Ebola Virus Disease (EVD)

CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
1.0	15 August 2014		Interim version endorsed by CDNA
1.1	26 September 2014	EVD SoNG working group	Revision for CDNA endorsement
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2.0	26 June 2015	EVD SoNG working group	New Appendix (Appendix 13) on cleaning in residential settings, revised factsheets, new section on border and monitoring measures during an outbreak with widespread and intense transmission. Endorsed by CDNA, noted by AHPPC
2.1	24 May 2018	Health	Revised to align with IPCEAG infection prevention guidelines and *Biosecurity Act 1995*; included mention of vaccination and post Ebola syndrome and infection prevention recommendations for Ebola survivors; updated mentions of the West Africa outbreak; and added sexual contact to the contact definition/ recording forms
2.2	24 December 2018	Health	Endorsed by CDNA

The Series of National Guidelines for Public Health Units ('the Guidelines') have been developed by the Communicable Diseases Network Australia (CDNA) and are initially endorsed by the Australian Health Protection Principal Committee (AHPPC) with subsequent versions noted by

AHPPC. Their purpose is to provide nationally consistent guidance to public health units (PHUs) in responding to a notifiable disease event.

These guidelines capture the knowledge of experienced professionals, and provide guidance on best practice based upon the best available evidence at the time of completion.

Readers should not rely solely on the information contained within these guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

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Contents

1. Summary

These guidelines are specifically for responding to Ebola Virus Disease (EVD), but would also be relevant for responding to a suspected/confirmed case of Marburg haemorrhagic fever.

It is not directly applicable for Lassa fever, or for vector-borne viral haemorrhagic fevers (VHFs) such as Crimean Congo haemorrhagic fever (CCHF) or Rift Valley fever (RVF).

These guidelines form the national minimum standard for infection control for EVD, which is based on the latest available evidence. Individual organisations may develop policies or institute practices that exceed the national minimum standard. It should be noted that training and procedures are required to use any additional personal protective equipment (PPE) safely.

For detailed guidance on infection prevention and control for EVD, refer to the *Infection prevention and control principles and recommendations for Ebola Virus Disease* document available from the Department of Health website (www.health.gov.au/ebola).

Public health priority

Urgent. EVD is a Listed Human Disease under the *Biosecurity Act 2015* and is a listed human disease as viral haemorrhagic fever under the *National Health Security Act 2007*.

All travellers who arrive in Australia with clinical and epidemiological evidence that suggests the possibility of having contracted a VHF including EVD should be immediately notified to the Public Health Unit (PHU) in that state or territory.

If a suspected case is notified from an international border, decisions concerning case and contact management, including assessment, transport and isolation will be made by the jurisdictional Chief Human Biosecurity Officer (CHBO) or delegated by the CHBO to the Human Biosecurity Officer (HBO).

Actions in the event of a suspected case:

- consider the possibility of EVD in persons with clinically compatible symptoms and with a compatible travel and/or exposure history
- isolate the case and institute appropriate infection control and the use of personal protective equipment (PPE)
- notify the CHBO or HBO through the state or territory PHUs of all persons under investigation for EVD
- conduct a clinical and exposure risk assessment in consultation with the CHBO and relevant infectious diseases service, using the EVD case definition (Section 7) and the patient assessment flow chart (Appendix 4)
- use the outcome of the risk assessment to determine whether the person under investigation requires laboratory testing for EVD
- assess the risk to contacts before or after laboratory confirmation, depending on the circumstances and the CHBO advice.

Risk assessment:

- a clinical and exposure risk assessment must be conducted in consultation with the CHBO and relevant infectious diseases service, using the EVD case definition (Section 7) and the patient assessment flow chart (Appendix 4)
- the outcome of the risk assessment will determine whether the person under investigation requires laboratory testing for EVD.

Specimen referral:

- if specimens are required for EVD laboratory testing, and capacity for preliminary testing does not exist in the jurisdiction, specimens should be sent to the National High Security Quarantine Laboratory (NHSQL) at the Victorian Infectious Diseases Reference Laboratory (VIDRL) immediately, coordinated by the jurisdiction's highest security public health laboratory
- telephone contact with the VIDRL on-call microbiologist is essential before any specimen referral
- the VIDRL on-call microbiologist can be contacted on 0438 599 437. In case of difficulty, back-up is provided by the VIDRL on-call laboratory manager (0438 599 439), and the Royal Melbourne Hospital Switchboard (03 9342 7000)
- in jurisdictions where facilities for preliminary EVD testing are available (e.g. New South

Wales (NSW), Queensland (QLD), South Australia (SA) and Western Australia (WA)), samples should be referred to VIDRL from the jurisdictional public health laboratory for confirmation
- refer to Section 8 – Laboratory Testing for more information

Contact tracing and management

Public health authorities should identify all contacts of suspect, probable or confirmed cases (depending on patient risk assessment and particular circumstances) from the time of onset of symptoms in the case. Refer to Section 11 – Contact Management for more information.

Contact tracing should focus on:

- any person who reported direct contact with the index case, i.e. direct contact with the bodily fluids, or with objects likely to have been contaminated with such fluids, or with the skin of the patient
- passengers who were seated in direct proximity to the index case, i.e. passengers who were one seat away from the index case (+/- 1 seat in all directions: Figure 1). In some situations, a more inclusive approach may be appropriate, such as where an ill passenger in a window seat has climbed over two adjacent passengers to access the aisle during the flight.
- crew members who provided in-flight service in the section of the aircraft where the index case was seated should be included in the trace-back
- cleaning staff that cleaned the section and seat where the index case was seated.

Control of environment

Disinfection and environmental decontamination are key components to control EVD. Cleaning and environmental decontamination is described in Section 10 and further detail is provided in Appendices 10 and 13.

2. The disease

Infectious agents

EVD is caused by an infection with Ebola virus which belongs to the family *Filoviridae*, which also contains the Marburg virus. Six species (1-3) of the genus *Ebolavirus* have been identified:

Genus: *Ebolavirus*
- Species: *Taï Forest ebolavirus*
  Virus: Taï Forest virus (formerly Cote d'Ivoire ebolavirus)
- Species: *Reston ebolavirus*
  Virus: Reston virus
- Species: *Sudan ebolavirus*
  Virus: Sudan virus
- Species: *Zaire ebolavirus*
  Virus: Zaire virus
- Species: *Bundibugyo ebolavirus*
  Virus: Bundibugyo virus
- Species: *Bombali ebolavirus*
  Virus: Bombali virus

The Zaire, Bundibugyo and Sudan viruses have been associated with large outbreaks in humans in Africa. Reston virus causes asymptomatic infections in humans, while Taï Forest viruses have not been associated with human outbreaks. The new species Bombali virus has not yet been identified in humans but could still pose a health risk (2).

Reservoir

Fruit bats of the *Pteropodidae* family are considered to be a likely natural host of the Ebola virus, with sporadic disease and outbreaks amongst other species such as chimpanzees, gorillas, monkeys, forest antelope and porcupines occurring from time-to-time (2, 4).

Mode of transmission

Ebola virus can be transmitted person-to-person via direct contact (through mucous membranes or broken skin) with (5):

- the blood or bodily fluids (including, but not limited to, urine, saliva, faeces, vomit, breast milk and semen) of people with EVD, and the bodies of people who have died of EVD.
- sexual transmission (oral, vaginal or anal sex)
- objects (e.g. needles, syringes) contaminated with blood or bodily fluids of people with EVD
- burial ceremonies that involve direct contact with the body of the deceased (6).
- Transmission through sexual contact, and through contact with other bodily fluids, such as breast milk, can occur after clinical recovery (7-11), however, the duration of infectivity remains unclear.

Ebola virus does not spread through air or water or in general by food. However, in Africa, infection has been documented through the handling of infected chimpanzees, gorillas, fruit bats, monkeys, forest antelope and porcupines (12).

Incubation period

From two to 21 days; most commonly eight to 10 days.

Infectious period

People with EVD are not infectious until they develop symptoms. People are infectious as long as Ebola virus persists in their blood and secretions (13). The infectivity is low at the onset of symptoms, and increases as symptoms worsen and as bodily fluid secretions increase (i.e. during the acute period of illness). For example, a patient with profuse vomiting and diarrhoea is more infectious than a patient with a fever only. Infectivity is highest at the point of death and after death.

The period of risk for transmission through sexual contact after clinical recovery cannot currently be defined, and as a precaution, should be considered to continue indefinitely until further information is available. Ebola virus has been isolated from semen 82 days after onset (10); while a case of possible sexual transmission has been described where the contact occurred 179 days after likely onset (11).

Following recovery from EVD, the risk of infectivity from patients with persistent infection is unknown but appears to be low and is likely to decrease over time (14). The virus may persist for several months in immunologically protected sites (e.g. spinal or intraocular fluid and the testes)

for an unknown length of time. Invasive procedures involving those sites in a person who has recovered from EVD will require a risk assessment for potential exposure.

Clinical presentation and outcome

The onset of symptoms is sudden and includes fever, myalgia, fatigue and headache. The next stage may include symptoms that are gastrointestinal (vomiting, diarrhoea), neurological (headaches, confusion), vascular, cutaneous (maculopapular rash), and respiratory (sore throat, cough) with prostration. Cases may develop a profound electrolyte disturbance, a septic shock-like syndrome, and progress to multi-organ failure, sometimes accompanied by profuse internal and external bleeding. The case-fatality rate (CFR) for the Zaire virus is estimated to be between 60% - 90%, followed by the Sudan virus (40% - 60%) (1). The CFR may be lower for other Ebola viral strains (15, 16). Variability in reported CFRs probably reflects viral strain, host factors and access to and standards of clinical care (17).

Post Ebola syndrome

Survivors report a range of sequelae described as post Ebola syndrome. The syndrome includes musculoskeletal pain, headaches and ocular problems (18). Late onset meningoencephalitis, memory loss and mental health disorders have also been reported (14).

Persons at increased risk of disease

Healthcare workers (HCW) and care givers in close contact with Ebola patients are at the highest risk of acquiring the disease as they are likely to come in contact with infected blood and bodily fluids. The risk of Ebola infections increases in resource poor settings with inadequate infection control.

People who are living in or travelling to affected areas of Africa may be at risk of infection; however, this risk is extremely low unless there has been direct exposure to the bodily fluids of an infected person (including unprotected sexual contact with confirmed cases after they have recovered), or an infected animal (alive or dead).

Disease occurrence and public health significance

EVD was first recognised in 1976 in two simultaneous outbreaks, in Nzara, Sudan, and in Yambuku, Democratic Republic of Congo. As of 21 August 2018, there had been 37 reported outbreaks of EVD in humans with more than 31,000 cases, including over 12,000 cases documented as fatal, and an average case-fatality rate of 50 % (19). The largest outbreak to date was first reported in March 2014 in West Africa (involving the neighbouring countries Guinea, Liberia and Sierra Leone, Nigeria, the United States (US) and Mali) (20). The total number of reported cases was about 28,616 (21). World Health Organization (WHO) declared the last of the countries affected, Liberia, to be Ebola-free by June 2016 (22).

EVD outbreaks in humans have emerged periodically in several African countries (the Congo, Democratic Republic of Congo, Uganda, South Sudan and Gabon, Sierra Leone, Liberia, Guinea, Mali, Nigeria and a single case in Ivory Coast). Two laboratory contamination incidents in Russia, one in England and import-related cases in South Africa, Italy, Spain and the United States have also been implicated to the EVD outbreaks outside Africa (23).

There have also been a number of incidents involving Ebola Reston virus in animals, but no symptomatic human cases (24, 25).

With a very high case fatality rate (up to 90% in some outbreaks) and potential for large outbreaks that are difficult to control in resource poor settings, an outbreak of EVD is a public health emergency, with effective control requiring the co-operation of all sectors of the community in-country and the involvement of international agencies.

The significance of EVD to public health in Australia is much lower; with a low risk of imported cases, and even lower risk of spread in the event of an imported case. However, a single case in Australia would require an urgent public health response and would be treated as a communicable disease incident of national significance (CDINS), with considerable community and media interest. Declaration of a CDINS by Australia's Chief Medical Officer (CMO) may trigger escalation through the stages of the *Emergency Response Plan for Communicable Disease Incidents of National Significance* (National CDPLAN). Escalation through the stages of the *National CDPLAN* may also be considered (www.health.gov.au/internet/main/publishing.nsf/Content/ohp-cdplan.htm).

3. Routine prevention activities

The risk of transmission in healthcare settings can be significantly reduced through the use of appropriate infection control precautions and environmental cleaning.

Travel restrictions are not routinely recommended for control of EVD, but it is recommended that travellers to countries where EVD occurs avoid areas where outbreaks are occurring.

