



## Infection Control Guiding Principles for Buildings Acute Hospitals and Community Settings

Policy  Procedure  Protocol  Guideline

*Insert Service Name(s), Directorate and applicable Location(s):*

All acute hospitals

All Community settings

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1	2009		SARI
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5	10 <sup>th</sup> Aug 2020	Section 3.1.1.10 and 3.1.1.11	AMRIC Team
6	10 <sup>th</sup> May 2022	Updates to Ventilation Guidance Reference to positive and negative pressure in rooms replaced by reference to controlled ventilation Revision to section on requirement for controlled pressure rooms Emphasis on rapid and complete drainage of water in bathroom fittings and avoidance of splash or reflux. Rephrasing of 3.1.1.6 Removal of content in 3.1.1.12 that relates to use of and markings in existing facilities as this is outside the scope of this document Removal of sections 3.1.1.13 and 3.1.1.14 introduced as a response to COVID-19 but not properly within the scope of this document Reference to importance of resilience with respect to capacity to dispose of waste (section 3.4.5) Updates to clinical hand wash sinks in residential care facilities	AMRIC Team

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## **1.0 INITIATION**

### **1.1 Purpose**

This document has been developed to support consideration of infection prevention and control requirements as central in designing new builds, refurbishing old builds, adding extensions, upgrading existing facilities and undertaking any building work that will impact on how care is provided to patients both in acute hospitals and residential settings in the community. It has been adapted from the 'Infection Prevention and Control Building Guidelines for Acute Hospital, SARI 2009' [1]. **For the purpose of this document, the term 'hospital' will include acute hospitals and all healthcare settings where clinical care is provided.** For ease of use, the recommendations will be divided into four sections:

- Part 1 – Governance
- Part 2 – Acute hospital settings
- Part 3 – Community settings
- Part 4 – Other settings

This guidance has been reviewed to ensure that experience and learning from the COVID-19 pandemic in relation to infrastructural issues has been considered and where appropriate has informed updates to this guidance.

By way of implementing this guidance, it is anticipated that it will be shared by Estates with their planning, design and building teams and will be supported by clinical teams including infection prevention and control teams. It will assist the design, re-design or refurbishment of hospitals to reduce and prevent the occurrence of HCAs and improve patient safety.

### **1.2 Scope**

#### **1.2.1 Target Users**

This guideline is intended for use in planning, designing, building and refurbishing any healthcare setting. As such, it is expected to be used by Estates staff and planners, hospital managers, Chief Officers Community Healthcare Organisations, community services managers, clinical staff and infection prevention and control professionals, quality and risk managers, design teams, those involved in the management and maintenance of buildings and construction contractors.

#### **1.2.2 Populations to whom it applies**

All people who access healthcare in hospitals or community settings.

### **1.3 Objectives**

To ensure infection prevention and control requirements are considered and incorporated as part of any new build, refurbishment or any internal works in HSE facilities and organisations funded by the HSE.

### **1.4 Outcomes**

To reduce and prevent the occurrence of HCAs and improve patient safety, identify and mitigate against infection prevention and control risks and ensure compliance with the current infection prevention and control guidance and regulations.

### **1.5 PPPG Development Group**

AMRIC Team, Capital and Estates, and HCAI Clinical Advisory Group.

### **1.6 PPPG Development Governance Group**

Antimicrobial Resistance and Infection Control Oversight Group.

### **1.7 Supporting Evidence**

- 1.7.1 'Infection Prevention and Control Building Guidelines for Acute Hospital, SARI 2009'  
<https://www.hpsc.ie/a->

