



Interim Infection Prevention and Control Precautions for Possible or Confirmed 2019 novel Coronavirus (2019 nCoV), Middle East Respiratory Syndrome Coronavirus (MERS-CoV) and Avian Influenza A in Healthcare Settings

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## Summary

This guidance has been reviewed in the context of the emergence of a novel Coronavirus in China. Although this is a new virus the experience so far indicates that it spreads in a similar way to other respiratory viruses and that the same steps to limit spread of this virus are likely to be effective. Even without the risk of importation of a novel virus most of these measures are appropriate to protect patients and to protect staff from infection with the influenza virus and other common respiratory viruses that are circulating.

Although staff concerns for their personal welfare and that of their colleagues and family are natural and reasonable it is important that patients with any infectious disease receive appropriate care. It is necessary to manage the risk of spread without compromising on the delivery of timely and appropriate care to the patient.

## **Key Recommendations**

- 1. Apply Standard Precautions when caring for all patients at all times.
- 2. Apply Contact and Droplet Precautions in addition to Standard Precautions when caring for any patient with a viral respiratory type illness.
- **3.** Identify patients that present with features of an acute viral respiratory infection as quickly as possible to any healthcare service, ask them to wear a surgical mask, minimize their contact with other patients and staff and move them as quickly as possible to a room with a door that can be closed.
- 4. Ensure that a staff member, carefully adhering to good infection prevention and control practice (Contact and Droplet Precautions) assesses the patient without delay. The assessment must include information on recent travel and recent contact with any person with a flu like illness know to have traveled to regions of concern.
- If there is reason to suspect a novel Corona virus or Avian Influenza take additional precautions as outlined here and seek advice from an Infection Prevention and Control Practitioner or Public Health Specialist.

# Introduction

This document outlines the interim infection prevention and control measures required for patients presenting with possible or confirmed Novel Coronavirus (2019-nCoV), Middle East Respiratory Syndrome (MERS-CoV) or Avian influenza infection in healthcare settings. The document had been adapted from guidance issued by the World Health Organisation and Public Health England.

## Coronaviruses

Coronaviruses are enveloped RNA viruses, which can cause infection in both humans and animals. The human coronaviruses mainly infect the upper respiratory and gastrointestinal tracts resulting in mild upper respiratory tract infections (simple colds), and very rarely cause severe disease. Coronaviruses are transmitted between an infected individual and others via respiratory secretions either directly (through droplets from coughing or sneezing) or indirectly (through touching contaminated objects or surfaces or touching/shaking hands). As coronaviruses have a lipid envelope a wide range of disinfectants are known to be effective against them. In recent years new Coronaviruses have emerged which have had significant impact in the healthcare setting.

#### Novel Coronavirus (2019-nCOV)

In December 2019 a novel coronavirus associated with a cluster of pneumonia cases was identified in the area of Wuhan, Hubei province in China. There is currently limited information on the severity and precise routes of transmission of this infection however it appears likely that it is transmitted in a similar way to other respiratory viruses. Contact (direct and indirect) and droplet play a large role in transmission of all respiratory viruses. This guidance is based on the assumption that aerosol transmission is also a risk that must be managed.

For the latest information on cases and risk assessments refer to the HPSC website.

#### Middle East Coronavirus (MERS CoV)

MERS-CoV is a zoonotic virus (i.e. it can be transmitted from animals to humans). Dromedary camels are believed to be the animal reservoir for the virus. This virus was first identified in 2012 in a patient from the Middle East who died from a severe respiratory infection.

#### Avian Influenza

Avian influenza is a contagious disease of animals caused by viruses that normally infect only birds and, less commonly, other animals such as pigs. Avian influenza viruses are highly species-specific, but have, on rare occasions, crossed the species barrier to infect humans. Current viruses that have the potential to begin circulating among humans include H5, H9 and H7 strains of avian influenza.

