Interim Infection Prevention and Control Precautions for Possible or Confirmed COVID-19 in a Pandemic Setting

V1.0

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Introduction

This document replaces the previously issued '*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'*.

It provides guidance and information on infection prevention and control (IPC) procedures to inform and advise local planning for COVID-19 in the acute healthcare setting. The guidance has been updated to reflect the declaration of a pandemic event and the increasing number of COVID-19 cases that are now reported due to local transmission events. Please note that this document is issued as preliminary guidance and elements of this guidance will be considered further by the Expert Advisory Group and further updates may follow within days. It is therefore essential that you confirm that you are using the latest version of guidance.

There is no doubt that these are extraordinary and challenging times. However, the fundamental principles of basic IPC remain the core defence we have for protecting our patients, our colleagues and ourselves from acquiring this disease.

Although the concerns of healthcare workers (HCW) 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 the delivery of timely and appropriate care to the patient.

This document reflects elements of guidance from the Department of Health and Social Care (DHSC), Public Health Wales (PHW), Public Health Agency (PHA) Northern Ireland, Health Protection Scotland (HPS) Public Health England, European Centre for Disease Control and the World Health Organisation. HPSC appreciates the support of international infection prevention and control colleagues at this time.

There is variation in detail between national guidance on infection prevention and control issued in different countries. Similarly, many specialist societies have issued recommendations, which differ in some details from national or international guidelines on infection prevention and control. Although differences in detail are a focus of considerable debate and can create a

very challenging environment for infection prevention and control practice is it important to focus on the clear consensus on all the most critical aspects of infection prevention and control and to continue to work together to manage those areas of difference and to look to emerging evidence to resolve those differences.

COVID-19 (SARS-CoV-2)

The virus which causes COVID-19 infection is called SARS-CoV-2 and belongs to the broad family of viruses known as coronaviruses. Global efforts to further our understanding of this pathogen have been ongoing since it was first identified in the Wuhan province of China in December 2019.

Transmission

The transmission of COVID-19 is thought to occur mainly through respiratory droplets generated by coughing and sneezing, and through contact with contaminated surfaces.

In most cases, individuals are usually considered infectious while they have symptoms. How infectious individuals are depends on the severity of their symptoms and stage of their illness. Higher levels of virus have been detected in patients with severe illness compared to mild cases. Like influenza, peak levels of virus are found around the time of symptom onset. In general virus remains detectable in respiratory secretions for up to eight days in moderate cases and longer in severe cases. The virus has also been detected in faeces, urine, blood and saliva samples from infected individuals although it is not clear that.

The extent of transmission from pre-symptomatic or asymptomatic people remains uncertain, although it is accepted as likely to occur in some cases. A recent evidence review by the Health Information & Quality Authority (HIQA) identified 11 case reports of pre-symptomatic or asymptomatic transmission. However, “the level of evidence (case reports) is low and is subject to a number of potential sources of bias and further study is required to determine the actual occurrence and impact of asymptomatic transmission”. Some modelling studies have inferred a high level of transmission from presymptomatic people however it is not clear how valid those inferences are.

The Report of the World Health Organisation (WHO) – China Joint Mission on Coronavirus Disease 2019 (COVID-19) notes “*The proportion of truly asymptomatic infections is unclear, but appears to be relatively rare and does not appear to be a major driver of transmission*.” Pregnant women do not appear more likely to contract the infection than the general

population. In a limited case series in China, no evidence of the virus was found in the amniotic fluid, cord blood or breast milk of six women with COVID-19 who had delivered by Caesarean section & none of the infants developed infection. To date, no evidence has been found to suggest that the virus is present in the breast milk of mothers with COVID-19.

Current estimates suggest a median incubation period from five to six days for COVID-19, with a range from one to up to 14 days.

Survival in the Environment

The SARS-CoV-2 virus is an RNA virus with a lipid envelope. The presence of the lipid envelope means that virus is less robust than a non enveloped virus and is susceptible to common household cleaning products. Survival on environmental surfaces is dependent on the surface type and the environmental conditions. One experimental study using a SARS-CoV-2 strain reported viability on plastic for up to 72 hours, for 48 hours on stainless steel and up to eight hours on copper. However, the levels of virus declined very quickly over the time period.

Staff

- Minimise the number of HCW caring for patients with possible or confirmed COVID-19
- Ensure there are adequate numbers of nursing/midwifery staff, clinicians and allied health professionals to allow them time to adhere to the necessary IPC precautions, in particular to adhere to safe donning and doffing of personal protective equipment (PPE). In general, one-to-one care is not required for a single patient with suspected or confirmed COVID-19 in a non-critical care setting, provided there is adequate staffing to allow staff to safely apply droplet & contact precautions, with addition of airborne precautions where aerosol-generating procedures (AGP) are deemed necessary
- Wherever possible, assign designated staff to care for patients with confirmed COVID-19 infection who may be accommodated in isolation room(s)/cohort bay(s)/areas of a ward for the duration of each shift. The allocation of staff should be reviewed regularly and depends on the number of patients accommodated on the ward, the care needs of the patients and case mix of the ward. Designating staff whenever there are sufficient

levels of staff available minimises the likelihood that staff have to care for patients with COVID-19 and patients without COVID-19 during the same shift. If patients without COVID can receive care from staff who are not assigned to care for patients with COVID-19, this also minimises negative impact on the care of non-affected patients

- Where possible designated extra catering support should be provided to staff working in cohort areas, to minimise their need to travel to communal eating facilities
- Consider assigning staff who have had confirmed COVID-19 and who have since recovered and have been deemed suitable to return to work for duties in COVID-19 cohort areas. These staff must continue to follow recommended IPC precautions, including appropriate use of PPE
- In order to ensure appropriate care for the patient with COVID-19 with the minimum of risk, HCWs who enter the patient's room or cohort area should plan to deliver as much of the care required as possible at each entry. Where appropriate, some communications may be performed with the patient remotely through use of a mobile telephone or other similar device
- Group meetings and social interaction among staff should be restricted and alternative methods of communication arranged (e.g., e-mail, teleconference, videoconference). In particular, social interaction between healthcare workers who do not have to work with each other should be avoided, as it introduces an additional avoidable risk. Where meetings are essential, select a meeting space that can facilitate the anticipated number of attendees, so that physical distancing can be observed
- At the start of each shift, all staff should be asked to check that they do not currently have symptoms of respiratory illness, such as fever, cough, shortness-of-breath or myalgia and in the event new symptoms develop during a shift, to report immediately to the person-in-charge

Guidance in relation to occupational health issues for healthcare workers (HCW) is available on www.hpsc.ie

Visitors

- In a pandemic situation, visiting restrictions will be required. However, local risk assessment and practical management must be considered, ensuring the response is both pragmatic and proportionate. Specific scenarios where a compassionate and practical approach is required include
    - Care of the dying
    - Maternity services – birth partners who are asymptomatic should NOT be restricted from being present to provide support to the mother in labour.
    - Children
    - Carers or key workers for those with intellectual and/or physical disability
- All visitors must be advised of potential infection exposure risk
- Visitors should be advised to wear appropriate PPE while in a patient's room including;
    - Surgical face mask, apron, gloves
    - If parents of infants or small children or other carers have difficulty adhering to the use of PPE while with the patient, they should be encouraged to prioritise hand hygiene, avoiding contact with face and eyes and to wear a surgical face mask
- Visitors should be instructed on how:
    - To put on (don) and remove (doff) PPE and to perform hand hygiene and respiratory hygiene and cough etiquette (Appendix 1). Visitors should be supported when donning and doffing PPE where practical.

Standard Precautions

Patient placement/assessment for infection risk

- All patients must be promptly assessed for infection risk on arrival at a healthcare setting. Patients should be continuously reviewed throughout their inpatient stay. In all healthcare settings, patients with symptoms of COVID-19 should be separated from non-symptomatic patients as soon as possible

Hand hygiene

- Hand hygiene is vital to reduce the transmission of infection in health and other social care settings and is a critical element of standard precautions
- Hand hygiene must be performed immediately before every episode of direct patient care and after any activity or contact that potentially results in hands becoming contaminated, including the removal of PPE, equipment decontamination, handling of waste and laundry:

Respiratory hygiene and cough etiquette

- All healthcare facilities should provide a supply of tissues, as well as access to alcohol based hand rub (ABHR) at department entrance, to give to any person who presents with an acute respiratory tract infection. Surgical facemasks should also be provided for the symptomatic patient to wear, where available and tolerated by the patient
- All staff, patients and visitors should be encouraged to adhere to respiratory hygiene/cough etiquette at all times (Appendix 1)
- Key messages include;
    - Cover your mouth and nose with a disposable tissue when coughing and sneezing to contain respiratory secretions
    - Discard used tissues into a waste bin immediately after use and clean your hands
    - If you don't have a tissue, cough into your forearm or the crook of your elbow
    - Clean your hands

Personal Protective Equipment (PPE)

- As part of standard precautions it is the responsibility of every HCW to undertake a risk assessment PRIOR to performing a clinical care task, as this will inform the level of IPC precautions needed, including the choice of appropriate PPE for those who need to be present
- All staff must be trained in the proper use of all PPE that they may be required to

wear

- In a pandemic situation, where stock shortages may be anticipated, new or different PPE items may need to be procured. In that situation, existing guidance for staff should be reviewed locally, to ensure it is compatible with the new item of PPE and if not, the guidance and training must be updated accordingly
- Staff who have recovered from COVID-19 infection and who have been deemed suitable to return to work should continue to follow the IPC precautions, including the wearing of PPE as recommended in this document
- **The unnecessary use of PPE will deplete stocks and increases the risk that essential PPE will not be available to staff when really needed**

Safe management of linen (Laundry)

- Organisations must plan for the safe storage of used/infectious linen awaiting collection and maintenance of supplies of clean linen for patient use
- All linen used in the direct care of patients with suspected and confirmed COVID-19 should be managed as 'infectious' linen
- Linen must be handled, transported and processed in a manner that prevents exposure to the skin and mucous membranes of staff, contamination of their clothing and the environment
- Disposable gloves and an apron should be worn when handling infectious linen
- All linen should be handled inside the patient room/cohort area. A laundry skip/trolley should be available as close as possible to the point-of-use for linen deposit, for example immediately outside the cohort area/isolation room
- When handling linen, the HCW should not:
    - rinse, shake or sort linen on removal from beds/trolleys;
    - place used/infectious linen on the floor or any other surfaces (e.g., a bedside locker/table top);
    - handle used/infectious linen once bagged;

- overfill laundry receptacles; or
- place inappropriate items in the laundry receptacle (e.g., used equipment/needles)

- When managing infectious linen, the HCW should:
  - Place linen directly into a water-soluble/alginate bag and secure;
  - Place the alginate/water-soluble bag into the appropriately-coloured linen bag (as per local policy)
  - Store all used/infectious linen in a designated, safe area pending collection

