Severe Acute Respiratory Syndrome (SARS) Avian Influenza and other severe viral respiratory infections

Infection control guidance for hospitalised patients

This guidance does not override the individual responsibility of health professionals to make appropriate decision according to the circumstances of the individual patient in consultation with the patient and /or carer. Healthcare professionals must be prepared to justify any deviation from this guidance.

Introduction

This document gives guidance on the assessment investigation, management and infection control precautions required for patients presenting with potentially severe infection due to virulent respiratory viruses, principally avian influenza and SARS.

This guideline is for use by the following staff groups :

All wards, departments and staff involved in the care of patients with possible or confirmed severe respiratory viral infection.

Lead Clinician(s)

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Approved by Chairman's action on behalf of the Trust Infection Prevention & Control Committee:	9th October 2014
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Key amendments to this Document:

Date	Amendment	By:
29/08/2014	Full review of document to ensure Management and Isolation precautions reflect current best practice guidance Section 6 to 18	C Catchpole Heather Gentry
28/04/2014	Updated to include information related to Middle East Respiratory Syndrome Coronavirus (MERS-CoV)	C Catchpole
09/05/2011	**5A Isolation of patients** – interim arrangements for isolation of patients presenting to A & E departments at the Alexandra and WRH sites.	Heather Gentry
09/05/2011	**5C Protective clothing** – To be worn by all staff with direct contact or on entering the room – updated guidance on process for fit test training staff in use of respirator masks.	Heather Gentry
09/05/2011	**10. Intensive Care** – inserted sentence instructing staff to ensure any new purchases of equipment are assessed from a decontamination perspective PRIOR to purchase.	Heather Gentry

December 16	Documents extended for 12 months as per TMC paper approved on 22nd July 2015	TMC
November 2017	Document extended for three months whilst under review	TLG
December 2017	Sentence added in at the request of the Coroner	
March 2018	Document extended for 3 months as approved by TLG	TLG
June 2018	Document extended for 3 months as approved by TLG	TLG
October 2018	Document extended until end of November	Heather Gentry
April 2019	Document extended for 6 months whilst review process takes place	TIPCC

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1. Introduction

NB: These guidelines may also be used in conjunction with the Major Outbreak Plan: food poisoning or communicable disease (Protocol WAHT-INF-005), and the Trust's Pandemic Influenza Plan.

1A Severe Acute Respiratory Syndrome (SARS)

Severe acute respiratory syndrome is a recently recognised illness caused by infection with a novel virus, SARS-associated Corona Virus (SARS-CoV). SARS was first identified in the winter/spring of 2002/3 when over 8000 cases were diagnosed with a 10% mortality overall. SARS activity in 2003/4 was very limited and there have been no recorded cases since. There are no specific clinical or laboratory findings which can distinguish SARS from other respiratory illness with certainty on presentation, so early recognition relies on a combination of clinical and epidemiological features. It is not known when or if SARS will re-emerge, however during 2002/3 the most common source of transmission of SARS-CoV infection was through healthcare facilities, therefore early recognition of potential cases and prompt implementation of appropriate infection prevention and control precautions is critical to reducing the risk of spread to both staff and other patients.

1B Avian Influenza

Avian influenza (AI) is an infection of wild waterfowl, in which it often causes few symptoms; however it may be much more pathogenic in other birds, and may cause outbreaks with high mortality rates. The most recent outbreaks of infection in various countries have been caused by the H5N1 strain.

Very infrequently avian influenza viruses are transmissible to humans. Currently the H5N1 strain of avian influenza has caused human cases and deaths in several countries. Latest updates are available from the Public Health England (formerly Health Protection Agency) website. The majority of these human cases have been associated with outbreaks of infection in poultry flocks, and so far there have been no confirmed reports of sustained human-human transmission. Emergence of a new strain with the ability to transmit from human-human (probably as a result of a combination of genes from both avian and human influenza viruses) would be of great concern because of the potential for an influenza pandemic to occur. Pandemics have affected millions of people, with a high mortality rate, eg Spanish influenza in 1918. The most recent pandemic occurred in 2009/10 (swine 'flu' caused by an H1N1 virus). The vaccines available against the predominant seasonal influenza viruses (including H1N1), whilst effective in preventing currently circulating human influenza viruses, give little or no protection against the H5N1 strain, and a pandemic due to a variant of this virus is likely to affect a high proportion of the population and lead to significant morbidity and mortality.

In the event that an influenza pandemic is declared, a patient presenting with influenza and appropriate travel or contact history should be considered to be at risk of having pandemic influenza. Initially the same procedures should be followed as for avian influenza; however the Trust's Pandemic Influenza Plan will come into operation.

1C MERS-CoV

MERS-CoV (Middle East Respiratory Syndrome coronavirus virus), previously known as novel coronavirus, is a new subtype/strain of coronavirus, first identified by the Netherlands in 2012. Following its identification by the Netherlands, a genetically very

similar strain was identified in a patient from the Middle East by Public Heath England's virus reference laboratories at Colindale. The virus identified in the UK was fully sequenced and detailed analysis indicates that the nearest relatives are bat coronaviruses. At this stage, since only a relatively small number of cases have been reported, there is still little information on how it is spread, the range of illness it can cause and the source of the infection.

Most cases of illness present with fever and cough that progress to a severe pneumonia causing shortness of breath and breathing difficulties. Renal problems have been a feature of some cases but at this point it is not clear whether this is a typical presentation. In small number of cases a diarrheal illness has been the first symptom to appear. Although most cases have been characterised by a severe illness, milder illness has been detected.

There is growing evidence that the infection is spread by the fine droplets created when people cough and sneeze, in common with many other respiratory viruses such as the cold virus and influenza.

So far there is only evidence of limited, non-sustained person-to-person transmission. If the virus was easily spread, we would have expected to see many more cases linked to people caring for cases or in contact with them.

Given the severity of the illness caused by the virus it is considered prudent to use a high level of personal protective equipment when caring for any case with a confirmed diagnosis. Additional measures include isolation of the patient and barrier nursing.

Coronaviruses are fairly fragile and are unlikely to survive for long outside the body - around 24 hours. They are easily destroyed by most detergents and cleaning agents

2. SARS

2A Case Definitions

1. Possible Case
Individual case

A person fulfilling the clinical case definition of SARS **AND** within ten days of onset of illness with a history of travel to an area classified by WHO as a potential zone of re-emergence of SARS. (This currently includes all provinces of China, including Hong Kong.)

OR

A person fulfilling the clinical case definition of SARS **AND** within ten days of onset of illness with a history of exposure to laboratories or institutes which have retained SARS virus isolates and/or diagnostic specimens from SARS patients.

2. Probable Case
An individual with symptoms and signs, consistent with clinical SARS (possible case) and with preliminary laboratory evidence of SARS CoV infection.

3. Confirmed case

An individual with symptoms and signs consistent with clinical SARS (Possible case) and with confirmed laboratory evidence of SARS-CoV infection.