## **General Preparedness Measures**

In preparation healthcare professionals or facilities that may be involved in investigation or management and care of possible cases should;

- Educate healthcare workers (HCWs) on the importance of applying Standard Precautions to all patients at all times and Contact and Droplet Precautions in addition to Standard Precautions for all patients with a suspected acute viral respiratory tract infection
- Ensure this guidance is disseminated and implemented with tailoring to local needs if required.
- Educate and train relevant HCWs on the clinical and epidemiological features of Novel Coronavirus ( 2019 nCoV), MERS-CoV and avian influenza A(H7N9) and the importance of early recognition
- Have systems in place to prompt reporting of suspected cases to the local infection prevention and control team and Public Health Department
- Ensure adequate supplies of personal protective equipment (PPE) are available and that staff are trained in the safe donning and doffing and disposal of PPE

### Respiratory and cough hygiene

All healthcare facilities should have available a supply of tissues and surgical masks and access to hand rub at reception to give to any person who presents with an acute viral respiratory tract infection

All individuals (HCWs, patients and visitors) with signs and symptoms of a respiratory infection should know how to apply respiratory hygiene/cough etiquette:

- Cover their mouth and nose when coughing and sneezing
- Use disposable tissues, as a source control to contain respiratory secretions
- Dispose of tissues into waste bins immediately after use

### **Hand Hygiene**

Hand hygiene is critical measure to prevent cross-infection. Hands should be decontaminated using alcohol hand rub or washed with soap and water if physically dirty:

- Before touching a patient
- Before a clean/aseptic procedure
- After blood and body fluid exposure
- After touching a patient
- After touching the patient's surroundings

Patients with acute viral respiratory tract illness should be encouraged to decontaminate their hands with alcohol hand rub on arrival and at intervals while in the health care setting

## Additional General Preparedness Measures for Acute Hospitals/Emergency Departments

Facilities should have a respiratory protection programme in place which incorporates education and practical training for HCWs to ensure that FFP 2 respirators are properly fitted when worn, this includes:

- Fit testing
- Undertaking a fit check each time a respirator is worn
- Preventing self-contamination when removing respirators

• Agency and other temporary placement staff must be either included in the facility's respiratory protection programme or have undertaken equivalent training and education prior to placement

Ensure that mechanical ventilated rooms where available have been commissioned, are serviced regularly and that there are mechanisms in place to ensure that the ventilation system is functioning correctly.

### Early recognition and source control

Rapid risk assessment and subsequent management are essential for infection prevention and control of rare and unusual respiratory viral infections. Details of risk assessment algorithms can be found on the HPSC website.

#### Case definition for Possible or Confirmed 2019 – Novel Coronavirus (2019 nCoV)

• Refer to <u>Algorithm</u> for investigation and public health management of possible cases and contacts of severe acute respiratory illness associated with 2019 nCoV for case definitions.

#### Case definition for Possible or Confirmed MERS-CoV

• Refer to <u>Algorithm</u> for investigation and public health management of possible cases and contacts of severe acute respiratory illness associated with MERS CoV for case definitions.

#### Case definition for Avian Influenza A(H7N9)

• Refer to <u>Algorithm</u> for the investigation and management of possible human cases of avian influenza A(H7N9), in returning travelers for case definitions.

## **Precautions in Specific Healthcare Settings**

#### **Primary Care**

If a patient telephones the practice the appropriate risk assessment should be performed over the telephone. If the person fits both the epidemiological AND clinical criteria, then transfer to a local hospital is indicated, following the same process as outlined in the relevant algorithm.

For patients presenting to Primary Care with acute viral respiratory illness, tissues, surgical masks and Alcohol Hand Rub should be available in Reception

Any patient with an acute viral respiratory tract infection who presents to reception should be moved to a room away from other patients and staff if possible and provided with a surgical mask & tissues

If there is no available room, where possible the patient should sit at least 1m away from others and be provided with a surgical mask and tissues. The patient should where possible sit at least 1 meter away from others.

Minimise the number of staff caring for the patient

Information on the assessment and initial management of cases (including PPE) in primary care is available on the HPSC website.