Staff Uniforms/Clothing

- The appropriate use of PPE will protect staff uniforms from contamination in most circumstances
- Scrubs are not considered to be PPE. However, healthcare facilities should consider the use of scrubs for staff who do not usually wear a uniform, but who are likely to work in areas of high activity, with direct contact with patients suspected or confirmed to have COVID-19
- Healthcare facilities should provide a designated area where staff can change into uniforms on arrival and when leaving work
- Where healthcare laundry services are available and it is feasible, they should be used to launder staff uniforms. If there is no laundry facility available, uniforms should be taken home in a disposable plastic bag. This bag should be disposed of into the household waste stream. Alginate /water-soluble bags should not be used to take uniforms home, as they are designed for use in commercial washing machines rather than domestic washing machines and may damage the domestic machine
- Uniforms should be laundered:
  - separately from other household linen;
  - in a load not more than half the machine capacity;

- at the maximum temperature the fabric can tolerate
- The risk of virus transmission from contaminated footwear is likely to be extremely low. The use of shoe covers is not recommended. However, HCW could consider designating a pair of comfortable, closed, cleanable shoes for wearing when working in a cohort or critical care area
- Staff should avoid bringing personal items, including mobile phones into cohort/isolation areas

Management of blood and body fluid spills

- Spillages should be managed in line with local policy

Management of waste

- Dispose of all waste from patients with confirmed or suspected COVID-19 as healthcare risk waste (also referred to as clinical risk waste) (Appendix 2)
- When removing waste, it should be handled as per usual precautions for healthcare risk waste
- The external surfaces of the bags/containers do not need to be disinfected
- All those handling waste should wear appropriate PPE and clean their hands after removing PPE
- Hands-free health-care risk waste bins should be provided in isolation rooms and cohort areas

Transmission-based precautions for COVID-19

- Transmission based precautions are IPC measures which are implemented in addition to standard precautions when standard precautions alone are insufficient to prevent the onward transmission of specific infectious diseases. They include contact, droplet and airborne precautions. In general COVID-19 is spread by respiratory droplets – so transmission may be direct, through contact with the respiratory secretions of someone with COVID-19, or indirect, through contact with a contaminated surface/object. Less

commonly airborne spread may occur for example during aerosol generating procedures.

- The key elements of transmission based precautions for COVID-19 are outlined in the sections below

Patient Placement for Inpatient Care

- Patients with COVID-19 should be located in proximity to each other to the greatest degree possible for example by identifying COVID-19 wards /units
- Isolation signage must be placed at the entrance to the patient's room to restrict entry and indicate the level of transmission-based precautions required, namely contact and droplet precautions. The door should remain closed
- Patients should be cared for in a single room with *en suite* facilities. If there is no *en suite* toilet a dedicated commode should be used, with arrangements in place for safe removal of a bedpan/urinal to an appropriate disposal point. Alternatively, arrange for safe access to a toilet close by, that is assigned for the use of that patient only
- In the event of a commode being used, the HCW should leave the single room wearing full PPE, transport the commode directly to the nearest sluice and remove PPE in the sluice after placing the contents directly into the bed pan washer or pulp disposal unit. A second HCW should be available to assist with opening and closing doors to the single room and sluice room
- Take time to explain to the patient the importance of the precautions that are in place to manage their care and advise them against leaving the room without HCW guidance. Listen and respond to any concerns they may have, to ensure support and optimal adherence is achieved during their care
- Avoid storing any unnecessary equipment or supplies in the patient's room or cohort area
- The allocation of patients for available single rooms should be decided locally, based on need, capacity for cohorting of patients with confirmed COVID-19 infection, ward infrastructure and available resources

Patient placement for aerosol generating procedures

- Further information on aerosol generating procedures (AGP) is available here
- Where an AGP is necessary, it should ideally be undertaken in a negative-pressure or neutral pressure room, using recommended airborne precautions
- If a negative/neutral pressure room is not available, the AGP should be undertaken using a process and environment that minimises the exposure risk for HCWs, ensuring that patients, visitors, and others in the healthcare setting are not exposed for example, in a single room, with the door kept closed, away from other patients and staff.
- HCW and visitors should leave the patient's room during an AGP, unless it is necessary for them to remain to assist with the patient's care during the AGP. Those present in the room during the AGP must wear the recommended PPE for an AGP situation, for the duration of the procedure and for 20 minutes afterwards in rooms with mechanical ventilation and for up to one hour in a room with natural ventilation.

Cohorting and Streaming

- At entry to the hospital, patients presenting for assessment should be segregated into 'Possible COVID' and 'non-COVID' parallel streams, based on criteria set out in the latest version of the COVID-19 Hospital Pathway
- Where possible, patients with suspected or confirmed COVID-19 should be isolated in single rooms with *en suite* facilities. However, where single room capacity is exceeded, it is necessary to cohort patients
- Patients with **confirmed COVID-19 can be cohorted together**
    - In the absence of single rooms, AGPs may be performed in multi-occupancy cohort areas **for confirmed COVID-19 patients.** However, all staff present in the area must wear appropriate PPE
- Patients with suspected COVID-19 should not be cohorted with those who are confirmed positive
- The risk of cohorting **suspected cases** in multi-occupancy areas is much greater than that of cohorting confirmed positive patients together, as the suspect cohort is likely to

include patients with and without COVID-19. This is most likely to occur in the assessment stage, where laboratory confirmation of COVID-19 is pending.

- Cohorting should be avoided if at all possible
    - When **suspected cases of COVID-19 are cohorted in multi-occupancy areas**:
        - An AGP should not be undertaken in a multi-occupancy area accommodating patients with suspected COVID-19, unless absolutely necessary, as there is an increased risk of cross-transmission to other patients
        - Patients with suspected COVID-19 requiring an AGP should be prioritised for negative pressure or single isolation rooms
        - Every effort should be made to minimise cross-transmission risk:
            - Maintain as much physical distance as possible between beds, if possible reduce the number of patients/beds in the area to facilitate social distancing
            - The patient should wear a surgical face mask where tolerated
            - Patients should remain in these multi-occupancy areas for as short a period of time as is possible
            - Use privacy curtains between the beds to minimise opportunities for close contact
- There should be clear signage indicating the area is a designated cohort area to alert staff, as cohort areas may include an area within a ward or extend to an entire ward. It may have multi-occupancy rooms or a series of single rooms.
- A designated cohort area should be separated from non-cohort areas by closed doors
- Minimise the unnecessary movement of staff in cohort areas and ensure that the number of staff entering the cohort area is kept to a minimum, for example during clinical ward rounds
- Staff working in cohort areas should not be assigned to work in non-COVID-19 areas
- Movement of staff and activities in cohort areas should ideally be linear (from clean to dirty zone) allowing staff to enter and exit the designated contaminated area through separate entrances. However, it is recognised that this may not always be feasible
- The area should not be used as a thoroughfare by other patients, visitors or staff, including patients being transferred, staff going for meal breaks, and staff and visitors entering and exiting the building

Personal Protective Equipment (PPE)

- The requirement for PPE is based on the tasks that a HCW is likely to perform
- Unnecessary and inappropriate use of PPE will deplete stocks and increases the risk that essential PPE will not be available to HCW when needed most
- This guidance **DOES NOT RECOMMEND** use of surgical facemasks in situations, other than for contact with patients with droplet-transmitted infections, including COVID-19
- PPE must be worn by ALL staff entering a room or cohort area where a patient with suspected or confirmed COVID-19 is being cared for
- PPE should be readily available outside the patient's room or cohort area
- Have a colleague observe donning and doffing of PPE where practical

Extended use of PPE

- In a pandemic situation, it is recognised that circumstances such as, limited access to supplies or overwhelming patient numbers may arise and HCW may need to make pragmatic decisions about their use of certain items of PPE. Where measures vary from usual best practice, it is necessary to ensure the lowest possible risk to patients and healthcare workers
- Where extended use of certain PPE items is deemed necessary, a HCW may not need to change their surgical face mask or eye protection when moving between patients in a cohort area, as long as they are not wet, soiled or torn. This includes moving between single rooms in cohort wards
- Gowns should be changed between patients and after completion of a procedure or task. However, if necessary to cope with workload or to manage PPE supplies;
    - Extended use of gowns in confirmed COVID-19 cohort areas may be considered for healthcare workers engaged in low contact activities
    - Where HCW are engaged in high contact activities, then gowns should be changed between patients, to minimise risk of cross-transmission of other pathogens commonly encountered in healthcare settings (e.g., antimicrobial resistant organisms, such as CPE, MRSA, VRE or *C. difficile*)
- Extended use of gloves is not appropriate. Gloves must be changed and hand hygiene performed between patients and between different care activities on the same patient

Types of PPE

Disposable plastic aprons are recommended to protect staff uniform and clothes from contamination when providing direct patient care and when carrying out environmental and equipment decontamination.

Fluid resistant gowns are recommended when there is a risk of extensive splashing of blood and or other body fluids, and a disposable plastic apron does not provide adequate cover to protect a HCW's uniform or clothing.

Fluid resistant coveralls provide equivalent protection to fluid resistant long-sleeved gowns if worn, donned and doffed correctly. However, they can be more challenging to doff correctly and specific training is required for HCW who may need to use these items of PPE.

If **non-fluid resistant gowns** are used and there is a risk of splashing with blood or other body fluids, a disposable plastic apron should be worn underneath the gown.

Eye protection/face visor should be worn when there is a risk of contamination to the eyes from splashing of blood, body fluids, excretions or secretions (including respiratory secretions)

- Surgical mask with integrated visor
- Full face shield or visor
- Goggles / safety spectacles

Surgical face masks

The WHO recommends two types of surgical facemask for use for HCWs in caring for patients with COVID-19 (Type IIR or Type II). Both masks have the same bacterial filtration rate of 98%. Type IIR masks are more appropriate in situations where there is a high risk of splashing by bodily fluids for example in the operating theatre, critical care unit and emergency department setting where a patient's condition may be unstable or acutely deteriorating.

Tips for surgical face masks:

- The mask must be donned appropriately, to allow for easy removal without touching the front of the mask
- Must cover the nose and mouth of the wearer
- Must not be allowed to dangle around the HCW's neck after or between each use
- Must not be touched once in place
- Must be changed when wet or torn or if removed to eat, drink or use a phone

- Must be worn once and then discarded as healthcare risk waste (also referred to as clinical waste)
- Perform hand hygiene after the surgical face mask is removed

Respirator masks

Respirator masks are routinely recommended for the care of patients with known airborne infectious diseases, including; varicella (chickenpox) and measles viruses and pulmonary tuberculosis (TB).

COVID-19 is not considered to be an airborne pathogen. However, when aerosol-generating procedures (AGP) are performed, FFP2 masks, in addition to eye protection are required. There is no reason to consider that cone shaped masks or FFP3 masks afford a higher degree of protection in practice than duckbill-style FFP2 masks. Properly-fitted cone shaped masks also provide appropriate protection.

Valved respirator masks are not fully fluid resistant, unless they are shrouded. If a valved non-shrouded respirator mask is used, facial protection such as a visor must always be worn.