- [z/microbiologyantimicrobialresistance/infectioncontrolandhai/guidelines/File,3439,en.pdf](https://www.gov.uk/government/collections/health-building-notes-core-elements)
- 1.7.2 UK DH Health Building Notes (HBN) <https://www.gov.uk/government/collections/health-building-notes-core-elements> – (collected current documents)
- 1.7.3 'Guidelines for the Prevention and Control of Infection from Water Systems in Healthcare Facilities' HPSC 2015 <https://www.hpsc.ie/abouthpsc/scientificcommittees/sub-committeesofhpscscac/waterguidelinessub-committee/Water%20systems%20in%20healthcare%20facilities%20FINAL%20amended%20May%202017.pdf>
- 1.7.4 'National Guidelines for the Prevention of Nosocomial Aspergillosis' HPSC <https://www.hpsc.ie/a-z/respiratory/aspergillosis/guidance/Aspergillus%20Guidelines%202018.pdf> Jan 2018
- 1.7.5 'National Standards for infection prevention and control in community services' HIQA 19 Sept 2018 <https://www.hiqa.ie/reports-and-publications/standard/national-standards-infection-prevention-and-control-community>
- 1.7.6 'National Standards for the prevention and control of healthcare-associated infections in acute healthcare services' HIQA 2017 <https://www.hiqa.ie/reports-and-publications/standard/2017-national-standards-prevention-and-control-healthcare>
- 1.7.7 HBN 00-09 Infection control in built environments 2013 <https://www.england.nhs.uk/publication/infection-control-in-the-built-environment-hbn-00-09/> .
- 1.7.8 HBN 09-03 Neonatal Units 2013 <https://www.england.nhs.uk/publication/neonatal-units-planning-and-design-hbn-09-03/> .
- 1.7.9 Core elements Health Building Note 00-03: Clinical and clinical support spaces 2013 [https://www.england.nhs.uk/wp-content/uploads/2021/05/HBN\\_00-03\\_Final.pdf](https://www.england.nhs.uk/wp-content/uploads/2021/05/HBN_00-03_Final.pdf)
- 1.7.10 HBN 04-01 Supplement 1: Isolation facilities for infectious patients in acute care settings 2013 <https://hberm.com/wp-content/uploads/2015/10/HBN-04-01-Supplement-1-Isolation-facilities-for-infectious-patients-in-acute-settings-20131.pdf>
- 1.7.11 Siegel et al, 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings (CDC, 2007, most recently updated July 2019). <https://www.cdc.gov/infectioncontrol/pdf/guidelines/isolation-guidelines-H.pdf>
- 1.7.12 <https://www.ecdc.europa.eu/sites/default/files/documents/Heating-ventilation-air-conditioning-systems-in-the-context-of-COVID-19-first-update.pdf> ECDC November 2020
- 1.7.13 WHO Roadmap to ensure and improve indoor ventilation in context of COVID-19 (March 2021) <https://www.who.int/publications/i/item/9789240021280>
- 1.7.14 Report on the Expert Group on the Role of Ventilation in Reducing Transmission of COVID-19. Second Report. <https://www.gov.ie/en/publication/aa43c-expert-group-on-the-role-of-ventilation-in-reducing-transmission-of-covid-19/>
- 1.7.15 HTM 03-01 Part A: Specialised Ventilation for Healthcare Buildings. 2021. <https://www.england.nhs.uk/publication/specialised-ventilation-for-healthcare-buildings/>
- 1.7.16 <https://www.who.int/publications/i/item/WHO-2019-nCoV-IPC-2021.1>
- 1.7.17 <https://www.healthfacilityguidelines.com/GuidelineIndex/Index/Infection-Control>
- 1.7.18 [https://www.rehva.eu/fileadmin/user\\_upload/REHVA\\_COVID-19\\_guidance\\_document\\_ver2\\_20200403\\_1.pdf](https://www.rehva.eu/fileadmin/user_upload/REHVA_COVID-19_guidance_document_ver2_20200403_1.pdf)

## 1.8 Glossary of Terms

AMRIC – Antimicrobial Resistance and Infection Control  
 CAG – Clinical Advisory Group  
 CEO - Chief Executive Officer  
 HBN – Health Building Note  
 HCAI – Healthcare Associated Infection  
 HIQA - Health Information Quality Authority  
 HSE – Health Service Executive  
 HTM - Health Technical Memoranda

## 2.0 DEVELOPMENT OF PPPG

Prevention and control of healthcare associated infection and the management of antimicrobial resistance requires a multi-disciplinary approach. This includes adequate space and facilities in all areas to support basic infection prevention and control practice, including appropriate patient placement. The basic infection control practices that should apply in all healthcare at all times are referred to as Standard Precautions. There is a requirement for a high proportion of single *en-suite* rooms. Single rooms should be the norm in new build acute hospital facilities. However, it is appropriate to consider some provision for two-bed units to support care of patients for whom single room accommodation may be inappropriate or stressful. Where such provision is made, each patient should have his/her own toilet facility.

A proportion of single rooms with specific requirements including ventilation controls are required to support implementation of extra precautions for some people infected with, suspected to be infected with or carrying certain types of bacteria or viruses. These extra precautions are referred to as Transmission-based Precautions. There are three categories of Transmission-based Precautions - Contact Precautions, Droplet Precautions and Airborne Precaution. There is also a requirement for a proportion of single rooms with specific requirements including ventilation controls to provide protection to some people who are profoundly vulnerable to infection for a period of time. This is called Protective Isolation.

It is important that hospital designs allow for flexibility of use over time and planning for future service requirements. Hospital buildings are likely to have a life span of many decades, during which time, there are likely to be considerable advances in healthcare technology and changes in the way in which healthcare is delivered.

Single room isolation of people for infection prevention and control purposes is rarely appropriate in any residential setting. However, single rooms are preferable for residents in long stay facilities as this may be the person's home for many years. Where appropriate provisions are made, the rate of falls in single patient rooms need not be higher than for multiple-bedded rooms [2]. Single rooms can facilitate visitors and family members to play a greater role in the care of the person.

The most commonly required category of Transmission Based Precautions is Contact Precautions. A standard single patient room with *en-suite* sanitary facilities is sufficient to support implementation of Contact Precautions. [3].

Containment of certain bacteria and viruses that are routinely spread by the airborne route requires single patient rooms that are specifically designed to minimise airborne transmission. Tuberculosis, measles and chickenpox are universally accepted as routinely transmitted by the airborne route. The requirement in this setting is that the system prevents the flow of air from the room to the corridor. This is because the air in the room is likely to carry pathogenic organisms that come from the person's airway. This is generally achieved by appropriate mechanical ventilation and ensuring that the doors between the room and ante-room and between ante-room and hallway are maintained closed except when entering or leaving the room.

Single patient rooms that are specifically designed to minimise spread of infection by the airborne route are also required in some circumstances for patients with respiratory tract infections that are normally transmitted mainly by the droplet route (such as influenza and COVID-19). Certain types of procedure performed on patients with respiratory viral infection may generate infectious small liquid respiratory particles. Such procedures are known as Aerosol Generating Procedures (AGPs) and are associated with an increased risk of transmission of infection. Endotracheal intubation is an example of an AGP. When AGPs are performed on patients with respiratory viral infection, they should be performed in such a room when possible. In addition, there is experience of increased risk of transmission when patients with respiratory viral infections, such as COVID-19, require high flow oxygen or similar respiratory support. Such patients should also be managed in single occupancy rooms where possible to minimise transmission.

