Infection control advice for secondary care:

Acute respiratory illness from novel or emerging pathogens (Middle East Respiratory Syndrome Coronavirus (MERS-CoV), Avian influenza (e.g. A/H7N9, A/H5N1) and Novel Coronavirus (2019-nCov))

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The current situation necessitates that clinicians have a high index of suspicion for possible Novel coronavirus (2019-nCov), Middle East Respiratory Syndrome Coronavirus (MERS-CoV) (formerly called novel coronavirus) or Avian influenza (e.g. A/H7N9, A/H5N1) in patients presenting with acute respiratory illness.

(For HPS case management algorithms and other documentation refer to: MERS-CoV and Avian influenza and novel coronavirus (2019-nCov) webpages).

These infectious agents are currently classified as High Consequence Infectious Diseases (HCID) transmitted by the airborne route. These are HCIDs spread by respiratory droplets or aerosol transmission in addition to contact routes.

1. General Information

This document outlines the infection prevention and control advice for healthcare workers who may be involved in receiving, assessing and caring for patients, within healthcare settings, who are a suspected or confirmed case. If a contact of a confirmed case develops a respiratory illness, then this guidance should be followed until results of testing are available.

The precautionary principle should be applied for novel or emerging respiratory pathogens of high consequence when the mode of transmission is incompletely determined. Droplet, contact and airborne precautions (including the use of correctly fitted FFP3 respirators) should be applied for all patients admitted with a suspected or confirmed novel or emerging respiratory pathogen (e.g. MERS-CoV or Avian Influenza or novel coronavirus (2019-nCov)).

2. Patient management

In the absence of effective drugs or a vaccine, control of this disease relies on the appropriate management of cases, (including isolation of possible, probable or confirmed cases and their close contacts). In preparation, healthcare facilities that may receive and care for any cases should ensure that staff are:

- Familiar with all Personal Protective Equipment (PPE) required including, provision of adequate supplies, where stored and how it should be used;
- Aware of what actions to take if a case presents;
- Aware of where a case will be isolated and the need for a negative pressure room, if available;
- Familiar with FFP3 respirator use and that fit testing and checking has been undertaken before using this equipment;
- Aware of how to access any national/local record sheets.
2.1 Patient Placement

Patients

Isolation

- Patients requiring admission should be admitted directly to a **negative pressure** isolation room. If this is not possible then a single room with en-suite facilities should be used. Room door(s) must be kept closed.
- Display signage to control entry into the isolation room.
- All necessary procedures and investigations should be carried out within the isolation room. The minimum number of required staff should be present and they must wear PPE as described below in **section 2.3**. Entry and exit from the room should be minimised during care procedures.
  - Procedures that produce aerosols or respiratory secretions i.e.
    - intubation, extubation and related procedures e.g. manual ventilation and open suctioning,
    - Tracheotomy/tracheostomy procedures (insertion/open suctioning/removal)
    - Bronchoscopy
    - Surgery and post mortem procedures involving high-speed devices
    - Some dental procedures (e.g. high-speed drilling)
    - Non invasive ventilation (NIV) e.g. Bi-level Positive Airway Pressure Ventilation (BiPAP) and Continuous Positive Airway Pressure Ventilation (CPAP)
    - High Frequency Oscillatory Ventilation (HFOV)
    - Induction of sputum
  - When a room is vacated following an aerosol generating procedure, the large particles will fall out within seconds, however, the smaller aerosol particles behave almost like a gas. Clearance of small aerosol particles is dependent on the ventilation and air change within the room. A single air change is estimated to remove 63% of airborne contaminants; after 5 air changes, less than 1% of airborne contamination is thought to remain. In an isolation room with 10-12 air changes per hour (ACH) a minimum of 20 minutes is considered pragmatic; in a side room with 6 ACH this would be approximately one hour.