Fit testing

Fit testing of respirator masks is required, to ensure that the mask fits properly to the wearer's face shape. Fit-testing is appropriate for all respirator masks. However, it may be less critical for duckbill style masks (FFP2) and ensuring a good fit for a wider range of staff may be easier.

In resource-limited settings, fit testing should prioritise those at greatest risk including;

- HCW most likely to be involved in performing AGPs, in particular endotracheal intubation
- HCW most likely to have the most prolonged exposure in that context

Tips for respirator facemasks:

- The wearer must undertake a fit check each time a respirator is worn, to ensure there are no gaps between the mask and face for air to escape unfiltered
- Respirator masks can remain effective when worn continuously for prolonged periods of time, but must be changed if wet or damaged

Powered Air Purifying Respirators (PAPRs)

A powered air purifying respirator (PAPR) encloses the entire head in a hood. Protection is provided against droplets (head is enclosed) and aerosols (air is pumped by a battery-powered pump though an appropriate filter into the hood). As the entire head is enclosed, a PAPR does not require a seal against the skin. The protection afforded is not reduced by facial hair. PAPRs are not generally used and are not widely available. There may be significant challenges in relation to their use, as staff training on safe use, cleaning and maintenance is required in accordance with, staff need to be trained in their use, the manufacturer's instructions, along with be issues of user comfort (Appendix 3)

Theatre caps/hoods and shoe covers

- There is no evidence that contamination of hair is a significant route of transmission for SARS-2-CoV. Outside of surgical procedures involving high-speed drilling, where there may be a risk of splashing and extended coverage is desirable, (e.g. neurosurgery), head covers are not required and are not recommended
- For a HCW with long hair, hair should be tied up and off their face when working in clinical settings
- Theatre shoe covers are not recommended outside of the operating theatre area

Recommendations for the use of Personal Protective Equipment (PPE) in the management of suspected or confirmed COVID-19

Table 1: Recommendations for the use of PPE in the management of suspected or confirmed COVID-19

1.0	**Non clinical areas such as administrative areas, medical records, staff restaurant and any other area where tasks do not involve contact with COVID -19 patients**	
1.1	All Activities	**NO PPE REQUIRED**
2.0	**Receptions Areas**	
2.1	Administrative activities in reception areas where staff are separated by at least one metre from a case of suspected/confirmed COVID 19 infection	**NO PPE REQUIRED** but steps for minimising chance for exposure should be implemented
3.0	**Patient transit areas, for example; corridors, elevators, stairwells, escalators, waiting areas**	
3.1	Transfer of patients through public areas	The patient should be asked to wear a surgical face mask Those physically transferring the patient should wear appropriate PPE For others in the area **NO PPE REQUIRED**
3.2	All other activities (e.g. providing security, moving equipment etc.)	**NO PPE REQUIRED**
4.0	**Pathology/Laboratory Areas**	
4.1	All activities	PPE as per laboratory biosafety guidance
5.0	**Clinical Areas**	
5.1	Providing Care	
5.1.1	Patients with respiratory symptoms/suspected/confirmed COVID-19 who require an **aerosol generating procedure*** **Note:** • *In situations where staff are in the room with a patient and there is a significant risk that an unplanned aerosol generating procedure may need to be performed urgently for example accidental extubation it may be appropriate to wear an FFP2 mask while in the room*	• Hand hygiene • Disposable single use nitrile gloves • Long sleeved disposable gown • FFP2 respirator mask • Eye protection

5.1.2	Patients with respiratory symptoms/suspected/confirmed COVID-19 who do not require an aerosol generating procedure but **do require high contact patient care activities that provide increased risk for transfer of virus and other pathogens to the hands and clothing** of healthcare workers including (but not limited to); • Close contact for physical examination /physiotherapy • Changing incontinence wear • Assisting with toileting • Device care or use • Wound care • Providing personal hygiene • Bathing/showering • Transferring a patient • Care activities where splashes/sprays are anticipated	• Hand hygiene • Disposable single use nitrile gloves • Long sleeved disposable gown • Surgical facemask • Eye protection* *Eye protection is recommended as part of standard infection control precautions when there is a risk of blood, body fluids, excretions or secretions splashing into the eyes. Individual risk assessment must be carried out before providing care. This assessment will need to include • Whether patients with possible COVID-19 are coughing • The task you are about to perform
5.1.3	Patients with respiratory symptoms/suspected/confirmed COVID-19 where the tasks being performed are unlikely to provide opportunities for the transfer of virus/other pathogens to the hands and clothing. Low contact activities for example • Initial clinical assessments • Taking a respiratory swab • Recording temperature • Checking urinary drainage bag • Inserting a peripheral IV cannula • Administering IV fluids • Helping to feed a patient	• Hand hygiene • Disposable single use nitrile gloves • Disposable plastic apron • Surgical facemask • Eye protection* *Eye protection is required to be worn as part of standard infection control precautions when there is a risk of blood, body fluids, excretions or secretions splashing into the eyes. Individual risk assessment must be carried out before providing care. This assessment will need to include • Whether patients with possible COVID-19 are coughing. • The task you are about to perform
5.2	**Cleaning**	
5.2.1	Cleaning where patient is present	• Hand hygiene • Disposable plastic apron • Surgical facemask • Household or disposable single use nitrile gloves
5.2.2	Cleaning when patient is not present. For example, after the patient has been discharged or the procedure is complete. Ensure adequate time has been left before cleaning, as per guidelines.	• Hand hygiene • Disposable plastic apron • Household or disposable single use nitrile gloves

6.0	**Internal transfer of patients with suspected or confirmed COVID-19 infection**	
6.1	Accompanying a patient between areas within the same facility (e.g. when moving a patient from a ward to radiology / theatre, GP waiting area to assessment room)	Hand hygiene If patient is walking and a distance of at least 1m can be maintained – the patient should be asked to wear a surgical face mask if tolerated ^ but **NO PPE REQUIRED** for staff accompanying the patient If staff accompanying patient and within 1m then as in section 5.0 • ^Surgical facemask not available, cover mouth with a tissue if coughing
7.0	**External transfer for example between home and dialysis unit, inter hospital transfer, hospital to LTCF**	
7.1	Accompanying a patient but able to maintain a physical distance of at least 1m and no direct contact is anticipated	Hand hygiene If a physical distance of at least 1m and contact is unlikely – the patient should be asked to wear a surgical face mask if tolerated* but **NO PPE REQUIRED** for staff accompanying the patient
7.2	Accompanying a patient within a 1m distance and likely to have direct contact	Hand hygiene PPE as per section 5.0
8.0	**Involved only in driving a patient, not loading or unloading from transport vehicle**	
8.1	No direct contact with patient and no separation between driver and the patient compartments	Hand hygiene Patient should be asked to wear a surgical face mask if tolerated. If not, driver to wear a surgical face mask
8.2	No direct contact with patient and the driver's compartment is separated from the patient	Hand hygiene Maintain a physical distance of at least 1m **NO PPE REQUIRED**
9.0	**Individuals who may be accompanying the patient (e.g., close family members)**	
9.1	• Visiting should be restricted • If visitors are permitted, they should be instructed	• Hand hygiene • Disposable plastic apron

	how to correctly perform hand hygiene and supervised in donning/doffing PPE • Note that sensitivity to patient and visitor needs is required in the application of this recommendation, for example with children and in end of life situations. Visitors should be informed of the risks but it must be accepted that in some situations people may not prioritise their own protection over their assessment of the needs of a loved one	• Disposable single use nitrile gloves • Surgical face mask

Donning PPE

Where to don PPE

- Don PPE in a designated area. This may be outside a room or a cohort area. If the entire ward is a cohort ward, then an area should be designated for this, at or near the entrance to the ward
- Adequate supplies of ABHR and PPE should be available and stored securely
- Placement of a mirror in the donning area should be considered, so a HCW can use the mirror to verify the integrity of their PPE and help to identify potential breaches in PPE in the absence of a colleague being present to check
- PPE must be comfortable and secure before leaving the donning area
- Signage highlighting key steps in the donning sequence, including instructions how to undertake a fit check of a respirator mask, where its use is indicated, must be clearly displayed

What to do before you put on your PPE

- Remove all jewellery
- Ensure you are well-hydrated and have availed of toilet facilities (in particular where prolonged patient care is anticipated)
- Tie hair neatly back away from the face
- Perform hand hygiene

Sequence of donning PPE

Videos on donning procedures are available on www.hpsc.ie

- Put on disposable gown and secure with ties
- Put on surgical face mask, secure ties/straps to crown of the head. Fit flexible band to bridge of nose. Fit snug to face and below chin

- For an AGP, put on a respirator face mask (FFP2) instead of surgical mask and fit check. Please note this will require that the straps are placed to the middle back of head and neck
- Put on eye protection (if required) – and adjust to fit
- Put on gloves – pull glove wrist over the gown cuff
    - Double gloving is not recommended in isolation rooms or cohort areas

Doffing PPE

- The procedure for removing PPE may vary across organisations, depending on the layout of the facility and availability of PPE
- The most important thing when removing PPE is to avoid self-contamination and to pay close attention to hand hygiene
- In a situation where an adequate new supply of certain PPE items temporarily cannot be secured, it may be necessary to modify usual procedures to facilitate collection of certain items of PPE for reprocessing – for example protective eye wear

Where to doff PPE

Where a patient is in a single room **with an ante-room** all PPE should be removed and discarded in the ante-room

When a patient is in a **single room with no ante-room,** remove gloves, gown and eye protection in the patient room. Do not remove the surgical facemask/respirator until outside the patient room.

Where patients with confirmed COVID-19 are being cared for in **a cohort area,** the location for doffing PPE will vary depending on the layout of individual facilities

Sequence of doffing PPE

When all items can be discarded

- Remove gloves and dispose in healthcare risk waste bin
- Perform hand hygiene
- Remove eye protection and dispose in healthcare risk waste bin (unless in exceptional circumstances it is being collected for reprocessing- see below)
- Remove gown (avoid touching the front of the gown) and dispose in healthcare risk waste bin
- Perform hand hygiene

- Remove mask/respirator. Grasp and lift mask ties from behind your head and remove surgical facemask or respirator mask if worn, away from your face
- Avoid touching the front of the mask or respirator and use ties to discard in healthcare risk waste bin
- Perform hand hygiene

Where eye protection is in short supply and may need to be reprocessed, leave the eye protection and mask on until you have left the patient room/cohort area.