In addition to requirement for single rooms as described above, certain people with profound immune deficiency, such as that which occurs immediately following bone marrow transplantation, require “Protective Isolation” in a room that protects them from exposure to unfiltered air. This is because ordinary air contains fungal spores, which are harmless to most people but can cause very serious disease in profoundly vulnerable people. The requirement in this setting is that the system prevents flow of unfiltered air, that is likely to contain fungal spores and other microorganisms, from the hallway or from outside the building into the room. This can be achieved by appropriate sealing of the room, by ensuring that the doors between the room and ante-room and between ante-room and hallway are maintained closed except when entering or leaving the room and by appropriate mechanical ventilation of the room. Mechanical ventilation ensures controlled inflow of air that is filtered to remove fungal spores and other microorganisms.

Rooms that allow for switching from negative pressure to positive pressure should be avoided. Such rooms have, in practice, resulted in frequent errors in relation to adjustment between their settings so that patients and staff are exposed to airborne infectious agents when the room is inappropriately set to positive pressure or that vulnerable patients are exposed to fungal spores when the room is inappropriately set to negative pressure. Isolation rooms with ventilation systems that are switchable are not allowed in new installations. In existing installations, where older switchable systems still exist, there must be a strict Standard Operating Procedure available to advise staff of their safe use. These systems must be clearly labelled as per HTM guidance.

“Neutral pressure” rooms support both Airborne Precautions for patients with airborne infections and “Protective Isolation” for patients with profound immune deficiency. They have advantages because they have this dual function. [4]

The ratio of airborne isolation rooms to general rooms required for a given hospital is dependent on local, regional, and potentially national prevalence of infections requiring airborne isolation (particularly tuberculosis), local IPC policy and national IPC strategy, and requirements for future emergency/ pandemic response planning.

A review of airborne isolation room requirements in hospitals in Florida, based on Health Resources and Service Administration critical benchmarks, concluded that large regional hospitals should have at least one airborne isolation room per 75 acute beds, other acute hospitals should have one per 150 beds, and that these should be located as close as possible to the emergency department [5]. The International Health Facility Guidelines (iHFG) updated in 2019 suggest 1 negative pressure isolation room per 100 inpatient units. <https://www.healthfacilityguidelines.com/GuidelineIndex/Index/Infection-Control>.

Both sources referred to predate the COVID-19 pandemic. In addition to the classical airborne pathogens listed above there is growing experience that other viruses, including, SARS-CoV-2 and Influenza virus, can also spread by the airborne route in particular in context of certain medical procedures and in crowded settings with poor general ventilation. This experience requires an increased focus on ensuring adequate general ventilation in all healthcare buildings in the context of any new build or refurbishment work.

In the context of that experience 1 in 75 should be considered a minimum for all new acute hospital builds and one controlled pressure room per 25 to 30 bed ward may be more appropriate. In a development on an existing site, the number of controlled pressure isolation rooms in the new build should take in to account the need to compensate for deficits in controlled pressure isolation rooms in other inpatient areas on the site.

The basic guiding principles include:

- Ensuring Infection Prevention and Control staff are central to every stage in designing new builds, refurbishing old builds, adding extensions, upgrading existing facilities and undertaking any building work that will impact on how care is provided to patients. The design and build should reflect the recommendations of the Infection Prevention and Control

- service, while taking account of project budget, scale and scope.
- Patient accommodation should be designed in a way that addresses a number of requirements related to Infection Prevention and Control including:
  - Maximising patient comfort and dignity
  - Ensuring ease of delivery of patient care
  - Appropriate provision for family members and other visitors
  - Minimising risk of transmission of microorganisms
  - Adequate facilities for storage of equipment and supplies
  - Adequate toilet and shower facilities designed and build to ensure rapid and complete drainage of all water and to prevent backflow from drainage systems to the greatest extent practical.
  - Number, design and placement of facilities to manage commodes in terms of storage and cleaning
  - Hand hygiene facilities – optimising design, visibility and location of wash hand sinks and location of alcohol gel dispensers
  - Environmental cleaning and decontamination – location, storage, accessibility
  - Building services and plant should be designed to mitigate infection prevention and control risks (for example removal of dead legs in water supply systems) and to incorporate efficient and optimised maintenance regimes (easy access allowing routine flushing/testing).
  - Ensuring adequate general ventilation in all areas.

The recommendations contained in this document are designed to minimise the risk of transmission of microbes for patients receiving care in hospitals and other healthcare settings.

### **3.0 Recommendations**

#### **Part 1 Governance**

#### **3.1 Planning and Governance**

##### **3.1.1 Planning and Design**

- 3.1.1.1 Planning and design of new hospitals, or major hospital refurbishments, should take account of relevant UK NHS Health Technical Memoranda (HTM), Health Building Notes (HBN), or an equivalent international guidance document that has been approved by HBS Capital and Estates.
- 3.1.1.2 Initial planning and design of all new builds, upgrades and refurbishments should maximise the available space for inpatient accommodation and support services within a design that allows for future reconfiguration of inpatient accommodation.
- 3.1.1.3 In the design and planning of new developments cognisance should be taken of future service needs and the flexibility of layouts and functions should be considered.
- 3.1.1.4 The overall shape and layout of new hospital buildings, upgrades or refurbishments should optimise staff workflow, patient comfort and safety and allow for optimal delivery of healthcare in consultation with infection prevention and control staff.
- 3.1.1.5 Where possible all new builds and refurbishments should be designed with future developments/requirements in mind – including requirements for surge response in a pandemic.
- 3.1.1.6 Buildings should be designed so as to support future service requirements such as may be required during an outbreak/pandemic. Consideration should be given as to how the building could, to the greatest practical extent, support a self-contained area with capacity to receive and care for patients and provide services for staff working in that area if required in an epidemic. This may require multiple access points to stream patients through separate entrance and exits. This may also require modification of the



ventilation of that area to support a different use for the area, such as for patients with infectious diseases transmissible through the air.