People travelling in countries affected by EVD should maintain good hygiene practices. Travellers should avoid direct exposure to the body fluids of an infected person or animal (alive or dead), including avoiding the consumption of "bushmeat". Travellers should avoid unprotected sexual contact with EVD cases after they have recovered.

Vaccination

As of mid-2018, there is no routine vaccination for the Ebola virus. During the end stages of the 2014-16 West African Ebola virus outbreak, experimental vaccines that had previously been developed were trialled for potential use in emergency situations and at-risk populations, with some evidence of efficacy and safety (26).These experimental vaccines are not yet widely available and are not for general use. The WHO Strategic Advisory Group of Experts on immunization reviewed the candidate vaccines in June 2017, and recommended that the candidate vaccine rVSV-ZEBOV should be deployed in the context of an Ebola outbreak, via a ring vaccination strategy that includes vaccination of contacts, contacts of contacts, as well as local and international healthcare and frontline workers in the affected areas and areas that may be at risk from the expansion of the outbreak (27). During the Ebola virus outbreaks in the Democratic Republic of Congo in 2018, ring vaccination of contacts of confirmed cases and contacts of contacts were undertaken using rVSV-ZEBOV (28).

4. Surveillance objectives

- to rapidly identify, isolate and treat cases, and prevent transmission to their contacts
- to identify and provide information to contacts and ensure that they are isolated rapidly should symptoms occur
- to establish a data management system for conducting surveillance of contacts.

5. Data management

Probable and confirmed cases of EVD infection should be entered onto the notifiable diseases database within one working day of notification/report. Data for suspected cases should be maintained according to jurisdictional protocols.

6. Communications

PHUs should immediately notify the central state/territory communicable diseases agency of suspected, probable and confirmed cases. The case's date of birth, sex, place of residence, indigenous status, date of onset, travel history, laboratory results, clinical status, likely place of acquisition, and follow-up action taken should be provided.

State/territory PHUs should immediately notify suspected, probable and confirmed EVD cases to the National Incident Room by telephone 02 6289 3030 or email: health.ops@health.gov.au.

7. Case definition

The case definition may have been updated since the publication of this guideline. Please check the case definitions webpage on the Australian Department of Health's website (www.health.gov.au/internet/main/publishing.nsf/Content/cdna-casedefinitions.htm) for the latest version.

Person under investigation

Requires clinical evidence and limited epidemiological evidence.

*Note: If a risk assessment determines that a **person under investigation** should be tested for Ebola virus, the person should be managed as a **suspected case** from that point forward regardless of clinical and epidemiological evidence.*

Suspected case

Requires clinical evidence and epidemiological evidence.

Probable case

Requires clinical evidence and epidemiological evidence, AND, laboratory suggestive evidence of EVD.

Confirmed case

Requires laboratory definitive evidence only.

For surveillance purposes, only probable and confirmed cases are submitted to the National Notifiable Diseases Surveillance System (NNDSS).

Definitions

Clinical evidence requires fever (≥38°C) or history of fever in the past 24 hours. Additional symptoms such as unexplained haemorrhage or bruising, severe headache, muscle pain, marked vomiting, marked diarrhoea and abdominal pain should also be considered.

Limited epidemiological evidence requires travel to an EVD affected area (country/region) in the 21 days prior to onset.

Epidemiological evidence requires a lower risk exposure or higher risk exposure as defined below in the 21 days prior to onset.

Lower risk exposures:

- household contact with an EVD case (in some circumstances this might be classified as higher risk such where the household was in a resource poor setting)
- being within approximately 1 meter of an EVD case or within the case's room or care area for a prolonged period of time (e.g. HCWs, household members) while not wearing recommended PPE (See Section 9)
- having direct brief contact (e.g. shaking hands) with an EVD case while not wearing recommended PPE

Higher risk exposures:

- percutaneous (e.g. needle stick) or mucous membrane exposure to blood or body fluids of an EVD case (either suspected or confirmed)
- direct skin contact with blood or body fluids of an EVD case without appropriate PPE
- laboratory processing of body fluids of suspected, probable, or confirmed EVD cases without appropriate PPE or standard biosafety precautions
- direct contact with an Ebola infected dead body without appropriate PPE in a country where an EVD outbreak is occurring
- direct handling of sick or dead animals from disease-endemic areas
- consumption of "bushmeat" in a country where EVD is known to occur

Note: The presence of higher versus lower risk exposures, and the patient's clinical condition may influence decisions about the need to transfer the patient to a designated EVD treatment hospital.

Note: Exposure to an EVD case in an Australian setting would require the case is probable or confirmed EVD according to laboratory criteria.

Laboratory suggestive evidence includes:

- Isolation of virus pending confirmation by VIDRL, Melbourne, or the Special Pathogens Laboratory, Centers for Disease Control and Prevention (CDC), Atlanta or Special Pathogens Laboratory, National Institute of Virology (NIV), Johannesburg; OR
- Detection of specific virus by nucleic acid testing (NAT), antigen detection assay, or electron microscopy pending confirmation by VIDRL, Melbourne, or CDC, Atlanta or NIV, Johannesburg; OR
- IgG seroconversion or a significant increase in antibody level or a fourfold or greater rise in titre to specific virus pending confirmation by VIDRL, Melbourne, or CDC, Atlanta or NIV, Johannesburg; OR
- Detection of IgM to a specific virus pending confirmation by VIDRL, Melbourne, or CDC, Atlanta or NIV, Johannesburg.

Laboratory definitive evidence requires confirmation of EVD infection by VIDRL, Melbourne*, or CDC, Atlanta, or NIV, Johannesburg.

- Isolation of a specific virus; OR
- Detection of specific virus by NAT or antigen detection assay; OR
- IgG seroconversion or a significant increase in antibody level or a fourfold or greater rise in titre to specific virus.

* The first case in any outbreak in Australia will also be confirmed by CDC, Atlanta or NIV, Johannesburg.

8. Laboratory testing

*If a risk assessment determines that a **person under investigation** should be tested for Ebola virus, the person should be managed as a **suspected case** from that point forward regardless of clinical and epidemiological evidence.*

To organise testing of a **suspected case**, the treating clinicians should contact their jurisdictional public health reference laboratory for advice on specimen type, collection and transport. Treating clinicians should:

- notify the jurisdictional PHU as soon as possible for further advice on EVD risk assessment, and public health management, and
- contact the Public Health Reference Laboratory for advice on appropriate specimen type, collection and transport.

Appendix 4 (EVD Patient assessment flow chart) provides guidance on assessing the risk and deciding whether to test for Ebola virus. A risk assessment as per the EVD Patient Assessment Flow Chart should be conducted in liaison with the CHBO and an infectious diseases specialist.

Organising testing

Testing for EVD in Australia is conducted at the NHSQL at VIDRL. In some jurisdictions facilities exist for the preliminary testing of samples for Ebola virus. Where preliminary testing is to be conducted at these facilities, samples should be sent to VIDRL from the jurisdictional public health laboratory for confirmatory testing.

Telephone contact with the VIDRL on-call microbiologist is essential before any specimen referral. The VIDRL on-call microbiologist can be contacted on 0438 599 437. In case of difficulty back-up is provided by the VIDRL on-call laboratory manager (0438 599 439), and the Royal Melbourne Hospital Switchboard (03 9342 7000).

Collecting, handling and transport laboratory specimens for a suspected, probable or confirmed case

The primary diagnostic method is detection of Ebola virus by polymerase chain reaction (PCR) in blood. PCR on a throat swab or urine may also be used and serology is also available.
The essential specimen for virus detection is venous blood. Blood (in EDTA tubes), throat swabs and possibly urine should be collected as per the *National high security quarantine laboratory guideline for management of quarantinable viral haemorrhagic fevers* (29).

Appropriate precautions must be used when collecting blood, urine or throat swab specimens. Infection control precautions are the same as those recommended for patient care, noting the particular recommendations for aerosol-generating procedures (see Section 9 - Case management, Isolation and Restriction, and Appendix 9).

Where tests for Ebola virus have been ordered, routine haematology and other tests should be minimised since blood is highly infectious. If other tests are required for the immediate management of the patient, these should only be performed in close collaboration with specialist physicians, laboratory staff and public health authorities at the point of care, or in laboratories associated with designated quarantine hospitals, guided by jurisdictional viral haemorrhagic fever or laboratory plans wherever possible.

For laboratories not associated with a designated quarantine hospital, there are guidelines for handling material collected from suspected cases: *Laboratory procedures and precautions for samples collected from patients with suspected viral haemorrhagic fevers: guidelines for laboratories that are not associated with a designated isolation hospital* (30).

While samples should be ideally processed in laboratories with Physical Containment Level 3 (PC3) facilities, these guidelines provide information about enhanced precautions for handling material in PC2 facilities where required. The guidelines provide for the necessary on-site testing for other possible causes of the illness, and other testing required for the immediate and ongoing clinical management of the case. Work should be conducted in a biological safety cabinet.

Ebola virus is a Tier 1 Security Sensitive Biological Agent (SSBA). Laboratory personnel should refer to the SSBA Standards (31) when handling specimens. Specimens should be transported in accordance with current regulatory requirements (including SSBA guidelines).

More information about testing, contact details for VIDRL, guidance on the collection and handling of samples and procedures for transportation is available in the *National high security quarantine laboratory guidelines for management of quarantinable viral haemorrhagic fevers* (29).

Re-testing

If a sample is collected from a patient at the very early stages of illness and returns a negative result on EVD PCR, then, in the absence of an alternative diagnosis through other testing, and in conjunction with continued illness, a follow up PCR at least three days post development of symptoms is advisable. Re-testing should be considered when public health authorities and clinicians agree that there is a material possibility of EVD or similar.

9. Case management

Person under investigation

A **person under investigation** should be placed in a single room. Treating clinicians should contact the jurisdictional PHU as soon as possible for further advice on EVD risk assessment and to discuss any need for EVD testing. Persons under investigation must not be allowed to leave the hospital except if they are being transferred. Where there is a need to test, the person should be classified and managed as a **suspected case**.

Suspected, probable and confirmed cases

Response times

Suspected, probable or confirmed cases should be immediately notified to the central state or territory PHUs who will notify the National Incident Room at the Australian Government Department of Health urgently. A follow up investigation should begin on the same day as notification.

Case investigation

Response procedure

The response to a notification will normally be carried out in collaboration with the treating clinicians, and be guided by the EVD PHU checklist (Appendix 2), the EVD Patient Assessment Flow Chart (Appendix 4) and the EVD Case Investigation Form (Appendix 5). The presence of higher versus lower risk exposures, and the patient's clinical condition may influence decisions about the need to transfer.

PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness

For suspected, probable or confirmed cases:

- Confirm results of relevant pathology tests, or recommend that tests be done
- Determine if the diagnosis has been discussed with the case or relevant care-giver before beginning any interview
- Review public health management of cases and contacts
- Ensure appropriate infection control guidelines are followed in caring for the case
- Identify the likely source of infection.

Note: It is strongly recommended that PHU staff do not conduct face-to-face interviews, particularly if alternative methods (e.g. phone conversation) are available. However, if interviews with suspected, probable or confirmed cases or with persons under investigation who are being tested are conducted face-to-face, the person conducting the interview must have a thorough understanding of the indicated infection control practices and be competent in using appropriate PPE. Treating staff may conduct the interview rather than public health staff to reduce the number of people entering the room.

Identification of contacts

The procedures for risk assessment and management of contacts, including contact definitions, are outlined under Section 11 - Contact Management.

Education

Provide an EVD Factsheet to cases (Appendix 1) or contacts (Appendix 6), if appropriate.

Case treatment

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and prevention of complications.
Empiric therapy for conditions such as malaria and bacterial sepsis may be considered by treating clinicians, particularly if there are likely to be delays in the availability of laboratory test results.

Cases should be managed in the designated quarantine hospital where this is possible, unless alternative arrangements are necessary (e.g. initial presentation in a rural area, patient too ill to be transported, on the basis of risk assessment) or the recommended expert advice.

Infection control measures

Infection control, and isolation and restriction

In summary, these should include – at a minimum:

- Placement of the patient in a single room with private bathroom and an anteroom, with the door closed. In hospitals where such facilities are not available, interim arrangements may be required, such as use of commodes in the patient's room and unoccupied adjacent rooms for anterooms; signposting on the room is recommended that includes a list of required PPE and check in procedures for HCWs/visitors.
- HCW to use a P2/N95 mask, and cover all skin using a suitable combination of PPE, such as a disposable fluid resistant gown (or fluid resistant overalls), gloves, and eye protection (e.g. goggles or face shield), leg and shoe coverings, when entering a patient care area. Double gloving is recommended.
- Close attention to hand hygiene.