- Remove gloves and dispose in healthcare risk waste bin
- Perform hand hygiene
- Remove gown (avoid touching the front of the gown) and dispose in healthcare risk waste bin
- Perform hand hygiene

EXIT THE ROOM

- Remove eye protection and place in a clean dry washable container for reprocessing, as per local arrangements
- Remove mask/respirator. Grasp and lift mask ties from behind your head and remove surgical facemask or respirator mask if worn, away from your face
- Avoid touching the front of the mask or respirator and use ties to discard in healthcare risk waste bin
- If reprocessing of masks becomes imperative in a pandemic situation, collection in a clean dry washable container may be necessary. But the practice should only be considered if all other options for resupply or substitution have been exhausted
- Perform hand hygiene

Duration of Transmission-Based Precautions

- Where possible patients should be discharged from hospital as soon as clinically appropriate.
- If a patient is discharged home and they are still in their isolation period, they should be advised to self-isolate. Advice for self-isolation is available here.
- In general a test of clearance is not required for COVID-19 patients and transmission based precautions can be discontinued fourteen days after symptom onset, where they have been fever free for five days. However, there may be a role for testing in those with severe immunocompromise if there is concern that prolonged viral shedding may occur.

- In general persons who attend hospital for outpatient or inpatient care who have had laboratory confirmed or clinically diagnosed COVID-19 do not require transmission based precautions if the following criteria are met;
    - 14 days have elapsed since the date of onset of symptoms and they have been fever free for the last 5 days (note if date of onset of symptoms is not clear use the date of diagnosis)
    - There are no other indications for applying transmission based precautions for example they are not colonised with a multi-drug resistant organism
- For profoundly immunosuppressed patients, for example certain oncology/haematology patients where there is concern about the possibility of prolonged viral shedding the first cycle of treatment they receive as an out-patient or as an in-patient should be administered in a single room to minimise contact with other vulnerable patients. Consideration may be given to repeat testing in this situation as if the virus is not detected the additional precautions for the first cycle of treatment after recover may not be necessary
- In general persons who attend hospital who are known to have had close contact with a laboratory confirmed or clinically suspected case of COVID-19 do not require transmission based precautions but do require Standard Precautions if the following criteria are met;
    - They have no symptoms of COVID-19 infection (this should be confirmed before attendance and again at reception)
    - 14 days have elapsed since their last exposure to the individual
    - There are no other known indications for applying transmission based precautions e.g. known to be colonised with multi drug resistant organism.
- Contact patients who present within the 14 days of exposure should be isolated (or physically separated from other patients if attending essential OPD/Days services) and managed with transmission based precautions even if they are asymptomatic.

Aerosol Generating Procedures

Aerosol generating procedures (AGPs) are defined as medical and patient care procedures that result in the production of airborne particles ≤5 µm in size, which can remain suspended in the air, travel over a distance and may cause infection if they are inhaled. AGPs create the potential for airborne transmission of infections that may otherwise only be transmissible by the droplet route.

- A list of AGPs and recommended PPE is outlined in Tables 2-6
- Where an AGP is necessary, it should ideally be undertaken in a negative-pressure or neutral pressure room, using recommended airborne precautions
- If a negative/neutral pressure room is not available, the AGP should be undertaken using a process and environment that minimises the exposure risk for HCWs, ensuring that patients, visitors, and others in the healthcare setting are not exposed. For example, a single room, with the door kept closed, away from other patients and staff
- Essential personnel only should be present in a room/area where an AGP is being performed
- HCW and visitors should leave the patient's room during an AGP, unless it is necessary for them to remain to undertake the AGP or to assist with the patient's care during the AGP. Those present in the room during the AGP must wear the recommended PPE for an AGP situation for the duration of the procedure and for 20 minutes afterwards in rooms with mechanical ventilation and for up to one hour in a room with natural ventilation
- In critical care settings, where there is additional risk that an unanticipated AGP (e.g., due to accidental extubation, requirement for suctioning) may need to be performed urgently, it may be appropriate for all HCW present the area to wear an FFP2 mask

Table 2: Aerosol generating procedures (AGP) which have been associated with an increased risk of transmission of respiratory infection

Procedures	AGP Related Increased Risk of Pathogen Transmission	PPE for those with CONFIRMED OR SUSPECTED COVID-19 infection
Intubation	Consistently recognised	Hand Hygiene FFP2 RESPIRATOR MASK Eye Protection Gloves Long Sleeved Gown
Front of neck airway procedures – Insertion of tracheostomy, cricothyroidotomy	Consistently recognised	Hand Hygiene FFP2 RESPIRATOR MASK Eye Protection Gloves Long Sleeved Gown
Tracheal Extubation	Consistently recognised	Hand Hygiene FFP2 RESPIRATOR MASK Eye Protection Gloves Long Sleeved Gown
Bronchoscopy	Consistently recognised	Hand Hygiene FFP2 RESPIRATOR MASK Eye Protection Gloves Long Sleeved Gown
Positive pressure ventilation with inadequate seal*	Consistently recognised	Hand Hygiene FFP2 RESPIRATOR MASK Eye Protection Gloves Long Sleeved Gown
CPR (pre intubation due to manual ventilation)	Consistently recognised	Hand Hygiene FFP2 RESPIRATOR MASK Eye Protection

Procedures	AGP Related Increased Risk of Pathogen Transmission	PPE for those with CONFIRMED OR SUSPECTED COVID-19 infection
		Gloves Long Sleeved Gown
High Frequency Oscillatory Ventilation (HFOV)	Consistently recognised	Hand Hygiene FFP2 RESPIRATOR MASK Eye Protection Gloves Long Sleeved Gown
Manual Ventilation	Consistently recognised	Hand Hygiene FFP2 RESPIRATOR MASK Eye Protection Gloves Long Sleeved Gown
Open Suctioning-procedure where a single-use catheter inserted into the ETT either by disconnecting the ventilator tubing or via a swivel connector	Consistently recognised	Hand Hygiene FFP2 RESPIRATOR MASK Eye Protection Gloves Long Sleeved Gown
Induction of Sputum	Consistently recognised	Hand Hygiene FFP2 RESPIRATOR MASK Eye Protection Gloves Long Sleeved Gown
High Flow Nasal Oxygen (HFNO) including AIRVO	Accepted by many	Hand Hygiene FFP2 RESPIRATOR MASK Eye Protection Gloves Long Sleeved Gown
Non-invasive ventilation – CPAP/BiPAP	Accepted by many	Hand Hygiene FFP2 RESPIRATOR MASK Eye Protection

Procedures	AGP Related Increased Risk of Pathogen Transmission	PPE for those with CONFIRMED OR SUSPECTED COVID-19 infection
		Gloves Long Sleeved Gown

Table 3: Potential Aerosol Generating procedures due to use of High Speed Devices

Procedure	AGP Related Increased Risk of Pathogen Transmission	PPE for CONFIRMED OR SUSPECTED COVID-19 infection
Instruments used in Autopsy Procedures	Consistently recognised	Hand Hygiene FFP2 RESPIRATOR MASK Eye Protection Gloves Long Sleeved Gown
Instruments used in Dental Procedures e.g. the use of a high-speed hand piece or ultrasonic instruments aerosolise patient's respiratory secretions, saliva	Consistently recognised	Hand Hygiene FFP2 RESPIRATOR MASK Eye Protection Gloves Long Sleeved Gown
Instruments used in surgical procedures e.g. the use of a high-speed drill in neurosurgery & major maxillofacial or ENT procedures traversing sinuses	Consistently recognised	Hand Hygiene FFP2 RESPIRATOR MASK Full Face Visor Gloves Long Sleeved Gown Hood

Table 4: Procedures, which may be associated with increased risk due to levels of droplet dispersion, proximity to airway, duration of procedure +/- where installation of fluid or suctioning may be part of the procedure

Procedures	**AGP Related Increased Risk of Pathogen Transmission Infection Risk**	**PPE COVID-19 CONFIRMED OR SUSPECTED**
Laryngoscopy	Plausible hypothesis- no evidence	FFP2 RESPIRATOR MASK Eye Protection Gloves Long Sleeved Gown Eye Protection
Upper GI endoscopy	Plausible hypothesis- no evidence	FFP2 RESPIRATOR MASK Gloves Eye Protection Gown/Plastic Apron
Transoesophageal Echo	Plausible hypothesis- no evidence	FFP2 RESPIRATOR MASK Gloves Eye Protection Gown/Plastic Apron
Fibreoptic endoscopic evaluation of swallowing (FEES).	Plausible hypothesis- no evidence	FFP2 RESPIRATOR MASK Gloves Eye Protection Gown/Plastic Apron

Table 5: Procedures which are unlikely to be of increased risk as there are low levels of droplet dispersion, HCW is not in direct proximity to airway, duration of procedure is short and where instillation of fluid or suctioning is not part of the procedure.

Procedures	AGP Related Increased Risk of Pathogen Transmission Infection Risk	PPE for those with CONFIRMED OR SUSPECTED COVID-19 infection
Collecting a nasopharyngeal swab	Not supported by evidence or plausible hypothesis and not recognised by most national bodies.	Hand Hygiene Surgical Face Mask Gloves Gown OR Plastic Apron* Risk Assessment Re: Eye Protection
Delivery of nebulised medications via simple face mask	Not supported by evidence or plausible hypothesis and not recognised by most national bodies.	Hand Hygiene Surgical Face Mask Gloves Gown OR Plastic Apron* Risk Assessment Re: Eye Protection
Closed suction systems (CSS) enable patients to be suctioned by a suction catheter enclosed within a plastic sleeve, without the need for ventilator disconnection	Not supported by evidence or plausible hypothesis and not recognised by most national bodies.	Hand Hygiene Surgical Face Mask Gloves Gown OR Plastic Apron* Risk Assessment Re: Eye Protection
Chest physiotherapy in absence of other AGPs	Not supported by evidence or plausible hypothesis and not recognised by most national agencies.	Hand Hygiene Surgical Face Mask Gloves Gown OR Plastic Apron* Risk Assessment Re: Eye Protection
Clinical dysphagia	Not supported by evidence or	Hand Hygiene

Procedures	AGP Related Increased Risk of Pathogen Transmission Infection Risk	PPE for those with CONFIRMED OR SUSPECTED COVID-19 infection
examinations- this examination includes orofacial assessment and administration of food and/or fluids to evaluate swallowing ability	plausible hypothesis and not recognised by most national agencies.	Surgical Face Mask Gloves Gown OR Plastic Apron* Risk Assessment Re: Eye Protection
Insertion of a nasogastric tube	Not supported by evidence or plausible hypothesis and not recognised by most national agencies.	Hand Hygiene Surgical Face Mask Gloves Gown OR Plastic Apron* Risk Assessment Re: Eye Protection

*Refer to National Guidelines on PPE

Table 6: Lower GI Procedures

Procedure	AGP Related Increased Risk of Pathogen Transmission Infection Risk	PPE for those with CONFIRMED OR SUSPECTED COVID-19 infection
Lower GI endoscopy	Not supported by evidence or plausible hypothesis and not recognised by most national agencies Note. RNA detected in Faeces but no cases of COVID-19	Gloves Apron Risk Assessment • Eye Protection • Surgical Face Mask

	transmission by this route have been reported	

Cleaning an area after an AGP has been performed

- Clearance of infectious particles after an AGP is performed will depend on the mechanical/natural ventilation and air changes per hour (ACH) within the room.
- A single air change is estimated to remove 63% of airborne contaminants; after five air changes, less than 1% of airborne contamination remains.
- In an isolation room with mechanical ventilation (10-12 ACH), it is advisable to wait for 20 minutes after the patient leaves following an AGP before entering the room to clean. A surgical face mask is not required if the patient is no longer in the room.
- A room with no mechanical ventilation is likely to have fewer air changes per hour (5-6 ACH). Therefore, it is advisable to leave the room for approximately one hour before cleaning after an AGP has been performed.

