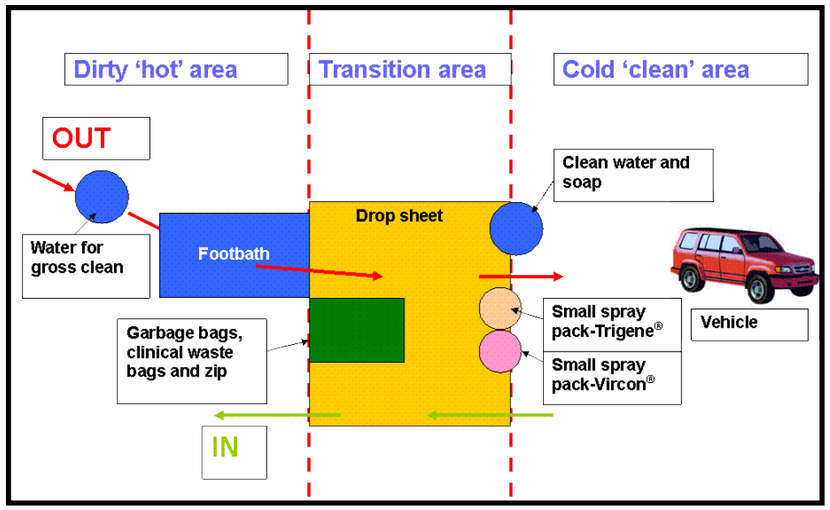
Before entering the property

Set up an entry/exit site as per Figure 1.
At the entry/exit point, identify a clean area, a dirty area (contaminated area where the suspect horse is) and a small transition area. On the clean side, lay out all gear required for the investigation. Before donning PPE, double check that nothing has been missed and no unnecessary gear is being taken into the dirty area.

Figure 1. Suitable entry/exit decontamination site



Then:
Place containers of disinfectant along with soap and clean water at the entry/exit point for use during exit.
Enter the 'dirty area' <u>only</u> after you are fully dressed in PPE and have all required gear. Any person assisting or in close proximity must wear the same standard of PPE.

PPE should be donned in the following sequence to assist best personal safety:

- Wash hands with soap/detergent.
- Don overalls then boots (overall legs go outside boots).
- Don safety eyewear, gloves and disposable respirator.
- Fit check the respirator.
- Pull overalls hood up if present and zip to chin.
- Perform respirator fit check.
- Double-glove and tape the outer gloves onto the sleeves of the overalls.

If using a powered air purifying respirator(PAPR), then:

- Wash hands with soap/detergent.
- Don overalls then boots (overall legs go outside boots).
- Pull overalls hood up if present and zip to chin.
- Don PAPR then gloves.
- Double-glove and tape the outer gloves onto the sleeves of the overalls.

Undertake the required sampling

- Clearly and uniquely label all specimens.
- Do not place yourself or assistants at risk of injury at any time.
- Minimise the chance of contamination of persons and their PPE.
- Undertake safe sharps handling and disposal of waste to prevent accidental exposure (i.e. do not re-cap needles, use the sharps container).
- Once sampling is complete, place in a clip seal bag for removal.

To leave the property

- Remove gross contamination from self and equipment.
- Do this before reaching the entry/exit point to minimise the risk of spreading contamination beyond the designated dirty area.
- Use a brush and soap/detergent and water.
- Clean the treads of the boots (e.g. at a tap on site or a bucket strategically placed back from the entry/exit site).
- Go to the dirty side of the entry/exit point.
- Double-bag the samples in clip seal bags and disinfect them to the clean side. Be careful not to contaminate the samples with disinfectant.
- Spray disinfectant on the outer gloves.

Final step—remove PPE

If non-disposable PPE cannot be adequately decontaminated on site, double-bag it and remove for later attention. This is not a preferred option.

To remove PPE where the respirator is a P2 respirator or a negative pressure full-face respirator:

- Remove the outer pair of gloves to garbage bag.
- Wash hands, still encased in the inner pair of gloves, in disinfectant.
- Remove overalls to garbage.
- Remove boots and stand on drop sheet/mat (transition area).
- Keep respirator on until overalls are removed.
- Remove hat/cap to garbage bag or soak in disinfectant, seal in a bag and remove for laundering.
- Remove and disinfect safety eyewear.
- Remove respirator (disposable respirators to garbage or mist/wipe reusable respirators with disinfectant solution).
- Remove inner gloves to garbage.

Where the respirator is a PAPR:

- Remove the outer pair of gloves to garbage bag.
- Wash hands, still encased in the inner pair of gloves, in disinfectant.
- Remove and disinfect the PAPR.
- Remove overalls to garbage.
- Remove boots and stand on drop sheet/mat (transition area).
- Remove the inner gloves to garbage.

After removal of PPE:

- Place all waste material in garbage bag and seal with zip tie/cable tie, disinfect surface.
- Double-bag waste by placing garbage bag into a clinical waste bag, seal with zip/cable tie and disinfect surface.
- Disinfect and double-bag non-disposable items for removal.
- Put on street shoes again.
- Pack up disinfection site, disinfecting all equipment thoroughly as packed.
- Wash disinfectant off reusable respirators with clean water.
- Wash hands and other exposed skin with soap and water.
- Depart the area, taking care not to re-enter the dirty area.

Personal downtime is time that should be spent away from other animals to prevent possible spread of HeV. It is recommended that there is no contact or only minimal contact with other animals or people until the following actions have been completed:

- Wash exposed areas of skin thoroughly with soap and water.
- Remove and wash dirty clothes in separate hot wash cycle with detergent. Do not wash potentially contaminated clothing with other household laundry.
- Take a hot shower with shampoo and soap.
- Dress in clean clothes.
- Put on clean footwear or footwear not worn in the dirty area.