Critical care

- If on a critical care unit, the patient should be nursed in a negative pressure isolation room where available; if not available, a neutral pressure side room with a closed ventilator circuit should be used.
- All respiratory equipment must be protected by a filter with high efficiency e.g. BS EN 13328-1.
- Disposable respiratory equipment should be used wherever possible. Re-usable equipment must be decontaminated in accordance with the manufacturer’s instructions.
- Ventilator circuits should not be broken unless absolutely necessary.
- Ventilators must be placed on stand-by when carrying out bagging.
• Water humidification should be avoided, and a heat and moisture exchange should be used if possible.

• Use only closed system suction.

Theatres

• Theatres must be informed in advance of any patient transfer.

• The patient should be transferred directly to theatre and should wear a surgical mask if it can be tolerated.

• The patient should be anaesthetised and recovered in the theatre.

• Disposable anaesthetic equipment should be used wherever possible.

• Anaesthetic equipment must be protected with viral filter efficiency of 99.99%.

• Instruments and devices should be decontaminated in the normal manner.

• The theatre should not be used for 15 minutes after the patient leaves if conventionally ventilated or 5 minutes if ultraclean ventilation used.

• The theatre should be cleaned as per local policy.

Intra-hospital transfers to other departments

• Any patients transfer must be in collaboration with the Infection Prevention and Control Team (IPCT):
  • The receiving department must be informed in advance.
  • The patient must be taken straight to and from the investigation/treatment room and must not wait in any communal area.
  • The patient should wear a surgical mask if this can be tolerated to minimise the dispersal of respiratory secretions and reduce environmental contamination.
  • To allow decontamination after any procedure, these patients should ideally be at the end of a clinical list (see patient care equipment and environmental control).

Transfer to another hospital

• If transfer is required, the IPCT at the receiving hospital and the ambulance staff must be advised in advance of the special circumstances of the transfer.

Staff

• Staff must comply with all infection control procedures as detailed.

• Only essential staff should enter the isolation room wearing personal protective equipment (see section 2.3).

• A record of all staff that has or had contact with a confirmed case/symptomatic contact of confirmed case must be maintained.

• The use of bank or agency staff should be avoided wherever possible.

• All Healthcare Workers (HCWs) should be vigilant for any respiratory symptoms during the incubation period which can be up to 14 days (for pathogen specific incubation periods please see case management algorithms in the Avian influenza, MERS-CoV)
and novel coronavirus (2019-nCoV) webpages in HPS website) following last exposure to a case and should not come to work if they have a fever or cough (see section 2.11).

- Follow up of staff contacts of patients will be co-ordinated by the local Occupational Health Department as per local policy.

Visitors

- Visitors should be restricted to essential visitors only; such as parents of paediatric patients or an affected patient’s main carer. Local risk assessment and practical management should be considered, ensuring a pragmatic and proportionate response, including the consideration of whether there is a requirement for visitors to wear PPE or RPE. These visitors must not visit any other care areas or facilities.
- A log of all visitors should be kept.
- Any follow up of community contacts of patients will be co-ordinated by the local Health Protection Team.

2.2 Hand Hygiene

- This is essential before and after all patient contact, removal of protective clothing and cleaning of equipment and the environment.
- Wash with soap and water, or use alcohol-based hand rub if hands are not visibly dirty or soiled

2.3 Personal Protective Equipment (PPE)

To be worn by ALL staff entering the room:

- Long-sleeved, fluid-resistant, disposable surgical gown.
- Non-sterile disposable gloves.
- An FFP3 respirator conforming to (EN149:2001): **Fit testing must be undertaken prior to using this equipment and fit checking must be performed each time an FFP3 respirator is worn.**
- Eye/face protection compatible with the FFP3 respirator (prescription glasses do not provide adequate protection against droplets, sprays and splashes).

It is vital that the PPE described above is worn for all airway management, including intubation.

Refer to Appendix 1 for instructions on the safe donning and doffing of required PPE.

2.4 Safe Management of Linen

- Treat all linen as infectious and bag in an alginate bag then a secondary clear bag before removing from the isolation room and then place directly into the laundry hamper/bag.
2.5 Safe Disposal of Waste
Dispose of all waste in the isolation room as healthcare waste (orange stream).