Use of PPE, especially additional PPE, requires adequate training and supervision (refer to ***Staff training on the use of PPE***). The use of a "buddy" system, where staff members observe each other in the safe removal of PPE after patient contact, is recommended. A knowledgeable and experienced staff member should be assigned to oversee the safe use of PPE in the patient care area.

Aerosol generating procedures (AGP) should be avoided in an EVD patient. If an AGP is essential, the PPE should include the minimum as stated above. Staff members should limit the use of needles and other sharps as much as possible.

Visitors should be restricted to a limited number of immediate family members; and only adults who are well. Visitors who enter the room of a suspected case, probable or confirmed case while in isolation must be trained in the correct use and safe removal of recommended PPE and supervised during the visit. Direct contact with the patient should not be allowed. A log should be kept of any visitors, including contact details.

Where a suspected case initially tests negative for EVD, but there is no alternative diagnosis and a high index of suspicion remains, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (Section 8 - Laboratory testing) and re-assessment.

Individual organisations may develop institute facility-specific infection control recommendations that exceed the national minimum standard specified here. Training in the use of PPE is particularly important when using any additional measures (beyond usual transmission-based precautions), because without sufficient training, additional PPE can be unsafe (32).

For hospitals managing the ongoing care of probable or confirmed EVD cases refer to the *Infection prevention and control principles and recommendations for Ebola Virus Disease* document (33).

The guidance includes recommended administrative and environmental controls for healthcare facilities, principles of PPE, training on correct use of PPE, use of a trained observed, designating

areas for PPE donning and doffing, preparation for doffing, selection of PPE for HCWs during management of Ebola patients and recommended PPE for HCWs and for observers.

Staff training on the use of PPE

Staff should be thoroughly trained in detailed procedures regarding how to put on and especially to take off PPE, including the correct order to avoid cross contamination and where used, to check that the respirator (P2/N95 mask) with which they are provided fits properly. They must also receive clear instructions on when PPE is to be used and how it is to be disposed of or, as appropriate, decontaminated, maintained and stored. This training should be held regularly. It is important that training be extended to all staff who may come into contact with suspected, probable and confirmed cases.

Infection Prevention and Control Expert Advisory Group (IPCEAG) document - *Infection prevention and control principles and recommendations for Ebola virus disease – Including information about personal protective equipment for clinical care of patients with suspected or confirmed Ebola virus disease in the Australian healthcare setting* (34) is recommended for putting on and taking off PPE used in ongoing care of probable or confirmed EVD cases.

The United States CDC *Guidance on Personal Protective Equipment (PPE) to be used by HCWs during management of patients with confirmed Ebola Virus Disease in U.S or persons under investigation (PUIs) for Ebola who are Clinically Unstable or have bleeding, vomiting, or diarrhoea in U.S. Hospitals, including procedures for putting on (donning) and removing (doffing PPE)* (35) guidance includes instructions for use of Powered Air Purifying Respirators (PAPR) or surgical hoods use.

Local guidelines may also be available.

Without detailed and thorough training, the use of PPE beyond that which HCW regularly use may endanger staff.

Management and monitoring of potentially exposed HCWs

Facilities should develop policies for monitoring and management of potentially exposed HCW. Facilities should keep a log of all staff that are involved in the care of EVD patients.

Persons with percutaneous or mucocutaneous exposures to blood, body fluids, secretions, or excretions from a patient with suspected EVD should:

- Stop working and immediately wash the affected skin surfaces with soap and water. Mucous membranes (e.g. conjunctiva) should be irrigated with copious amounts of water or eyewash solution
- Immediately contact occupational health/supervisor for assessment and access to post-exposure management services for all appropriate pathogens (e.g. HIV, hepatitis C etc.)

Release of cases from isolation

If the medical condition allows, a suspected case may be released from isolation and discharged following a negative test for EVD. They should be given a factsheet (Appendix 1) and contact details for the jurisdictional PHUs and quarantine hospitals (Appendix 3). In case of a high index of suspicion (such as in the absence of an alternative diagnosis), the suspected case would have to remain isolated and monitored.

Probable and confirmed cases may be released from isolation in consultation with an infectious diseases physician and PHUs and allowed to return home if recovered sufficiently from the illness. However, convalescent patients must be meticulous about personal hygiene due to the possibility of the presence of virus in bodily fluids, particularly semen, in which the presence of virus has been demonstrated for up to three months after recovery (10). A case of possible sexual transmission has been described where the contact occurred 179 days after likely onset (11). The case should be given advice regarding safe sex for 12 months or until two negative PCR test results are taken a minimum of one week apart (36-38).

Infection control precautions during convalescence

For patients who have recovered and been discharged after their acute illness, only standard precautions are needed when clinical evaluation and care is performed. There is no evidence that recovered patients of EVD pose any special risk to HCWs when this care involves contact with intact skin, sweat, tears, conjunctivae, saliva, and cerumen. In addition, individuals who have completely recovered from EVD and are not febrile, do not pose a risk of Ebola virus exposure through phlebotomy as such patients are not viraemic. For patients who present during convalescence with late stage manifestations of EVD, such as acute neurological or ocular symptoms, infection control practices recommended for evaluating persons under investigation for EVD should be used until testing for Ebola virus is negative (14).

This also applies where invasive procedures are being conducted on immunologically protected sites where there is the possibility of contact with spinal fluid, semen, or ocular contents (e.g. lumbar puncture, spinal anesthesia, prostate or testicular surgery and intraocular procedures). EVD survivors who have any new or recurrent ocular or neurologic symptoms should seek care for complications associated with potential Ebola virus persistence. EVD survivors with fever should be assessed for both common community-acquired infections (e.g. malaria, influenza, common cold, typhoid fever, gastroenteritis, etc.) as well as possible complications related to Ebola virus persistence.

Blood donation

The Australian Red Cross Blood Service recommends that a case defers donating blood for 12 months from the date of recovery (this is a conservative deferral given the lack of evidence about the duration of viraemia post recovery).

It is recommended that a contact of someone with EVD defers donating blood for eight weeks from date of last contact before donation. If contact is ongoing, deferral should be increased to a maximum of 12 months from date of case recovery plus an additional eight weeks.

Summary of PPE recommendations for patient management

Level 1 PPE checklist for low risk of exposure to blood and other body fluids
Recommended PPE for contact and droplet precautions includes:

- fluid resistant P2/N95 (if available) or surgical mask
- face shield or goggles
- two pairs of gloves
- long-sleeved, disposable fluid resistant gown (or fluid resistant overalls).
- leg and shoe coverings

Level 2 PPE checklist for high risk of exposure to blood and other body fluids
Recommended PPE for enhanced contact and droplet precautions includes:

- fluid resistant P2/N95 mask, face shield or goggles, and head cover OR a powered air-purifying respirator
- two pairs of gloves
- surgical scrubs (or equivalent), and long-sleeved, disposable fluid resistant gown to mid-calf or fluid resistant overalls
- enclosed, fluid and sharps resistant footwear plus fluid resistant boot covers to mid-calf
- plastic apron if fluid contamination is anticipated

10. Environmental evaluation

This section applies primarily to probable and confirmed cases, acknowledging there may be a need to consider environmental cleaning for a suspected case with a high pre-test probability of EVD.

Full PPE (covering all skin) must be worn when undertaking environmental cleaning, including a P2/N95 mask, because cleaning procedures have the potential to generate aerosols.

Patient residence

It is not usually recommended that environmental cleaning of a suspected case's residence or other potentially contaminated areas be undertaken prior to receipt of test results for EVD. In most jurisdictions, the time between notification of a suspected case and receipt of the preliminary laboratory test results will be less than 24 hours. If EVD is felt to be unlikely, it may be possible to allow household members to continue to reside in the home and leave potentially contaminated areas of a residence or other facility unused temporarily.

If significant delays are expected, or where areas are urgently required to be cleaned, environmental cleaning may be undertaken – in discussion with the relevant PHU. If a suspected case is considered to have a high pre-test probability of EVD based on the clinical and exposure risk assessment, and the potentially contaminated areas or objects cannot be isolated until test results are known, environmental cleaning might be undertaken prior to the confirmation of a case.

Appendix 13 provides further detail on undertaking environmental cleaning in domestic premises.

If a suspected case tests negative for EVD, and, re-testing is not required, no further special action is required for waste and isolated objects from the person's residence.

Cleaning and disinfection in healthcare settings

Routine environmental cleaning and disinfection

Disinfection and environmental treatment is a key component to control EVD. All potentially contaminated personal items and items used in the treatment of the patient should be disinfected with an appropriate viricide. Ebolaviruses are readily inactivated by low-level disinfectants. The preferred disinfectant solution is sodium hypochlorite made up to 1,000 parts per million (ppm) available chlorine (check the manufacturer's instructions) for routine environmental cleaning and 5,000 ppm for spills.

Terminal Cleaning

Once the patient has left the room the entire room should be cleaned with a neutral detergent and with a 1,000 ppm sodium hypochlorite solution. All cleaning equipment should be disposed of into clinical waste.

Body fluid spill

Appropriate PPE must be worn for cleaning body fluid spills, including gloves, disposable impermeable overshoes or boots, and P2/N95 masks with face shields/goggles and fluid resistant gowns or fluid resistant overalls. Spills should be cleaned using a spill kit. In the absence of a specific kit, spills should be absorbed with paper towels, liberally covered with a 5,000 ppm sodium hypochlorite solution and left to soak for 30 minutes before being wiped up, and disinfect the area again.

Patient equipment and linen

Limit the equipment that enters the patient's room, as it must be dedicated to the patient throughout their stay and cannot be used elsewhere. Disposable equipment and linen should be used wherever possible.

See Appendix 10 for further information on cleaning and disinfection.

Waste treatment and disposal

Items stained or containing body fluids are treated as clinical waste, and double bagged as the waste leaves the room. Waste must be stored securely prior to collection. Toilet waste may be flushed as usual, except where specific local requirements exist to the contrary. Disposable bed pans can be disposed of into the clinical waste after the addition of high absorbency gel, if available.

See Appendix 11 for further information on waste treatment and disposal.

Disposal of the deceased

Requirements for the disposal of bodies are prescribed under state and territory public health legislation (see Appendix 12).

Other factors to consider

Where local transmission of EVD is thought to have occurred, a thorough review of contributing environmental factors should be undertaken. This should include a review of infection control procedures, and opportunities for exposure to environments contaminated by body fluids.

Animal health

If a case has had contact with animals in Australia it may be appropriate to consult with the relevant state or territory animal health authority to assess the risk that animals could have become infected. Dogs have previously been shown to have developed antibodies to Ebola virus, but to date, it has not been reported that dogs have any clinical signs of infection (39).

11. Contact management

Identification of contacts

Contact tracing is conducted to identify and monitor persons who may have had contact with a probable or confirmed EVD case. Contacts of suspected cases should also be considered for contact management, particularly if there is likely to be a delay in confirming or excluding the diagnosis in the suspected case.

Contacts should be provided with information about the disease and risk of transmission, and monitored for the development of symptoms for 21 days after the last exposure to the case while the case was likely to be infectious (i.e. the maximum incubation period).

Based on an exposure risk assessment, there may be circumstances where restrictions are considered, such as for contacts who are HCWs, or for people planning travel to rural or remote areas with limited access to healthcare.

Contacts that develop a fever within 21 days of the last possible exposure to a suspected case should be immediately isolated, medically evaluated and assessed as per Appendix 4.

Contact definition

PHUs should identify all contacts of suspect, probable or confirmed cases (depending on patient risk assessment and particular circumstances) from the onset of symptoms in the case.

Contacts of an EVD case are assessed for their likely level of exposure, and managed according to risk category as per Table 1.

Table 1: Risk assessment and management for contacts of probable and confirmed* cases of EVD

Contact exposure category	Definition	Action and advice
Casual contacts	No direct contact with the patient or body fluids but who have been in the near vicinity of the patient	Reassure about very low risk Provide contacts factsheet (Appendix 6)
Lower risk exposures	Household contact with an EVD case (in some circumstances this might be	Explain what is meant by low risk

Contact exposure category	Definition	Action and advice
	classified as higher risk such where the household was in a resource poor setting); or Close contact in healthcare or community settings where close contact is defined as: • being within approximately one meter of an EVD patient or within the patient's room or care area for a prolonged period of time (e.g. healthcare personnel, household members) while not wearing recommended PPE (Section 9 - Case management: infection prevention, isolation and restriction) or • having direct brief contact (e.g. shaking hands) with an EVD patient while not wearing recommended PPE Healthcare workers	Twice daily self-monitoring of temperature for 21 days from last exposure; provide thermometer and instructions on use Notify public health authority if fever or other symptoms[+] develop Provide contacts factsheet (Appendix 6) Consider daily (or twice daily) active monitoring by PHU / jurisdictional communicable disease control branch An exposure and clinical risk assessment conducted by public health authorities, as well as an assessment of personal circumstances, will inform what activities and/or restrictions are required as part of an individual management plan
Higher risk exposures	Contacts with higher risk exposures have had direct contact with the patient or their bodily fluids. • percutaneous (e.g. needle stick) or mucous membrane exposure to blood or body fluids of an EVD patient • direct skin contact exposure to blood or body fluids of an EVD patient without appropriate PPE, or • laboratory processing of body fluids of suspected, probable, or confirmed EVD cases without appropriate PPE or standard biosafety precautions, or • direct contact with a dead body without appropriate PPE, or • Sexual contact with someone who has EVD or who is in the convalescent phase	Inform about risks Twice daily self-monitoring of temperature for 21 days from last exposure; provide thermometer and instructions on use Daily (or twice daily) active monitoring by PHU / jurisdictional communicable disease control branch Notify public health authority if fever or other symptoms[+] develop Provide template contacts factsheet (Appendix 6) An exposure and clinical risk assessment conducted by public health authorities, as well as an assessment of personal circumstances, will

Contact exposure category	Definition	Action and advice
		inform what activities and/or restrictions are required as part of an individual management plan

*Contact tracing may be undertaken in response to a *suspected* case where there may be a delay in laboratory diagnosis.

