

# **The University of Queensland, School of Veterinary Science**

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## **Biosecurity and Infection Control Procedures: Equine Hospital (Gatton)**

This document outlines the protocols and standard operating procedures (SOPs) for biosecurity at the Equine Hospital at the Gatton Campus.

All staff or students entering the Equine Hospital must have read these biosecurity guidelines.

All staff must have undergone a staff hospital induction, including basic biosecurity training.

Students must have undergone an induction and orientation session (unless under constant supervision by a member of hospital staff).

## Equine Hospital Biosecurity: Minimum hygiene standards

*These measures are to be implemented at all times, for all patients, as the minimum standard*

### Basic clothing, personal hygiene and entry/exit procedures

- All staff and students having contact with horses are to wear appropriate clothing within the hospital, either:
  - Overalls (not to be worn outside the hospital)
  - Scrubs (not to be worn outside the hospital)
- Appropriate footwear (covered shoes, preferably boots) to be worn at all times within the hospital
  - Shoes must be clean (no mud, no manure) prior to entry to the hospital
- All persons entering and exiting the hospital to wash hands and arms to the elbow at the basin provided at the hospital entry. Paper towels to be used.
- Jewellery should not be worn on hands or arms. If a watch is worn, it must be capable of thorough disinfection (ie suitable for immersion in disinfectant)
- Any equipment that is carried in and out of the hospital (e.g. stethoscope) must be disinfected with alcohol-based disinfectant gel (Microshield Angel antimicrobial hand rub cleanser – provided on the door of every stable and throughout the hospital)
- Long hair should be tied back.
- All horse owners and visitors must be accompanied by a member of staff who is to ensure compliance with biosecurity protocols.
- Laundered overalls and scrubs are available daily to staff. **Students to provide their own cloth overalls; these should be kept separately from other clothing and equipment after wearing (eg in a garbage bag) and laundered in hot water after each use.**

### Patient handling (minimum standards for all patients regardless of disease status)

- **Gloves** (latex or nitrile) to be worn at all times when examining new patients or handling hospitalised patients. Gloves are provided on all stable doors and throughout the hospital.
- **Disinfect hands** with alcohol-based disinfectant gel (Microshield Angel antimicrobial hand rub cleanser – provided on the door of every stable and throughout the hospital) **before and after** handling **every** patient
- Wash hands thoroughly with Microshield chlorhexidine soap (provided over sinks) under running water if hands come in contact with any faeces or body fluids
- **All patients must be triaged on/prior to arrival and assigned a biosecurity classification as described below.**
- **Procedure-based requirements for PPE for normal horses are outlined in Table 1**

## Disposal of waste

- Soiled dressings and clinical waste to be removed from work areas and placed in biohazard bins (yellow liner) for appropriate disposal (incineration)
- Appropriate bins are provided and changed once to twice daily or more if required; wear gloves while changing and disinfecting bins
- All work areas are to be cleaned and disinfected immediately after procedure is completed
- Soiled bedding to be disposed of away from the hospital in accordance with local council regulations
- Sharps to be disposed of immediately after use in designated sharps container.

## Cleaning and disinfection of equipment between patients

- This includes husbandry equipment (such as halters, twitches) and medical equipment (such as endoscopes, mouth gags, stethoscopes, nasogastric tubes etc) – must be cleaned and disinfected promptly after use
- Contaminated or dirty clothing should be changed prior to examination of the next patient

## Hospital room and stable cleaning protocols

- Wherever possible, contamination of the hospital environment should be minimised:
  - All horses should have feet picked out prior to removal from their stable (hoof pick provided on all stable doors)
  - Faeces, urine and other body fluids should be cleaned as soon as possible from the work area or from corridors
- Hospital floors to be cleaned daily; all impervious surfaces (floors, bench tops, cupboards etc) to be cleaned with detergent daily;
- Porous surfaces (walls, ceilings) to be cleaned regularly to prevent build-up of dust and cobwebs.
- All stables will be cleaned and disinfected between patients using standard protocols: ***See “Stable cleaning and disinfection protocols” below***