When preparing to assess the patient, in so far as possible, maintain at least 1 meter distance from the patient and apply Contact and Droplet precautions (Appendix 1)

- Gloves
- If available a disposable long-sleeved gown is recommended. If not available wear a plastic apron and roll up sleeves.
- Eye protection (face shield or goggles)
- Respiratory protection (surgical face mask)

The patient should remain in the room with the door closed.

Do not allow others to enter the room

If a case is considered possible when a consultation is already in progress, withdraw from the room, close the door and decontaminate your hands. Apply appropriate PPE before completing assessment.

If the person fits both the epidemiological AND clinical criteria, then transfer to a local hospital is indicated, following the same process as outlined in the relevant algorithm.

Following patient transfer ensure room remains closed until environmental decontamination is complete

Refer to specific sections of this guideline in relation to environmental decontamination, cleaning of equipment and waste. Additional guidance is available on the hpsc website and as necessary from Public Health.

#### Follow up of contacts

Make a list of all patients in the waiting room who may have had potential exposure – see definitions of close contacts as per risk assessment algorithm.

No action is required until the suspect case is confirmed

If the suspected case is confirmed, the local Department of Public Health will contact the GP/Practice regarding follow-up of contacts.

## **Accident and Emergency & Inpatient Settings**

#### Staff

Minimise the number of staff caring for the patient with possible or confirmed infection

A record of all staff caring for a patient with possible or confirmed cases be maintained. The record sheet should be placed outside the door and all staff entering and leaving must complete this and record the timing and duration of exposure.

The use of bank or agency staff should be avoided

Arrangements should be in place for HCWs involved in care of presumptive or confirmed cases to have access to an occupational health team and emergency contact details for out of hours advice in the event they develop symptoms

HCWs who provide direct care or examination to a possible or confirmed case should:

- Self monitor for any respiratory symptoms in the 14 days following last exposure to a case
- Not come to work if a fever or cough develops and contact the Occupational Health Department or designated emergency contact they have been provided with.

### **Patient Placement**

A possible case should be managed in a negative pressure room or neutral pressure room where available. If this is not possible then a standard single room with en-suite facilities should be used. Doors of isolation rooms must remain closed.

Emergency Departments without single or airborne isolation rooms must ensure that patients assessed as possible cases are immediately moved to an appropriate room elsewhere in the hospital for assessment

If there is no en-suite toilet a dedicated commode should be used with arrangements in place for safe removal of a bedpan to appropriate disposal point.

Place an isolation sign indicating the type of transmission-based precautions on the door ensuring that patient confidentiality is maintained.

Avoid storing any extraneous equipment in the patient's room.

A buddy system to observe for inadvertent contamination is recommended, especially during high-risk procedures

Note in order to ensure appropriate care for the patient with the minimum of risk a person who enters the patients room should plan to deliver as much of the care required as possible at each entry.

### **Personal Protective Equipment**

To be worn by ALL persons entering the room where a suspected, possible, presumptive or confirmed case is being cared for

- long sleeved, fluid-repellent disposable gown over scrubs
  - non-sterile surgical gloves double-gloving will be required if there is a need to disinfect items from the room prior to their removal (such as in the specimens, mobile devices and handling dead bodies sections)

• A FFP 2 respirator is recommended for all personnel in the room. Fit testing must be undertaken before using this equipment and a respirator should be fit-checked every time it is used.

• Eye protection must be worn (prescription glasses do not provide adequate protection against droplets sprays and splashes)

• It is recommended that eye protection should be single-use and disposed as clinical waste after use. This is due to the difficulties associated with cleaning to eliminate contamination

#### Putting on PPE

- 1. Decontaminate hands
- 2. Put on disposable gown
- 3. Put on mask (FFP2 or FFP3)

Fit Check

- A. Place mask over nose, mouth and chin
- B. Fit flexible nose piece over nose bridge
- C. Secure on head with elastic
- D. Adjust to fit
- E. Inhale- mask should collapse
- F. Exhale- check for leakage around face