+Other symptoms include headache, joint and muscle aches, abdominal pain, weakness, diarrhoea, vomiting, stomach pain, rash, red eyes, chest pain, difficulty swallowing, bleeding (e.g. blood in stool or persistent bleeding from mouth or venepuncture sites or bruising).

Adapted from *Management of Hazard Group 4 viral haemorrhagic fevers and similar human infectious disease of high consequence* (40).

Contact assessment

Demographic and epidemiological data should be collected from all persons identified as having had close contact with a probable or confirmed EVD case using the case report form (Appendix 5). Information on close contacts should be managed according to jurisdictional requirements.

Identification and assessment of the close contacts of suspected cases may be deferred pending the results of initial laboratory testing. However, contact tracing should be considered if EVD infection remains high on the list of differential diagnoses, even if initial laboratory results are negative.

In the event of a suspected case on an aircraft, see Section 12 - Special Situations.

Contact testing

Routine laboratory screening for EVD infection is not recommended for asymptomatic contacts.

Prophylaxis

No specific prophylactic treatments are available for contacts.

Education

Contacts should be counselled about their risk and the symptoms of EVD and provided with a factsheet (Appendices 6,7,8) suitable for their level of exposure, as per Table 1 above.

Isolation and restriction

Routine home isolation of asymptomatic contacts is not recommended, but contacts with higher or lower risk exposures to the case are advised to monitor their health for 21 days after the last possible contact with a probable or confirmed EVD case.

An exposure and clinical risk assessment conducted by public health authorities, as well as an assessment of personal circumstances, will inform what activities and/or restrictions are required as part of an individual management plan. For example, measures to reduce body contact and/or

social mixing with other people may be recommended based on a risk assessment of the particular circumstances. This may include avoiding sexual contact.

Special arrangements for the monitoring of returning aid workers who have worked in a healthcare and community settings apply (Appendix 7 - Returning aid workers who have worked in healthcare or community settings during an Ebola outbreak).

Close contacts with higher risk exposures

Work restrictions may be considered for some contacts with higher risk exposures or for healthcare worker contacts (see Table 1) for 21 days following the last possible contact with the case. Home isolation is not routinely recommended during this period if these individuals remain asymptomatic, but measures to reduce body contact and/or social mixing with other people may be recommended based on a risk assessment of the particular circumstances.

Management of symptomatic contacts

If the contact develops symptoms consistent with EVD within the 21 days following the last contact with the case, the individual should be immediately isolated and managed as per the current clinical recommendations for suspected EVD cases, with a clinical risk assessment (Appendix 4), and depending on the outcome of the risk assessment, urgent testing for EVD. The clinical management of symptomatic contacts should then be guided by Appendix 4, and may include monitoring and repeat testing.

Symptomatic contacts that test negative for Ebola virus by nucleic acid testing (NAT) will still need to be monitored for 21 days after their last contact with a probable or confirmed EVD case. If the symptomatic contact's laboratory specimen was collected during the first three days of illness, re-testing for EVD can be considered, based on clinical judgement and results of other investigations. See Section 8 – Laboratory testing: Re-testing.

HCWs working in Australia

In an Australian clinical setting, HCWs who have taken recommended infection control precautions, including the use of appropriate PPE, while caring for a probable or confirmed EVD case are not considered to have had low or high-risk exposures to EVD.

However, given that not all breaches in PPE are obvious and work conditions may elevate anxiety levels, HCWs caring for probable or confirmed EVD cases may be advised to monitor their temperature daily. This approach means that HCWs are managed as low risk contacts even in the absence of known lower risk exposures; however no restriction in work duties is necessary while the HCW is asymptomatic.

Individual hospitals and healthcare organisations will need to implement their own occupational health and safety policies for staff caring for, or involved in the care of EVD cases. This might include hospital management conducting an interview or questionnaire for these staff at the beginning of each shift to ask about symptoms.

If the HCW develops symptoms consistent with EVD they should isolate themselves and notify their employer and PHU immediately.

Returning aid workers who have worked in healthcare or community settings during an Ebola outbreak

Public health authorities and/or employers may take a precautionary approach to returned aid workers, particularly those who were involved in direct patient care in an Ebola outbreak, during the 21 days since the aid worker has left the EVD-affected country.

An exposure and clinical risk assessment conducted by public health authorities, as well as an assessment of personal circumstances, will inform what type of self-monitoring (temperature checks etc.) is required as part of an individual management and monitoring plan. Where appropriate, there may be advice given to the aid worker about restricting social mixing and avoiding bodily contact with others and/or being within easy travel to adequate tertiary health care.

The returned aid worker must not work in clinical care during their 21 day monitoring period. Employers might consider temporary re-assignment to non-direct patient care duties, or a non-punitive leave policy that covers the 21 day monitoring period.

Separately, the aid worker's host organisation should have a policy for returning workers, including advice on self-monitoring of temperature and/or other symptoms of EVD for 21 days since leaving the EVD-affected country, being within easy travel distance of a hospital or adequate tertiary health care, and the need for a period of restriction in clinical care activities during the monitoring period.

Appendix 7 outlines an approach to the management of returning aid workers.

Enhanced border and monitoring measures that may apply during outbreaks with widespread and intense transmission

Well-established processes are always in place at Australia's international borders to screen ill travellers for EVD and all other Listed Human Diseases (LHD). Ill travellers (including passengers and crew) displaying signs or symptoms of an LHD are required to be reported to the Australian Government Department of Agriculture and Water Resources (Agriculture) as part of pre-arrival reporting requirements under the *Biosecurity Regulations 2016*. Once an ill traveller has been reported, an Agriculture biosecurity officer (BO) will conduct an assessment using the *Traveller with Illness Checklist* (TIC) to decide whether further action is required. If indicated by the TIC, the BO will contact a state or territory on-call CHBO for further advice and direction.

However, during an outbreak overseas with widespread and intense transmission and where the risk of importation to Australia is increased, there may be a need for enhanced border screening measures and/or post border monitoring activities that extend beyond the above business-as-usual processes. This is to ensure that everyone who could be at risk is detected, safely managed, knows how to monitor their health and knows who to contact if they become unwell. The following options may be considered and adjusted to be commensurate with the risk.

Enhanced border screening

Under policy direction from Health, BOs may screen all incoming passengers who have travelled in affected areas during the previous 21 days. These passengers can be asked about possible exposures to EVD and their body temperature may be measured.

Anyone who may have been in direct (unprotected) contact with an infected person or undertaken certain other high risk activities (e.g. funeral attendance) without sufficient personal protective

measures, has a recent history of fever (previous 24 hours), or who has a measured body temperature of ≥38°C will be referred to a state or territory HBO for further assessment, which may include transfer to a designated quarantine hospital.

Passengers who have travelled in affected areas during the previous 21 days may be provided with written instructions on what to do should they develop any symptoms of EVD.

Communications at the border

EVD communications, such as brochures or information cards, providing travel advice on prevention, protection, signs, symptoms and treatment can be made available at the border. The Australian Government Department of Agriculture and Water Resources is responsible for facilitating the display and availability of these items.

EVD signage can be displayed at the border in the form of printed banners or electronic screens. These communications consist of short awareness messages with infographics referring travellers to the Australian Government Department of Health's website for more information.

Negative (non-automatic) pratique of aircraft and vessels

Incoming aircraft or vessels can be made subject to negative pratique under the *Biosecurity Act 2015*. Travellers, air crew and cargo are not allowed to disembark until EVD risks have been evaluated and risk mitigation measures put in place. This border measure can be used for all incoming aircraft from a country at high-risk of exposure to EVD.

Human Biosecurity Control Orders

Under the *Biosecurity Act 2015*, travellers who are identified as having, or being suspected of having, an LHD, and who do not comply with recommended public health measures may be placed under a Human Biosecurity Control Order (HBCO). A number of measures can be imposed under an HBCO to manage the risk presented by the individual, including isolation, a requirement to undergo treatment, and restricting international travel.

Post-border monitoring

Universal daily monitoring for travellers who have signs or symptoms of EVD and are returning from affected countries, or a traveller who is a contact of someone with EVD, regardless of risk, may be implemented to facilitate early clinical assessment of returning travellers and to assure public safety. Monitoring may be passive, active, daily or twice daily, depending on the individual circumstances of the traveller. Systems such as automated text message (41) or call centres may be used to collect monitoring data from returning travellers. Reporting of interstate travel may also be required during the period of monitoring. Where there is interstate travel, a formal handover between the HBO (or delegate) in the jurisdictions of travel will occur.

12. Special situations

Suspected, probable or confirmed case who travelled by aircraft

An assessment of possible transmission of Ebola virus on an aircraft should be undertaken on a case-by-case basis. This should occur after careful risk assessment, taking into account the index case status, the presence of symptoms during the flight, any potential exposures during the flight, and the goals of the contact tracing. Assessment of the risk of transmission will be the role of a

HBO following identification of a suspected EVD case via the TIC (this is notified to the HBO by a BO).

Goals of contact tracing

- Prevention of onward transmission and awareness-raising for early detection in passengers/crew/ground staff who have had direct contact with the index case, or direct contact with the bodily fluids of the index case
- Reassurance for passengers/crew/ground staff with negligible exposure to the index case and subsequently low/no risk of EVD

When should contact tracing an aircraft be considered?

Contact tracing should be considered for suspected, probable and confirmed cases if the case was symptomatic during the flight. To ensure a consistent approach, upon notification of an incident involving a case on an aircraft, an expert jurisdictional panel consisting of the jurisdictional executive group of CDNA should be urgently convened to assess risk and agree on the approach to contact tracing. Considerations for the expert panel will include whether the case was symptomatic during flight, and whether the symptoms were "wet" with copious vomiting, diarrhoea and other fluids, or "dry" with onset of fever, muscle pain, headache and sore throat. A wider radius of follow-up may be required for a "wet" case than the standard -/+1 seat, including the row and the toilets used by the case.

Contact tracing should focus on:

Passengers and crew with reported direct contact: Co-travellers and crew members who had reported direct body contact , i.e. direct contact with the bodily fluids, or with objects likely to have been contaminated with such fluids, or with the skin of the index case should be traced. To gather this information, any records of significant events on the flight should be obtained from the airline.

Passengers one seat away (+/-1 seat in all directions): As direct contact is the main route of transmission for Ebola virus, only the passengers who were seated in direct proximity to the index case should be included i.e. only passengers who were one seat away from the index case (+/- 1 seat in all directions). If the index case occupied an aisle seat, the passengers seated directly across the aisle from the index case should also be traced (Figure 1).

Crew members of plane section: Crew members who provided in-flight service in the section of the aircraft where the index case was seated should be included as well as other crew members who had direct contact with the patient.

Cleaning staff of plane section: Inform cleaning staff of the suspected case prior to cleaning so that additional infection control precautions can be used. The cleaning staff that cleaned the section and seat where the index case was seated should be traced.

Passengers who shared the same toilet as the index case: Previously published guidance has suggested that in the absence of specific incidents, the use of the toilet by the index case is not considered a risk for others (with the exception of the situation described below) and therefore not relevant when considering contact tracing (42).

If there have been specific incidents such as the repeated and/or significant vomiting and/or diarrhoea in one or more of the toilets, efforts should be made to identify these toilet/s and

associated aircraft section and persons who may have been exposed to the case's bodily fluids in this setting.

The index case is a crew member: If a crew member is the suspected EVD case, contact tracing efforts should concentrate on passengers seated in the area where the crew member was working during the flight and all of the other members of the crew.

Persons with no direct exposure to the index case: Public health authorities may wish to communicate with every passenger from the aircraft, irrespective of their exposure risk, to provide basic information and establish a mechanism for public health follow up if required.