## Stable cleaning and disinfection protocols

**After a horse leaves the stable and prior to a new horse entering:**

- 1. Remove all bedding and manure.**
  - The activity of disinfectants is decreased in the presence of organic debris so in order to maximize the effectiveness of disinfection it is important to include a detergent cleaning step in addition to physical removal of bedding and manure.
- 2. Clean all surfaces with an anionic detergent** (follow recommended dilution on pack)
  - Detergent solution can be delivered using a Hydrofoamer (set to appropriate dilution)
  - For some contaminated areas or equipment it may be necessary to use a hand-sized brush and be sure to “disrupt” all surfaces that animals or faecal material may have contacted.
- 3. Rinse with clean water.**
- 4. Apply a dilute solution (1:50 dilution of 5% sodium hypochlorite) of bleach and allow at least 10 minutes contact time.**
  - For small areas or equipment, bleach can be applied with a mop or brush.
  - More efficient application of bleach with better coverage and longer contact time can be obtained by using a Hydrofoamer filled with 3 parts bleach to 1 part anionic detergent.
- 5. Rinse thoroughly with clean water and allow the treated area to dry as much as possible.**
- 6. Spray walls and floor with a peroxygen disinfectant: 2% Virkon®-S**
  - delivered using a back-pack pump sprayer, gas-powered sprayer or similar
  - When spraying Virkon®-S or similar agents a mask (fit-tested type such as P-2) and gloves must be worn as well as safety goggles.
  - **Allow 10-20 minutes contact time for Virkon®-S.**
7. The area may be rinsed with clean water but as the oxidizing activity of Virkon®-S dissipates over a relatively short period of time this is not essential.
- 8. Drying is important to achieving maximum effect so allow the area to dry as much as possible before re-bedding or reintroducing animals.**

*When using any cleaning and disinfecting agents it is essential that the Material Safety Data Sheet (MSDS) for each product be consulted and the guidelines for proper mixing, use, disposal and any specific precautions be carefully followed. In particular, the recommendations for appropriate Personal Protective Equipment e.g., gloves, eye protection etc. must be strictly adhered to.*

### Other considerations for stall cleaning:

- Remember, “dirt” cannot be disinfected. Removal of gross organic debris prior to cleaning and disinfection of solid, non-porous surfaces is critical
- All stall equipment such as buckets and feed tubs, should also be thoroughly cleaned; scrub with a brush using an anionic detergent, rinse, and then apply a bleach solution (1:50 dilution of 5% sodium hypochlorite). Spraying with 2% Virkon®-S should be used as a final step with high risk or known positive animals. Equipment that is used for feed and water should be allowed to dry and then be rinsed thoroughly with clean water before reusing.
- Stall cleaning equipment; brooms, shovels, pitchforks etc., should also be cleaned using a detergent and a brush to remove gross debris followed by immersion of the equipment’s head in 2% bleach solution and wiping down of the handles. Such equipment can also be soaked in tubs of disinfectant (e.g., Nolvasan® [chlorhexidine], 2 oz per gallon). Drying in the sun is helpful.
- For equipment such as muzzles, brushes, lead shanks, twitches, halters, etc. , some disinfectants will cause certain materials such as rubber to deteriorate: be sure to read the label to check that a disinfectant is safe to use with a given material. In general, clean off gross debris with anionic detergent using a sponge or brush, then soak for approximately 1 hour in drums or buckets containing an appropriately diluted chlorhexidine solution.
- Be aware that it is unlikely that everything in the animal housing/handling environment is completely cleanable. Porous surfaces with intact finishes such as painted or varnished wood can be cleaned but items with surface damage or those that are made up entirely or in part of porous materials are much more difficult to clean and may be impossible to disinfect completely. For example, nylon ropes can be immersed in disinfectant for several hours and then allowed to dry, but a fully porous material such as a cotton lead rope cannot be properly disinfected.

