

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

Title of PPPG Development Group:	Antimicrobial Resistance and Infection Control (AMRIC) Implementation Team		
Approved by:	ARMIC Oversight Group AMRIC Implementation Team Estates (Document submitted for review to HCAI Clinical Advisory Group)		
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5	10 th August 2020	Section 3.1.1.10 and 3.1.1.11	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 managers and planners, hospital managers, Chief Officers Community, 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.

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, 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'
- 1.7.2 UK DH Building Notes <https://www.gov.uk/government/collections/health-building-notes-core-elements>
- 1.7.3 'Guidelines for the Prevention and Control of Infection from Water Systems in Healthcare Facilities' HPSC 2015
- 1.7.4 'National Guidelines for the Prevention of Nosocomial Aspergillosis' HPSC Jan 2018

- 1.7.5 'National Standards for infection prevention and control in community services' HIQA 2018
- 1.7.6 'National Standards for the prevention and control of healthcare-associated infections in acute healthcare services' HIQA 2017.
- 1.7.7 HBN 00-09 Infection control in the built environment DH 2009.
- 1.7.8 HBN 00-09 Infection control in built environments 2013.
- 1.7.9 HBN 09-03 Neonatal Units 2013.
- 1.7.10 Core elements Health Building Note 00-03: Clinical and clinical support spaces
- 1.7.11 HBN 04-01 Supplement 1: Isolation facilities for infectious patients in acute care settings.
- 1.7.12 Siegel et al, 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings (CDC, 2007, most recently updated July 2019).

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-factorial 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. Ideally, 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 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 spread by the airborne route such as tuberculosis, measles and chickenpox requires single patient rooms that are specifically designed to minimise airborne transmission. The requirement in this setting is that the system prevents the flow of air from the room to the hallway. 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 maintaining the room at negative pressure compared to the hallway 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 also required in some circumstances for patients with respiratory tract infections that are normally transmitted by the droplet route (such as influenza and COVID-19). Certain types of procedure performed on patients with droplet transmitted infection may generate infectious aerosols. 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 droplet transmitted infection, they should be performed in such a room when possible.

In addition to requirement for rooms for people with airborne-transmitted infectious disease and those with droplet-transmitted infectious disease undergoing AGPs, 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 maintaining the air within the room at positive pressure relative to the hallway. Positive pressure is maintained by 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 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 prepared to advise staff of their 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 number of airborne isolation rooms and the type of airborne isolation rooms required for a given hospital is dependent on case mix, local prevalence of infections requiring airborne isolation (particularly tuberculosis) and requirements for future emergency 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 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.

- 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
 - 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).

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 Health Technical Memoranda (HTM), Health Building Notes (HBN), or an equivalent international guidance document that has been approved by HBS 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 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 **streaming of patients** if required during an outbreak/pandemic. This may require multiple access points to stream patients through separate entrance and exits.
- 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 social 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 preferable with an impervious surface (no grooves). The purpose of the partition will inform the height requirement.

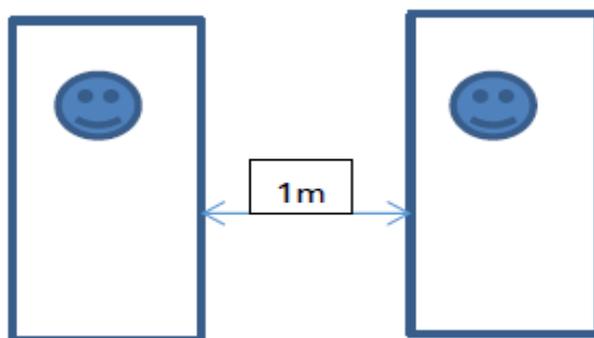
3.1.1.9 Wall-mounted hand hygiene stations with alcohol-based hand rub should be available at all entrances and exits and outside every room/ward.

3.1.1.10 Distancing (including Social Distancing)

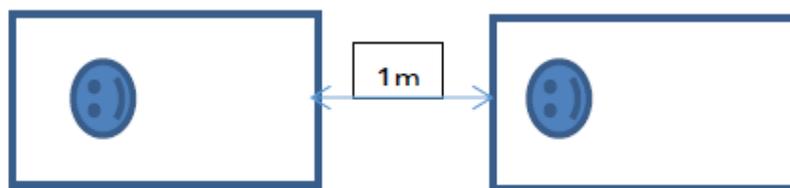
The following reflects distancing that meets IPC requirements as informed by COVID-19 pandemic.