Management of aircraft contacts: People included in the contact tracing should be managed according to Section 11 - Contact Management. This requires an assessment of exposure risk and categorisation into high, low or no risk contacts.

Management consists of one or more of the following:

- Provision of information through factsheets and discussion with public health authorities
- Assessment of the need for medical evaluation of the contact if they are reporting symptoms at time of first interview; or following exposure to the index case
- Advice on the need for self-monitoring for temperature and notification to PHUs and/or presentation to health facilities if they develop a fever within 21 days of last exposure to the index case.

Collecting event and passenger information

If a diagnosis cannot be laboratory confirmed in a timely manner, contact tracing should be considered if the evidence strongly suggests EVD as the likely cause of the index case's disease.

The National Incident Room at the Australian Government Department of Health coordinates the collection of international flight manifests and incoming passenger cards (IPCs) (health.ops@health.gov.au).

Attempts should be made to contact the airline to investigate whether crew members remember (or even recorded) any incidents on board which resulted in potential exposures to crew or passengers.

It is possible that there could be an ill international traveller on a subsequent domestic flight. Public health authorities may be notified of this via airline or airport staff. For the purpose of contact tracing, passenger manifests may be obtained in conjunction with airlines or airport authorities. Given that passenger manifests on domestic airlines may not have complete contact information, it may be necessary to obtain contact details urgently from disembarking passengers.

Figure 1: Relevant areas for VHF contact tracing from the ECDC website (42)

Outbreaks in healthcare facilities

If one or more suspected, probable or confirmed EVD cases are identified in a healthcare facility, an outbreak management team should be convened, including a senior facility manager, an infection control practitioner and appropriate clinical staff, in consultation with PHU staff. Control measures may include:

- identification and monitoring of close contacts
- active case finding and treatment
- isolation and/or cohorting
- work restriction for healthcare workers who have had close contact (i.e. unprotected exposure) with a suspected, probable or confirmed case
- distribution of factsheets and other information
- epidemiological studies to determine risks for infection.

Outbreaks in residential care facilities or other residential institutions (e.g. prisons or boarding schools)

Although no EVD outbreaks in institutions other than in healthcare facilities have been reported, it is assumed that fellow residents in an institution may be at greater risk of infection if there has been a confirmed case living at the institution while infectious, particularly if there are shared bathroom/toilet facilities.

If one or more probable or confirmed EVD cases are identified in a residential care facility or institution, an outbreak management team should be convened, including PHU staff.

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Additional information:

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United States Centers for Disease Control and Prevention (CDC), Ebola virus disease, available from the CDC website (www.cdc.gov/vhf/ebola/index.html)

Public Health England (PHE), Ebola virus disease clinical management and guidance, available from the PHE website (www.gov.uk/government/collections/ebola-virus-disease-clinical-management-and-guidance)

14. Appendices

- **Appendix 1**: Ebola Virus Disease (EVD) Factsheet
- **Appendix 2**: PHU Ebola Virus Disease (EVD) checklist
- **Appendix 3**: Jurisdictional Public Health Unit Contact Details and quarantine hospitals
- **Appendix 4**: Ebola Virus Disease (EVD) patient assessment flow chart
- **Appendix 5**: Ebola Virus Disease (EVD) case report form

- **Appendix 6**: Ebola Factsheet for contacts
- **Appendix 7**: Returning aid workers who have worked in healthcare or community settings in an Ebola outbreak
- **Appendix 8**: Guidance for aircrews and cleaning staff on the management of Ebola Virus Disease (EVD)
- **Appendix 9**: Components of infection control
- **Appendix 10**: Cleaning and disinfection
- **Appendix 11**: Waste treatment and disposal
- **Appendix 12**: Post mortem care and examination
- **Appendix 13**: Recommendations for decontamination of premises of a probable or confirmed Ebola Virus Disease (EVD) case

15. Jurisdiction specific issues

Links to Australian state and territory public health legislation, and the Commonwealth *Biosecurity Act 2015* and amendments are available at the Australian Government Department of Health website: www.health.gov.au/internet/main/publishing.nsf/content/cda-state-legislation-links.htm.

Public health staff should be familiar with the Viral Haemorrhagic Fever contingency plan for their jurisdiction where these plans exist.

Appendix 1: Ebola Virus Disease (EVD) factsheet

EVD

EVD is a serious and often fatal disease caused by the *Ebolavirus*. Early treatment at a hospital can help people survive the disease.

Since 1976, a number of Ebola outbreaks have occurred, including a large outbreak in West Africa from 2014 to 2016. Poverty and limited healthcare have fuelled the majority of these outbreaks.

There is an extremely low risk of a similar outbreak in Australia.

Symptoms

- If someone has been infected by the virus, it can take up to 21 days for symptoms to appear
- EVD is a serious illness with a sudden onset of fever, muscle and joint aches, weakness, and headache
- This is followed by vomiting, diarrhoea, rash, and liver and kidney problems
- Some people may have internal and external bleeding
- In disadvantaged countries around half of people with EVD die of the disease

How it spreads

- EVD is spread by touching someone who is sick with or who has died from EVD or by touching their body fluids such as blood, vomit, diarrhoea, sweat, or through sex
- It can also be spread by contact with objects contaminated with the bodily fluids of cases
- EVD doesn't spread through the air
- A person with EVD can only spread the disease **once they become sick**
- In affected areas of Africa, people can get infected with EVD through close contact with the blood, secretions, organs or other bodily fluids of infected animals (e.g. through the hunting or preparation of "bushmeat")

People at risk

People living or visiting affected areas of Africa may be at risk of infection. However, their risk of infection is extremely low unless they have direct contact with the bodily fluids of an Ebola-infected person or animal (alive or dead).

Preventing infection

Avoiding contact with a person sick with EVD or their bodily fluids prevents spread of the disease.

Hunting and contact with "bushmeat" in affected areas of Africa should be avoided.

Some vaccines have been developed and trialled for potential use in emergency situations but these vaccines are not yet widely available and not for general use.

How it is diagnosed?

A blood test can diagnose EVD.

How it is treated?

At the moment there is no specific cure for EVD but intensive medical care can save lives.

How health authorities will prevent its spread in Australia

People who travel from Ebola-affected countries are checked for symptoms at Australian international borders. A person with Ebola symptoms will be taken from the airport to a hospital which is equipped to manage suspected EVD patients.

Anyone who may be at risk of EVD but who is well can travel on within Australia, but will be safely managed to protect their health and the community.

It is unlikely that someone with EVD will arrive and become ill in Australia, but our health system is prepared to safely manage them if they do.

What should a person at risk of EVD do if they become unwell?

Anyone who becomes unwell while travelling in areas affected by EVD should seek medical assistance immediately (by phoning a doctor or going to a medical emergency department or calling for an ambulance if urgent medical attention is required). They should not wait until they arrive back in Australia to seek medical assistance.

If you have returned within the last 21 days from travel to areas affected by Ebola and if you have a temperature of 38°C or over, OR feel sick, withdraw from contact with others, stay at home and call **[NUMBER] in [STATE/TERRITORY]** to speak to your public health unit. The public health unit staff will help you and tell you what to do next. If you need immediate medical assistance dial 000 and advise them that you have been in an Ebola affected country.

If you become unwell, you should avoid direct physical contact with any other person, until you have been told it is okay to do so by the public health unit.

Further information

World Health Organization Ebola updates available from the WHO website: (www.who.int/emergencies/diseases/en)

Australian Government Department of Health - Ebola webpage (www.health.gov.au/internet/main/publishing.nsf/Content/ohp-ebola.htm)

Appendix 2: PHU Ebola Virus Disease (EVD) checklist

1. Using the EVD Investigation form, contact the patient's doctor to:

- Confirm the onset date and symptoms of the illness
- Confirm results of relevant pathology tests, or recommend that tests be done in accordance with local laboratory referral protocols
- Find out if the case or relevant care-giver has been told what the diagnosis is before beginning the interview
- Inform the doctor that public health staff will be contacting the patient/next of kin/carer
- Review case management including infection control measures being used in caring for the case

2. Interview the case or care-giver to complete exposure and contact history and other details

- Complete the exposure history and other sections of the EVD Investigation Form
- Identify close contacts according to the contact definition

3. Follow-up patient's contacts to:

- Assess risk of EVD transmission
- Determine current symptoms, if any
- Explain symptoms and need to immediately report any new symptoms
- Explain to healthcare worker close contacts any need for work restrictions during the potential incubation period if there has been exposure
- Provide an EVD factsheet and recommend any self-monitoring for relevant contacts.

4. Operational considerations for contact tracing

- Contact tracing team members and relevant roles and responsibilities
- Define circumstances where contact tracing will be done by telephone or in person
- Consider need for dedicated call center and scripts in response to a notified case
- Surveillance data management of contacts

Training for contact tracing team

- EVD transmission
- Rationale for contact tracing
- Training in use of contact interview form and explanation of factsheets, including if/how jurisdictions will recommend restrictions for contacts of confirmed cases
- Infection prevention and control measures for contact tracers, including use of personal protective equipment (PPE), and instructions for use of thermometers if face-to-face interviews or assessments are conducted

Resources

- Contact listing sheets, case and contact interview forms
- Temperature logging forms for contacts
- Information/factsheets for contacts
- Consideration of thermometers supplied to contacts, or advice on which thermometers to use

- It is strongly recommended that public health unit (PHU) staff do not conduct face-to-face interviews, particularly if alternative methods (e.g. phone conversation) are available However, if interviews with suspected, probable or confirmed cases or with persons under investigation who are being tested are conducted face-to-face, the person conducting the interview must have a thorough understanding of the indicated infection control practices and be competent in using appropriate PPE. Treating staff may conduct the interview rather than public health staff to reduce the number of people entering the room
- If face-to-face interviews are going to be conducted, the need for alcohol-hand rub, supply of PPE– disposable gloves, P2/N95 masks, gowns, goggles, guidelines on when to use / put on PPE and general guidance for conduct during home visits such as no physical contact with people or objects at location, maintain > 1 meter distance from individuals, don't enter the residence, should all be considered

Policy for health monitoring of contact tracers

- Consideration of the need for temperature monitoring in the event that face-to-face contact tracing is required and symptomatic contacts are encountered.

5. Notify central jurisdictional communicable disease control agency and Chief Human Biosecurity Officer

6. Central communicable disease control agency to notify Australian Government Department of Health, National Incident Room

7. Consider need for media release and designate a media spokesperson

Appendix 3: Jurisdictional public health unit contact details and quarantine hospitals

State/territory	Public health unit contact details
ACT	02 6205 2155 Monday – Friday during business hours 02 9962 4155 After hours
NSW	1300 066 055 Contact details for the public health offices in NSW Local Health Districts (http://www.health.nsw.gov.au/Infectious/Pages/phus.aspx)
NT	08 8922 8044 Monday – Friday daytime 08 8922 8888 ask for CDC doctor on call –for after hours
QLD	13 432 584 Contact details for the public health offices in QLD Area www.health.qld.gov.au/system-governance/contact-us/contact/public-health-units
SA	1300 232 272
TAS	1800 671 738
VIC	1300 651 160
WA	08 9222 2131 After hours 08 9328 0553 Contact details for the public health offices in WA (www.public.health.wa.gov.au/3/280/2/contact_details_for_regional_population__public_he.pm)

State/territory	Name of quarantine hospital(s) Contact details
ACT	Canberra Hospital 02 5124 0000
NSW	Westmead Hospital 02 9845 5555 Children's Hospital Westmead 02 9845 0000
NT	Royal Darwin Hospital 08 8922 8888 Ask for CDC doctor on call
QLD	Royal Brisbane and Women's Hospital 07 3636 8111 Gold Coast University Hospital 1300 744 284 Cairns Hospital 07 4226 0000
SA	Royal Adelaide Hospital 08 8222 4000 Women's and Children's Hospital Adelaide 08 8161 7000
TAS	Royal Hobart Hospital 03 6166 8308 and ask for the on-call Infectious Diseases Physician
VIC	Royal Melbourne Hospital Grattan Street, Parkville 03 9342 7000
	The Royal Children's Hospital 50 Flemington Road, Parkville 03 9345 5522
WA	Sir Charles Gairdner Hospital 08 6457 3333 and ask for on-call Clinical Microbiologist
	Perth Children's Hospital 08 6456 2222 and ask for on-call Clinical Microbiologist

Appendix 4: Ebola Virus Disease (EVD) Patient Assessment Flow Chart – *Advice for healthcare facilities and staff*

Does the patient have a fever (>38°C) or history of fever in the past 24 hours?