## Equine patient biosecurity triage and classification at admission

- In terms of hospital biosecurity, the **most important** infectious organisms carried by horses are:
  - *Salmonella spp* (z)
  - *Clostridium difficile* (z)
  - *Cryptosporidium spp* (z)
  - *Streptococcus equi equi* (Strangles)
  - Methicillin Resistant *Staphylococcus aureus* (MRSA) (z)
  - Equine herpes virus 1 (neurologic/abortion form)
  - Hendra virus (z)

(z) Signifies zoonotic potential

- The identification of horses that are suspected of/confirmed to be carrying these organisms is imperative, as prevention of transmission will require biosecurity precautions in addition to the minimum standards described above

Cases can be divided into the following 3 categories based on clinician assessment and history:

**1) Low Risk**

- No signs or history of systemic illness (no fever, no diarrhoea)
- Includes most cases presented for elective/routine procedures and for musculoskeletal injury

**2) Medium Risk**

- Horse has non-specific clinical signs of systemic disease, including any of the following:
  - Pyrexia
  - Colic
  - Neurological dysfunction
  - Acute respiratory signs (dyspnoea, nasal discharge etc.)
  - History of recent abortion (last 7 days)

**3) High Risk**

- Horses with clinical signs that are highly suggestive of active disease caused by the organisms mentioned above. This includes:
  - Horses with diarrhoea (at admission)
  - Horses that have a combination of acute neurological disease **and** pyrexia
  - Horses with acute disease coming from a property where there has been recent, undiagnosed acute death in other "in-contact" horses
  - Horses where one of the organisms mentioned above has been confirmed by laboratory testing
- Any other horse where there is significant concern of communicable, exotic or zoonotic disease, at the discretion of the admitting clinician

## Protocols for admission, handling and treatment based on biosecurity classifications:

### 1) Low Risk

- Housing and handling according to minimum standards described above
- **Procedure-based PPE only** (as described in Table 1)

### 2) Medium Risk

- Housing and handling according to minimum standards,
- **Procedure-based PPE only** (slightly higher level, as described in Table 1)
- If unvaccinated, these horses should be tested for Hendra Virus as soon as possible
  - o Nasal swabs and EDTA blood submitted for PCR analysis
  - o If the Hendra virus PCR is negative, and depending on clinical signs, the horse may be downgraded to the Low Risk category at the discretion of the clinician responsible for the case

### 3) High Risk

- These horses should only be **admitted to the isolation facility**, and should be **housed in isolation stalls**
- **Standard isolation protocols (including PPE)** to be followed for all procedures (see below)
- These horses must be tested for Hendra Virus as soon as possible (prior to admission if clinical signs are highly suggestive)
  - o Nasal swabs and EDTA blood submitted for PCR analysis
  - o If the Hendra virus PCR is negative, and depending on clinical signs, the horse may be downgraded to the Low Risk category at the discretion of the clinician responsible for the case
- Horses should undergo laboratory testing for other specific organisms mentioned above, as deemed appropriate by the clinician responsible for the case
- Horses with clinical signs that are highly suggestive of Hendra virus or EHV1 (abortion/neurological form) should not be admitted to the hospital (until appropriate tests have shown the horse to be free of these diseases).

## Initial case triage

- For all emergency cases (ie non-elective evaluations) a senior clinician must discuss the case by phone with the client or referring veterinarian prior to accepting the case for admission
- Clients should be instructed that they should not begin travelling with the horse until they have confirmed with a senior clinician that the case will be accepted.
- For any potential emergency case, the senior clinician on duty should ascertain
  - HeV vaccination status
  - Clinical presentation
- The senior clinician may advise the client/referring veterinarian that the case cannot be admitted based on clinical suspicion of infectious disease that presents a biosecurity risk.
  - This may include suspicion of HeV, EHV1 (neurologic/abortogenic) or other disease and is at the discretion of the senior clinician on duty.
  - If there is doubt, the case should always be discussed with at least one of the large animal internal medicine specialists and or the Hospital Director.
- All emergency cases where a history of HeV vaccination is claimed should be confirmed by microchip scan and cross checking with the registry at the earliest convenience
- Current vaccination for HeV does not alter the requirement for procedure-based PPE as outlined in Table 1.