Patient Care Equipment/Instruments/Devices

- Reusable non-invasive medical devices should as far as it is possible be allocated to the individual patient or cohort of patients
- These items (including stethoscopes) can be reused, with appropriate decontamination after patient use, after blood and body fluid contamination and at regular intervals, as part of the equipment cleaning schedule
- Manufacturer's instructions should be followed for cleaning and disinfecting of reusable medical equipment after use
- Increase the frequency of cleaning/disinfection for reusable non-invasive care equipment when used in isolation or cohort areas
- Single-use items must be discarded after use, in line with standard procedures
- Staff should increase the frequency of cleaning of electronic equipment, such as mobile and desk phones, tablets, desktop touch screens, keyboards, printer touch screens. A

supply of wipes should be available in areas where the devices are most commonly used.

Mobile healthcare equipment

- The following advice applies to devices that cannot be left in the isolation room, such as portable X-ray machines and portable electronic devices used in patient care:
    - 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 must have had training n IPC procedures, including hand hygiene and use of PPE
    - the operator should wear PPE, as described earlier in this document, when in the isolation room or cohort area
    - any equipment taken in to the room which must be subsequently removed needs to be disinfected immediately after leaving the area
    - 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
- Personal digital assistants (PDAs) that are used with electronic blood tracking systems.
    - PDAs and wireless printers where used should be dedicated for use in cohort areas for confirmed/suspected COVID-19 patients and should not be used in non- COVID 19 areas
    - the operator of the device must be trained and supervised in IPC procedures, including hand hygiene and use of PPE
    - the operator should wear PPE, as described earlier in this document, when in the isolation room or cohort area
    - Due to the requirement for HCW to wear PPE they will be unable to scan their ID badge therefore they should bring a photocopy of their badge to the bedside for

the PDA. The photocopy should be discarded in the clinical waste bin in the room.

- After use, devices should be decontaminated in line with usual local policy. No additional precautions are required.
- It is important to check the cleaning guidelines accompanying each device. If a particular device is not capable of being adequately decontaminated (e.g., PDA with touch pads/buttons, they should not be used in these areas. If their use is unavoidable, consider using a single-use, self-adhesive protective film to cover the device and dispose of film after use.
-

General Environment

- The care environment should be kept clean and clutter free to facilitate cleaning
- All non-essential items should be removed. This is to prevent unnecessary waste of essential supplies, which may occur if unused items in an area become contaminated
- Only the minimum amount of equipment and supplies essential to patient care each day should be stored within an isolation room, ante-room or cohort area. Consider increasing the frequency of topping-up stock to achieve this
- Patient observation charts, medication prescription and administration records (drug kardexes) and healthcare records should not be taken into the isolation room or patient zone within a designated cohort area to minimise the risk of contamination
- Avoid the use of fans that re-circulate the air
- If an electronic patient health record (EHR) is used in the facility, a mobile workstation for

the EHR should remain in the cohort area

Routine cleaning

- Decontamination of equipment and the care environment must be performed using either:

  - A combined detergent/disinfectant solution at a dilution of 1,000 parts per million available chlorine (ppm available chlorine (av.cl.)); or
  - A general purpose neutral detergent in a solution of warm water, followed by a disinfectant solution of 1,000 ppm av.cl.
  - Only cleaning (detergent) and disinfectant products supplied by employers are to be used. Products must be prepared and used according to the manufacturer's instructions and recommended product "contact times" must be followed
- Cleaning/ disinfection should only be performed by HCW fully-trained to undertake cleaning of an isolation room/cohort area and a cleaning schedule should be available
- Staff should be trained in the donning and doffing of PPE
- Equipment used in the cleaning/disinfection of the isolation area should be single-use where possible and stored separately to equipment used in other areas of the ward/hospital
- The patient isolation room should be cleaned/disinfected at least once per day and more frequently, as required and after an AGP or other potential contamination

Frequency of cleaning

- An increased frequency of decontamination should be incorporated into the environmental decontamination schedules for areas where there may be higher environmental contamination rates (e.g., toilets/commodes, particularly if patients have diarrhoea; and 'frequently-touched' surfaces, such as medical equipment, door/toilet handles and bedside locker tops, patient call bells, over bed tables and bed rails). These areas should be cleaned at least twice daily and when known to be contaminated with secretions, excretions or body fluids
- Patient isolations rooms, cohort areas and clinical rooms must be decontaminated at least daily
- Clinical rooms should also be decontaminated after clinical sessions for patients with

suspected/known COVID-19. Where an AGP has not been performed, the room can be cleaned as soon as possible, once the patient has vacated the room. There is no requirement for the room to remain unused. **Please note this is a change from previous guidance.**

Terminal Cleaning

Terminal cleaning is performed after the patient has vacated the room and is not expected to return (e.g., following patient discharge or transfer). In addition to the routine cleaning protocols, a terminal clean requires:

- Removal of all detachable objects from a room or cohort area, including laundry and curtains
- Removal of disposable items, including paper towels and toilet paper*
- Removal of waste
- Cleaning (wiping) of lighting and ventilation components on the ceiling
- Cleaning of curtain rails and the upper surfaces of hard-to-reach fixtures and fittings
- Cleaning of all other sites and surfaces working from higher up to floor level
- A terminal clean checklist is good practice to support cleaning or household staff to effectively complete all environmental cleaning tasks, which should be signed off by the cleaning supervisor before the room reopens for occupancy by a new patient

Unused Medication, Blood Products and PPE

- Do not discard unused medicines or PPE that have been in close proximity to a COVID-19 case (e.g., contents of a crash tray or wrap or an intubation kit). If necessary, decontaminate medicine boxes/outer packaging with alcohol 70% wipes or disinfectant wipes. A partially-consumed medication tray/wrap/kit should be refurbished/replenished, as per local hospital arrangements.
- Unused blood components that were brought into an isolation room or cohort area should not be discarded due to concerns about COVID-19 so long as they meet local

haemovigilance criteria for return. If there is concern about surface contamination then decontaminate the outer surface of the blood component bag using alcohol 70% wipes or disinfectant wipes.

Catering

- There is no need to use disposable plates or cutlery. Crockery and cutlery can be washed in a dishwasher, or by hand using household detergent and hand-hot water after use
- Where practical, catering staff should not bring the catering trolley into a cohort area
- If a HCW is already in a cohort area and wearing PPE, that person could take the meal trays from the catering staff member at the entrance to the area and deliver them to each patient, so the catering staff does not need to enter the cohort area
- If catering staff do need to enter the cohort area and will be within one metre distance of a patient, they should wear appropriate PPE

Specific scenarios

A suspected case of COVID-19 in an inpatient

- The usual principles of detection and management of a cluster or outbreak of a transmissible pathogen in acute healthcare settings apply to COVID-19
- A local surveillance system should be implemented in each ward/clinical area, whereby early detection of an admitted patient with new symptoms which may be consistent with COVID-19 is part of the routine daily assessment and clinician and nursing handovers and also sought at visits by the IPC team to each ward (e.g., inpatients and/or HCW with new fever, new onset or worsening of underlying respiratory symptoms and/or new onset of influenza-like illness (sore throat, cough, myalgia)
- Any HCW with symptoms consistent with COVID-19 infection should not attend work and report illness following the established local protocol
- At the start of each shift, all HCW assigned to a clinical area should be asked to check that they do not currently have symptoms of respiratory illness, such as fever, cough,

shortness of breath or myalgia

- In the event that any new symptoms develop during a shift, the HCW must report immediately to the person-in-charge
- Where an inpatient develops new symptoms consistent with COVID-19, apply the recommended IPC precautions for a patient with suspected COVID-19, a nasopharyngeal swab should be taken and a test ordered for SARS-CoV 2 (COVID-19)
- Inform the infection prevention and control team (IPCT) that an inpatient is being investigated for COVID-19
- If the patient is already in a single room, continue the recommended IPC precautions for a patient with suspected COVID-19
- If the patient is accommodated in a multi-occupancy room/bay with other patients at the time that new symptoms develop, all patients in the room should be clinically evaluated, with ongoing close monitoring for new symptoms consistent with COVID-19. If any additional patients have or develop new symptoms, they should also be tested for SARS-CoV-2 (COVID-19)
- The multi-occupancy room or bay should be closed to new admissions pending receipt of the pending test result(s)
- A risk assessment must be undertaken, with regard to decisions to move patients who are awaiting a test result. This needs to take into account duration of the contact of the patients in the multi-occupancy room prior to symptom onset, the dependency and casemix of the patients currently in the room, whether there is availability of single room(s) for patient(s) with symptoms awaiting test results on that ward, the anticipated turnaround time for receipt of a laboratory test result and the availability of staffing on the ward for day and night shifts. It may be prudent to avoid moving patients, unless clinical need dictates transfer to another department for escalation of care
- If a patient does not have symptoms and is otherwise fit for discharge, they may be discharged, with advice for the patient to self-monitor for 14 days and contact their GP via telephone for advice in the event new symptoms develop
- If it is deemed appropriate for all of the patients to remain in the affected multi-

occupancy room/bay pending receipt of laboratory test result(s), the recommended IPC precautions for a patient with suspected COVID-19 should be applied to all patients in the bay, with nursing staff designated for the care of those patients for the duration of the shift

- The test results should be reviewed as soon as available to inform next steps
- If an inpatient is confirmed to have COVID-19, clinical care should be continued following the recommended IPC precautions for patients with confirmed COVID-19 and they should be moved to a single room, if not already accommodated in a single room OR if there are two or more patients with COVID-19 on the ward, they may be cohorted together

A cluster or outbreak of COVID-19 in a hospital

- Each IPCT should have a robust system in place for early detection of inpatients with COVID-19 diagnosed after admission, as this may indicate hospital-acquisition and transmission
- It is important that the IPCT and Occupational Health Department are in close contact to rapidly detect if there are HCW with confirmed COVID-19 who have any epidemiological links to wards with suspected cross-transmission
- If the test results indicate there are COVID-19 acquisition associated with a ward or unit, an outbreak should be declared, an outbreak control team convened, each case of COVID-19 notified by the laboratory and an outbreak of COVID-19 notified to the Department of Public Health
- All of the usual outbreak control measures apply
- Contacts of patients with confirmed COVID-19 should be cohorted together and monitored for new symptoms, with clinical care to include contact and droplet precautions
- Avoid cohorting confirmed COVID-19 patients with patients who are not confirmed to have COVID-19

- Wherever feasible, try and avoid moving inpatients between wards where transmission of COVID-19 is suspected, unless escalation of care is indicated

Guidance in relation to occupational health issues for healthcare workers (HCW) is available on www.hpsc.ie

Care of the Dying

- A compassionate, pragmatic and proportionate approach is required in the care of the dying.
- The presence of a person close to the individual should be facilitated in so far as it is possible, they should be aware of the potential infection risk.
- Pastoral care team where requested by the person or their family should NOT be restricted from entering an isolation room or cohort area.
- All persons in attendance should be advised to wear a surgical mask and plastic apron. Gloves are not essential so long as those in attendance understand the risks perform hand hygiene after touching the person and before leaving the room.
- Visitors should be instructed on how to put on and take off the PPE & how to perform hand hygiene. Where practical visitors should be supervised when donning and doffing PPE
- For the anointing of the sick or other rites where only transient physical contact is required, gloves are not necessary so long as hand hygiene is performed after anointing or touching the person.
- Visitors to patients who are dying should be regarded as COVID-19 contacts and should avoid contact with people other than the person they are accompanying

Specific settings

The following guidance is given to assist specific care settings to implement the principles of standard precautions and transmission-based precautions described in this document, which apply in all care settings. This section will be updated as further information

becomes available.