2B Clinical case definition

The respiratory illness should be severe enough to warrant hospitalisation and include a history of:

Fever of 38°C (documented or reported)
AND
One or more symptoms of lower respiratory tract illness (cough, difficulty breathing, shortness of breath)
AND
Radiographic evidence of lung infiltrates consistent with pneumonia or Respiratory Distress Syndrome (RDS) OR autopsy findings consistent with the pathology of pneumonia or RDS without an identifiable cause.
AND
No alternative diagnosis to fully explain the illness

2C Routes of transmission

- Close contact with a symptomatic person via large respiratory droplets. Transmission via contaminated fomites may also occur but is less common. Spread via the faecal-oral route has also been identified as a risk factor.

- Close contact may be considered to be having cared for, lived with, or had face-to-face (within one metre) contact with, or direct contact with respiratory secretions and/or body fluids of a person with SARS.

- Close contact with a probable case (see case definition) is considered to present a higher risk of transmission of infection compared to a history of travel to an affected area

2D Incubation period

Between 2 and 10 days

2E Period of infectivity

- SARS is less infectious but more virulent than most other acute respiratory infections, eg Influenza

- Transmission of infection may occur when symptoms are mild during the prodromal illness

- People may remain infectious up to 10 days following the resolution of fever

- Cases that have more severe illness are more infectious and infectivity appears to increase in the second week of illness.

- Transmission of infection from an asymptomatic person is very unlikely

3. Avian Influenza (AI)

It is essential to obtain a clear clinical history with appropriate epidemiological information to include travel and contact information.

3A Clinical case definition:

a) fever ≥38^{0}C and lower respiratory tract symptoms (cough or shortness of breath) or CXR findings of consolidation or ARDS
OR

b) other severe/ life threatening illness suggestive of infectious process

AND patients **MUST** fulfil a condition in **EITHER** category 1 **OR** 2 below

Exposure 7 days prior to the onset of symptoms:

1) close contact (within one metre) with live, dying or dead domestic poultry or wild birds, including live bird markets, in an area of the world affected by avian influenza A/H5N1, or with a confirmed A/H5N1 (or other circulating strain) infected animal other than birds (eg cat or pig)

2) close contact (providing care/touching/speaking distance within one metre) with human case(s) of:
   - severe unexplained respiratory illness, originating in high risk area
   - unexplained illness resulting in death originating in high risk area

If these criteria are NOT met, the patient is unlikely to have Influenza A/ H5N1, he/she should be treated and investigated as clinically appropriate.

AI is unlikely if clinical severity does not require hospitalisation, however the HPU and primary care team should be informed to arrange follow up to confirm recovery.

3B Incubation period

Typically 3 to 5 days but may be up to 7 days.

3C Period of infectivity

Currently there is no evidence to suggest that the highly pathogenic strain of AI has adapted to spread easily to humans, although there are a small number of cases where human to human transmission has occurred. Seasonal influenza is infectious from 24 hours before, to approximately 5 days after, the onset of symptoms (although this period may be extended in children and immunocompromised individuals).

4. MERS-CoV

4A Clinical case definition

1. possible case

Any person with severe acute respiratory infection requiring admission to hospital:

- With symptoms of fever (≥ 38^{0}C) or history of fever, and cough
  AND
- With evidence of pulmonary parenchymal disease (eg. clinical or radiological evidence of pneumonia or Acute Respiratory Distress Syndrome (ARDS)1)
  AND

- Not explained by any other infection or aetiology
  AND AT LEAST ONE OF
- History of travel to, or residence in an area where infection with MERS-CoV could have been acquired in the 14 days before symptom onset*
  OR
- Close contacts during the **14 days** before onset of illness with a confirmed case of MERS-CoV infection while the case was symptomatic
  OR
- Healthcare worker based in ICU caring for patients with severe acute respiratory infection, regardless of history of travel or use of PPE
  OR
- Part of a cluster of two or more epidemiologically linked cases within a two week period requiring ICU admission, regardless of history of travel

*Currently areas identified are Bahrain, Iraq, Israel, Jordan, Kingdom of Saudi Arabia, Kuwait, Lebanon, Occupied Palestinian Territories, Oman, Qatar, Syria, UAE and Yemen

2. Presumptive positive case
Any person with PHE MERS-CoV Testing Laboratory positive confirmation of infection with
MERS-CoV

3. Confirmed case
Any person with PHE National Reference Laboratory (RVU) positive confirmation of infection
with MERS-CoV

4. Discarded case
Any possible case with a negative MERS-CoV laboratory result

5. Action to Take If Patient Fulfils Above Case Definitions For AI, MERS-CoV Or SARS

Admitting doctor (who should be a senior member of the medical team) must:

- Inform the Consultant Medical Microbiologist or a senior Infection Prevention and Control Nurse (IPCN), preferably **before** admission to hospital/A & E Department
- Inform CDSC duty doctor on 020 8200 6868 and complete a standard report form for registered medical practitioners available at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/324450/Notifiable_disease_form.pdf
- Inform PHE Local Health Protection Unit (LHPU) on 01562 756 300 (via ambulance control out of hours).
- For further information on responsibilities and how to report a notifiable disease and causative organisms refer to https://www.gov.uk/notifiable-diseases-and-causative-organisms-how-to-report

Infection Prevention and Control Team (IPCT) will inform/liaise with:

- Other members of the IPCT
- Occupational Health Department
- Chief Executive / Deputy of Hospital Trust
- Consultant in Communicable Disease Control/HPU
- Communicable Disease Surveillance Centre

Record keeping:

- A record of all staff that have contact with the patient should be kept by the senior nurse on duty (sample form, **Appendix 1**, which should be copied as required)

Send completed forms **daily** to Occupational Health Department for monitoring purposes.

6. Management of Cases

6A Isolation of patients

- Patients referred to hospital or who present to the A & E Department and who meet the definition of a suspect or probable case of SARS, MERS-CoV or avian influenza should be put **immediately** in a room separate from other patients (and an isolation nursing notice attached to the door) while they are waiting further assessment and a decision to admit or send home.
- GP referrals should be passed to a senior member of the admitting medical team for assessment **PRIOR** to acceptance for admission. Patients should be kept at home wherever possible until appropriate accommodation has been agreed with the IPC Team or Consultant Microbiologist if admission is advised. **DO NOT ADMIT SARS, MERS-CoV OR AVIAN INFLUENZA PATIENTS TO THE MAU.**

In the A & E departments the most appropriate area to place suspect or possible cases is a **Single Room at both the Worcester and Redditch sites,** both with the **door closed** for any patient who is clinically stable (level 1) and only requires oxygen (which can be provided from a portable cylinder), observations monitoring +/- IV fluids pending assessment and placement if the patient needs admitting.