## Obtaining and submitting samples for Hendra virus testing

- Contact the Laboratory Liaison Officer before sending any samples
  - Call (07) 3276 6062 (business hours) or email [bslclo@deedi.qld.gov.au](mailto:bslclo@deedi.qld.gov.au)
- Samples should only be obtained by staff wearing appropriate PPE (see Table 1)
- A range of samples can be taken from live horses – generally a nasal swab and EDTA blood will be sufficient
- Sample dispatch:
  - Samples must be packaged appropriately – training will be provided to staff
  - Samples must be dispatched to a government veterinary laboratory in the shortest time possible.
  - Notify the laboratory that HeV samples are coming by telephoning the Laboratory Liaison Officer on (07) 3276 6062.
  - Fill out a specimen advice sheet (SAS) with all details, including a thorough history. Place the SAS outside the sample package so it can be read before the package is opened.
  - A copy of the SAS is available from the Biosecurity Queensland website ([www.biosecurity.qld.gov.au](http://www.biosecurity.qld.gov.au)). Click on 'Animal health & diseases' > 'A-Z list' > 'Hendra virus' > 'Submitting samples for analysis' (under 'For veterinarians') > 'Specimen advice sheet' (under 'Sample submission forms').
  - Clearly write HENDRA VIRUS EXCLUSION – URGENT PRIORITY on the SAS.
  - Samples should be kept refrigerated, NOT frozen.

**Table 1: Procedure-based personal protective equipment (PPE) protocols for UQ Equine Hospital**

These protocols are aimed at minimising the zoonotic risk of diseases including Hendra virus, as well as the spread of infectious disease to other horses.

<b>Procedure</b>  <b>Case Classification</b>	<b>Procedures involving no/minimal contact with body fluid</b> <ul style="list-style-type: none"> <li>- General handling</li> <li>- Lameness examination</li> <li>- Auscultation</li> <li>- Radiology, ultrasound</li> </ul>	<b>Procedures that involve non-aerosolised body fluid contact</b> <ul style="list-style-type: none"> <li>- Rectal examination</li> <li>- General surgery</li> <li>- All injections</li> <li>- Venipuncture</li> <li>- Collection of fluid from cavities (eg thoracocentesis)</li> </ul>	<b>Procedures that involve contact with aerosolised body fluid and potential inhalation</b> <ul style="list-style-type: none"> <li>- Dentistry</li> <li>- URT endoscopy</li> <li>- Nasogastric intubation</li> <li>- Nasal swab</li> <li>- BAL</li> </ul>
<b>Low Risk</b> <ul style="list-style-type: none"> <li>- No systemic illness</li> <li>- Lameness cases, elective surgery</li> </ul>	<b>1. Minimum hygiene standards</b>	<b>1. Minimum hygiene standards</b>	<b>1. Minimum hygiene standards</b> <b>2. Face protection:</b> <ul style="list-style-type: none"> <li>- Goggles</li> <li>- P2 mask</li> </ul> <u>or</u> <ul style="list-style-type: none"> <li>- Plastic face shield</li> </ul>
<b>Medium Risk</b> <ul style="list-style-type: none"> <li>- Systemically ill horses, with e.g. fever, colic, respiratory disease (prior to definitive diagnosis)</li> </ul>	<b>1. Minimum hygiene standards</b>	<b>1. Minimum hygiene standards</b> <b>2. Face protection:</b> <ul style="list-style-type: none"> <li>- Protective eyewear</li> <li>- P2 mask</li> </ul> <u>or</u> <ul style="list-style-type: none"> <li>- Plastic face shield</li> </ul>	<b>1. Minimum hygiene standards</b> <b>3. Face protection:</b> <ul style="list-style-type: none"> <li>- Protective eyewear</li> <li>- P2 mask</li> </ul> <b>2. Impervious gown or overalls</b>
<b>High Risk</b> <ul style="list-style-type: none"> <li>- Horses with diarrhoea upon admission</li> <li>- In cases where there is a high suspicion of Hendra virus (based on history and/or clinical signs)</li> <li>- Confirmed or highly suspicious Strangles cases</li> </ul>	Horses to be moved to isolation facility. Observe isolation protocols and PPE <ul style="list-style-type: none"> <li>- Impervious disposable overalls</li> <li>- Impervious boots</li> <li>- Nitrile gloves</li> <li>- Protective eyewear and P2 mask (if HeV suspect)</li> </ul>	Horses to be moved to isolation facility. Observe isolation protocols and PPE <ul style="list-style-type: none"> <li>- Impervious disposable overalls</li> <li>- Impervious boots</li> <li>- Nitrile gloves</li> <li>- Protective eyewear and P2 mask (if HeV suspect)</li> </ul>	Horses to be moved to isolation facility. Observe isolation protocols and PPE <ul style="list-style-type: none"> <li>- Impervious disposable overalls</li> <li>- Impervious boots</li> <li>- Nitrile gloves</li> <li>- Protective eyewear and P2 mask (if HeV suspect)</li> </ul>