Critical Care Setting

- If admitted to a critical care unit, the patient should be nursed in a negative pressure isolation room where available, or if not available, a single room with a closed ventilator circuit should be used
- The door to the room must remain securely closed, except when entering or leaving
- All respiratory equipment must be protected by a filter with high efficiency (e.g., BS EN ISO 23328-1:2008)
- 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

Operating theatres

- The decision that surgery is essential during the period of infectivity for a patient with confirmed COVID-19 should be made by senior surgeons and anaesthetists. Wherever possible, surgery should be deferred until the patient is no longer infectious and is in optimal condition for surgery
- Ventilation in both laminar flow and conventionally ventilated theatres should remain fully on during surgical procedures where patients have suspected or confirmed COVID-19 infection.
    - Aerosols which may be generated as a result of AGPs will be localised and rapidly diluted by operating theatre ventilation.
    - Air passing from operating theatres to adjacent areas will be highly diluted and is not considered to be a risk.
    - Local risk assessment may dictate that a neutral pressure theatre or negative pressure theatre is preferred for COVID19 procedures (Appendix 4)

- The patient should be transported directly into the operating theatre and should wear a surgical mask if it can be tolerated
- The operating theatre staff must be informed in advance of a patient transfer of a confirmed or possible COVID-19 case
- The patient should be reviewed, anaesthetised, intubated, extubated and recovered in the operating theatre
- Appropriate PPE should be worn by staff present in the theatre when AGP are performed (e.g., intubation, extubation). If the operative procedure is anticipated to involve an AGP, as described in the section on AGP, all staff present in the theatre for the duration of the surgery must wear appropriate PPE for an AGP scenario
- Entry and exit from the room should be minimised during the procedure
- Disposable anaesthetic equipment should be used where possible
- The anaesthetic machine must be protected by a filter with viral efficiency to 99.99%
- The operating theatre should be cleaned, as per local policy, paying particular attention to hand contact points (e.g., on the anaesthetic machine)

• Instruments and devices should be decontaminated in the normal manner, in accordance with manufacturer's advice.

In these extraordinary times with increased demand for critical care ventilator support, theatre areas may be temporarily converted to critical care units. Any healthcare organisation which is undertaking this assessment or provision should seek to obtain specialist advice both internally from the organisations own multi-disciplinary team (estates (AP(V), IPC, Clinical leads, Decontamination leads, Medical Gas AP(MPGS), Estates etc…) but also from an appropriately qualified and experienced Authorising Engineer (Ventilation) or other suitable professional design consultants with Healthcare Ventilation experience. Further details in Appendix 5

Outpatient Department (OPD) or Day Service

- To the greatest extent, patients should be contacted in advance of attendance at the

outpatient department (OPD) or day service to remind them to reschedule their appointment and to call their GP if they develop symptoms consistent with COVID-19

- A check for common symptoms of COVID-19 should be reinforced at reception or department entrance, through direct questioning and signage
- If a patient attends the OPD or day service with symptoms of COVID-19 and their appointment cannot be deferred and/or clinical assessment or a change in a treatment plan is required, the patient should be immediately shown to a designated separate area. The patient should be asked to wear a surgical face mask if tolerated and instructed to stay in this location and not visit other departments or parts of the hospital/unit or go to public areas while awaiting assessment
- Other patients of the department who do not have symptoms of COVID-19, should remain in the usual waiting and examination area, physically separated from any patient with symptoms of COVID-19
- The use of facemasks by asymptomatic patients who attend day services is not recommended, however where the patients anxiety is such that they would not attend for a necessary medical appointment out of concern or fear, then the provision of a mask to alleviate this should be provided.
- For patients who have recovered from COVID-19 a clinical decision is required regarding fitness to proceed with treatment especially if it is for immunosuppressing chemotherapy. The first treatment post illness should be provided in a single room separate to others in light of potential prolonged viral shedding in immunesuppressed individuals. Transmission based precautions should be applied.

Radiology

- Refer to the section on mobile medical equipment for guidance on mobile X-ray devices
- Refer to the section on PPE for guidance on requirements when undertaking procedures for those with known or confirmed COVID-19 infection
- Symptomatic patients should be asked to wear a surgical face mask while waiting for and during their procedure, where tolerated

- Appointments should be scheduled so that patients are not kept waiting in communal areas
- If a patient with suspected or confirmed COVID-19 infection attends the radiology department, all surfaces and equipment that the patient has been in direct contact with should be cleaned and disinfected after the patient has left, as per standard protocol
- If no aerosol generating procedure has been performed the room can be cleaned once the patient has left.
- Pay special attention to thorough cleaning of frequently-touched sites, such as the trolley, chair handles and horizontal surfaces
- For CT scanning –once the patient has left the room the area can be immediately cleaned and disinfected as per standard protocols.

Dialysis

Guidance for Dialysis Units is available on www.hpsc.ie

Maternity Units

Guidance for maternity settings is available on www.hpsc.ie

Transfer

Internal Transfer

- Minimise movement of the patient from the single room or designated cohort area
- Patient should wear a surgical mask when outside their room or designated cohort area
- All HCWs who are in close contact (within one metre) of the patient should wear appropriate PPE during transfer
- HCW in the receiving departments should be informed of the precautions required prior to the transfer of the patient (e.g., diagnostic departments, operating theatre)
- Investigations should be scheduled so that patients are not waiting in communal areas
- HCWs carrying out procedures should wear appropriate PPE for the task to be undertaken

- Cleaning and decontamination of the patient's room or bedspace in a cohort area, along with equipment should be undertaken following the procedure

External Transfer

- Transfer of patients with confirmed COVID-19 to another hospital should be avoided, unless it is required for medical care
- If transfer is required, it is the responsibility of the transferring facility to inform in advance, the HCW in the receiving facility and the ambulance personnel of the diagnosis, the date of symptom onset and the precautions required
- Standard, contact and droplet precautions, with appropriate PPE should be continued during patient transfer and upon arrival at the receiving facility
- In keeping with the written communication issued by the HSE's Chief Clinical Officer on 19.03.20, transfer of patients should be not be refused or delayed, pending results of testing for COVID-19. Testing of asymptomatic individuals as a condition of transfer is not acceptable

Guidance on the transfer of hospitalised patients from an acute hospital to a residential care facility

Please refer to guidance for residential care facilities available on www.hpsc.ie

Transfer from primary care/community settings using Hospital Transport systems e.g. Dialysis or Oncology Day Care

- Patients attending for essential care (Dialysis/Oncology) should be advised; to contact their usual care unit by telephone if they have new symptoms consistent with COVID-19, rather than presenting themselves
- Patients who have been in close contact with someone who has suspected or confirmed COVID-19 infection should be instructed to advise the unit in advance of attending
- Patients should be advised to check their temperature before travelling
- Asymptomatic patients can travel by their usual means

- Asymptomatic patients who have been informed that they are close contacts of person with COVID-19 infection will be following public health advice for self-quarantine. They may drive themselves to the unit or be driven by someone who is willing to drive them (Units should have arrangements in place in the event this is not possible). They should not use public transport or travel with another patient from the unit. The patient should be advised to:
    - Wash hands with soap and water before leaving their house
    - In so far as is possible, maintain one metre (three feet) distance from other individuals (e.g., sit in the back seat passenger side away from the driver)
- Patients who have symptoms of possible COVID-19 must telephone in advance of their appointment and if necessary may drive themselves to the unit, if they feel well enough or be driven in private transport by someone who has already had exposure and is willing to drive them. If they have a surgical face mask this should be worn, if tolerated for transfer to the hospital. Where this is not possible, the unit should have alternative arrangements in place

Laboratory

- For information in relation to laboratory processes, refer to HPSC recommendations on *Biosafety guidance for diagnostic laboratories handling specimens from individuals with possible, probable or confirmed infection with Novel Coronavirus (2019 nCoV), Middle East respiratory syndrome Coronavirus or Avian Influenza A* available at www.hpsc.ie
- Double bagging of specimens at time of collection is not required, but care should be taken not to contaminate the outer bag
- Laboratory specimens, including those from COVID-19 patients can be sent by pneumatic tube systems, in line with standard operating procedures
- Blood cultures can be collected, as per standard procedures
- Clinical HCW should notify laboratory HCW when specimens are submitted from a patient with suspected or confirmed infection, through proper completion of request forms or electronic test ordering systems, or by direct communication with the laboratory. Transport

of specimens between laboratories should be in accordance with Category B transportation regulations

Point-of-Care Testing

- Point-of-care testing (POCT) should not be performed on potentially-infectious specimens where a practical and safe alternative exists. If point-of-care blood gas analysis is necessary to manage a critically ill patient, the incremental risk to HCW beyond the risk of delivering direct patient care is likely to be minimal and it may be performed with the following precautions:
    - The operator must adhere to standard, contact and droplet precautions throughout the blood specimen collection at the patient's bedside
    - The needle should be removed and disposed of safely and the adaptor applied to the tip of the syringe. If air must be expelled from the sampling syringe, this should be performed in the patient care zone with the syringe pointing away from the operator
    - Ideally a blood gas analysis machine should be placed within the patient room if repeat testing is likely to be required. If a blood gas analysis machine is not in the patient room, then the syringe should be laid flat in a disposable tray with deep sides for transport to the blood gas analyser
    - Remove PPE and perform hand hygiene on leaving the patient room. Apply clean gloves and transfer specimen to a clean disposable tray and take the tray with the specimen to the blood gas analyser
    - The analysis of the specimen may be performed as normal, using standard precautions The residual blood in the syringe should be discarded as per standard practice and the instrument and its surroundings be cleaned/disinfected after use

Care of the deceased with confirmed COVID-19 infection

- Please refer to www.hpsc.ie for additional guidance for funeral directors and to the RCPI Faculty of Pathology guidance for performing autopsy procedures.