These rooms have been chosen because the ventilation is separate to the rest of the hospital and can be summarised as;

	Alexandra	WRH	Kidderminster
Cubicle number in A&E/ MIU	Room3 Room 4 Room5	Room 4 Room 5 Room 6	Assessment Room

Neither room is fit for purpose for Level 2 patients or above who would need to be dealt with in the A & E resuscitation areas for clinical safety. This will require ***an immediate total shut down of the extract ventilation from the department*** (currently attached to hospital ventilation system with supply and extract) to the rest of the hospital.
If it is not possible to re-locate other patients who are currently in the resuscitation area e.g. expedite transfer to admitting ward, discuss with the IPC Team or Consultant Microbiologist for measures to reduce the risk of exposure (dependent on the patient's clinical condition this may include use of face mask, inspiratory filters on ventilator circuits and risk assessment based on likelihood of SARS diagnosis.

WRH Site – An **urgent** request is to be made to the Cofely on call Manager to have the shift engineering team attend **immediately** to isolate the area via BMS AHU 16 which feeds A&E, Cardiac Cath Lab and Part of Critical Care Unit

ALEXANDRA Site – ***During normal working hours***, the Estates Department General Office should be contacted on extn 44902 **stating this is an urgent request for immediate response**, one of the tradesmen will close local smoke/fire dampers

serving the Emergency Dept, using the Fireman's override panel in the Hospital Street. The dampers required are ref. MFD/ 4G 1 to 6 (North). This closes off the Hot and Cold Supply ducts and the Clean Extract ducts.

In addition, Dirty Extract fans ref. EF 4L2 and EF 4L3 will need to be shut down in Link Plant Room No. 4. (NB - this will also close down Dirty Extract ventilation to Wards 5 and 6 opposite).

ALEXANDRA Site - Outside of normal working hours, the On Call Estates Manager will be contacted via switchboard, who will mobilise the On Call Tradesmen to attend site and carry out the above procedure.

Other unaffected resuscitation cases could be dealt with in cubicles 6 & 7 at the Alexandra site and cubicles 4, 5 & 6 at the WRH site as a back-up. The area should effectively be cordoned off if in use.
Patients requiring admission at the Alexandra site and not requiring transfer to Avon 3 side rooms would go to a single room on the Ward 9 template which is the only inpatient area with no direct links to the ventilation system. The patient is to be transported wearing an FFP2 Respirator mask, if this can be tolerated or at least an FFP1 fluid shield mask across the mouth and nose to reduce the risk of respiratory transmission. A planned route to the admitting ward should be cleared for direct transfer from A & E to Ward 9.

An alternative route to Ward 9 to consider may be for an ambulance from A & E to pharmacy entrance of the building then take the lift to ward 9 (this is potentially a less busy section of the corridor and more easily cleared), if deemed to be necessary.

Kidderminster Site – ***During normal working hours***, the Estates Department office at Kidderminster should be contacted on extn 53341 **stating this is an urgent request for immediate response**. Air Handling unit No 2 would need to be isolated within Plant room 1 or via the Building Management System. This would isolate ventilation to MIU / Imaging / Oral Facial / Retail pods.

Kidderminster Site – ***Outside of normal working hours***, the On Call Estates Officer/ Manager will be contacted via the Alexandra switchboard, who will mobilise the On Call Tradesmen to attend site and carry out the above procedure, **stating this is an urgent request for immediate response**.

All Sites
The supply and extract ventilation from A & E and MIU should remain switched off until such time as the patient is either discharged from the department or admitted to a suitable isolation facility.
Due to the effects of ventilation shut down on the temperature and humidity of the circulating air, the need to remain in "shut down" mode should be reviewed with estates and the IPC Team on an hourly basis with an aim to have a decision to admit or transfer/discharge within 3 hours.

- **If a decision is made to admit please discuss with the Consultant ID Physicians, a Consultant Medical Microbiologist or one of the Infection Prevention and Control Nurses <u>BEFORE</u> moving the patient.** Cases should be isolated and accommodated as follows in descending order of preference, and depending on availability:

1. **High level infectious isolation negative pressure rooms on Avon 3 at Worcester with their own bathroom facilities, with the door closed (GM028 and GM030) – see also Appendices 2 and 3**

NB: Every effort should be made to admit to one of these rooms; this may mean relocation of a patient already occupying a room, based on risk assessment.

Do NOT transfer the patient through the hospital; outside access to the negative pressure rooms on Avon 3 beds is available.

2. Single rooms with negative pressure facilities (only available at Worcester)
3. Single rooms with ventilation switched off / no ventilation
4. Cohort placement in a ward area with independent facilities

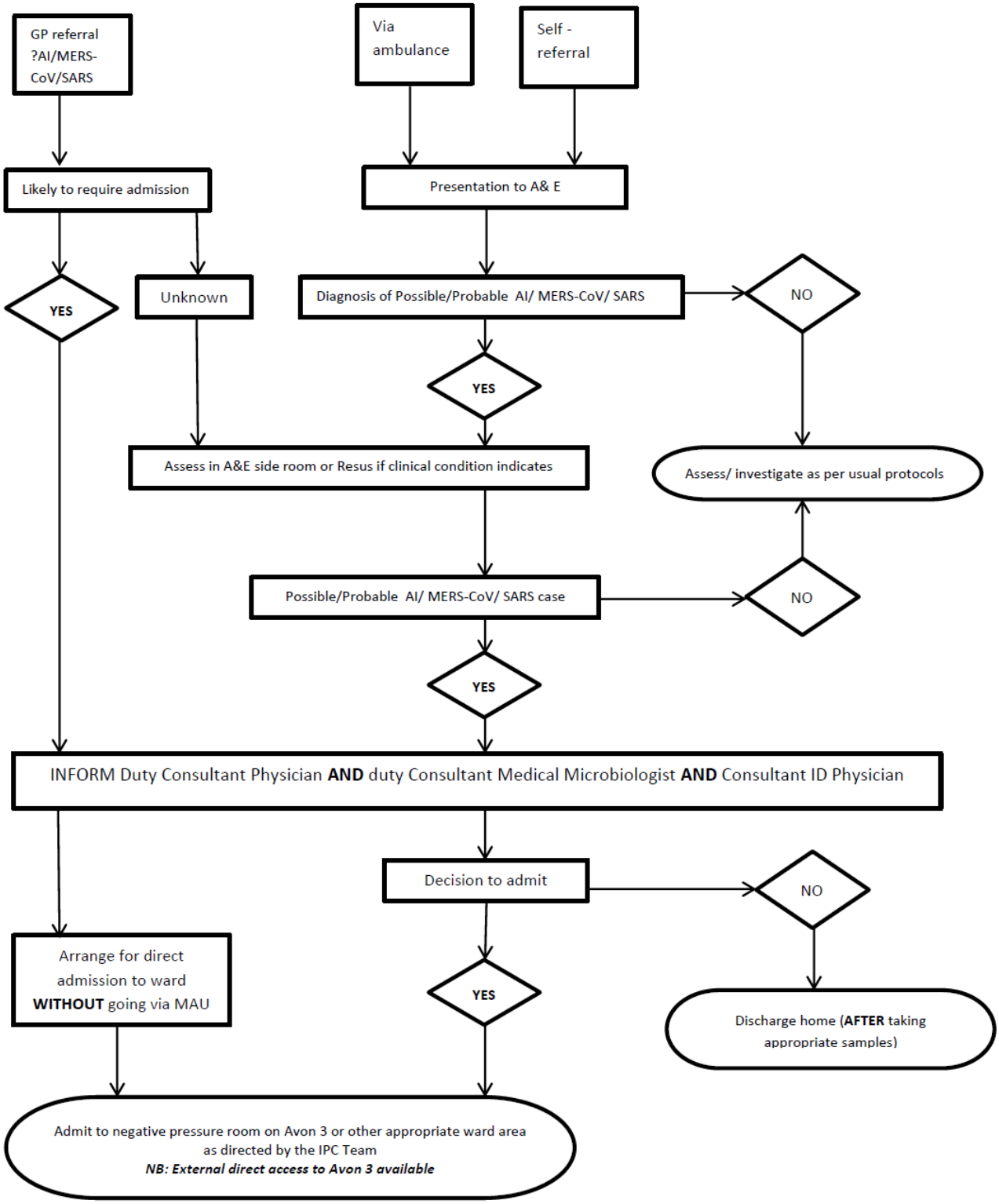
When transferring patients from A & E or another area to a ward / single room other than on Avon 3 the following should be considered:

- Ensure that the receiving clinical area is aware that the patient is on their way and is prepared to receive the patient

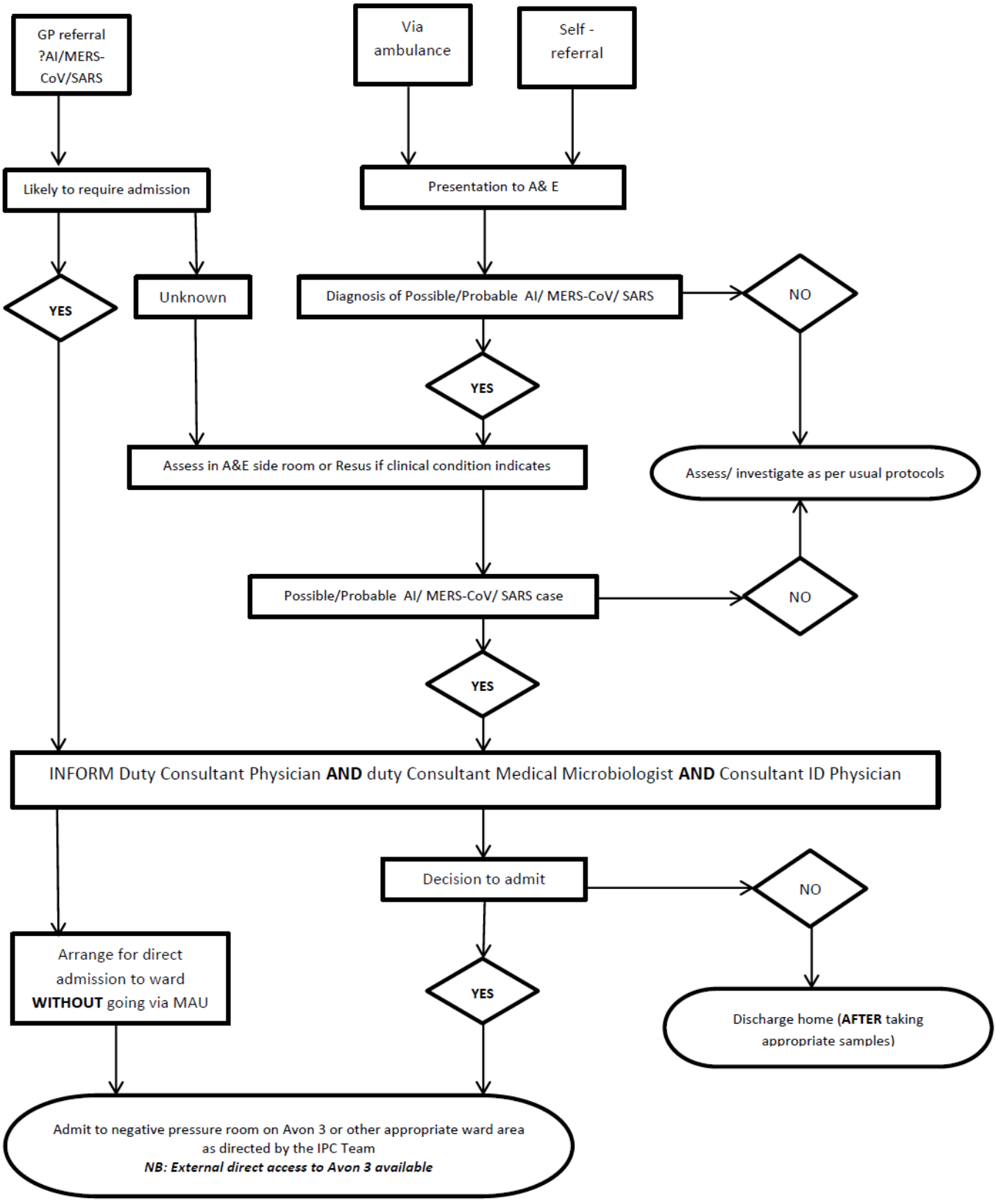
- The patient should be transferred using the shortest route which avoids entering other clinical areas.

Turning off air conditioning and opening windows for good ventilation is recommended if an independent air supply is unfeasible (guidance will be given by the IPCT). Please ensure that if windows are opened they are away from public places.