Equipment downtime is time taken to ensure any reusable equipment taken into the dirty area is safe and does not pose a risk as a source of disease transmission. Most of this equipment should have been decontaminated during exit from dirty area. Reusable equipment should be taken off double-bagged.

If possible, leave sealed until results are known:

- If results are **negative**, clean as per practice routine.
- If results are **positive** contact Biosecurity SA.
- If equipment cannot be isolated for this long, then the person cleaning it should don PPE, remove the equipment from its sealed container, clean with detergent and then disinfectant. Remember to remove PPE safely.

What to do before you leave the property

- Provide advice on appropriate biosecurity and PPE to property owners/managers.
- Enquire as to the amount of human contact with the sick/dead horse.
- Contact Biosecurity SA to notify of suspect Hendra case or to provide an update of situation if already notified.
- Isolate sick or dead horse/s from people, and other animals (including pets).
- Provide advice to owners, or other contact persons, to seek medical advice and contact SA Health (Communicable Disease Control Branch) if unwell or concerned about possible exposure.
- Body disposal on the property should only be undertaken by persons who are aware of the risks and familiar with appropriate disposal methods.
- Stop or limit the movement of horses on and off the property.
- Stop or limit the movement of horse products (manure) and equipment (tack, dental equipment) off the property.
- Visiting horse practitioners (such as farriers) should return at a later time or only work on healthy horses on the property if that work is essential.

Note: If accidental exposure to blood or body fluid or sharps injury occurs, wash the affected area of skin thoroughly with soap and water and/or irrigate mucous membranes with water or saline.
Seek immediate medical advice.

Sampling requirements and equipment list

Preferred samples from live horses are:

- nasal, oral (tongue surface) and rectal mucosal swabs (not faecal swab)
- blood (1x10ml serum tube, 1x10ml EDTA tube and 1x10 ml lithium heparin tube)
- urine swab (from the ground immediately post-urination if possible).

Sampling equipment required to collect samples from each live horse:

- shielded vacutainer needle and holder (plus several spares)
- 1 x serum, 1 x EDTA and 1 x lithium heparin vacutainer (plus spares)
- 3 x virus transport media (VTM), plus spares. If VTM is not available, place swabs in small amount of saline
- 4 x swabs (plus spares)
- sharps disposal container.

Preferred samples from dead horses are:

- nasal, oral, rectal mucosal swabs
- blood—(if available) 1x10 ml serum tube, 1x10 ml EDTA tube and 1x10 ml lithium heparin tube.

Note: AAHL have indicated that the clot from the jugular vein (taken following a cut to the vein) and submandibular lymph node tissue can increase overall test sensitivity when combined with swabs. Collection of these samples requires limited necropsy work and should only be taken if the associated risks can be managed—including any blood released during the procedure.

Sampling equipment required to collect samples from each dead horse:

- shielded vacutainer needle and holder (plus several spares)
- 1x10 ml serum tube, 1x10 ml EDTA tube and 1x10 ml lithium heparin tube (plus spares)
- 3 x VTM (plus spares)
- 4 x swabs (plus spares)
- scalpel, scissors, forceps to collect tissue samples
- sample jars for fresh and formalised tissue samples
- cut-resistant gloves may be considered (e.g. Kevlar®).

Additional equipment:

- small (but adequate) sharps container with built-in needle removal facility
- 2 x A4 clip seal bags to remove samples off premises
- plastic bucket for carrying equipment
- small spray pack (500 ml) of Virkon® or other suitable disinfectant (soap, hypochlorite, iodophor/iodine, biguanidine, quaternary ammonium compound).

Personal protection equipment (PPE) per person

- 1 x pair of disposable overalls (at least splash resistant rating)
- 1 x disposable P2 (or N95) particulate respirator plus spares, or reusable negative pressure respirator/s or PAPR/s and filters
- 1 x pack of disposable gloves (nitrile gloves recommended)
- safety eyewear and/or a face shield
- 1 x roll of duct tape
- 1 x pair of impervious rubber boots
- 1 x disposable or washable hat or cap if overalls do not have a hood.

Disinfection and waste disposal equipment required (suggested minimum)

- foot bath and 2–3 buckets
- scrubbing brush
- hoof pick or medium screwdriver
- 20 L water
- Virkon® sachets or bulk supply (for mixing at 50 g per 5 L water) or supplies of other chosen disinfectant—hypochlorite, iodophor/iodine, biguanidine, quaternary ammonium compound
- soap or detergent
- small hand sprayer for chosen disinfectant
- (if using reusable respirators) small hand sprayer with suitable disinfectant (e.g. Trigene®)
- 1 x heavy duty garbage bag
- 1 x clinical waste bag
- 2 x zip/cable ties
- ground sheet or plastic mat (no more than 1 square metre).

Warnings

- **Hendra virus (HeV) is a zoonotic disease with a high case fatality rate in infected people and horses.**
- **Make sure appropriate personal protective equipment (PPE) is available and worn by you and all assistants.**
- **Make sure you have skilled assistants to handle horses being sampled.**
- **Only undertake absolutely necessary sampling to obtain a diagnosis.**
- **Do not take a sample if it is unsafe to do so. Seek help if necessary.**
- **If unsure of symptoms, check clinical signs in the document *Guidelines for veterinarians handling potential Hendra virus infection in horses*. This document is available on the Biosecurity Queensland website at www.biosecurity.qld.gov.au**

Information contained in this field guide has been sourced from the *Hendra Virus - veterinary practice manual* (May 2010) by the kind permission of the State of Queensland, Department of Employment, Economic Development and Innovation (Biosecurity Queensland).

Hendra virus: equipment list and property entry/exit procedure

Quick reference field guide

Government of South Australia
Biosecurity SA