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.



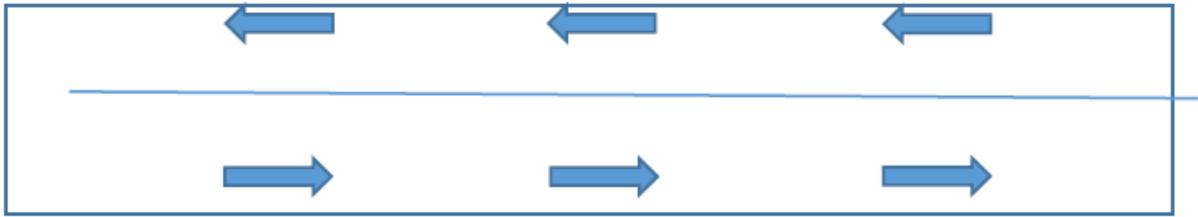
When lined up end to end a **minimum distance** of 1m is required from foot of bed/trolley to head of bed/trolley.



Corridors

People passing corridors is unlikely to be a major factor in spread of infection in healthcare if people do not form informal groups in the corridor. However, the possibility cannot be excluded. Therefore, newly constructed corridors should be of sufficient width to facilitate social distancing between people passing in the corridor. Where practical the layout should support unidirectional flow when this is required. In many existing buildings, unidirectional flow may have limited application because the building lay out does not support it or patients/service users and staff cannot be expected to use a long circuitous route to get from A to B following a one-way system when there is a short route direct route the other way. A user-unfriendly one-way

system could be counterproductive to some degree since it could increase footfall as well as impair efficiency. Marking a corridor as illustrated regardless of width may help to manage the risk of physical contact in corridors and thus to manage risk.



Lifts/Elevators

Newly installed lifts should be of sufficient size to facilitate social distancing. Many existing lifts are quite small. The number of people that can be accommodated in the lift with appropriate distance will depend on the size of lift and the purpose it is used for. In a lift for transporting a patient/resident in a bed, no one other than essential persons should be in the lift at that time. In lifts used for people standing or using chairs, consideration should be given to maximising the distance between people in the lift. The most practical arrangement is probably to demarcate the lift into halves or quarters with signage indicating that people are intended to stay in the half/quadrant and face forward (limiting face-to-face contact). Time in the lift is likely to be brief (minutes) and if people with symptomatic infection are not present, briefly occupying a lift with someone is very unlikely to contribute significantly to spread of droplet transmitted infection such as SARS-CoV-2 if people do not have physical contact and avoid informal group discussions. Excessively restricting the number of people who can use the lift could become counterproductive if the consequence is the number waiting for the lift build up at busy times.

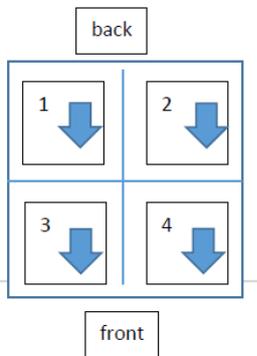
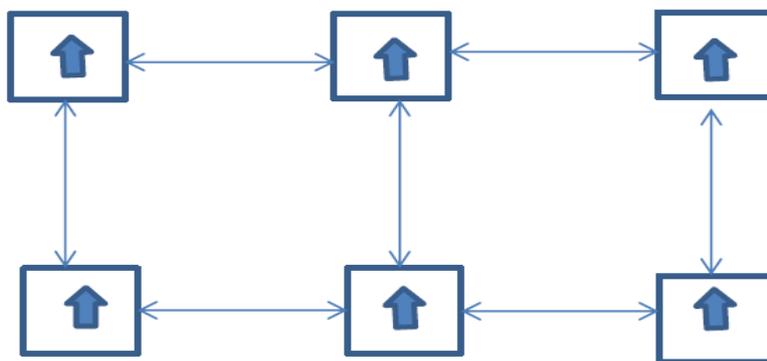


Diagram of seating arrangements in a public or patient waiting area



Ideally, seats available for use should be arranged to maintain distance. If the seating area is managed as clinical space with controlled access, a minimum distance of 1m must be maintained. 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. Where distance cannot be maintained in waiting areas patients and those who accompany them should wear a cloth face covering or provided with a surgical mask. Note where a patient is accompanied by a person and that person is from their household there is no requirement to maintain social distance.