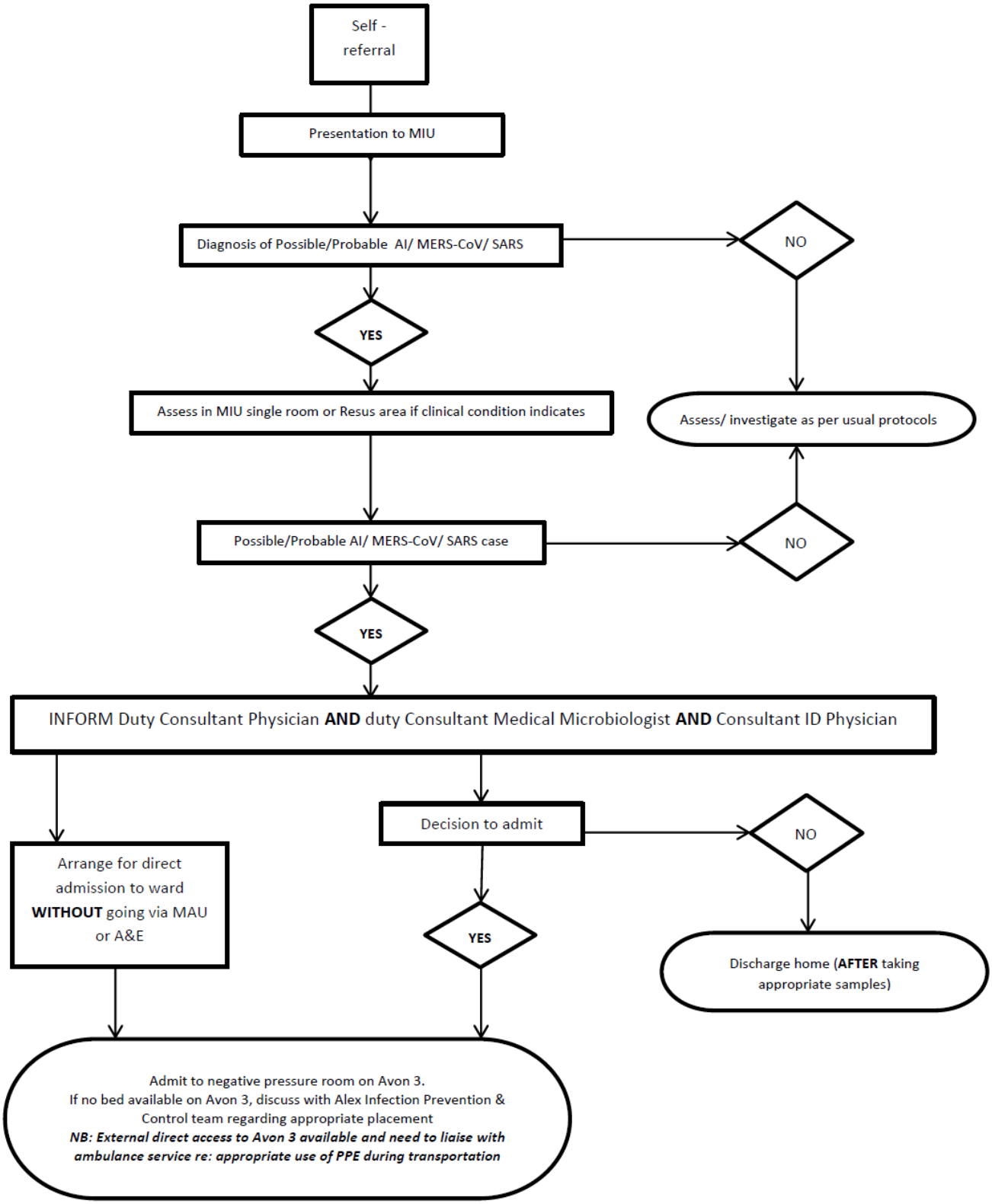
6B (i) Algorithm for management of possible/probable Avian Influenza (AI), MERS-CoV or SARS patients at Worcestershire Royal Hospital (WRH)



6B (ii) Algorithm for management of possible/probable Avian Influenza (AI), MERS-CoV or SARS patients at Alexandra Hospital



6B(iii) Algorithm for management of possible / probable AI MERS-CoV or SARS patients at Kidderminster Treatment Centre



6C Protective clothing – To be worn by all staff with direct contact or on entering the room

- Long sleeved, thumb loop/cuffed fluid-repellent **disposable gown** (e.g. 5530 Premier/ yellow long sleeved gowns) available in the IPCT out of hours store on each site, A & E, Critical care, Avon ward and from IPCT at WRH, from A & E or IPCT at the Alex and from MIU at Kidderminster.
- **Non-sterile examination gloves** (NOT vinyl) are recommended, and the cuffs of the gloves should cover the cuffs of the gown. The wearing of two pairs has been recommended and is assumed in the chart summarising removal of PPE (below).
- **Respirator masks** (FFP3 mask) must be worn. It is important that each respirator is applied properly, and that a "Fit Test" is performed (specific training will be required – a register of staff trained to fit test others is available on the M:\Acute\SharedPerformanceInfo\Infection Control\FFP3 MASK TRAINING REGISTERS and in the folder accompanying the fit test kit located in the emergency drug cupboard on the WRH and Alexandra sites).
- **A surgical hat** should also be worn
- **Eye protection must be worn.** Visors such as Universal Safeview are preferred to goggles as they are more comfortable and can be used as disposable items and worn over the wearer's own spectacles (the wearer's own spectacles do not provide adequate protection against droplets, sprays and splashes).
- Dispose of outer gloves, hat, eye protection, and gown in the orange (hazardous waste) bin inside the room immediately before you leave. Remove mask and inner gloves outside the room, and dispose of as orange bag (hazardous) waste. Do NOT re-use these items.
- Wash hands immediately with soap and water, and apply alcohol gel before re-entering the main ward/department.
- Nursing staff providing care to isolated patients should wear theatre scrub clothing, which should be sent to the laundry as infected linen at the end of the shift.

It is vital that the protective clothing above is worn for all airway management including intubation

PPE	Details	Order for putting on (all outside room)	Order for taking off
Face mask	FFP3 respirator	1	5 **outside room**
Gloves	First pair	2	6 **outside room**
Gown	long sleeve fluid-repellent	3	4 **inside room**
Hat	Surgical hat	4	3 **inside room**
Eye protection	Even if staff wear spectacles	5	2 **inside room**
Gloves	Second pair	6	1 **inside room**

6D Equipment

- Use dedicated equipment where possible in isolation room (remove non-essential items prior to occupation). Equipment used elsewhere must be decontaminated prior to re-use (see below).
- Dispose of single use equipment as hazardous (orange bag) waste inside room.
- Re-usable equipment should be avoided. If used, disinfect with a freshly prepared solution of 1000ppm available chlorine or the Clinell peracetic acid (red) wipes. Care - hypochlorite may corrode some metals. Other suitable disinfectants may be used if the above are not available (discuss with Infection Prevention and Control Team). No special procedures required for transporting clean used equipment to Sterile Services.
- Ventilators should be protected with filters and standard decontamination procedures followed
- Closed system suction systems should be used
- Crockery should be treated as normal and washed using the ward dishwasher (WRH) or return to central catering (Alexandra site).
- Use of equipment that re-circulates air (eg fans, hot air warming blankets) should be avoided. If used, they should be decontaminated in accordance with manufacturers' instructions and any filters changed. Fans, however, cause less air movement than opening windows in the re-aerosolisation of settled particles. Staff changing filters must be instructed in safe working practices.

6E Hand hygiene

- Essential before and after all patient contact, removal of protective clothing and cleaning of the environment
- Use soap and water, or use sanitising hand gel if hands are physically clean.
- Staff must not wear rings, wrist watches and wrist jewellery.
- HCWs should not wash their hands in patient washrooms / en-suite facilities.

6F Linen

- Bag linen inside single room – do not carry through ward / department
- Linen should be bagged in accordance with procedures for infected linen (red alginate inner bag + white plastic outer bag +/- yellow infected linen tape at the Alexandra and Kidderminster sites and no tape at WRH site).

6G Waste

- Dispose of all waste as hazardous (orange bag) waste, which should be double bagged prior to removal from the ward
- Patients should be encouraged to use the en-suite facilities, however if required, urine/excreta should be disposed of via the sluice room on Avon 3

(see **Appendix 2**). If a dedicated sluice room is not available, gelling agents should be used and waste discarded as hazardous (orange bag) waste.