Communication of level or risk

- As COVID-19 is a new and emerging pathogen, it is understandable that those who will be handling the remains will be concerned and may wish to be made aware of the patient's infectious status

Hygienic preparation

- Any IPC procedures that have been advised before death must be continued in handling the deceased person after death
- Hygienic preparation includes washing of the face and hands, closing the mouth and eyes, tidying the hair and in some cases shaving the face
- Washing or preparing the body for religious reasons is acceptable if those carrying out the task wear long-sleeved gowns, gloves, a surgical face mask and eye protection if there is a risk of splashing which should then be discarded

Transport to the Mortuary

- An inner lining is not required in terms of COVID-19 risk but may be required for other, practical reasons such as maintaining dignity or preventing leakage affecting the mortuary environment
- A surgical face mask or similar should be placed over the mouth of the deceased before lifting the remains into the inner lining
- Those physically handling the body and placing the body into the inner lining should wear, at a minimum, the following PPE:
    - Gloves
    - Long sleeved gown
    - Surgical face mask
- Play close attention to hand hygiene after removal of PPE

- Once in the hospital mortuary, it would be acceptable to open the inner lining if used for family viewing only (the mortuary attendant should wear PPE to open the inner lining as above)
- The family should be advised not to kiss the deceased and should clean their hands with alcohol hand rub or soap and water after touching the deceased

PPE is <u>not required</u> for transfer, once the body has been placed in the coffin

Extraordinary measures when PPE is in short supply

Reduce risk of exposure as much as possible

- Where possible, maintain a distance of at least one metre (and if possible two metres) from the patient at all times. If this distance can be maintained and hand hygiene is performed, the use of PPE provides no additional risk reduction, unless an AGP is being performed
- The absolute minimum number of staff required to provide care should engage with the patient. If remote communication by telephone or similar device is adequate, no one should enter the patient space. When entry into the patient room/space is necessary, no more than one person should enter the room, unless there is task that requires two people
- Try to plan ahead for the person who enters the patient room or designated multi-occupancy cohort area, to complete as many tasks as possible on a single visit

Substituting Items of PPE

- **Surgical face masks** - In some instances, a surgical face mask with a specification somewhat different from that usually used may be available. Options may include; use of FFP2 respirator masks in situations in which they are not strictly required or the use of any surgical mask that is fluid repellent, fully covers the nose and mouth and can be tied appropriately for ease of removal, it can be accepted as suitable for use in the current circumstances.

- **Gowns** - If gowns are not available, disposable plastic aprons provide substantial protection. All HCW should be bare below the elbow and should perform hand hygiene extending up to the elbow after removing gloves in this situation

Prioritising use of PPE

AGPs are likely to represent the highest risk of transmission of infection to HCWs and when PPE is in short supply, these are the procedures that should be prioritised for PPE items

Decontamination of eye/face protection, for example goggles where there is a shortage of equipment

- In situations where the supply of new disposable eye protection cannot be secured AND the activity being undertaken involves a high risk of splash or spray to the eyes, a HCW may reuse their goggles/safety spectacles
- Where reuse of eye protection is being considered:
- Ensure there is no obvious signs of damage – Discard if signs of damage
- Ensure there are no foam, cloth or elastic elements - items with such elements cannot be effectively decontaminated
- Check they are visibly clean before attempting to decontaminate – Discard if visibly soiled with blood/body fluids, including respiratory secretions, as heavily soiled items cannot be effectively decontaminated
- The item should then be carefully decontaminated, using a disinfectant wipe for reuse by the same healthcare worker
- The risk of reuse of eye protection (goggles, visor, mask) should be balanced against the risk to the user of a risk of splash or spray to the eyes
- Where practical to do so, decontamination of goggles for reuse by different users should be centralised in a facility which normally reprocesses items, may add an additional margin of safety
- Where reprocessing of a PPE item that is normally designated as a single use item is indicated, a documented record should be retained locally of every day on which

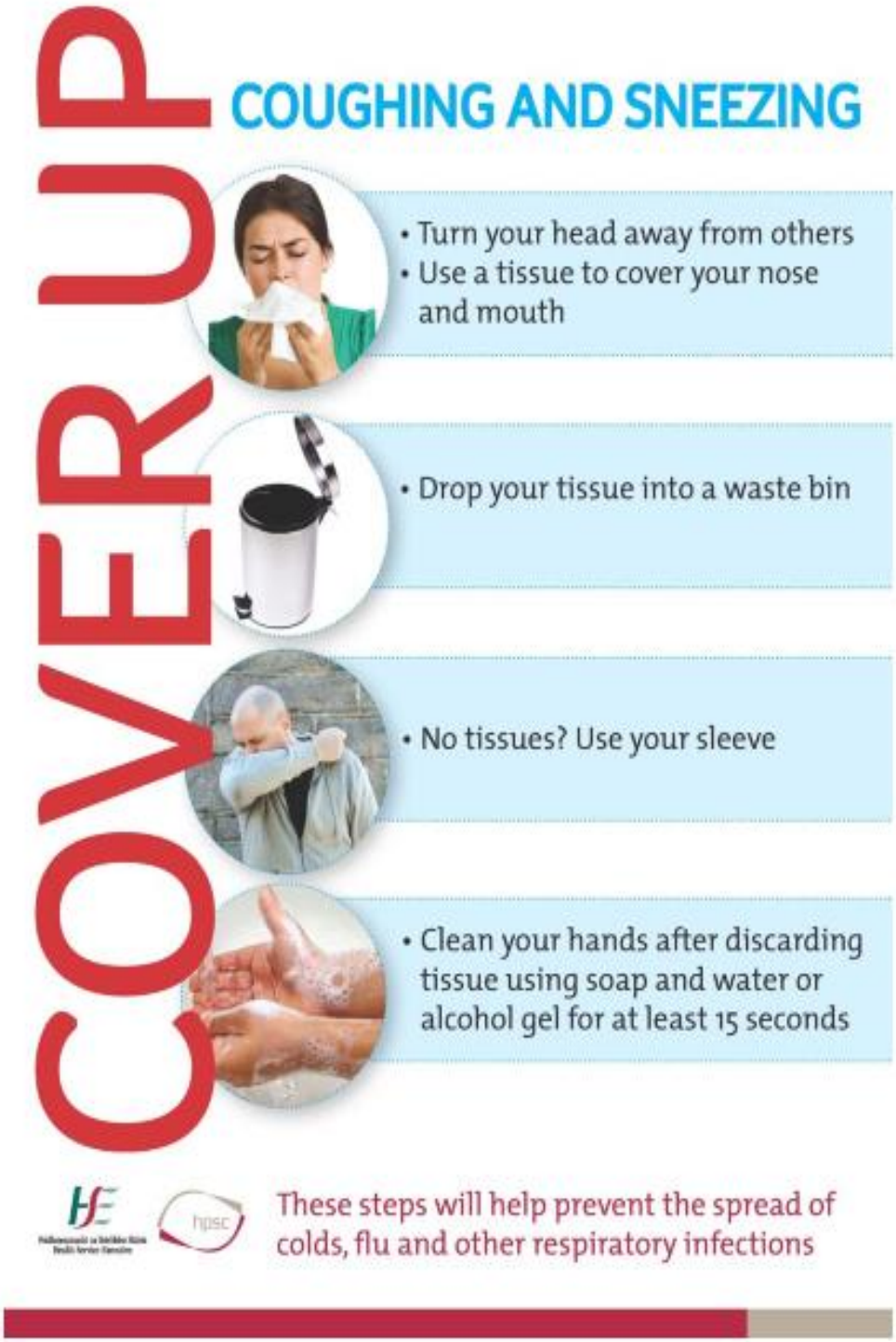
reprocessing was practiced and in so far as possible, the quantity of items reprocessed should also be documented

- Every effort must be made to secure a new chain of supply, so the practice of reprocessing can be discontinued as quickly as possible

Decanting Alcohol-Based Hand Rub (ABHR)

- Decanting of ABHR from large to smaller containers is not ideal, but is acceptable if necessary in the context of a shortage of suitably-sized ABHR units AND in the context of the current COVID-19 pandemic.
- The container used must be clean, dry and of a suitable nature. If removal of temporary units of ABHR is an issue, then increasing the number of fixed ABHR units may be considered locally.

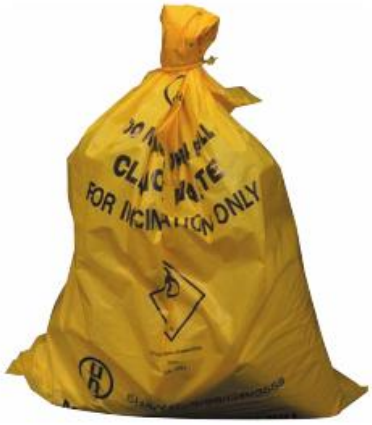
Appendix 1 Respiratory/Cough Etiquette



Appendix 2 Healthcare Risk Waste

RISK WASTE

YELLOW BAG



- All blood-stained items and all items soiled with body fluids assessed as infectious
- Suction catheters & tubing
- Incontinence waste from known or suspected enteric infections
- Bag should be closed using 'swan neck' when 2/3 full

*** NO SHARPS, LIQUIDS OR HARD OBJECTS**

RISK WASTE

YELLOW SHARPS BIN
(with blue or red lid)

- All Needles
- All Syringes
- Scalpels
- Contaminated slides
- Sharps tips of clear IV giving sets

- Blood-stained or contaminated glass
- Stitch cutters
- Guide wires/ trocars
- Razors

*** NO FREE LIQUIDS**

NOTE Use Long Bin for large trocars, knives, stapling guns, etc.

RISK WASTE

YELLOW 30/60 LITRE RIGID BIN
(with yellow lid)

- Blood Administration Sets (never disconnect line from bag)
- Contained blood and body fluids
- Non-cultured laboratory waste (including autoclaved microbiological cultures)
- Disposable suction liners
- Redivac drains (ensure drain closure sealed)
- Sputum containers
- Chest drains

NOTE
Absorbent material or gelling agent should be used in sufficient quantities to hold the fluid and prevent leakage.

*** NO SHARPS OR FREE LIQUIDS**

Appendix 3 Preliminary Guidance on Facial Hair and Respiratory Protection in the Healthcare Setting in the Context of COVID-19 and other pathogens transmitted by the same route.

v1.0, 18.03.2020

Background

Healthcare workers (HCWs) are at increased risk of exposure to a variety of respiratory hazards including transmissible respiratory diseases. One element of protecting HCWs against infectious respiratory hazards is the effective use of specific items of personal protective equipment (PPE). Surgical face masks and respirator masks are the most commonly used types of PPE in this context.

1. Surgical masks

Surgical masks are intended to protect the wearer against the mucosa of the nose and mouth and most of the surrounding skin from impact of respiratory droplets originating from the respiratory tract of the patient. The degree of protection afforded is related to the properties of the mask and how it is applied in particular the fit of the mask to the face. Facial hair that is sufficient to prevent the mask from fitting flush against the skin of the face is likely to result in reduced protection against droplet impact.