3.1.1.7 In relation to areas other than single-patient rooms consideration should be given to facilitating ease of placement of mobile or fixed partitions when required as part of the response to an outbreak/pandemic.

3.1.1.8 If partitions are considered in specific circumstance a risk assessment is required. The risk assessment should take into account the size of the area, can physical distancing be maintained, the type of service being delivered and the ease of access to bed space required during emergencies (for example a cardiac arrest trolley).  
If partitions are used, they must be made of material that is smooth and cleanable preferably with an impervious surface (no grooves).

<https://www.england.nhs.uk/publication/infection-control-in-the-built-environment-hbn-00-09/> (Section 3.140)

3.1.1.9 All clinical areas should have capacity for adequate ventilation to the greatest extent that is practical consistent with comfort and without introducing other potentially greater risks (for example aspergillus spores).

HTM 03-01 Part A provides guidance on the ventilation requirements of different room types in the clinical setting including minimum air change rates.

<https://www.england.nhs.uk/publication/specialised-ventilation-for-healthcare-buildings/>

Where local exhaust ventilation is required, it is preferable that it is located at the bedhead to reduce risk of infection

Computerised Fluid Dynamic (CFD) modelling is a useful design tool in demonstrating adequate ventilation in rooms for managing patients with respiratory viral infections. It has particular benefit where there is a need to demonstrate a 'clean air path'.

3.1.1.10 Wall-mounted hand hygiene stations with alcohol-based hand rub should be available at all entrances and exits and outside every room/ward.

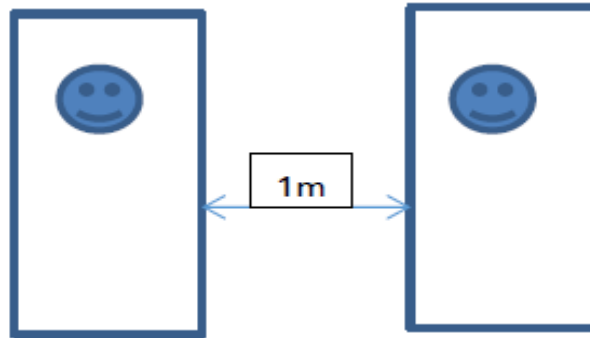
3.1.1.11 Walls: Smooth cleanable impervious surfaces are recommended in clinical areas. Design should ensure that surfaces are easily accessed, will not be physically affected by detergents and disinfectants, and will dry quickly. Additional protection to the walls should be considered to guard against gouging/impacts with bedheads and trolleys. Wall surfaces should be maintained so that they are free from fissures and crevices (see also Health Building Note 00-10 Part B – 'Walls and ceilings').

3.1.1.12 Distancing (including physical distancing)

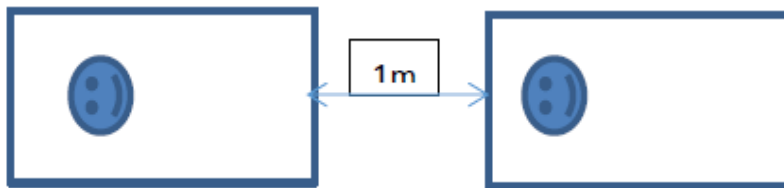
The following reflects distancing that meets IPC requirements as informed by COVID-19 pandemic. New builds and refurbishments should ensure that these requirements can be met.

### Spacing between beds and trolleys

When lined up side to side a **minimum distance** of 1m is required from edge of bed/trolley to edge of bed/trolley.



When lined up end to end a **minimum distance** of 1m is required from foot of bed/trolley to head of bed/trolley.



### Corridors

Newly constructed corridors should be of sufficient width to facilitate physical distancing between people passing in the corridor. Where practical the layout should support unidirectional flow when this is required.

#### Lifts/Elevators

Newly installed lifts should be of sufficient size to facilitate physical distancing.

#### Waiting areas

New build and refurbished waiting areas should facilitate distancing between patients /couples. A distance of 1m should be maintained between individual patient seats and between paired seats for couples (that is to allow a patient and accompanying person who is supporting them to sit side by side). The distance applies side to side and between seats in different rows. All seats should face the same direction (as per arrows) to avoid people being seated face to face.

## **3.1.2 Involvement of infection prevention and control teams and staff**

3.1.2.1 HSE Estates and AMRIC should agree an infection prevention and control liaison at national level to work with Estates in relation to infection prevention and control



requirements for new builds, infrastructural developments and the refurbishment/upgrades of existing facilities.