2.6 Patient Care Equipment
- Dispose of single-use equipment as healthcare waste inside the room.
- Use dedicated patient care equipment in the isolation room.
- Re-useable equipment should be avoided if possible. If used, decontaminate in accordance with [Appendix 2](#).
- Avoid the use of fans that re-circulate the air, and has the potential to turn a negative pressure room into a positive pressure room.

2.7 Environmental Decontamination
- It is possible that the virus can survive in the environment for at least 48 hours, so environmental decontamination is vital.
- Domestic staff must wear protective clothing as indicated above when entering the isolation room, and they must be made aware of the need for additional precautions and be trained in these accordingly.
- The isolation room should be cleaned after the rest of the ward area.
- Decontaminate the isolation room at least daily using:
  - A combined detergent disinfectant solution at a dilution of 1000 parts per million available chlorine (ppm available chlorine (av.cl.)); or
  - A detergent clean followed by disinfection (1000ppm av.cl.)
  - Frequently hand-touch surfaces throughout the unit/ward area may require more regular decontamination
- Environmental cleaning equipment must be single use or dedicated to the isolation room.
- Following transfer and/or discharge of the patient follow guidance above on waste, linen and equipment):
  - Before entering the room, perform hand hygiene then put on a disposable plastic apron and gloves. See [appendix 3](#).
  - Collect all cleaning equipment and healthcare waste bags before entering the room.
  - The person responsible for undertaking the cleaning with detergent and disinfectant should be familiar with these processes and procedures:
    - Remove:
      - All healthcare waste and any other disposable items
      - Bedding/bed screens, treat as infectious linen
      - Patient care equipment following decontamination
The room/area should be decontaminated using:

- A combined detergent disinfectant solution at a dilution (1000ppm av.cl.);
- A detergent clean followed by disinfection (1000ppm av.cl.).
- Any cloths and mop heads used must be disposed of as single use items.

2.8 Managing Blood and Body Fluids Spillages

- Disinfect all blood and body fluid spills in accordance with Appendix 3.

2.9 Specimens

- All specimens must be treated as biohazard:
  - Use biohazard label
  - Mark lab Request form accordingly
  - Double bag sample

Please see laboratory guidance on HPS website for further details on handling and transportation of specimens.

2.10 Care of the Deceased

Guidance can be found in appendix 12 of the NIPCM

- Staff washing/preparing the body should wear disposable long-sleeved gown and gloves. Eye/face protection should be worn if it there is anticipated/likely splashing of blood or body fluids.
- A body bag must be used: The act of moving a recently deceased body onto a hospital trolley for transportation to the morgue might be sufficient to expel small amounts of air from the lungs and thereby present a minor risk.
- Once in the hospital mortuary the body bag can be opened for viewing only.
- If a post mortem is required, then use safe working techniques (e.g. manual rather than power tools and wearing appropriate PPE).
- Mortuary staff and funeral directors must be advised of the biohazard risk.

2.11 Occupational Exposure

- All HCWs should be vigilant for any respiratory symptoms during the incubation period which can be up to 14 days (for pathogen specific incubation periods please see case management algorithms in the Avian influenza, MERS-CoV and for novel coronavirus (2019-nCov) on a precautionary basis the same period of 14 days is currently being recommended) following last exposure to a confirmed case and should not come to work if they have a fever or cough. They should seek advice from their IPCT/occupational
health department as per the local policy. Their hospital IPCT and/or local HPT will advise on where they should be medically assessed. During this period, symptomatic HCWs should avoid contact with people both in the hospital and in the general community.