# Equine Isolation Procedures

## Admission to isolation

- Horses to be admitted to isolation stalls only if authorised by clinician responsible for the case
- Horses considered “high risk” based on history should be admitted to isolation upon arrival at the hospital (eg. cases with diarrhoea)
- Based upon information provided over the phone, cases with clinical signs or history that is highly suspicious of Hendra virus or EHV1 (neurological/abortion form) will not be permitted to come to the hospital. Instead, the caller will be advised by the clinician on duty to contact their regular veterinarian to pursue appropriate procedures/testing.

## Staff and student entry/exit procedure and PPE requirements for isolation cases

- Human entry should be kept to the minimum necessary. Where possible, treatment times should be synchronised to minimise unnecessary entry
- In general, entry by staff/students to isolation stalls should be left to last if a batch of procedures is being performed across the hospital (e.g. stable cleaning, morning or afternoon treatments)
- **Entry procedure for isolation stalls:**
  - Don latex gloves and impervious boot covers at the entry to the isolation area (kept at perimeter gate)
  - Enter isolation stall ante room
  - Don nitrile gloves (over latex), rubber over-boots and impervious disposable overalls
  - Don protective eyewear/face shield and P2 mask (if HeV suspect only)
  - Walk through Virkon-S foot bath
  - Enter patient stall via internal stall door
- **Exit procedure for isolation stalls:**
  - Exit stall via internal stall door into ante room
  - Remove outer pair of gloves and dispose in provided bin
  - Remove impervious disposable overalls and dispose in infectious waste bin
  - Wash hands (still inside latex gloves) with chlorhexidine soap and water
  - Remove mask and goggles (if applicable)
  - Walk into Virkon-S foot bath and scrub boots (soles and walls) using brush provided, taking care to remove any gross contamination and to cover the entire surface with Virkon-S
  - Remove boots on other side of foot bath and place back on rack.
  - Exit stall
  - Walk to isolation area perimeter gate and remove impervious boot covers and latex gloves, disposing in provided bin
  - Walk across Virkon-S mat
  - Disinfect hands with alcohol-based disinfectant gel (Microshield Angel antimicrobial hand rub cleanser)
  - Exit isolation area

## Isolation equipment and cleaning protocol

- Isolated patients must have their own equipment including thermometers, stethoscopes, halters, lead ropes, buckets, NG tubes, funnels, stall cleaning equipment;
- Disinfectant foot baths/mats must be cleaned and re-stocked daily (or more often if contaminated with organic material)
- Isolation stalls must be cleaned last or preferably by different personnel than those cleaning non-isolation stalls.
- Drugs, feed, bedding and other consumables that enter the isolation area must not leave the isolation area (except as waste)
- All waste from the isolation area must be disposed of in the provided infectious waste bins
- Equipment that must enter/leave isolation temporarily (e.g. x-ray equipment) must be cleaned and disinfected after use and before leaving the isolation area (use appropriate disinfectant according to specific equipment materials)
- Stall and equipment cleaning between cases should be performed using the multiple step protocol described in “Stable cleaning and disinfection protocols” above, and must include all stable-cleaning equipment to be re-used in the stall.
- Isolation stalls that have housed diarrhoea cases or cases that have had positive faecal *Salmonella* cultures must have 2 consecutive negative environmental cultures before the next horse can be accepted

## Isolation bedding disposal

The clinician responsible for the case will confirm with barn staff how the bedding for each isolated case is disposed of.

- If stall contents considered by attending Clinician to have a **zoonotic** potential (Confirmed *Salmonella*, *Cryptococcus*) all waste to be treated as Biohazard (ie yellow bins with yellow bin liners) and ACE waste utilised for subsequent incineration.
  - Note that in all cases of confirmed Hendra Virus Biosecurity Queensland will direct quarantine measures and waste management
- If stall contents considered by attending Clinician to constitute a **risk to horse health** all waste to be treated as Biohazard (ie yellow bins with yellow bin liners) and ACE waste utilised for incineration.
- If stall contents considered by attending Clinician to be of no or minimal risk to horse health then bedding is disposed of as per regular arrangement

Note :- all PPE used within Isolation is to be disposed of through Biohazard / Clinical Waste Bins within Isolation and on no accounts should be disposed of through general waste.