- 3.1.2.2 The local infection prevention and control team/advisors must be involved at all stages of new healthcare developments; particularly development briefing/planning meetings, design development, planning, construction planning, equipping and commissioning of the new facility. The local infection prevention and control team/advisors must be represented on the client project team for the new development. Their advice and recommendations should be consistent and aligned to national standards incorporated into the process.
- 3.1.2.3 Involvement of infection prevention and control team in the process should be in line with the recommendations detailed in HBN 00-09 (“Infection control in the built environment”) [6].
- 3.1.2.4 There should be consultation with all grades of staff who will be potential users of the ward/unit early in the briefing/planning phase, to ensure adequate space is allocated for all services, including ancillary or support services (such as storage and collection and disposal of healthcare waste). Patients and other potential stakeholders should be included in the consultation process, where relevant.
- 3.1.2.5 Infection prevention and control requirements must be incorporated in the design and fit-out of all patient care areas in acute hospitals and community residential facilities. This includes inpatient care areas, outpatient departments, day wards, operating theatres, physiotherapy departments, accident and emergency departments, central sterile supplies departments etc. The design of such areas should take account of the relevant UK HTM (or equivalent), where one exists.
- 3.1.2.6 Prior to Construction Contract Award, the following items need to be considered, specified and incorporated (as appropriate) into any tender specifications and documentation, to form part of the suite of Construction Contract documentation:
- The requirement for all works to be carried out in compliance with the latest version of the ‘National Guidelines for the Prevention of Nosocomial Aspergillosis’ HPSC <https://www.hpsc.ie/a-z/respiratory/aspergillosis/guidance>. Any and all requirements for aspergillosis protection and enabling works and control parameters need to be reviewed, considered and designed with the Client Stakeholder Group and Project Design team.
  - The requirement for work permit system/submission of method statements to be presented for review and comments to the client stakeholder team (including infection prevention and control representation), as appropriate, with adequate review periods agreed at the outset.
  - Any and all testing and monitoring protocols required during construction works, and assignment of responsibility for same, including testing frequencies, intervals, methods and results reviews and actions need to be clearly specified and set out.
  - Any and all testing and monitoring protocols required prior to substantial completion, handover and occupancy, and assignment of responsibility for same, including scheduling, testing frequencies and periods, intervals, methods, timelines for results and results reviews and actions need to be clearly specified and set out.

### **3.1.3 Carrying out the works**

- 3.1.3.1 Appropriate safeguards must be put in place to minimise the risk of transmission of infection during the construction period, with particular reference to prevention of aspergillus and legionella transmission, in accordance with relevant national guidelines [7].
- 3.1.3.2 When working in or around “live” healthcare facilities or where construction work may impact on the provision of services, a work permit system/method statement must be in place and adhered to by all parties. Prior to any works commencing, the works (and the time period for same) must be signed off by the appropriate parties (which may include local infection prevention and control professionals). The contractors (and or sub-

contractors) must abide by the terms of the work permit. The work practices must be adequately supervised and be compliant with the local infection prevention and control requirements.

3.1.3.3 Technical details of submissions for building services, systems, finishes, infrastructure, plant, iron monger and Group 1 items should be presented for review and comment to the infection prevention and control stakeholder team, as appropriate, with adequate review periods permitted.

3.1.3.4 Infection prevention and control staff should be involved and have final sight of all Room Data Sheets (RDSs) prior to final sign-off. They need to be involved in not only the room layout, but also all the room fitting out, plumbing, electrics all of which are contained within the RDSs.

#### **3.1.4 Sign-off of completed projects**

3.1.4.1 On completion of all works, and prior to substantial completion certificate being issued, the infection prevention and control stakeholder team will be afforded the agreed and allocated time periods, intervals and frequencies for undertaking all appropriate testing and monitoring in accordance with the contract documentation. The contract timeline will account for these testing timelines (as agreed prior to tender) and should not incur delays to handover timelines.

3.1.4.2 On completion of a project the Design Team (Architect normally) will issue a Certificate of Substantial Completion. This certificate will state that the works are substantially complete and are in accordance with the design and specifications for the project. The relevant members of the Design Team will also, where necessary, issue a statement of compliance with Planning Permission, Fire Certification and Building Regulations.

3.1.4.3 On receipt of practical completion, the local Infection Prevention and Control Team assist the Design Team, HBS Estates and Service Management in snagging, de-snagging and commissioning the facility.

## Part 2 – Acute Hospital Settings – Infection Prevention and Control

### 3.2. Inpatient accommodation for new hospital builds or major renovations

These infection prevention and control recommendations apply to:

- New hospital builds (that is where a wholly new acute hospital facility is being constructed).
- Major additions to existing hospitals (that is where newly constructed inpatient accommodation is added on an existing hospital site, such as the addition of a new ward block or wing).
- Major renovations and infrastructural developments to existing hospital in-patient accommodation areas (that is where an existing inpatient accommodation area is entirely re-modelled, including an extension to provide significant increase in the footprint of the inpatient accommodation area).

#### 3.2.1 Proportion of single patient rooms

Newly built acute hospital inpatient accommodation should generally comprise entirely or almost entirely of single patient en-suite rooms. Some provision for two bed units (although with individual patient toilets) may be considered where appropriate to meet the overall care needs of some people [7].

#### 3.2.2 Single patient room design

All single patient rooms should have “en-suite” shower and toilet facilities. They should be designed and installed so as to minimise risk of pooling of water after use or reflux or back splash from the drainage system.

All single patient rooms should have a clearly visible clinical hand wash sink (HBN 00 - 09), in close proximity to the entrance to the room (in addition to a sink for patient use, included as part of the “en-suite” facilities). The “en-suite” facilities should be for the sole use of the person occupying the room. They should be designed and installed so as to minimise risk of pooling of water after use or reflux or back splash from the drainage system.