6H Visitors

- The number of visitors should be restricted and in some circumstances it may be preferable to exclude all except essential visitors.
- Close contacts of a probable or confirmed AI / MERS-CoV **/** SARS patient should be screened for signs and symptoms of AI/ MERS-CoV / SARS before being permitted to enter the hospital by A & E / Ward staff.
- Visitors entering the isolation room must wear protective clothing as previously detailed
- Visitors should be trained in the appropriate use of protective clothing by ward staff competent to do so.
- A list of all visitors should be recorded by ward staff and kept by the nurse in charge.

6I Cleaning

- Standard isolation room cleaning to be implemented and ward housekeepers/domestic staff informed.
- Domestic staff must be made aware of the need for additional precautions (see below)
- Daily cleaning should be carried out with 1000ppm available chlorine.
- Domestic staff to wear protective clothing as indicated above (**6C**)
- The isolation area should be cleaned after the rest of the ward area
- Dedicated or disposable equipment must be used for cleaning
- Cleaning equipment must be decontaminated with a 1000ppm available chlorine solution following each use or other method as advised by the IPC Team.
- Dispose of all cleaning cloths and launder mop heads after each use.
- The rooms in A & E / MIU or any cubicle where patients with suspected AI/ MERS-CoV /SARS are evaluated should be cleaned and disinfected **before** another patient is seen or cared for in that environment. High level disinfection (Red Clean) using hydrogen peroxide vapour is essential.
- Curtains to be laundered on patient discharge from an area.

7. Transfers To Other Departments Within The Same Hospital

Where possible, all procedures and investigations should be carried out in the single room. Only a minimal number of essential staff should be present in room during any procedures.

Only if clinical need dictates should patients be transferred to other departments and the following procedures then apply:

- The department must be informed in advance
- The patient must be taken straight to and return from, the investigation / treatment room, and must not wait in a communal area.
- Ideally patients should be at the end of a list to allow appropriate decontamination after any procedure.
- The patient should wear a 'surgical (FFP1 fluid shield)' mask – this will prevent large droplets being expelled into the environment by the wearer.
- Portering and escort staff need not wear masks during transit if the patient is able to wear a mask (if required an FFP2 “duck bill” respirator mask should be worn). Gloves and gowns should be worn for direct contact with the patient.
- The trolley / chair should be wiped with a 1000ppm available chlorine solution after use.
- Staff carrying out procedures must wear the protective clothing indicated above.
- The treatment / procedure room and all equipment should be cleaned with a 1000ppm available chlorine solution. SARS corona virus is an enveloped RNA virus and is therefore susceptible to disinfection methods. It is, however, possible that it can survive in the environment for up to 24hrs, so environmental decontamination is vital.

If ambulance transfer is required, ambulance control and ambulance personnel collecting the patient must be informed in advance (at the time of booking) and will transport the patient using category 3 containment measures.

8. Transfer to Other Institutions

- Transfer of hospitalised SARS MERS-CoV AI cases to another hospital, once admitted into an in-patient bed, should be avoided unless absolutely necessary.
- SARS MERS-CoV/ AI patients should not be transferred solely for the purpose of accommodation in a negative pressure room unless they have been assessed in the A & E at the Alex or MIU at Kidderminster, and a bed is available on Avon 3 at WRH.
- Transfer of other patients who may have been exposed to SARS MERS-CoV AI and could be incubating disease should also be avoided. If transfer is essential, the IPC Team at the receiving hospital must be advised in advance of the transfer.

9. Clinical Care / Hospital Management Of Adults With SARS, MERS-CoV Or AI

- For SARS, advice is available by clicking on this link to Public Health England main website pending an updated direct new link awaited to SARS guidance. https://www.gov.uk/government/organisations/public-health-england

- For MERS-CoV, advice is available by clicking on this link to: https://www.gov.uk/government/collections/middle-east-respiratory-syndrome-coronavirus-mers-cov-clinical-management-and-guidance

- Patients who fulfil the criteria for AI should have appropriate samples for investigation taken and start oseltamavir treatment as soon as possible; click on this link for further advice: Public Health England Avian Influenza **https://www.gov.uk/government/collections/avian-influenza-guidance-data-and-analysis**

10. Medical Procedures

- Procedures that produce aerosols of respiratory secretions should be avoided if at all possible, eg. nebulisers, bronchoscopy induced sputum, positive pressure ventilation via a facemask, intubation and extubation, airway suctioning.

- Where these procedures are medically necessary, they should be undertaken in a negative pressure room if available or in single room with the door closed. The minimum number of required staff should be present and all staff present in the room **must** wear personal protective equipment (PPE) as described above (**6C**) including visor/ eye protection. Entry and exit from the room should be minimised during the procedure.

- The use of powered air purifying respirators (PAPR) during aerosol generating procedures is not recommended. This is because there are concerns over the removal, disposal, cleaning and decontamination of this equipment, which may increase the potential risk of self-contamination, and at this time there is inadequate evidence to determine whether PAPRs further reduce the transmission of SARS. If PAPRs are used, staff must be properly trained in their safe use.

11. Intensive Care

- To reduce the risk of difficult intubation in an emergency situation without adequate infection prevention, SARS, MERS-CoV and AI patients should be transferred early to intensive care if their condition is deteriorating and consideration given to early planned intubation by an experienced operator.

- Patients MUST be nursed in side rooms with full precautions as described above (**6A**)

- All respiratory equipment must be protected with a filter that has viral efficiency to 99.99%

- Disposable respiratory equipment should be used wherever possible. Re-usable equipment must at a minimum be disinfected in accordance with manufacturers' instructions. A process should be agreed prior to purchase of the equipment and approved by the IPC Team / Trust decontamination Lead.

- The ventilator circuit should not be broken unless absolutely necessary.

- In-line filters and nebulisers should be used with especial reference to the expiratory circuit.

- Ventilators must be placed on standby when carrying out bagging.

- Protective clothing as detailed above to be worn (**6C**)
- The use of non-invasive positive pressure ventilation equipment should be avoided.
- Water humidification should be avoided where possible.
- Only essential staff should be in the patient's room when airway management, cough inducing activities or nebulisation of drugs is being carried out.

12. Theatres

- Theatres must be informed in advance.
- The patient should be transported directly to the operating theatre and should wear a 'surgical (FFP1 fluid shield)' mask.
- The patient should be anaesthetised and recovered in the theatre.
- Staff should wear protective clothing as detailed above (**6C**).
- Disposable anaesthetic equipment should be used wherever possible.
- Re-usable anaesthetic equipment should be decontaminated in line with manufacturers' instructions.
- The anaesthetic machine must be protected by a filter with viral efficiency to 99.99%.
- Instruments and devices should be decontaminated in the normal manner. Instruments must be transported safely to the Sterile Services Department and SSD staff informed of infection risk.
- The theatre should be cleaned using a 1000ppm available chlorine solution.
- Theatres should not be used after the patient leaves for 15 minutes if conventional ventilation or 5 minutes if ultra clean ventilation; this will allow for a complete air change within the theatre and reduce the risk of exposure to staff and patients.