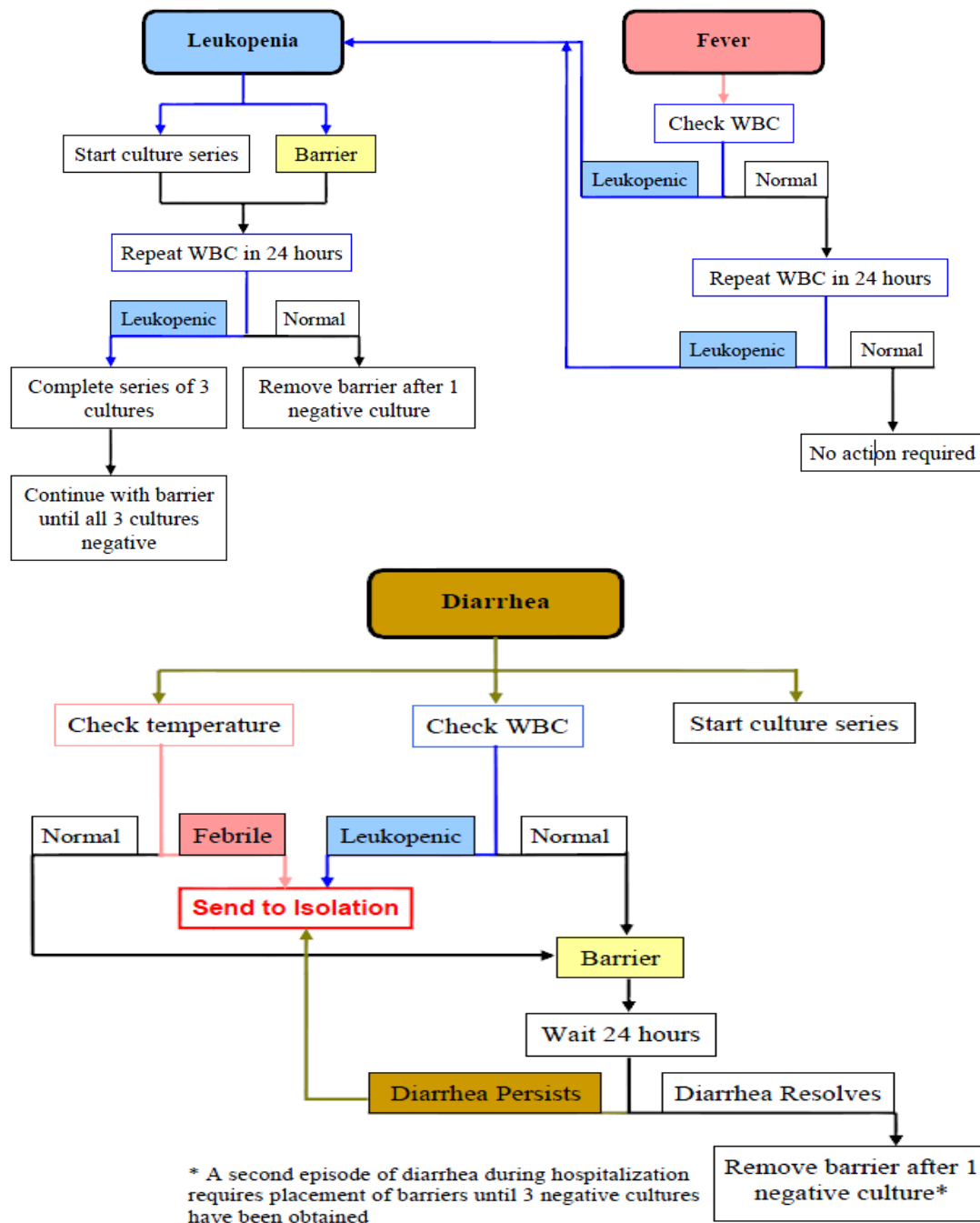
## **Barrier precautions and isolation procedures for horses that develop clinical signs of infectious disease whilst in hospital**