The design and space requirements of single patient rooms should follow the specifications outlined in UK HBN 04-01 “Adult In-patient Accommodation” Supplement, or equivalent international guidance document.

Single patient rooms in critical care areas (for example intensive care units) should have a minimum floor area of 26m<sup>2</sup> (not including “en-suite” sanitary facilities, if such facilities are present) [HBN 04-01].

Single patient rooms should be designed in a way that maximises visibility of patients by healthcare staff, while allowing for patient privacy. Consideration should be given to maximizing the visibility of patients to assist monitoring of those patients. In the case of hospital facilities for children, the design should take account of the need to accommodate a parent or guardian in the room to accompany the child.

#### 3.2.3 Proportion of airborne isolation rooms

Newly built general acute hospitals should have a minimum of one airborne isolation room for every 150 acute inpatient beds [1].

Newly built regional and tertiary hospitals should have a minimum of one airborne isolation room for every 75 acute inpatient beds [1].

Airborne isolation rooms should be provided within both critical and non-critical care areas including emergency departments.

Newly built emergency departments and critical care units should include at least one airborne isolation room.

Some hospital units will require a higher proportion of isolation rooms with controlled ventilation, based on local risk assessment. These decisions should be made in consultation with the infection prevention and control team in the hospital. Such units could include:

- Those likely to accommodate patients with infections transmissible by the airborne route, such as infectious disease units or respiratory units.
- Those likely to house patients with profound immunosuppression, requiring protective isolation, such as solid organ or bone marrow transplantation units.

#### **3.2.4 Airborne isolation room design**

Airborne isolation rooms **should not** be based on a “switchable” negative/ positive pressure design. HBN 04 Supplement 1 <https://hberm.com/wp-content/uploads/2015/10/HBN-04-01-Supplement-1-Isolation-facilities-for-infectious-patients-in-acute-settings-20131.pdf>

Airborne isolation rooms require a dedicated ante room, which should have a minimum floor area of 4m<sup>2</sup>.

In the design of new acute inpatient accommodation, consideration should be given to including one or more single patient rooms with “en-suite” sanitary facilities and dedicated anterooms in each ward, which could be readily converted to airborne isolation rooms, if required. This is in addition to the requirements of 3.2.1 above.

#### **3.2.5 Multiple patient room design**

Where rooms accommodating more than two beds must be accepted in a plan for major renovation they should not contain any more than four beds per room (HBN 00-09).

Multiple-bedded rooms should be designed in a way that maximises the potential for future reconfiguration of such rooms.

All multiple-bedded rooms should include shower and toilet facilities for the sole use of the people occupying the room.

There should be a minimum floor space for each bed of 19m<sup>2</sup> (3,600mm x 3,700mm) space which includes the bed, to allow for clinical activity and potential future reconfiguration of rooms.

#### **3.2.6 Ward/unit layout**

Design of wards/units that include in-patient accommodation should take account of recommendations set out in UK HBN-04, or equivalent international guidance document.

Wards/units should be designed so that the flow of goods, services and waste materials is such that cross-contamination between contaminated and clean items is minimised.

In areas such as emergency departments and out-patient services where individual patient room with own toilet are not the model there should be sufficient toilets to manage needs at peak occupancy. There should be separate toilet facilities for those awaiting care and those receiving care.

#### **3.2.7 Ward/unit fixtures and fittings**

Furniture, surface finishes and other fixtures and fittings within any ward/unit that includes in-patient accommodation should be easily cleaned and disinfected, and designed to minimise the risk of transmission of infection, in line with the recommendations in HBN 00-09 2013, or equivalent international guidance document.

Advice should be sought, early in the design phase, on selection of furniture, surface finishes and other fixtures and fittings from the infection prevention and control team.

- Hand hygiene facilities in patient care areas should follow the recommendations included in the latest version of Guidelines for Hand Hygiene in Irish Healthcare Settings (SARI, 2015). *A National Clinical Guideline on Infection Prevention and Control is in development. Once approved by the National Clinical Effectiveness committee, the SARI building guidance for acute hospitals of 2015, and the SARI guidance on hand hygiene in Irish healthcare settings will be retired from use.*
- Wall-mounted hand hygiene stations with alcohol-based hand rub should be available at all entrances and exits and outside every room/ward.
- Clinical hand wash sinks
  - should be independent of patient and/or en-suite sinks and should be dedicated for hand washing only and labelled accordingly.
  - should conform to HBN 00-10 Part C Sanitary Assemblies
  - should be accessible and located so that they are convenient for use; they should not be situated behind curtain rails
  - Planning the appropriate number of bedpan washers, macerators and other critical waste disposal services should take account of the need for continuity of service during equipment failure or scheduled downtime. This particularly important in areas intended for high-risk infectious patients and areas intended to have capacity to function as self-contained units.

### **3.2.8 Ventilation**

It is important to ensure adequate ventilation in all areas consistent with comfort and without introducing other potentially greater risks (see above).

## **3.3 Re-modelling of in-patient accommodation in existing acute hospitals**

These recommendations apply to internal renovations or re-modelling of existing in-patient accommodation areas. Such renovations may involve major internal construction work, including re-modelling, which may include removal of external walls to ensure compliance with infection prevention and control requirements.

### **3.3.1 Infection prevention and control and hospital refurbishment**

The recommendations outlined in Recommendation 3.1 apply to all renovation, re-modelling or refurbishment projects in existing acute hospitals.

