sterile long cuff gloves (nitrile gloves preferable)
- long sleeved fluid-resistant or impermeable gown that extends to mid-calf.
- For patients who are clinically unstable with "wet" symptoms, also:
- a hood that covers all of the hair, ears and extends past neck and shoulders, and
- fluid-resistant or impermeable boot covers that extend to at least the mid-calf.

NOTE:
- Restrict entry to essential staff only.
- Keep a list of staff with patient contact.
- Avoid aerosolising procedures.
- Refer to Appendix 9 of Queensland Health Guideline for infection prevention and control for the management of viral haemorrhagic fevers.

Last updated: February 2024

Visit: www.health.qld.gov.au/vhf

Public health units — 13 HEALTH (13 43 25 84)

Forensic and Scientific Services — Business hrs: (07) 3000 9387 After hrs: 0431 502 157

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STOP

Restricted Entry

Visitors - DO NOT ENTER **See staff stations**

Staff

Engage a PPE trained observer and use a checklist to put on PPE

Reminder

- **Work carefully and slowly.**
- **Use alcohol based hand rub (ABHR) on outer gloves for hand hygiene between different patient care activities while in the room.**

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Removal of PPE for combined airborne and enhanced contact precautions

A trained observer must guide the removal of PPE using this checklist.

Reminder: Take care, work slowly and carefully. Avoid touching your face. Use ABHR between each step.

Order of removal of PPE

☐	ABHR or disinfectant wipe on outer gloves
☐	Remove apron
☐	ABHR or disinfectant wipe on outer gloves
☐	Visual inspection
☐	Disinfect and remove outer gloves
☐	Inspect and disinfect inner gloves with ABHR or disinfectant wipe
☐	Remove face shield
☐	Disinfect inner gloves with ABHR or disinfectant wipe
☐	Doff hood
☐	Disinfect inner gloves with ABHR or disinfectant wipe
☐	Remove gown
☐	Disinfect inner gloves with ABHR or disinfectant wipe
☐	Remove boot covers
☐	Disinfect inner gloves with ABHR or disinfectant wipe, and remove and replace with new
☐	Remove respirator
☐	Disinfect inner gloves with ABHR or disinfectant wipe
☐	Disinfect washable shoes
☐	Disinfect inner gloves with ABHR or disinfectant wipe and remove

9 Document approval details

Document custodian

Queensland Infection Prevention and Control Unit (QIPCU), Communicable Diseases Branch, Queensland Public Health and Scientific Services.

Approval officer

Dr Heidi Carroll, A/Executive Director, Communicable Diseases Branch, Queensland Health

10 Version Control

Version	Date	Prepared by	Comments / reason for update
0.1	2019	CDIM	New guideline created, but not published, as an amalgamation of: 1. Interim guidelines for managing Ebola virus disease patients in Queensland 2. Infection control guideline for the management of Ebola virus disease in Queensland 3. Interim PPE guidelines for managing Ebola virus disease patients These three guidelines are to be decommissioned.
0.2–1.2	01 September 2022 to March 2024		New VHF Guideline developed following preliminary CDB work in 2019 on EVD Guideline. Detailed content removed from Guideline body and inserted as appendices. Evidence-base enhanced. Removal of reference to “designated facilities”. Introduction of two-tier PPE approach.