3.1.1.11 Partitions/Screens

The priority in the first instance is to ensure that people with symptoms of COVID-19 (such as fever, cough, shortness of breath, sudden loss of sense of taste or smell) do not attend for work. If no virus is present, the virus cannot spread.

Patients of course need to be able to attend – the key there is to identify patients with suspected COVID-19 as quickly as possible and to manage them with specific additional measures (single room etc.).

All of the measures applied otherwise are intended to manage the residual risk related to the possibility that a person (patient or worker) who may be infectious but is present in a general care areas or a work space but are not recognised.

The primary controls intended to manage spread of infection due an infectious person being present but unrecognised are hand hygiene, respiratory etiquette, maintaining distance and surgical mask use in accordance with NPHET recommendations. The risk associated with droplet transmitted infection declines progressively with increasing distance therefore if it is not possible to maintain required social distance at all times in all settings the goal should be to keep as much distance as possible. Consideration should also be given to optimizing the natural ventilation of rooms and offices through window opening where possible.

If adequate distance cannot be maintained the use of screens is a practical measure to reduce exposure to droplet and can minimise the need to wear masks for extended periods when healthcare workers are seated at desks or similar situations in a shared space for an extended period.

In this context, the screen is intended to prevent droplets from one person impacting on the face or workspace of the other person. It is sufficient that the screen blocks the pathway from the nose and mouth to the face and workspace of the other person for most of the time. Screens do not need to be floor to ceiling. If two people are seated at workstations for most of the time the screen should be sufficient width and height to ensure that if they sneeze or cough while seated that the droplets impact on the screen not on the other person's face or work station.

Where screens are used in a clinical areas, (oncology day wards/dialysis units/ED) the height and width should be adequate to prevent spray from the nose and mouth of one person impacting on the face or space of another person – so the screen is required mainly in relation to the position of the head for most of the time when the person is present. Screens do not need to be floor to ceiling. Screens may be fixed or mobile depending on overall clinical requirements including emergency access.

Screens should be cleaned with detergent and water once or twice per day in an office space. In clinical areas, the screen should be cleaned with detergent and water or detergent wipes after the patient vacates the space and before the next patient arrives.

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.

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.

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 26m² (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.

Airborne isolation rooms require a dedicated ante room, which should have a minimum floor area of 4m².

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 of 19m² (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 UK HFN 30, 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).

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 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 hospitals 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. 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 resident/clinical hand wash sink. 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.
- Single person rooms, including en-suite sanitary facilities, should have a floor area of at least 22.5m². The single bedroom is 16m² with a 6m² 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).
- 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.

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 suspect 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).

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.

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, Estates and CAG will review this guideline every two years.

9.0 References

1. A Strategy for Antimicrobial Resistance (SARI), 2009, Updated 2015.
2. Chaudhury H, Mahmood A, Valente M. The use of single patient rooms vs. multiple occupancy rooms in acute care environments: a review and analysis of the literature. The Coalition for Health Environments Research, 2003.
3. Biehl LM, Higgins P, Wille T, Peter K, Hamprecht A, Peter S et al. Impact of single-room contact precautions on hospital-acquisition and transmission of multidrug-resistant Escherichia coli: a prospective multicentre cohort study in haematological and oncological wards. Journal of Clinical Microbiology and Infection 2018.

4. Walker JT, Hoffman P, Bennett AM, Vos MC, Thomas M, Tomlinson N. Hospital and community acquired infection and the built environment: design and testing of infection control rooms. *Journal of Hospital Infection* 2007; 65 (suppl 2): 42-49.
5. Negative pressure room study: enhancing airborne infection isolation capacity in Florida hospitals. Florida Hospital Association, July 2004 (www.fha.org).
6. HBN 00-09 Infection Control in Built Environments (2013).
7. National Guidelines for the Prevention of Nosocomial Aspergillosis HPSC Jan 2018.
8. Health Building Note 00-09: Infection Control in the Built Environment.
9. Health Building Note 04-01: Adult Inpatient Accommodation DH 2013.
10. Capital Projects Manual & Approvals Protocol HBS Estates June 2018.

ENDS