Any such project in existing acute hospitals should be seen as an opportunity to improve infection prevention and control infrastructure.

### **3.3.2 Hospital development plans**

Acute hospitals should produce a development control plan/spatial strategy, in consultation with the local infection prevention and control team, to examine ways of maximising the proportion of single rooms (with “*en-suite*” facilities) and minimising the proportion of multiple-bedded rooms and the number of beds in each multiple-bedded room. The plan should take account of current and future bed capacity and bed usage, in line with HSE regional and national policy. The plan should prioritise delivery of improved infection control-related infrastructure within as brief a time period as possible. The goals of ensuring that all multiple-bedded rooms have a toilet dedicated for use of people in that room and that multiple-bedded rooms with more than four beds are eliminated merits high priority in any such plan.

### **3.3.3 Internal reconfiguration**

If an extension to the existing hospital footprint, or construction of new hospital buildings, is not planned within 10 years, hospitals should aim to convert existing in-patient accommodation in line with the recommendations outlined in this document. Where the recommendations in section 3 are not achievable within the existing hospital footprint, hospitals should reconfigure existing inpatient accommodation to achieve a mixture of single and multiple-bedded rooms with avoidance of rooms with more than four beds to the greatest extent possible.

## Part 3 – Community Settings - Infection Prevention and Control

### 3.4 Inpatient/service user accommodation for new builds or major renovations in community settings

These recommendations are similar to those outlined in Recommendation 3.1 above and applies to:

- New Residential Care Centres (that is where a wholly new facility is being constructed).
- Major additions to existing Residential Care Facilities (that is where newly constructed inpatient accommodation is added on an existing site, such as the addition of a new ward block or wing).
- Major renovations to existing in-patient/residential accommodation areas (that is where an existing inpatient/residential accommodation area is entirely remodelled, including an extension to provide significant increase in the footprint of the in-patient/residential accommodation area).

#### 3.4.1 Proportion of single person rooms

Newly built accommodation in residential care facilities should generally be made up of single person rooms unless there is a specific requirement for some twin rooms to meet the needs of some residents. This relates to people's general preference and as the facility may be the person's home for the foreseeable future.

#### 3.4.2 Single resident room design

- All single resident rooms should have “*en-suite*” shower and toilet facilities.
- In long-term care facilities, there is generally no requirement for a clinical hand wash sink in every resident's room. This is different from the recommendation for clinical hand wash sinks referred to in SARI 2015 guidance on hand hygiene in Irish healthcare settings and in the SARI 2015 buildings guidance.
- *A National Clinical Guideline on Infection Prevention and Control is in development. Once approved by the National Clinical Effectiveness committee, the SARI building guidance for acute hospitals of 2015, and the SARI guidance on hand hygiene in Irish healthcare settings will be retired from use.*
- Hand hygiene can generally be supported by having a clinical hand wash sink within easy walking distance of each room together with appropriate access to alcohol-based hand rub.
- Wall-mounted hand hygiene stations with alcohol-based hand rub should be available at all entrances and exits and outside every room/ward.
- Wherever possible long-term care facilities should be designed to include some resident rooms with a clinical hand wash sink to cater for the care of residents with specific needs for example residents with diarrhoea, stomas or discharging wounds. The number of such rooms required will depend on the intended profile of residents. In general, one-room-in-ten with a clinical hand wash sink may be appropriate. The resident's hand wash sink in a room should not be considered as serving as a dual purpose as resident/clinical hand wash sink.  
When installed, the following should apply to clinical hand wash sinks:
- Clinical hand wash sinks
  - should conform to HBN 00-10 Part C Sanitary Assemblies
  - should be accessible and located so that they are convenient for use; they should not be situated behind curtain rails
- Single person rooms, including en-suite sanitary facilities, should have a floor area of at least 22.5m<sup>2</sup>. The single bedroom is 16m<sup>2</sup> with a 6m<sup>2</sup> en-suite.
- Single person rooms should have adequate seating space for family and other visitors that does not interfere with care of the person.

#### 3.4.3 Multiple person room design

- Multiple-bedded rooms should not contain any more than **four** beds per room.
- Multiple-bedded rooms should be designed in a way that maximises the potential for future reconfiguration of such rooms.



- All multiple-bedded rooms should include shower and toilet facilities for the sole use of the people occupying the room.
- The layout of the bedroom should allow for care activity to take place adjacent to the bed without intruding into the adjacent bed space

#### **3.4.4 Ward/unit layout**

Wards/units should be designed so that the flow of goods, services and waste materials is such that cross-contamination between contaminated and clean items is minimised.

Layout should be such as to facilitate cohorting of a group of residents in one section of the unit if required in the context of an outbreak of infectious disease.

#### **3.4.5 Ward/unit fixtures and fittings**

- Furniture, surface finishes and other fixtures and fittings within any ward/unit that includes inpatient accommodation should be easily cleaned and disinfected, and designed to minimise the risk of transmission of infection, in line with the recommendations in UK HBN 00-09, or equivalent international guidance document.
- Advice should be sought, early in the design phase, on selection of furniture, surface finishes and other fixtures and fittings from the infection prevention and control team.

Hand hygiene facilities in resident care areas should follow the recommendations included in Guidelines for Hand Hygiene in Irish Healthcare Settings (SARI 2015). There is however an updated recommendation on the placement of sinks, namely that a clinical hand wash sink should be provided in each single-bed patient room with the exception of mental health, learning disability settings and residential care facilities.