- Consider additional symptoms such as unexplained haemorrhage, severe headache, muscle pain, marked vomiting or diarrhoea, abdominal pain AND,
- Report returning from a country where there is a current EVD outbreak or other compatible exposure in the 21 days prior to illness onset

NO – EVD highly unlikely manage locally

YES – PATIENT UNDER INVESTIGATION

Has the patient:

- had higher risk exposures, such as cared for patients (with no or inadequate personal protective equipment (PPE), PPE breach or come into contact with bodily fluids of OR handled clinical specimens (blood urine faeces, tissues, laboratory specimens) from an individual or animal known or strongly suspected to have EVD
- had lower risk exposures such as house contact with an EVD case, being with 1m of a case without PPE, or brief direct contact such as shaking hands, OR
- presented with marked vomiting OR marked diarrhoea OR bruising OR bleeding?

NO – INVESTIGATE AS USUAL TO FIND THE CAUSE OF THE ILLNESS

YES

SUSPECTED CASE

Note: The presence of high versus lower risk exposures, and the patient's clinical condition may influence decisions about the need to decision to transfer.

- ISOLATE in a single room with own bathroom and anteroom and the door closed (negative pressure room if available)
- URGENT discussion with local ID physician + Public Health Unit (PHU) + local laboratory + quarantine hospital (ID + Intensive Care Unit) RE: Diagnosis, status and need for transfer for management and EVD testing
- Collect specimens for testing based on advice received
- Liaise with ambulance and hospital for transfer

CONSIDER ADDITIONAL INFECTION CONTROL PRECAUTIONS

- Additional PPE may be required if there is copious amounts of blood, bodily fluids, vomitus, or faeces. Seek expert infection control advice
- COMMENCE PUBLIC HEALTH ACTIONS
- Work with the PHU to identify close contacts. Further actions depend on results of EVD testing

EVD test positive – PROBABLE/CONFIRMED CASE

- Urgent discussion with Public Health Unit and ID physician, discuss any need for transfer

EVD OUTBREAK AREAS

Outbreaks have previously occurred in the Nigeria, Sierra Leone, Guinea, Liberia, Mali, Congo, South Sudan, Gabon and Uganda.

Check WHO outbreak updates for recent reports: http://who.int/csr/don/en/

INFECTION CONTROL/PPE (SEE APPENDIX 9 FOR DETAILS)

- Single room with own bathroom (with door closed)
- Healthcare worker (HCW) to use a P2/N95 mask, and cover all skin using a suitable combination of PPE, such as a disposable fluid resistant gown or fluid resistant overalls, gloves, and eye protection (e.g. goggles or face shield), leg and shoe coverings, when entering a patient care area. Double gloving might also be considered.
- Restricting entry of non-essential staff and visitors
- Avoid aerosol-generating procedures, but if unavoidable, follow PPE recommendations as above

Appendix 5: Ebola Virus Disease (EVD) case report form

1 NOTIFICATION	Date notified	--/--/---- dd/mm/yyyy
	Notifier name	
	Notifier organisation	
	Telephone	
	Email	
	Treating Doctor	
	Telephone	
	Fax	
	Email	
2 INTERVIEW	Was the case interviewed?	☐ Yes ☐ No ☐ N/A
	If case not interviewed, state who was interviewed and their relationship to the case	
	Date of first interview	__ /__ /____ dd/mm/yyyy
	Name of interviewer	Telephone number of interviewer
3 CASE DETAILS	Name (first name, surname)	
	Date of birth	__ /__ /____ dd/mm/yyyy
	Age (yrs / months)	__ Yrs __ Mths
	Sex	☐ Male ☐ Female
	Occupation - *specify*	
	English preferred language	☐ Yes If no, *specify language….*
	Address (permanent)	
	Telephone (home)	
	Telephone (mobile)	

	Email			
	Temporary address (if different from permanent address)			
	Telephone (temporary home)			
	Telephone (mobile)			
	Email			
	Indigenous Status	☐ Aboriginal origin	☐ Torres Strait Islander origin	☐ Both Aboriginal and Torres Strait Islander origin
		☐ Not Aboriginal or Torres Strait Islander	☐ Unknown	
	Ethnicity – *specify*			
	Country of birth – *specify*			
4 CLINICAL DETAILS	Date of first symptom onset	__ /__ /____	dd/mm/yyyy	
	Febrile phase	☐ fever	☐ malaise	☐ myalgia
		highest measured temperature		
		☐ headache	☐ pharyngitis	☐ conjunctival injection
		☐ vomiting	☐ diarrhoea	☐ bloody diarrhoea
		☐ abdominal pain	☐ rash	☐ petechiae
	Other symptoms –*specify*			
	Complications	☐ Hypotension	☐ Spontaneous bleeding	☐ Oedema
		☐ Shock	☐ Neurologic involvement	☐ Multi-organ failure
	Other complications – *specify*			
5 HOSPITAL and TREATMENT DETAILS	Hospitalised	☐ Yes	☐ No	☐ Unknown
	Date admitted	__ /__ /____	Date discharged	__ /__ /____
	Name of hospital – *specify*			
	Isolated in single room	☐ Yes	☐ No	☐ Unknown

	Admitted to ICU or HDU	☐ ICU	☐ HDU	☐ Unknown
	Date admitted to ICU/HDU	__ /__ /____	Date discharged	__ /__ /____
6 OUTCOME	Patient outcome	☐ Alive	☐ Dead	☐ Unknown
	Date outcome information sought	__ /__ /____		
7 LABORATORY CRITERIA	***Testing must be organised according to the Laboratory Testing Guidelines in discussion with jurisdictional public health laboratory***** Specimens collected	☐ Blood/ serum	☐ Throat swab	☐ Urine
	Date collected	__ /__ /____	__ /__ /____	__ /__ /____
	Laboratory that received specimens			
	Specimens transferred to Jurisdictional PH lab (if relevant e.g. NSW, QLD)	☐ Yes	☐ No	☐ Unknown
	Detection of virus by PCR in Jurisdictional PH lab (if relevant)	☐ Yes	☐ No	☐ Unknown
	Specimens transferred to NHSQL	☐ Yes	☐ No	☐ Unknown
	Isolation of virus	☐ Yes	☐No	☐ Unknown
	Detection of virus by	☐ PCR	☐ Antigen detection	☐ Electron microscopy
	IgG titre(s)	☐ Single high titre	Titre ---	Date __ /__ /____
		☐ Four fold rise	1st titre ---	Date __ /__ /____
	IgM positive		2nd titre ---	Date __ /__ /____
		☐ Yes	☐No	☐ Unknown/not done
	Confirmation by	☐ Special pathogens lab Atlanta CDC	☐ National Institute of Virology, Johannesburg	
	Lymphopaenia	☐ Yes	☐ No	☐ Unknown
	Thrombocytopaenia	☐ Yes	☐ No	☐ Unknown

8 EXPOSURE PERIOD	**Between dates:**	__ /__ /____ (onset of symptoms minus 21 days)	TO	__ /__ /____ (onset of symptoms minus 1 day)
	During this time was there contact with a confirmed / probable case/s?	☐ Yes	☐ No	☐ Unknown
	Case Contact 1 name			
	Case Contact 1 type	☐ Living patient	☐ Deceased patient	
	Specify type of contact	☐ Visit sick patient	☐ Care for sick patient – *specify type of care*	☐ Bury deceased patient ☐ Sexual contact of survivor or someone who later got sick
		☐ Exposed to blood, saliva, urine, vomit or faeces of sick patient	☐ Exposed to blood, saliva, urine, vomit or faeces of deceased patient	☐ Sexual contact (oral, vaginal, anal)
	Case Contact 2 name			
	Case Contact 2 type	☐ Living patient	☐ Deceased patient	
	Specify type of contact	☐ Visit sick patient	☐ Care for sick patient – *specify type of care*	☐ Bury deceased Patient ☐ Sexual contact of survivor or someone who later got sick
		☐ Exposed to blood, saliva, urine, vomit or faeces of sick patient	☐ Exposed to blood, saliva, urine, vomit or faeces of deceased patient	☐ Sexual contact (oral, vaginal, anal)
	Recent residence or travel in an area with active Ebola virus disease / outbreak	☐ Yes	☐ No	☐ Unknown
	If yes, specify country, region			
	Specify dates of travel	__ /__ /____	To	__ /__ /____

		Animal exposures			
		Contact with bats, primates or other animals from disease-endemic area?	☐ Yes Details	☐ No	☐ Unknown
		Contact with people who are in close contact with bats or primates from disease-endemic areas b/c of their work?	☐ Yes Details	☐ No	☐ Unknown
		Laboratory exposure	☐ Yes Details	☐ No	☐ Unknown
		Did the case visit a healthcare facility or hospital during their exposure period?	☐ Yes *Specify including date last attended:*	☐ No	☐ Unknown
		Other high risk settings (e.g. funeral / burial of suspected/ confirmed EVD patient) -*Specify*			
		For any exposure Location of possible exposure			
		Nature of possible exposure- *specify*			
		Dates of possible exposure	__ /__ /____	**To**	__ /__ /____
7	**PLACE INFECTION ACQUIRED**	Australian state or territory *Specify*			
		Country - *specify*			
8	**INFECTIOUS PERIOD**	Between dates	__ /__ /____ (onset of symptoms)	**To**	__ /__ /____ (10 weeks after onset or as long as blood/ secretions contain virus)
		Isolation commenced	☐ Yes	☐ No	☐ Unknown
		If yes, date isolation commenced	__ /__ /____		
		Details of isolation			
		Did case travel during their infectious period?	☐ Yes	☐ No	☐ Unknown
		PLACE VISITED	**Arrival date**	**Departure Date**	**Flight no. or mode of transport**

		1			
		2			
		3			
		4			
		Did the case attend any of the following places during their infectious period?	**Name**	**Telephone**	**Date attended**
		☐ Childcare			
		☐ Preschool / School			
		☐ Educational / residential facility			
		☐ Hospital / healthcare facility			
9	**CASE CLASSIFICATION**	☐ Confirmed	☐ Probable	☐ Suspected	☐ Rejected
10	**CONTACT MANAGEMENT**	**Contact setting**	**No. of casual contacts**	**No. of low risk close contacts**	**No. of high risk close contacts**
		Household			
		Ambulance staff			
		Medical/healthcare staff			
		Laboratory staff			
		Work			
		Sexual			
		Other - *specify*			
		Contact surveillance	**No. of casual contacts[#]**	**No. of low risk contacts[##]**	**No. of high risk contacts[###]**
		No temperature monitoring but advice to seek information and health care if symptoms develop			

	Twice daily self-monitoring of temperature for 21 days and reporting to PHU if fever or other symptoms develop			
	Details of contacts hospitalized with fever			
	Name	DOB	UR no.	Telephone

** See *Laboratory procedures and precautions for samples collected from patients with suspected viral haemorrhagic fevers*. The Australian Government Department of Health (www.health.gov.au/internet/main/publishing.nsf/Content/cda-pubs-other-vhf.htm)

#No direct contact with the patient or body fluids but who have been in the near vicinity of the patient

##Household contact with an EVD case (in some circumstances this might be classified as higher risk such where the household was in a resource poor setting) or
Close contact in healthcare or community settings where close contact is defined as:

- being within approximately 1 metre of an EVD patient or within the patient's room or care area for a prolonged period of time (e.g. healthcare personnel, household members) while not wearing recommended personal protective equipment (Section 9 - Case management Infection Prevention, Isolation and Restriction)
- having direct brief contact (e.g. shaking hands) with an EVD patient while not wearing recommended personal protective equipment

###Contacts with higher risk exposures have had direct contact with the patient or their bodily fluids.

- percutaneous (e.g. needle stick) or mucous membrane exposure to blood or body fluids of an EVD patient
- direct skin contact exposure to blood or body fluids of an EVD patient without appropriate personal protective equipment (PPE)
- laboratory processing of body fluids of suspected, probable, or confirmed EVD cases without appropriate PPE or standard biosafety precautions
- direct contact with a dead body without appropriate PPE
- Sexual contact with someone who has EVD or who is in the convalescent phase

Appendix 6: Factsheet for contacts

Ebola

Information for people who may have been exposed to a case.

This factsheet provides information about the disease and what you need to do now.

The risk of acquiring Ebola virus disease (EVD or Ebola) is very low unless there has been direct physical contact with the bodily fluids of an infected person (alive or dead). You cannot catch Ebola just by sharing the same room or aircraft without close physical contact and/or direct exposure to the bodily fluids of an infected person.

What is EVD?

EVD is a serious and often fatal disease caused by the Ebola virus. Early treatment at a hospital can help people survive the disease.

Even if there is a case in Australia, Ebola **won't** become widespread here like it has in some disadvantaged African countries.

Symptoms

- Ebola virus can cause a serious illness with a sudden onset of fever, muscle and joint aches, weakness, and headache.
- This is followed by vomiting, diarrhoea, rash, and liver and kidney problems.
- Some people have lots of internal and external bleeding.
- In disadvantaged countries over half of people with Ebola die of the disease.