13. Staff

- The use of bank or agency staff should be avoided wherever possible
- Staff involved in the care of SARS, MERS-CoV or AI cases should avoid working in other parts of the hospital or in other hospitals until they are past the incubation period (10 days following last contact with a suspect or probable case).
- Staff must comply with all infection prevention and control procedures as detailed above
- A record of all staff caring for the patient must be maintained (record sheet at **Appendix 1**). The record sheet should be placed at the door and all staff entering must complete this. This record should be sent to the Occupational Health Department each day.

- All HCWs should be vigilant for symptoms of SARS or AI in the 10 days following last exposure to a case and should not come to work if they have a fever. Further advice should be sought from their IPC Team and Occupational Health Department. They should stay off duty for seven days after the resolution of fever and respiratory symptoms. During this period, potentially infected workers should avoid close contact with persons both in the hospital and in the general community.

Healthcare workers returning from an affected area should return to work as normal ***unless***, they are unwell and have symptoms consistent with SARS or AI, in which case they should stay off work and phone their GP for assessment ***or*** they are well, but have been in close contact with a SARS case, or worked in a healthcare setting where cases were being treated. Healthcare staff in this group should avoid contact with patients for 14 days after departure from an affected area, should contact their local Occupational Health Department, and monitor their own health for 14 days, seeking medical advice if they become unwell.

14. Sample Collection From SARS, MERS-CoV and AI patients:

- Contact the consultant microbiologist about appropriate samples for investigation of possible SARS MERS-CoV or AI cases.

- All clinical specimens from SARS MERS-CoV and AI cases should be labelled as High-Risk and securely transported to the designated laboratory using special transport equipment. Contact Microbiology for advice. Danger of Infection labels are available from Service point.

Microbiological investigations:

For investigation of SARS:

- Virus shedding is maximal between 6 and 10 days post illness onset in the respiratory tract. Stool samples have been shown to be positive in 60% by day 6 and 100% at day 13 post illness.

- The following specimens are required for SARS investigations:
  - Respiratory specimens: nasopharyngeal aspirates, nasal washes, tracheal aspirates or bronchoalveolar lavage in sterile containers.
  - Throat and nasal swabs for viral PCR (Remel swabs: contact the Department of Microbiology for supplies if no swabs available on ITU or A/E
  - 20 ml of blood collected into EDTA
  - stool sample in a sterile container
  - 20 ml of mid-stream urine or a clean catch in a sterile container
  - 20 ml of acute serum (clotted sample of blood)
  - 20 ml of convalescent serum (21 days post-illness - clotted sample of blood)

Other pathological specimens:
Clinical specimens from probable and suspect SARS patients required for pathology management tests (i.e., those normally undertaken in haematology or biochemistry laboratories) should be subject to a common high standard of handling (i.e., that applicable to HIV/hepatitis or other blood-borne pathogens). Such specimens may be processed at CL2 and should be labelled 'HIGH RISK'.

For investigation of Avian influenza:
Please discuss the appropriate samples to collect with the duty Medical Microbiologist; however influenza A may be diagnosed from nasopharyngeal aspirates, bronchoalveolar

lavage, endotracheal aspirate or nose and throat swabs. Blood samples for acute and convalescent (more than 14 days after onset of infection) serology should also be collected.

For investigation of MERS-CoV

4 Samples should be (at the minimum):

1) A **sputum** sample*, **2)** and **3)** a **duplicate** set of nose and throat swabs for viral PCR (Remel swabs), and **4)** an **acute** serum sample.

(**testing of a lower respiratory tract sample (**i.e. sputum or BAL**) is necessary for formal exclusion of MERS-CoV diagnosis)*

15. Contact Tracing

- Follow up of contacts of SARS MERS-CoV and AI patients will be co-ordinated by the local Health Protection Unit see: https://www.gov.uk/government/collections/middle-east-respiratory-syndrome-coronavirus-mers-cov-clinical-management-and-guidance

- Follow up of staff contacts of SARS MERS-CoV and AI patients will be co-ordinated by the Occupational Health Department

16. Surveillance

- Enhanced hospital based surveillance for 'atypical pneumonia' should be instigated as directed by the IPCT.

- Consideration should be given to introducing twice daily temperature monitoring of all in-patient contacts, as directed by the IPCT.

17. Last Offices

- Carry out last offices using the protective clothing and medical procedures identified above.

- A body bag should be used

- Mortuary staff and funeral directors must be advised of the biohazard risk

18. Post Mortem Examination Of Suspect Or Probable SARS, MERS-CoV and AI patients

If a post-mortem examination is made on a patient who dies meeting the case definition of a probable case, precautions should be taken against the risk of infection from aerosols created during the examination. For autopsies and post-mortem assessment of SARS MERS-CoV and AI cases, personal protective equipment (PPE) should include:

- Protective garments: surgical scrub suit, surgical cap, impervious gown or apron with full sleeve coverage, face shield, shoe covers and double surgical gloves with an interposed layer of cut-proof synthetic mesh gloves.

- Respirator masks, or powered air-purifying respirators (PAPR) equipped with a high efficiency particulate air (HEPA) filter should be worn. PAPR is recommended for any procedures that result in mechanical generation of aerosols, eg use of oscillating saws. Autopsy personnel who cannot wear respirators because of facial hair or other fit-limitations should wear PAPR.

Safety procedures (which are standard) should include:

- prevention of percutaneous injury,
- removing protective outer garments when leaving the immediate autopsy area and discard in appropriate laundry or waste receptacles, either in an antechamber to the autopsy suite or immediately inside the entrance if an antechamber is not available.
- hand washing upon glove removal.
- Embalming is not advisable

20. References

Public Health England advice and guidance, is available at:

- Severe Acute Respiratory Syndrome **-** direct new link is awaited to SARS guidance. Main wesbite address is **https://www.gov.uk/government/organisations/public-health-england**
- MERS **https://www.gov.uk/government/collections/middle-east-respiratory-syndrome-coronavirus-mers-cov-clinical-management-and-guidance**
- Avian Influenza **https://www.gov.uk/government/collections/avian-influenza-guidance-data-and-analysis**

21. Monitoring Of Compliance

Owing to the rarity of these conditions, compliance with this policy will be assessed as and when cases arise, by the Infection Prevention and Control Team, and will form part of any Root Cause Analysis and incident / outbreak report.

Monitoring Tool

This should include realistic goals, timeframes and measurable outcomes. How will monitoring be carried out? Who will monitor compliance with the guideline?