- Bedpan washers/Macerators: There is no persuasive evidence or consensus of expert opinion to favour use of either reusable or disposable bedpans or urinals from an infection prevention and control perspective. Whichever approach is chosen, there is a requirement from an infection prevention and control perspective for appropriate equipment (bedpan washer disinfectors or macerators) that is appropriately installed and maintained and which can be repaired promptly.
- Planning the appropriate number of bedpan washers, macerators and other critical waste disposal services should take account of the need for continuity of service during equipment failure or scheduled downtime. This particularly important in areas intended for high-risk infectious patients and areas intended to have capacity to function as self-contained units.

#### **3.4.6 Ventilation**

It is important to ensure adequate ventilation in all areas consistent with comfort and without introducing other potentially greater risks (see above).

### **3.5 Healthcare Centres and other outpatient-type facilities in the community**

#### **3.5.1 Clinic/Unit rooms**

- Healthcare is provided in various settings within the community including health centres, primary care centres and clinic rooms within buildings. The general principles outlined above apply and local infection prevention and control staff should be consulted at all stages including design of new builds, upgrading or refurbishment of existing facilities and procurement of equipment for use in these facilities (HBN 00-09).

- Clinic space should be designed to minimize cross-contamination between contaminated and clean items.
- Waiting areas should be designed to support adequate distance between people waiting and appropriate access to toilet facilities. Where possible consideration should be given to providing a discrete waiting area for a person with a suspected communicable infectious disease waiting to be seen.

### **3.5.2 Fixtures and fittings**

- Furniture, surface finishes and other fixtures and fittings within any clinic room/unit where clinical care is delivered should be easily cleaned and disinfected, and designed to minimise the risk of transmission of infection.
- Community setting advice should be sought from HIQA at project briefing stage.
- Advice should be sought, early in the design phase, on selection of furniture, surface finishes and other fixtures and fittings from the infection prevention and control team.
- Hand hygiene facilities in patient care areas should follow the recommendations included in the latest version of Guidelines for Hand Hygiene in Irish Healthcare Settings (SARI, 2015).

Refer to section 3.4.6 for notes on ventilation for this sector

## **Part 4 - Other Settings - Infection Prevention and Control**

### **3.6 Settings where end of life care is frequently provided**

Hospitals and other settings may have additional non-clinical facilities dedicated for the dignity and comfort of families under special circumstances. These facilities include family rooms and kitchenettes where clinical care does not occur but may be located close to acute clinical care areas. These facilities should be provided with a dedicated toilet with hand hygiene facilities. The furniture and fittings of these rooms may include soft furnishings for comfort but should be selected with a view to ensure that components such as cushions can be detached to facilitate cleaning and that surfaces are cleanable (for example vinyl). Any type of blinds and skirting boards that are easy to clean are acceptable.

### **4.0 GOVERNANCE AND APPROVAL**

- AMRIC Implementation Team
- HBS Estates
- AMRIC Oversight Group
- Clinical Advisory Group

### **5.0 COMMUNICATION AND DISSEMINATION**

- This guideline is circulated through the Acute Operations Office to all Hospital CEOs and General Managers, Community Operations to all Chief Officers.
- This guideline is circulated through Estates to all Regional Estates Leads.
- This guideline is also available on line [www.hse.ie/infectioncontrol](http://www.hse.ie/infectioncontrol).

### **6.0 IMPLEMENTATION**

Implementation of this guideline is the responsibility of all hospital managers, Chief Officers and Regional and local Estates Leads.

### **7.0 MONITORING, AUDIT AND EVALUATION**

The learning from this guideline should be shared with relevant professionals at team meetings.

### **8.0 REVISION/UPDATE**

The AMRIC Implementation Team, Capital and Estates and CAG will review this guideline every two years.

## 9.0 References

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14. WHO Roadmap to ensure and improve indoor ventilation in context of COVID-19 (March 2021) <https://www.who.int/publications/i/item/9789240021280>

## 10.0 Additional relevant material

1. Guidelines for the Prevention and Control of Infection from Water Systems in Healthcare Facilities' HPSC 2015 <https://www.hpsc.ie/about/hpsc/scientificcommittees/sub-committeesofhpscscac/waterguidelinessub-committee/Water%20systems%20in%20healthcare%20facilities%20FINAL%20amended%20May%202017.pdf>
2. National Standards for infection prevention and control in community services' HIQA 19 Sept 2018 <https://www.hiqa.ie/reports-and-publications/standard/national-standards-infection-prevention-and-control-community>
3. National Standards for the prevention and control of healthcare-associated infections in acute healthcare services' HIQA 2017 <https://www.hiqa.ie/reports-and-publications/standard/2017-national-standards-prevention-and-control-healthcare> .
4. HBN 09-03 Neonatal Units 2013 <https://www.england.nhs.uk/publication/neonatal-units-planning-and-design-hbn-09-03/>.
5. Core elements Health Building Note 00-03: Clinical and clinical support spaces 2013 [https://www.england.nhs.uk/wp-content/uploads/2021/05/HBN\\_00-03\\_Final.pdf](https://www.england.nhs.uk/wp-content/uploads/2021/05/HBN_00-03_Final.pdf)
6. HBN 04-01 Supplement 1: Isolation facilities for infectious patients in acute care settings 2013 <https://hberm.com/wp-content/uploads/2015/10/HBN-04-01-Supplement-1-Isolation-facilities-for-infectious-patients-in-acute-settings-20131.pdf> .
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**ENDS**