**Removing PPE** 

- 4. Put on Eye Protection goggles or face shield
- 5. Put on gloves

	Removing FFL
In patients' room	<ol> <li>Remove gloves (avoid touching outside of gloves dispose in clinical waste</li> <li>Decontaminate hands</li> <li>Remove goggles from behind and dispose in clinical waste</li> <li>Remove apron/gown( avoid touching the front of the apron/gown)</li> </ol>
In ante room or directly outside patients' room. Ensure door is closed	<ul> <li>5. Grasp and lift ties from behind your head and pull off respirator away from your face. Avoid touching the front of the respirator and use ties to discard.</li> <li>6. Discard all PPE into clinical waste</li> <li>7. Decontaminate hands</li> </ul>

## **Aerosol Generating Procedures**

Procedures that produce aerosols of respiratory secretions, for example bronchoscopy, induced sputum, positive-pressure ventilation via a face mask, intubation and extubation, and airway suctioning carry an increased risk of transmission. Where these procedures are medically necessary, they should be undertaken in a negative-pressure room, if available or in a single room with the door closed.

Only the minimum number of required staff should be present, and they must all wear PPE as described above. Entry and exit from the room should be minimised during the procedure.

If aerosol generating procedures are undertaken in the patient's own room, the room should be decontaminated 20 minutes after the procedure has ended.

If a different room is used for a procedure it should be left for 20 minutes, then cleaned and disinfected before being put back into use.

Clearance of any aerosols is dependent on the ventilation of the room. In hospitals, rooms commonly have 12-15 air changes per hour, and so after about 20 minutes there would be less than 1 per cent of the starting level (assuming cessation of aerosol generation).

If it is known locally that the design or construction of a room may not be typical for a clinical space, or that there are fewer air changes per hour, then the local IPCT would advise on how long to leave a room before decontamination.

### Visitors

Visiting should be restricted to essential visitors only e.g. parents/carer of children

All visitors should be advised of the risks.

A record of all visitors should be maintained.

Visitors should wear appropriate PPE while in patient's room

Visitors should be educated on:

- Donning and removing PPE
- Hand hygiene
- Respiratory hygiene and cough etiquette

## **Laboratory Specimens**

For guidance in relation to the transport of specimens to the National Virus Reference Laboratory, UCD see the relevant risk assessment algorithm

Specimens for the laboratory should be double bagged in the isolation room by a staff member wearing recommended PPE

All specimens and request forms should be marked with biohazard label and hand delivered to the laboratory

Transport of samples between laboratories should be in accordance with Category B transportation regulations.

For additional information in relation to laboratory processes refer to HPSC recommendations on the HPSC website.

#### Waste

Dispose of all waste in the isolation room as clinical waste (also known as infectious/healthcare risk waste) (Appendix 3)

## **Environmental Hygiene**

Only take essential equipment and supplies into the room. Do not stockpile as unused stock will have to be discarded on cessation of additional precautions

Patient charts/records should not be taken into the isolation room

Cleaning and decontamination should only be performed by staff trained in the use of the appropriate PPE;

The main patient isolation room should be cleaned at least once per day] and following aerosol generating procedures or other potential contamination. Cleaning of the isolation area is undertaken separate to the cleaning of the other clinical areas

There should be more frequent cleaning of commonly used hand touched surfaces and of anteroom/lobby areas (at least twice per day)

## **Cleaning and disinfection**

#### Patient's room

Thoroughly clean the environment and furniture and all patient care equipment daily

A combined detergent disinfectant solution at a dilution of 1000 parts per million available chlorine <sup>\*</sup> (ppnm av.cl.) or a detergent clean followed by disinfection (1000ppm av.cl.)

Pay special attention to frequently touched sites and equipment close to the patient.

#### Cleaning and disinfection of the environment on discharge/transfer:

Prior to initiating environmental cleaning and disinfection, all privacy, shower and window curtains must be removed and sent for laundering or if disposable should be discarded.

All disposable items including paper towels and toilet paper should be discarded.

All sterile and non-sterile supplies in the patient's room to be discarded on patient transfer/discharge.

Disposable crockery and cutlery should be used in the patient's room as far as possible to minimise the number of items which need to be decontaminated.