What should I do to monitor my health and for how long?

Public Health Unit (PHU) staff will contact you to assess your exposure. You will be provided with information about what you should do to monitor your health and what activities you should avoid, if any, for 21 days after your possible exposure to the Ebola virus.

It is known that early medical care for Ebola can be life-saving. It is very important to detect the earliest symptoms of Ebola. **If you become unwell, we will help you get treatment and minimise the risk to others.**

This may include measuring and recording your temperature with a thermometer twice a day and monitoring yourself for any other Ebola symptoms for 21 days after your exposure. To protect yourself and others during the monitoring period we recommend:

- You must be able to leave an event or public area immediately if you begin to feel ill
- You must be contactable by phone at all times
- Discuss any travel plans with your PHU

PHU authorities may contact you daily to check your health.

What should I do if I become unwell?

If you have a temperature of 38°C or over, OR feel sick, withdraw from contact with others, stay at home and call **[NUMBER] in [STATE/TERRITORY]** to speak to your PHU. The PHU staff will help you and tell you what to do next. If you need immediate medical assistance dial 000 and advise them that you have been in an Ebola affected country.

If you become unwell, you should avoid direct physical contact with any other person, until you have been told it is okay to do so by the PHU, and always wash your hands carefully.

How it spreads

- The Ebola virus is spread by touching someone who is sick with or who has died from Ebola infection or by touching their body fluids such as blood, vomit, diarrhoea, or sweat, or through sex.
- It can also be spread by contact with objects contaminated with the bodily fluids of cases.
- The Ebola virus does not spread through the air.
- A person with Ebola can only spread the disease **once they become sick**.
- In affected areas of Africa, people can catch an Ebola infection through close contact with the blood, secretions, organs or other bodily fluids of infected animals (e.g. through the hunting or preparation of "bushmeat").

What can I do to protect myself and my family?

The most important thing is that if you become sick, try not to touch anyone else and call **[NUMBER] in [STATE/TERRITORY]** to speak to your PHU.

In general we recommend the following:

- Wash your hands after going to the toilet
- Wash your hands before preparing food
- Don’t share items that may have blood or bodily fluids on them, such as razors, toothbrushes and towels

Appendix 7: Returning aid workers who have worked in healthcare or community settings in an Ebola outbreak

Aid workers returning to Australia from Ebola-affected countries are subject to monitoring and may be asked to comply with a range of restrictions for 21 days after leaving an Ebola-affected country. If possible, the aid worker should fly directly to their final destination in Australia. It is important to note that most returning aid workers are at low to very low risk of developing Ebola, and persons who may be incubating Ebola virus but who have not developed symptoms pose no risk to other people. Further information on aid workers who are departing from or returning to Australia from an area affected by a Listed Human Disease (LHD) can be found at [https://www.health.gov.au/internet/main/publishing.nsf/Content/ohp-ebola-Information-for-Health-Professionals].

Table 2: Restriction plans for returning aid workers who have worked in healthcare or community settings in an Ebola outbreak.

Category	Aid workers not involved in direct patient care – no known exposures	Aid workers with lower risk exposures	Aid workers with higher risk exposures
Examples	Aid workers who have worked supporting the Ebola response but who did not work in a laboratory or clinical setting caring for patients with Ebola Virus Disease (EVD) and who did not conduct contact tracing activities in the community.	Majority of aid workers involved in routine care of EVD patients and handling of samples **wearing appropriate personal protective equipment (PPE),** OR Brief direct contact (i.e. shaking hands) or being in a patient care area for a prolonged period of time while **not wearing appropriate PPE**	Needle-stick injury, unprotected exposure to blood or body fluids (**breach of PPE, or not wearing appropriate PPE**)
Probability of illness	Very low	Low	High
Public health measures			
Identification of aid worker	Host organisation to notify Australian Government Department of Health of aid worker's return to Australia and provide their contact details **and** Aid worker to self-report to jurisdictional public health unit Public Health authorities to keep a register of aid workers being monitored.	Host organisation to notify Australian Government Department of Health of aid worker's return to Australia and provide their contact details **and** Aid worker to self-report to jurisdictional public health unit Public health authorities to keep a register of aid workers being monitored.	Host organisation to notify Australian authorities (e.g. Australian Government Department of Foreign Affairs and Trade (DFAT) and Health) in the event of medical evacuation of Health Care Workers (HCW) with a higher risk exposure. Host organisation to notify Australian Government Department of Health of aid worker's return to Australia and provide their contact details where there is a

			previously unreported exposure, **and** Aid worker to self-report to jurisdictional public health unit Public Health authorities to keep a register of aid workers being monitored.
Assessment	Public Health authorities will contact each returning aid worker to conduct an exposure and clinical risk assessment, and an assessment of personal circumstances, such as the proximity of the person's usual place of residence to a facility that can test for Ebola.		
Outcome of assessment	The outcome of the risk assessment will determine what type of self-monitoring (temperature checks etc) is required. Public health authorities will put in place an appropriate voluntary plan, including whether any restriction of activities (living, working, movement) is appropriate.		
Options for the public health management may include:			
Self-monitoring[1]	Self-monitor[1] fever and symptoms twice daily for 21 days after leaving Ebola-affected country. Notify public health unit and seek appropriate healthcare if symptoms develop.	Self-monitor[1] fever and symptoms twice daily for 21 days after leaving Ebola-affected country, reporting if symptoms occur. Consider active daily reporting to nominated public health authority.	Active daily check of health by nominated public health authority and self-monitor[1] fever and symptoms twice daily for 21 days after leaving Ebola-affected country, reporting if symptoms occur.
Travel within Australia	Aid worker may be advised to ensure ready access to medical care, and may be required to discuss travel with public health authorities during the 21 days after leaving the Ebola-affected country.	Aid worker may be required to notify public health authorities about their intended travel for the 21 day monitoring period. If travel is agreed, the individual must have timely access to medical care at the destination. Consideration may be given for the aid worker to be in a location with ready access to designated quarantine hospital (capital cities of states and territories). Where there is travel from one jurisdiction to another, there is formal	Chief Human Biosecurity Officer (CHBO) to decide if returning aid worker to remain at the port of arrival during the 21 day monitoring period*. Aid worker must have ready access to designated quarantine hospitals (capital cities of states and territories) during monitoring period. After aid worker reaches final destination in Australia, they are likely to be required to not travel within Australia for 21 days after leaving the Ebola-affected country. Where there is travel from one jurisdiction to another, there is formal

[1] During an outbreak overseas with widespread and intense transmission, health authorities may implement daily active monitoring for 21 days after leaving an affected country for all returning aid workers, regardless of their risk category.

		communication and handover between the two CHBOs.	communication and handover between the two CHBOs or their delegates.

And based on the outcomes of a risk assessment and assessment of personal circumstances may also include:			
Minimise bodily contact with others		If a risk assessment indicates it would be appropriate, the responsible public health unit will develop an appropriate plan under which the aid worker may be asked to limit their social mixing and avoid all bodily contact (e.g. hugging, kissing, intimate contact), and/or restrict activities as much as possible to within the home, during the 21 days after leaving an Ebola-affected country.	
Clinical work in Australia	No work in clinical care for 21 days after leaving Ebola-affected country	No work in clinical care for 21 days after leaving Ebola-affected country	No work in clinical care for 21 days after leaving Ebola-affected country
International travel from Australia	Onwards international travel within 21 days after leaving Ebola affected country should be discussed	No onwards international travel within 21 days after leaving Ebola-affected country	No onwards international travel within 21 days after leaving Ebola-affected country
Informing household members	Household members should be informed about the very low risks to the returning aid worker, and how to help monitor signs and symptoms.	Household members should be informed about the low risk to the aid worker's household members should symptoms develop, and about the need to avoid all bodily contact with them if advised by public health authorities.	Household members should be informed about the low risk to the aid worker's household members should symptoms develop, and about the need to avoid all bodily contact with them if advised by public health authorities.

* Under the World Health Organization declaration of a Public Health Emergency of International Concern (PHEIC) healthcare workers who have been exposed to EVD should not travel unless they are being appropriately medically evacuated and breaches of PPE should be reported immediately in-country. Therefore, healthcare workers in this category should have been notified to the Department of Health as part of the medical evacuation process. However, there is the possibility of a previously unknown or unreported exposure.

Appendix 8: Guidance for aircrews and cleaning staff on the management of Ebola Virus Disease (EVD)

This section provides guidance to aircrews and cleaning staff in the management of EVD. It should be read in conjunction with the factsheet on EVD (Appendix 1).

Management of ill people on aircraft if EVD is suspected

Crew members on a flight with a passenger or other crew member who is ill with a fever, or one or more other symptoms, including headache, muscle pain, vomiting, diarrhoea, abdominal pain, or unexplained haemorrhage or bruising, and who is traveling from or has recently been in an EVD risk area, should follow these precautions:

- Keep the sick person separated from others as much as possible.
- Give tissues to a sick person and provide a plastic bag for disposing of used tissues.
- Wear impermeable disposable gloves for direct contact with blood or other body fluids and use eye mask/goggles.
- Wash hands/use alcohol rubs after the removal of gloves.

Universal Precaution Kits: Airplanes traveling to countries affected with Ebola should carry Universal Precaution Kits, as recommended by the International Civil Aviation Organization (ICAO), for managing ill on-board passengers (43).

General Infection Control Precautions

Personnel should always follow basic infection control precautions to protect against any type of infectious disease.

What to do if you think you have been exposed

Any person who thinks he or she has been exposed to Ebola virus either through travel, assisting an ill traveller, handling a contaminated object, or cleaning a contaminated aircraft should take the following precautions:

- notify your employer immediately.
- monitor your health for 21 days. Watch for fever, chills, muscle aches, severe diarrhoea, vomiting, rash, and other symptoms consistent with EVD.

Health authorities will contact you to provide advice on monitoring your health.

When to contact a health care provider

- If you develop sudden fever, chills, muscle aches, severe diarrhoea, vomiting, rash, or other symptoms consistent with EVD, you should seek immediate medical attention:
    - before visiting a health care provider, alert the clinic or emergency room in advance about your possible exposure to EVD so that arrangements can be made to prevent spreading it to others
    - when traveling to a health care provider, limit contact with other people. Avoid all other travel
- If you are located abroad, contact your employer for help with locating a health care provider.

Guidance for Airline Cleaning Personnel

Ebola virus is transmitted by close contact[2] with a person who has EVD or with their blood or bodily fluids. Treat any bodily fluid as infectious. Blood or bodily fluids on interior surfaces can spread Ebola virus if they get into your eyes, nose, or mouth. Hand hygiene is the critical infection control measure against an Ebola infection. Wear disposable impermeable gloves when cleaning visibly contaminated surfaces.

For any ill traveller on board an aircraft, **even if EVD is not considered,** the airline's ground and cleaning crews should be notified so that preparations can be made to clean the aircraft after passengers have disembarked.

When cleaning aircraft after a flight with a patient who may have had EVD, personnel should follow these precautions:

- wear impermeable disposable gloves while cleaning the passenger cabin and lavatories
- wipe down lavatory surfaces and frequently touched surfaces in the passenger cabin, such as armrests, seat backs, tray tables, light and air controls, and adjacent walls and windows with a registered cleaner/disinfectant that has been tested and approved for use by the airplane manufacturers
- special cleaning of upholstery, carpets, or storage compartments is not indicated unless they are obviously soiled with blood or body fluids
- special vacuuming equipment or procedures are not necessary
- do not use compressed air, which might spread infectious material through the air
- if a seat cover or carpet is obviously soiled with blood or body fluids, it should be removed and discarded by the methods used for biohazardous material
- dispose used gloves according to the company's recommended infection control precautions when cleaning is completed or if they become soiled or damaged during cleaning.
- clean hands with soap and water (or waterless alcohol-based hand sanitizer when soap is not available) immediately after gloves are removed

Guidance for Air Cargo Personnel

Packages should not pose a risk. Ebola virus is spread through direct contact with blood or bodily fluids (such as urine or saliva) from an infected person.

- packages visibly soiled with blood or body fluids should not be handled
- cargo handlers should wash their hands often to prevent other infectious diseases

[2] Close contact is defined as having cared for or lived with a person with EVD or having a high likelihood of direct contact with blood or body fluids of an EVD patient. Close contact does not include walking by a person or briefly sitting across a room from a person.

Appendix 9: Components of Infection Control

For detailed guidance on the components of infection control for Ebola Virus Disease (EVD), refer to chapter 4 of the *Infection prevention and control principles and recommendations for Ebola Virus Disease* document available from the Australian Government Department of Health website (33) (health.gov.au/internet/main/publishing.nsf/Content/ohp-ebola-Information-for-Health-Professionals).