- Horses that develop clinical signs of potentially infectious disease (eg diarrhoea) should be confined to their stall, with barrier precautions applied to entry/exit, until further testing
  - A small area around the entry to the stall is isolated with tape
  - A stall-side foot bath of Virkon-S is provided
  - Appropriate PPE is provided for donning/doffing within the taped area , including impervious boot covers, impervious gowns (or overalls), nitrile gloves, and goggles/masks (if applicable)
  - All waste (including bedding) is treated as infectious waste and disposed of in appropriate bins placed within taped area
  - Horse movement is minimised
  - Equipment must not be shared with other horses, and must be cleaned and disinfected if removed from the stall area
  - A flow chart specifically for diarrhoea, fever and leucopenia (suspect *Salmonella spp.*) is shown in Figure 1. below
  - Removal of barrier precautions, or (alternatively) movement of the horse to an isolation is based on:
    - Results of testing
    - Progression or resolution of clinical signs
    - Discretion of the clinician responsible for the case

***Hospitalised horses that develop highly suspicious clinical signs, or that return a positive test for Hendra virus, must be placed immediately in isolation (by staff wearing appropriate PPE) and Biosecurity Queensland must be immediately notified (13 25 23 or 1800 675 888).***

Figure 1. Barrier precautions and isolation of cases with diarrhoea,

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**Definitions**

- Leucopenia: WCC less than  $4 \times 10^9$  /L
- Fever: multiple instances of rectal temperature increase to greater than 38.5°C in a 24 hour period
- Diarrhoea: soft/liquid manure retaining no shape in the bedding passed more than twice in a 12 hour period
- Barrier precautions: stop movement of patient and confine to stall, warning tape around patient stall, disposable boots, gowns/overalls, nitrile gloves, and 2% Virkon foot bath provided stall-side
- Culture Series: Series of three faecal *Salmonella* cultures (reflux can be used in absence of faeces) submitted on consecutive days.
- **A positive *Salmonella* culture in the presence of clinical signs mandates moving to isolation facility**

## Human exposure to Hendra virus and other zoonoses

- Any staff or students that have been exposed to biological materials from a suspected or confirmed infectious zoonotic case should report to the clinician in charge of the case, and should immediately be referred to the Gatton campus medical staff
- In the event of a Hendra virus positive case, Biosecurity Queensland will contact Queensland Health as per an agreed notification protocol. Queensland Health will decide whether any people require monitoring and/or medical assistance.
- If any person is concerned about their health, they should report their concerns to the senior clinicians immediately, and they should then be referred to the Gatton campus medical staff

## Exotic/emergency animal diseases affecting equines<sup>1</sup>

- African horse sickness
- Anthrax
- Australian lyssaviruses (including bat lyssavirus)
- Brucellosis
- Contagious Equine Metritis
- Dourine
- Equine babesiosis (piroplasmiasis)
- Equine encephalomyelitis (Western Eastern & Venezuelan)
- Equine encephalosis
- Equine influenza
- Glanders
- Hendra Virus
- Japanese Encephalitis
- Potomac fever
- Rabies
- Screw Worm fly
- Surra
- Vesicular stomatitis

### Notification procedure:

Notification of exotic/notifiable diseases can be made by contacting one of the following:

- Biosecurity Queensland on 13 25 23 (business hours)
- Emergency Animal Disease Watch Hotline on 1800 675 888 (24 hours).

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<sup>1</sup> See Ausvetplan

## REFERENCES & RESOURCES

Biosecurity QLD Guidelines:

[http://www.dpi.qld.gov.au/documents/Biosecurity\\_GeneralAnimalHealthPestsAndDiseases/Hendra-GuidelinesForVets.pdf](http://www.dpi.qld.gov.au/documents/Biosecurity_GeneralAnimalHealthPestsAndDiseases/Hendra-GuidelinesForVets.pdf)

Ausvetplan:

[http://www.animalhealthaustralia.com.au/programs/eap/ausvetplan/ausvetplan\\_home.cfm](http://www.animalhealthaustralia.com.au/programs/eap/ausvetplan/ausvetplan_home.cfm)