#### Treatment rooms (e.g. X-ray )

Clean and disinfect the environment and furniture after use with a neutral detergent and disinfectant (e.g., hypochlorite solution 1000 ppm) or combined detergent disinfectant solution (at a dilution of 1000 parts per million available chlorine).

Paying special attention to frequently touched sites (door handles, bed rails etc) and horizontal surfaces.

#### Patient Care Equipment/Instruments/Devices

Use disposable equipment whenever possible.

Dedicate patient care medical devices (e.g., thermometers, sphygmomanometers, stethoscopes, glucometers) to single patient use.

Manufacturer's instructions should be followed for cleaning and disinfecting of reusable medical equipment after use.

Single use items should be disposed of after use

### Linen

Bag linen inside the patient isolation room. As per standard precautions all contaminated laundry should be carefully placed in an alginate stitched or water soluble bag and then placed into a laundry bag clearly identified with labels, colour-coding or other methods prior to transport to an approved laundry capable of dealing with contaminated linen.

Unbagged linen should not be carried through the ward or other clinical areas.

### Mobile healthcare equipment

The following advice applies to devices that cannot be left in the isolation room, such as portable X-ray machines;

- the use of mobile healthcare equipment should be restricted to essential functions as far as possible to minimise the range of equipment taken into and later removed from the room
- the operator of the device, if not routinely looking after the patient, must be trained and supervised in infection control procedures, including use of PPE
- the operator should wear PPE as described earlier in this document, when in the isolation room. Use of double-gloving will facilitate disinfection of devices on leaving the room
- any equipment taken in to the room which must be subsequently removed needs to be disinfected prior to leaving the anteroom. This can be achieved by removing the outer layer of gloves and then using appropriate disinfectant for surfaces (as specified in the environmental decontamination and specimens sections) to disinfect the machine
- any additional items such as a digital detector or a cassette will also need to be disinfected in a similar fashion, regardless of whether there has been direct contact with the patient or not. This is due to the risk of environmental contamination of the equipment within the isolation room
- if the mobile device has any wheels, then these will need to be disinfected by spraying a chlorine-based solution (as specified in the environmental decontamination section)

## **External Transfer**

Transfer of cases to another hospital should be avoided unless it is necessary for medical care.

If there are insufficient facilities for isolating a possible or confirmed case, then the risks of transfer should be carefully considered against the risks of a lapse in infection control procedures due to insufficient facilities.

If transfer is required, it is the responsibility of the transferring facility to inform in advance, staff in the receiving facility and ambulance personnel of the precautions required.

### **Internal Transfer**

Minimise movement of the patient from the single room.

Patient should wear a surgical mask when outside their room.

Staff should wear appropriate PPE during transfer.

Staff in the receiving departments should be informed of the precautions required prior to the transfer of the patient (e.g. diagnostic departments, operating theatre).

Patients must not be held in communal areas.

HCWs carrying out procedures should wear appropriate PPE.

Cleaning and decontamination of the room and equipment should be undertaken following the procedure.

### **Operating theatre**

The patient should be anaesthetised and recovered in the operating room.

Staff should wear appropriate PPE.

Disposable anaesthetic equipment should be used where possible.

The anaesthetic machine must be protected by a filter with viral efficiency to 99.99%.

Reusable equipment (anaesthetic, instruments etc) should be decontaminated as per manufacturer's instructions.

Operating room should be cleaned and disinfected after use.

Operating room should not be used for 15 minutes after the patient leaves (based on a conventional ventilation system with 20 air changes per hour).

## **Critical Care Settings**

If on a critical care unit, the patient should be nursed in a negative pressure isolation room where available, or 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.

### **Care after death**

If a post-mortem is required, the recommendations on infection prevention and control precautions required should be discussed with the National Incident Management Team.

A body bag should be used for transferring the body.

The outer surface of the body bag should be decontaminated immediately before the body bag leaves the anteroom area. This will need to be completed by an individual who has removed the outer layer of the double-gloves, after which there has not been further contact with the room environment. This may require at least two individuals wearing such protective clothing, in order to manage the remains easily.