3 Version History

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Summary of changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>V7.4</td>
<td>29/01/20</td>
<td>Section 2.1 Patients/Isolation 3rd bullet, 2nd sub-bullet. Last sentence amended to read: ‘In an isolation room with 10-12 air changes per hour (ACH) a minimum of 20 minutes is considered pragmatic; in a side room with 6 ACH this would be approximately one hour.’</td>
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<tr>
<td>V7.4</td>
<td>29/01/20</td>
<td>Appendix 4 Category A Waste flowchart added showing procedure for handing waste from dealing with patients who present with HCID. Includes contact details for NSS Waste Contingency Service</td>
</tr>
<tr>
<td>V7.5</td>
<td>31/01/20</td>
<td>PPE: highlight that two pairs of gloves are required and update of appendix 1 to reflect this Waste: waste no longer requires to be treated as category A waste Linen: to be treated as ‘infectious linen’ rather than category A waste Care of the deceased: changed to reflect that embalming is permitted and link to appendix 13 of the NIPCM Wuhan coronavirus changed to Novel Coronavirus (2019-nCov)</td>
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</tbody>
</table>
Appendix 1 - Putting on and removing Personal Protective Equipment (PPE)

Putting on (donning) PPE

PPE should be put on before entering the room. If full PPE is required, for example for a potentially infectious aerosol generating procedure, all staff in the room or entering the room following the procedure (within one hour if in a side room, or twenty minutes if in an isolation room) should wear the following PPE put on in the following order:

1. Inner pair of non-sterile, disposable gloves
2. Disposable, fluid-resistant gown
3. FFP3 respirator (perform a fit check)
4. Eye/face protection i.e. goggles or full facial visor
5. Outer pair of non-sterile, disposable gloves worn over gown cuffs

The order given above is practical but the order for putting on is less critical than the order of removal given below.

Removal of (doffing) PPE

PPE should be removed in an order that minimises the potential for cross-contamination. Before leaving the room gloves, gown and eye protection should be removed (in that order) and disposed of as healthcare waste. After leaving the area, the respirator can be removed and disposed of as healthcare waste. Guidance on the order of removal of PPE is as follows:

**Outer gloves**

- Remove outer gloves without touching the inner gloves
- Grasp the outside of the glove with the opposite gloved hand; peel off.
- Hold the removed glove in gloved hand.
- Slide the fingers of the un-gloved hand under the remaining glove at the wrist.
- Peel the second glove off over the first glove and discard appropriately.

**Gown**

- Unfasten or break ties.
- Pull gown away from the neck and shoulders, touching the inside of the gown only.
- Turn the gown inside out, fold or roll into a bundle and discard.
Inner gloves

- Remove outer gloves without touching the inner gloves.
- Grasp the outside of the glove with the opposite gloved hand; peel off.
- Hold the removed glove in gloved hand.
- Slide the fingers of the un-gloved hand under the remaining glove at the wrist.
- Peel the second glove off over the first glove and discard appropriately.

Eye protection

- To remove, handle by headband or earpieces and discard appropriately.

Respirator

- **Remove after leaving clinical area**
- Stand up straight and bring the bottom strap or elastic up to meet the top strap or elastic.
- Avoid bending your neck.
- Lift both straps over the top of the head, allow the respirator to fall away from the face and discard appropriately.

To minimise cross-contamination, the order outlined above should be applied even if not all items of PPE have been used.

Perform hand hygiene immediately after removing all PPE.
Appendix 2 - Routine decontamination of reusable non-invasive patient care equipment

- Check manufacturer’s instructions for suitability of cleaning products especially when dealing with electronic equipment.
- Wear appropriate PPE e.g disposable, non-sterile gloves and aprons.

No

Is equipment contaminated with blood?

No

Is equipment contaminated with urine/vomit/faeces or has it been used on a patient with a known or suspected infection/colonisation?

Yes

- Immediately decontaminate equipment with disposable cloths/paper roll and a fresh solution of 1,000 parts per million available chlorine (ppm av cl)* rinse and thoroughly dry
- Or use a combined detergent/chlorine releasing solution with a concentration of 1,000 ppm av cl*, rinse and thoroughly dry
- If the item cannot withstand chlorine releasing agents consult the manufacturer’s instructions for a suitable alternative to use following or combined with detergent cleaning.