2. Respirators

In this context, respirators are intended to provide protection from infectious agents spread by the airborne route (small aerosols) including aerosols generated during Aerosol Generating Procedures (AGPs).

There are two types:

(a) Respirator masks (flat or cone shaped, FFP2 or FFP3)

These are disposable masks and are intended to protect the wearer against inhalation of infectious aerosols in addition to protection against droplet impact. The degree of protection afforded is related to the properties of the mask and how it is applied, in particular the fit of the mask to the face. The filtration of aerosols is entirely dependent on forcing inhaled air to pass though the fabric of the mask. This works if the seal of the mask against the face prevents air circumventing the mask. Respirator masks that do not fit flush because of facial hair along the sealing area of the respirator cannot be considered as providing adequate protection against exposure to aerosols.

Fit testing of respirator masks and the fit checking of the mask each time used is required to ensure that the mask fits properly to the wearers face shape, with no gaps between the mask and face for air to escape unfiltered.

(b) Powered Air Purifying Respirators (PARPs)

PARPs enclose the entire head in a hood. Protection is provided against droplets (head is enclosed) and aerosols (air is pumped by a battery-powered pump though an appropriate filter into the hood). As the entire head is enclosed, PARPs do not require a seal against the skin. The protection afforded is not reduced by facial hair. PARPs are not generally used and are not widely available. There may be significant challenges in relation to use of PARPs. They may not be easy to source, costs are significant, staff need to be trained in their use, they must be cleaned and decontaminated according to the manufacturer's instructions and there can be issues of user comfort.

Options for Management

There is no one solution that will work for every facility and for every healthcare worker. The options for healthcare workers with facial hair that prevents a surgical mask or respiratory mask from fitting flush against the skin are as follows:

1. Remove facial hair that interferes with the fit of the mask flush against the skin. This is the most practical way to ensure that staff can benefit fully from protection provided by surgical masks and properly fitted respirator masks.
2. For healthcare workers for whom removal of facial hair that interferes with the fit of the mask flush against the skin is not an acceptable option
    a) surgical masks are likely to provide useful protection against droplet transmitted infection but this may be at a reduced level.
    b) respirator masks cannot be expected to work effectively
3. Risk management options include
    a) Consider if they can be assigned duties that do not involve direct care for patients for whom aerosol precautions are required.
    b) Wear a PARP when caring for patients for whom airborne precautions are required.

Notes.

1. This note relates only to use of respiratory protection related to infectious disease. Exposure to other hazardous substances is beyond the scope of this document.

2. For an illustration of facial hairstyles that may impact on the function of respirator masks see https://blogs.cdc.gov/niosh-science-blog/2017/11/02/noshave/

Appendix 4 Converting an operating theatre from a positive to neutral pressure theatre

Table 3 below provide a summary of the main requirements to change from a positive pressure theatre as per HTM03 to a neutral pressure theatre. Different hospital will have different theatre arrangements based on size, age and complexity. The table below is a guide only to achieve a neutral pressure theatre scheme and it will be dependent on the dynamics on site and agreement locally on site with clinical/IPC/Estates teams to achieve an arrangement that best fits their needs in protecting and reducing risk to patients and staff. The final scheme will be totally dependent on where the additional extract capacity to the theatre is provided to achieve neutral pressure theatre.

Table 3: Neutral Pressure COVID 19 Theatre

Room Name	Air Change Rate (ACH)	Comment on ACH	Nominal Pressure Pa	Comment
Theatre	15-25 Min 15 reqd Good room air dilution reqd.	Min 15 ACH required for Anaesthetic Gases as per HTM03.	Neutral to Corridor. Neutral pressure in theatre will require active extract air terminals	Additional extract air will be required to achieve neutral pressure and maintain ACH above 15.
Anaesthetic	10 ACH Not use as an Anaesthetic Room.	Min 10	Possibly plus 10 pa to corridor (Ideally the anaesthetics room should be neutral pressure to the theatre, however this may not be practical, in which case the anaesthetics room should only have all surfaces as clear as practical and all surplus or spare equipment held elsewhere).	In line with national guidance the patient should be brought into and out of the theatre through the anaesthetic room, but anaesthetised and recovered in theatre.
Sterile Pack Store (before each procedure only if used)			10 pa to theatre Need to be careful here not to over pressurise the theatre as it's a Neutral pressure theatre that's required.	The preparation room could be dispensed with to avoid having stock that could become pre-contaminated. Sterile packs, instruments and

				consumables would be delivered to the theatre on a case by case basis. If a preparation room is required, then it should be maintained at 10Pa to both the theatre and corridor.
Scrub			Generally Equal to theatre.	May need additional extract here to achieve neutral pressure in the theatre relative to the corridor and maintain adequate ACH within the theatre.
Dirty Utility			Negative to the theatre to achieve neutral pressure theatre Min minus 5 pascals and ideally minus10pa	May need additional extract capacity here to assist in achieving neutral pressure in the theatre relative to the corridor and maintain adequate ACH within the theatre.

Appendix 5 Converting operating theatres to critical care units

In these extraordinary times with increased demand for critical care ventilator support theatre areas may be temporarily converted to critical care units. Any healthcare organisation which is undertaking this assessment or provision should seek to obtain specialist advice both internally from the organisations own multi-disciplinary team (estates (AP(V), IPC, Clinical leads, Decontamination leads, Medical Gas AP(MPGS), HBS Estates etc…) but also from an appropriately qualified and experienced Authorising Engineer (Ventilation) or other suitable professional design consultants with Healthcare Ventilation experience

Typically 2 critical care bed spaces could be provided per theatre with an additional bed located in the anaesthetic room if needed. Additional spaces may be available in the theatre recovery area. The number and type of medical gases and electrical power outlets will have to be checked on site locally prior to critical care usage.

Theatres areas converted to Critical Care Units for non COVID-19 patients

- If kept for the exclusive use by non-infected patients the ventilation system is likely to need little modification or adjustment however lowering both supply and extract rates to achieve Air Change Rates per Hour (ACH) between 10-25 ACH based on patient and staff comfort would be appropriate.
- Recovery spaces are designed to provide 12-15 ACH and should be neutral to surrounding areas so no modifications to the ventilation system should be needed but subject to verification of ventilation system performance room air change rates and pressure profiles

Theatres converted to Critical Care Cohort Units for suspected or confirmed COVID-19 patients

Many COVId-19 patients requiring critical care will undergo aerosol generating procedures. It is recommended where possible that these procedures are performed in negative pressure or neutral pressure rooms with all staff using appropriate PPE for airborne precautions.

Where theatres are being converted to critical care areas then a local risk assessment is required to determine best fit solution with older type systems in view of temporary works required and what's practically achievable relative to risk and resources available. Where infrastructure permits it may be possible to achieve negative pressure or neutral pressure in theatre areas as outlined in Table 1& 2.

If it is not possible to achieve negative or neutral pressure in these areas then it is suggested to modify the ventilation to achieve Air Change Rates per Hour (ACH) of between 10-20 ACH based on patient and staff comfort. As theatres may remain at positive pressure it is essential that where AGPs are being performed all staff in the cohort area including corridors are wearing appropriate PPE

Table 1 below provide a summary of the main requirements to change from a positive pressure theatre as per HTM03 to a negative pressure CCU. Different hospital will have different theatre arrangements based on size, age and complexity. The table below is a guide only to achieve a neutral pressure theatre scheme and it will be dependent on the dynamics on site and agreement locally on site with clinical/IPC/Estates teams to achieve an arrangement that best fits their needs in protecting and reducing risk to patients and staff. The final scheme will be totally dependent on where the additional extract capacity to the theatre is provided to achieve negative pressure Critical Care Unit.

Table 1: Negative Pressure CCU

Room Name	Air Change Rate (ACH)	Comment on ACH	Nominal Pressure Pa	Comment
Theatre Converted to Facilitate Two COVID19 CCU patients.	10-20ACH	Min 10 ACH	Negative to Corridor. Negative pressure in theatre will require active extract air terminals	Additional extract air will be required to achieve negative pressure.
Anaesthetic Converted to Facilitate One COVID19 CCU patient.	10-15 ACH	Min 10 ACH	Negative to Corridor. Neutral pressure to the theatre. Step back supply air.	
Sterile Pack Store (before each procedure only if used)			10 pa to theatre and corridor. Need to be careful here not to over pressurise CCU.	The preparation room could be dispensed with to avoid having stock that could become pre-contaminated. Sterile packs, instruments and consumables would be delivered to the CCU on a case by case basis. If a preparation room is

				required, then it should be maintained at 10Pa to both the adjacent CCU
Scrub			Generally Equal to theatre.	May need additional extract here to achieve negative pressure in the CCU relative to the corridor and maintain adequate ACH within the CCU or 10 -12 ACH.
Dirty Utility			Negative to the CCU Minimum minus 5 pascals and ideally minus 10 pa.	May need additional extract capacity here to assist in achieving negative pressure in the CCU relative to the corridor and maintain adequate ACH within the CCU

Theatres converted to Critical Care Units for suspected or confirmed COVID-19 patients

Table2 below provide a summary of the main requirements to change from a positive pressure theatre as per HTM03 to a Neutral pressure CCU. Different hospital will have different theatre arrangements based on size, age and complexity. The table below is a guide only to achieve a neutral pressure theatre scheme and it will be dependent on the dynamics on site and agreement locally on site with clinical/IPC/Estates teams to achieve an arrangement that best fits their needs in protecting and reducing risk to patients and staff. The final scheme will be totally dependent on where the additional extract capacity to the theatre is provided to achieve Neutral pressure Critical Care Unit.

Table 2: Neutral Pressure CCU:

Room Name	Air Change Rate (ACH)	Comment on ACH	Nominal Pressure Pa	Comment
Theatre Converted to Facilitate Two COVID19 CCU patients.	10-20 ACH	Min 10 ACH Thermal Comfort will influence acceptable higher figure and turndown may be required.	Neutral to Corridor. Neutral pressure in theatre will require additional air exhaust capacity	Additional extract air will be required to achieve Neutral pressure.
Anaesthetic Converted to Facilitate One COVID19 CCU patient.	10-15 ACH	Min 10 ACH	Neutral to Corridor. Neutral pressure to the theatre.	
Sterile Pack Store (before each procedure only if used)			10 pa to theatre. Need to be careful here not to over pressurise CCU.	The preparation room could be dispensed with to avoid having stock that could become pre-contaminated. Sterile packs, instruments and consumables would be delivered to the CCU on a case by case basis. If a preparation room is required, then it should be maintained at 10Pa to both the adjacent CCU
Scrub			Generally Equal to theatre.	May need additional extract here to achieve neutral pressure in the CCU relative to the corridor and maintain adequate ACH within the

				CCU
Dirty Utility			Negative to the CCU Minimum minus 5 pascals and ideally minus 10 pa.	May need additional extract capacity here to assist in achieving negative pressure in the CCU relative to the corridor and maintain adequate ACH within the CCU