Page/ Section of Key Document	Key control:	Checks to be carried out to confirm compliance with the policy:	How often the check will be carried out:	Responsible for carrying out the check:	Results of check reported to: *(Responsible for also ensuring actions are developed to address any areas of non-compliance)*	Frequency of reporting:
	WHAT?	**HOW?**	**WHEN?**	**WHO?**	**WHERE?**	**WHEN?**
	These are the 'key' parts of the process that we are relying on to manage risk. We may not be able to monitor every part of the process, but we MUST monitor the key elements, otherwise we won't know whether we are keeping patients, visitors and/or staff safe.	What are we going to do to make sure the key parts of the process we have identified are being followed? (Some techniques to consider are; audits, spot-checks, analysis of incident trends, monitoring of attendance at training.)	Be realistic. Set achievable frequencies. Use terms such as '10 times a year' instead of 'monthly'.	Who is responsible for the check? Is it listed in the 'duties' section of the policy? Is it in the job description?	Who will receive the monitoring results? Where this is a committee the committee's specific responsibility for monitoring the process must be described within its terms of reference.	Use terms such as '10 times a year' instead of 'monthly'.
P9 – 6A	Patient isolated promptly; • In A&E • On admitting ward	Check A&E, patient medical records and OASIS for ADT status change	As part of ongoing patient management review	Ward Sister and IPC Nurse reviewing patient	Exception report to Lead Nurse IPC – this would then be reported to either outbreak committee if relevant or TIPCC	On a case by case basis
P9 – 6A	Immediate shut down of extract ventilation from A&E department	Check relevant estates department log	As part of the post case review	Estate's site lead and incident report author	TIPCC through incident report, by exception where non-compliance indicated	On a case by case basis
P10 – 6A	Once decision to admit patient has been discussed with Consultant ID Physician,	Check patient medical records, CMM clinical record and ICNet system	As part of the post case review	Incident report author	TIPCC through incident report, by exception where non-compliance	On a case by case basis

	Consultant Medical Microbiologist (CMM) or Infection Prevention and Control Nurse BEFORE moving the patient.				indicated	
P15 – 17 6C to 6L	Compliance with protocols for PPE use, equipment, linen and waste management, hand hygiene practices, cleaning of isolation facility protocols and visitor control.	Observation of practices by IPC Nurse, Consultant Microbiologist, Consultant ID Physician, Matron and Ward Sister	Within 12 - 24 hours of admission and repeated daily, if concerns identified or during clinical review visit.	IPC Nurse, Ward Sister, Matron, Consultant Microbiologists, Consultant ID Physician	Immediate feedback to clinical team (medical, nursing and therapies). TIPCC through incident report, by exception where non-compliance indicated	On a case by case basis

Contribution List

Key individuals involved in developing the document

Name	Designation
Chris Catchpole	Consultant Microbiologist
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Claire Constantine	Consultant Microbiologist
Anne Dyas	Consultant Microbiologist, ICD Alexandra/Evesham Sites

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Circulated to the following CDs/Heads of dept for comments from their divisions/ directorates / departments

Name	Directorate / Department
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Members of Trust Infection	Prevention and Control Committee not identified above

Circulated to the chair of the following committee's / groups for comments

Name	Committee / group
Lindsey Webb	Director of |Infection Prevention and Control and Trust Infection Prevention and Control Committee

Appendix 1

Staff contact record sheet
(to be completed daily using a new sheet)
Send completed sheets to Occupational Health Dept

Name of index patient ……D.O.B……

Date of record ……

RECORD YOUR NAME IF YOU ENTER THE ROOM (please print and indicate job title)

NAME (PRINT)	JOB TITLE	CONTACT DETAILS IF NOT BASED ON THE WARD

Appendix 2

Additional operational precautions to be taken on Avon 3 when High level infectious isolation rooms in use.

In addition to the operational policy for use of the High Level Infectious Isolation (HLII) rooms on Avon 3 (see Isolation Policy), the following precautions/actions should also be undertaken when nursing SARS, MERS-CoV or Avian Influenza patients on the unit:

- The two sets of double doors either side of the HLII rooms must be closed and notices indicating that infection prevention precautions are in place should be displayed on the doors (**Appendix 3**). Only essential staff should be allowed access to the unit and the nursing station (Ext: 30156) should be phoned to request permission to enter the unit.

- The door into the sluice room from Avon 1 should be locked to prevent access and allow the sluice room to be used exclusively for waste from the HLII rooms.

- The door into the clinical room from Avon 3 should be locked to allow its exclusive use by Avon 1.

- A full height sealed barrier should be erected to prevent access to the nurses' station on Avon 3 from the nurses' station on Avon 1 (contact Catalyst Duty Manager via switchboard).

- Personal protective clothing will be available outside the negative pressure rooms and should be disposed of as per **6C**.

NB: These precautions should also be implemented as far as is practicable on any unit where SARS, MERS-CoV or avian influenza patients are nursed, and the Infection Prevention and Control Team will advise depending on local facilities / arrangements.

Appendix 3

Restricted Area Notice

PULL TOGETHER
TO PREVENT
INFECTION

WARD .....

INFECTION CONTROL

RESTRICTED AREA

NO ADMISSION TO UNAUTHORISED PERSONNEL

TELEPHONE EXT. .....
FOR PERMISSION TO ENTER

Supporting Document 1 - Equality Impact Assessment Tool

To be completed by the key document author and attached to key document when submitted to the appropriate committee for consideration and approval.

		Yes/No	Comments
1.	**Does the policy/guidance affect one group less or more favourably than another on the basis of:**		
	• Race	No	
	• Ethnic origins (including gypsies and travellers)	No	
	• Nationality	No	
	• Gender	No	
	• Culture	No	
	• Religion or belief	No	
	• Sexual orientation including lesbian, gay and bisexual people	No	
	• Age	No	
	• Disability		
2.	**Is there any evidence that some groups are affected differently?**	No	
3.	**If you have identified potential discrimination, are any exceptions valid, legal and/or justifiable?**	No	
4.	**Is the impact of the policy/guidance likely to be negative?**	No	
5.	**If so can the impact be avoided?**	N/A	
6.	**What alternatives are there to achieving the policy/guidance without the impact?**	None	
7.	**Can we reduce the impact by taking different action?**	No	

If you have identified a potential discriminatory impact of this key document, please refer it to Human Resources, together with any suggestions as to the action required to avoid/reduce this impact.

For advice in respect of answering the above questions, please contact Human Resources.

Supporting Document 2 – Financial Impact Assessment

To be completed by the key document author and attached to key document when submitted to the appropriate committee for consideration and approval.

	Title of document:	Yes/No
1.	Does the implementation of this document require any additional Capital resources	Yes
2.	Does the implementation of this document require additional revenue	No
3.	Does the implementation of this document require additional manpower	Yes
4.	Does the implementation of this document release any manpower costs through a change in practice	No
5.	Are there additional staff training costs associated with implementing this document which cannot be delivered through current training programmes or allocated training times for staff	Yes
	Other comments: Investment in additional extract ventilation in A&E Alexandra site and WRH to facilitate local HEPA filtered extraction in the clinical rooms identified for patient isolation. Additional manpower required in the event of a case being isolated in A&E or on ward – level 3 care one to one patient to nurse ratio. Specialist training required for use of PPE, guidance will be given at the time of a case being identified or national notification of potential cases via Public Health England (PHE) or World Health Organisation (WHO)	

If the response to any of the above is yes, please complete a business case and which is signed by your Finance Manager and Directorate Manager for consideration by the Accountable Director before progressing to the relevant committee for approval.

- Case for ventilation in A&E submitted and current risk deemed low. Not progressed.
- Staffing would be sourced at time of incident
- Training would be arranged if national intelligence identified a heightened risk and need