Yes

- Immediately decontaminate equipment with disposable cloths/paper roll and a fresh solution of 1,000 parts per million available chlorine (ppm av cl)* rinse and thoroughly dry
- Or use a combined detergent/chlorine releasing solution with a concentration of 1,000 ppm av cl*, rinse and thoroughly dry
- If the item cannot withstand chlorine releasing agents consult the manufacturer’s instructions for a suitable alternative to use following or combined with detergent cleaning.

No

- Decontaminate equipment with disposable cloths/paper towel and a fresh solution of general-purpose detergent and water or detergent impregnated wipes.
- Rinse and thoroughly dry.
- Disinfect specific items of non-invasive, reusable, communal care equipment if recommended by the manufacturer e.g 70% isopropyl alcohol on stethoscopes

Yes

- Follow manufacturer’s instructions for dilution, application and contact time.
- Clean the piece of equipment from the top or furthest away point
- Discard disposable cloths/paper roll immediately into the healthcare waste receptacle
- Discard detergent/disinfectant solution in the designated area
- Clean, dry and store re-usable decontamination equipment
- Remove and discard PPE
- Perform hand hygiene

* Scottish National Blood Transfusion service and Scottish Ambulance Service use products different from those stated in the National Infection Prevention and Control Manual
Appendix 3 – Management of blood and body fluid spillage

Blood and/or body fluid spillage

1. Wear appropriate personal protective equipment (PPE) e.g non-sterile disposable gloves/aprons

2. Is the spillage on soft furnishing?
   - Yes
     - Spill contains ONLY urine/faeces/vomit/sputum
       - Do not use a chlorine releasing agent directly on a urine spill
       - Soak up spillages/gross contamination using disposable paper towels
       - If a urine spillage a gelling agent can be used.
     - Decontaminate area with a solution of 1,000 parts per million available chlorine (ppm av cl) solution or use a combined detergent/chlorine releasing solution with a concentration of 1,000 ppm av
       - Follow manufacturers instructions on contact time
   - No
     - Spill contains blood or body fluid as specified
     - Apply chlorine releasing granules directly to the spill1.
     - If granules not available place disposable paper towels over spillage to absorb and contain it applying solution of 10,000 parts per million available chlorine (ppm av cl) to the towels
     - Follow manufacturers instructions on contact time or leave for 3 minutes
     - Discard the gross contamination into a healthcare waste bag
     - If granules not available place disposable paper towels over spillage to absorb and contain it applying solution of 10,000 parts per million available chlorine (ppm av cl) to the towels
     - Follow manufacturers instructions on contact time or leave for 3 minutes
     - Discard the gross contamination into a healthcare waste bag
     - Apply chlorine releasing granules directly to the spill.
     - If granules not available place disposable paper towels over spillage to absorb and contain it applying solution of 10,000 parts per million available chlorine (ppm av cl) to the towels
     - Follow manufacturers instructions on contact time or leave for 3 minutes
     - Discard the gross contamination into a healthcare waste bag
     - All NHSScotland settings must use granules, or equivalent product e.g spill kit.

3. Is it a spill of blood or body fluid as specified in Box 1?
   - Yes
     - Wash area with disposable paper towels and a solution of general purpose detergent and warm water
     - Dry area or allow to air dry
     - Discard paper towels and disposable PPE into a healthcare waste bag
     - Perform hand hygiene
   - No
     - Discuss with IPCT and consider:
       - If furnishing heavily contaminated you may have to discard it.
       - If the furnishing can withstand a chlorine releasing solution then follow appropriate procedure for the type of spill.
       - If it is safe to clean with detergent alone then follow appropriate procedure.
       - If it is not safe to clean with detergent then the item should be discarded.

Box 1
- Cerebrospinal fluid
- Peritoneal fluid
- Pleural fluid
- Synovial fluid
- Amniotic fluid
- Semen
- Vaginal secretions
- Breast Milk
- Any other body fluid with visible blood