Appendix 10: Cleaning and disinfection

The information in this Appendix primarily applies to those patients who have been categorised as probable or confirmed Ebola Virus Disease (EVD) cases. The personal protective equipment (PPE) requirements for environmental cleaning are the same as those for patient care. As described in Section 10 - Environmental Evaluation, there may be situations that require environmental cleaning of a residence or other non-hospital setting prior to the availability of laboratory test results for a suspected case with a high pre-test probability. This should follow the principles outlined in this Appendix, following discussion with public health authorities.

Diligent environmental cleaning and disinfection and safe handling of potentially contaminated materials is required as blood, sweat, vomitus, faeces and other body secretions represent potentially infectious materials.

Ebola viruses are readily inactivated by disinfectants. The preferred disinfectant solution is sodium hypochlorite made up to 1,000 parts per million (ppm) available chlorine (check the manufacturer's instructions) for routine environmental cleaning and 5,000 ppm for spills.

Neutral soaps and detergents should be used liberally for washing hands and the patient. Do not use disinfectants as part of routine patient washing.

All clinical waste should be double bagged as infectious waste when leaving the room.

Routine Environmental Cleaning

Daily cleaning of the room still applies and the room should be cleaned as per usual practice. A daily clean with neutral detergent is required while the patient is in the isolation room.

Dispose of all cleaning equipment; including buckets, mop handles, mop heads and cloths into the clinical waste after each clean.

The patient toilet should be cleaned with a 1,000 ppm sodium hypochlorite solution after each use, after the contents have been flushed.

Terminal Cleaning

Terminal cleaning should be performed according to jurisdictional policies and procedures.

Once the patient has left the room the entire room should be cleaned with a neutral detergent then allowed to air dry. Dispose of all cleaning cloths and mop heads into the clinical waste.

Once the room is air dry repeat the cleaning process with a 1,000 ppm sodium hypochlorite solution and ensure the disinfectant is liberally applied to all surfaces within the isolation room. Dispose of all cleaning equipment including buckets, mop handles, mop heads, cloths into the clinical waste after a terminal clean.

Allow the room to air dry. Where negative pressure is being used, maintain the negative pressure during the terminal clean. Then allow an additional 30 minute period after the room has air dried before switching off the negative pressure and allowing the next patient to enter the room.

Body Fluid Spill

PPE including gloves, disposable impermeable overshoes or boots, and fluid resistant masks with face shields/goggles and disposable fluid resistant gowns or disposable fluid resistant overalls should be worn for cleaning up a spill of blood or other body fluid.

Such spills should be covered with absorbent paper towels, liberally covered with a 5,000 ppm sodium hypochlorite solution and left to soak for 30 minutes before being wiped up. Discard the towels into a plastic lined receptacle and place this in an autoclave bag for sterilisation prior to disposal.

Following the removal of the initial material the area of contamination should again be liberally covered with a 5,000 ppm sodium hypochlorite solution and left for 30 minutes before rinsing.

Patient Equipment

Limit the equipment that enters the patient's room. The patient must have their own dedicated equipment that remains with them for the duration of their hospitalisation. Use disposable products when available.

When reusable non-critical equipment leaves the patient room, ensure a two stage cleaning with a neutral detergent followed by a second clean with a 1,000 ppm sodium hypochlorite solution. For semi critical and critical equipment, ensure routine disinfection/sterilization reprocessing occurs. No additional disinfection or sterilization cycle is required.

Linen

Disposable linen is the first choice preference for patient clothing and bed linen.
Linen is treated as clinical waste. For linen wet from body fluids, place into a leak-proof bag and not a cloth linen bag.

Patient clothing should be disposed of as clinical waste. The patient should wear hospital clothing and not their own clothes. Patient clothing and linen must not be processed in a domestic washing machine.

For detailed guidance on cleaning and disinfection for EVD, refer to chapter 5 of the *Infection prevention and control principles and recommendations for Ebola Virus Disease* document available from the Australian Government Department of Health website (33) (www.health.gov.au/internet/main/publishing.nsf/Content/ohp-ebola-Information-for-Health-Professionals).

Appendix 11: Waste treatment and disposal

Ebola-associated waste disposal is subject to state and local regulations.

Waste

Items stained or containing body fluids are treated as clinical waste. Clinical waste bags must adhere to Australian Standards and be leak proof. Facilities should have a system of double bagging the clinical waste. This should involve keeping the first clinical waste bags inside the patient room and then placing these bags inside a second clinical waste bag kept outside the patient room.

Prior to collection by the contractor, waste must be stored securely and access restricted to authorised and trained personnel

Toilet Waste

Toilet waste can be flushed into the sewage system.

Some jurisdictions may recommend additional measures be applied after discussion with local water authorities. Additional measures may include the addition of chlorine (in a suitable concentration for a spill) to the toilet waste prior to flushing, and allowing up to 30 minutes prior to flushing.

In all cases, ensure the toilet lid is down when flushing. If staff are required to flush the toilet, it is recommended they wear a P2/N95 mask in addition to their other personal protective equipment (PPE) in case of aerosols when the toilet is flushed.

If a patient is unable to use the private bathroom, a disposable pan should be used. The contents of the pan are to be solidified with high-absorbency gel then both the pan and contents disposed into clinical waste.

For detailed guidance on waste treatment and disposal, refer to chapter 5 of the *Infection prevention and control principles and recommendations for Ebola Virus Disease* document (33) (www.health.gov.au/internet/main/publishing.nsf/Content/ohp-ebola-Information-for-Health-Professionals).

Appendix 12: Post-mortem care and examination

Post-mortem examination

A post-mortem examination on a suspected, probable or confirmed case should not be carried out unless considered absolutely essential by either the medical or legal authority responsible for the case. A post-mortem examination on a person known to have died of Ebola Virus Disease (EVD) exposes staff to unwarranted risk and should not be performed.

In the event that a post-mortem examination is required it should be performed by operators using the highest level personal protective equipment (PPE) appropriate for high risk infectious diseases, as per accepted forensic medicine procedures. Aerosol formation must be avoided (e.g. electrically powered cutting instruments must not be used). All solid and liquid waste must be decontaminated with disinfectant solution or autoclaved, then incinerated. After the post-mortem has been completed the room must be thoroughly cleaned with disinfectant solution.

Where a patient suspected of having EVD dies prior to a definitive diagnosis being made, it may be necessary on public health grounds to conduct limited diagnostic testing after death to establish or eliminate the diagnosis of EVD.

Disposal of the deceased

State and territory public health regulations specify the requirements for handling of bodies for EVD. Requirements under the regulation may include:

- A person must, when carrying out any procedure on a body, comply with the guidelines specified in Part B of the *Australian Guidelines for the Prevention and Control of Infection in Healthcare* published by the National Health and Medical Research Council (44).
- A person must, when placing a body in a bag or wrapping a body, comply with a particular infection control policy.
- The body of a dead person is not removed from a place 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, and
    - the name of, or an identification of, the dead person is clearly and indelibly written on the top outer surface of the bag or wrapping, and
    - if the person has reason to believe that the body is infected with a prescribed infectious disease—the bag or wrapping is clearly marked as appropriate.

Bodies with a prescribed infectious disease must not be embalmed or made available for viewing.

The Hospital infection control team should work closely with the relevant funeral director to ensure that all appropriate infection control measures are implemented.

Staff wearing appropriate PPE must place the body of a confirmed or suspected EVD patient in a leak-proof double body bag. Absorbent material must be placed between each bag, and the bag sealed and disinfected with a 1,000 ppm sodium hypochlorite solution or other appropriate disinfectant.

The body must be cremated or buried in a sealed casket as soon as possible.

Persons who dispose of the body must take the same personal protection precautions outlined for medical and laboratory staff.

Appendix 13: Recommendations for decontamination of domestic premises of a probable or confirmed Ebola Virus Disease (EVD) case

For detailed guidance on environmental cleaning for EVD, refer to the *Infection prevention and control principles and recommendations for Ebola Virus Disease* document (33).

Principles

When planning for environmental cleaning in a non-hospital setting, it is important to consider whether the case was symptomatic, and whether the symptoms were "wet", with copious vomiting, diarrhoea and other fluids, or "dry" with onset of fever, muscle pain, headache and sore throat:

- there is negligible risk that household items used by a patient who is not producing secretions would contain Ebola virus, and these items should be cleaned and reused in the normal way unless there is reason to discard them
- whilst awaiting laboratory test results for a case in the "wet" phase, it may be possible to isolate any potentially contaminated items, such as by closing off a room

The length of time the Ebola virus remains viable in the environment is unknown, however documented evidence shows a viability period of six days (7, 45, 46).To minimise risk to decontamination staff, decontamination should be delayed until six days after the case has been removed from the premises, where possible. This could involve shutting off a room or area of the house. The presence of other material e.g. faeces (which may provide protection for the virus), temperature, relative humidity and ultraviolet (UV) light can affect whether Ebolaviruses remain viable in the environment; however, they are readily inactivated by low-level disinfectants.

Cleaning requirements for low risk/ "dry" case

Ensure appropriate Personal Protective Equipment (PPE) is worn, comprising a long sleeved shirt, gloves, mask and goggles or face shield. Areas where hand contact is most likely to have occurred (toilets, hand basins, taps, door knobs, bins, and bench tops) should be wiped down with a weak sodium hypochlorite solution. Used cleaning materials should be bagged and disposed of into the general waste.

Cleaning for a higher risk/ "wet" case

Training and PPE requirements for staff

Staff or persons undertaking decontamination must have an understanding of the nature of the Ebola virus and its modes of transmission and must follow appropriate infection control procedures including:

- Hand hygiene
- Cover all skin using an appropriate combination of PPE including, but not limited to:
    - gloves
    - a fluid resistant long-sleeved gown or fluid resistant overalls
    - eye protection (e.g. goggles)
    - P2/N95 respirator
    - face shield, leg and shoe coverings

Planning the cleaning

Conduct an initial inspection of premises to determine:

- access for unloading / loading of equipment and vehicles to limit the risk of contamination spread
- the nature and extent of any contamination and the necessary techniques and resources to address the nature and extent of contamination
- particular consideration of the need for and method of removing and disposing of any large items such as mattresses
- locations identified for the storing of waste receptacles and furniture or other items, preparing and disposing of cleaning solutions, transfer of materials to prevent (re)contamination, clean sites for the donning and doffing of PPE etc.

Cleaning procedure

Surfaces

Areas where hand contact is most likely to have occurred (door knobs, taps, bench tops) should be decontaminated as a priority in a two stage process – first with a neutral detergent and then with a strong sodium hypochlorite solution.[3] Other surfaces without visible contamination should be wiped down with a weak sodium hypochlorite solution.[3] Where there is gross contamination of a surface such as by blood, faeces, vomit or other bodily fluids, disinfect any visible surface contamination by covering with absorbent material (e.g. paper towels), then strong hypochlorite solution on to saturate the area, and allow solution to soak into spills for at least 30 minutes before cleaning.

Decontamination of linen, clothing, bedding and soft furnishings

- Grossly contaminated materials such as bed linen or clothing should be bagged, or otherwise contained, on site, and transported/disposed of as infectious waste[4]
- Bed linen, clothing and other materials that are not grossly contaminated should be laundered in the normal way
- Soft furnishings that are not grossly contaminated may be steam cleaned as a precaution

Safety precautions and disposal of cleaning equipment

- The generation of contaminated aerosols or splashes (e.g. through pressure sprays) or dusts (e.g. dry seeping) should be avoided. Areas where disinfectants are being used should be well ventilated
- Use of chemicals (including recommended contact times) must be as per the manufacturer's instructions and/or Material Safety Data Sheet
- Any cleaning solutions repeatedly applied from a bucket should be disposed as clinical waste either at the end of cleaning of each room or when contamination of the solution is suspected
- All used cleaning solutions should be disposed of as clinical waste

[3] In this document, strong sodium hypochlorite solutions are those containing 5000–10 000 ppm available chlorine (0.5–1%), depending on the starting product; weak solutions contain 500–1000 ppm (0.05–0.1%). Refer to the South Australian factsheet for healthcare professionals – Guide to dilution for chlorine-based disinfectant solutions [www.sahealth.sa.gov.au/wps/wcm/connect/d3396d00411006b8875bcf8f6fad9ea1/FactSheet-dilutions-sodium-hypochlorite_V2+2-phcs-ics-20140917.pdf?MOD=AJPERES&CACHEID=d3396d00411006b8875bcf8f6fad9ea1]

[4] Infectious waste to be packaged for transport as a Category A waste under relevant state or territory requirements

- All PPE, cleaning cloths and mops should be disposed of as infectious waste
- During cleaning, household members should not be present

If a PPE breach occurs during cleaning, procedures for blood and body fluid exposures should be followed.