The trolley carrying the body would need to be disinfected prior to leaving the anteroom including the wheels. The wheels may be disinfected by spraying a chlorine-based solution or alternative disinfectant (as discussed in the environmental decontamination section).

Prior to leaving the anteroom, the staff members would need to remove their protective clothing .

Washing or preparing the body is acceptable if those carrying out the task wear long-sleeved gowns gloves and a surgical mask which should then be discarded. Mortuary staff and funeral directors must be advised of the biohazard risk.

After use, empty body bags should be disposed of.

### References

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z/microbiologyantimicrobialresistance/infectioncontrolandhai/guidelines/File,14612,en.pdf

## **Appendix 1**



# Appendix 2: PPE

PPE	Technical description	Relevant standards	
Long- sleeved gown which is suitable for level 1 PPE only	Disposable Single use Latex free Fluid resistant Provides full impervious cover Cuffs (preferably waterproof) Different sizes available Different lengths available – chosen length should reach to wearer's mid calf Light colours preferable to better detect possible contamination Fasteners/ties at neck and waist Preferably secured with Velcro at neck for easy doffing	Quality compliant with this standard: Tested for resistance to fluid penetration EN 13795 high performance level or AAMI level 3 performance (minimum level required) or Equivalent	
Long- sleeved gown which is suitable for both level 1 & level 2 PPE	Disposable Single use Latex free Fluid resistant Provides full impervious cover (360 degrees) Cuffs (preferably waterproof) Different sizes available Different lengths available – chosen length should reach to wearer's mid calf and cover top of knee high rubber boots Light colours preferable to detect possible contamination Fasteners/ties at neck and waist Preferably secured with Velcro at neck for easy doffing	Quality compliant with this standard: Tested for resistance to blood-borne pathogen penetration AAMI PB70 Level 4 performance or Equivalent	

PPE item	Technical description	Relevant standards	
PPE item Surgical mask Level 1 PPE	Technical description Disposable Single use Fluid resistant 160 mm Hg Latex free Good breathability Easy to differentiate between internal and external surface BFE (%) age at 3.0 microns (>98%) PFE (%) age at 0.1 microns (>98%) Delta P (Pa) at least 38.5	Relevant standards         Quality compliant with standards:         • EN 14683 Type 11R performance         • ASTM F2100 level 2 or level 3         • Or equivalent	
	PFE (%) age at 0.1 microns (>98%)		

PPE Item	Technical Description	Relevant Standards	
FFP2 Respirator Mask	Good breathability Shape that will not collapse easily	Quality compliant with: EN149:2001	

Gloves	Nitrile	EU standard directive 93/42//EEC Class 1,	
	Non-sterile	ENALE FUnction downly diversitive 20/202/EEC	
	Single use	EN455 EU standard directive 89/686/EEC	
	Latex free	Category 111, EN 374 ANSI/ISEA 105-2011	
	Disposable	ACTNA DC210, 10 Or activitations	
	Ambidextrous	ASTM D6319-10 Or equivalent	
	Powder free Intermediate		
	length (approximately 12		
	inches)		
	Different sizes – Small,		
	medium, large, extra-large		
	Extended cuff		
	Beaded cuff		

# Appendix 3

RISK WASTE	RISK WASTE	RISK WASTE
YELLOW BAG	YELLOW SHARPS (with blue or red lid	and a second
DR INCINALION ONLY	<ul> <li>All Ne</li> <li>All Sy</li> <li>Scalpe</li> <li>Conta slides</li> <li>Sharp clear I sets</li> </ul>	ringes els minated
<ul> <li>All blood-stained items and all items solled with body fluids assessed as infectious</li> <li>Suction catheters &amp; tubing</li> <li>Incontinence waste from known or suspected enteric infections</li> <li>Bag should be closed using 'swan neck' when</li> </ul>	contar glass	Chest drains
2/3 full	* NO FREE LIQUIDS	Absorbent material or gelling agent should be used in sufficient quantities to hold the fluid and prevent leakage.