General

820 .1.00 Infection prevention and control involves identification of transmissible agents and intervention to minimise the spread of these infections.

820 .2.00 A number of strategies contribute to the control of infection, such as handwashing, careful aseptic technique and the observance of 'standard precautions'. Isolation rooms to separate immunocompromised or infectious patients from other patients are also a vital part of infection control. These rooms may be standard rooms or special rooms with positive or negative pressure.

820 .3.00 Infection prevention and control requirements are critical to the planning of a Health Care Facility and need to be incorporated into plans and specifications.

820 .4.00 All areas of the facility shall be designed, constructed, furnished and equipped in keeping with the principles of infection control.

820 .5.00 By far the most important of the infection control strategies is effective handwashing. Handwashing facilities shall be installed in all patient care areas, and in all areas where careful attention to hygiene is essential, such as Kitchens, Laundries, Pharmacies, Laboratories, etc, and staff amenities areas, such as Bathrooms, Toilets and Change Rooms. Refer to detailed requirements for staff hand-basins, later in this document.

820 .6.00 Facets of construction and fit-out that contribute to effective infection control are covered in various sections of these Guidelines. They include ventilation, floor coverings, waste management, provision for ease of cleaning, provision for sterilisation and disinfection of equipment and instruments, and provision for the isolation of infectious patients as required.

Handwashing - Staff

820 .7.00 Staff should be encouraged to wash their hands before and after every patient contact. In all Health Care Facilities the following handwashing facilities should be available:

+ Hand basins with warm and cold water supplies;
+ Taps with hands-free operation;
+ Supplies of soap or detergent;
+ Disposable paper towels or single use cloth towels.

Handwashing facilities should comply with appropriate Australian Standards. Refer References and Further Reading.

820 .8.00 Taps should be fitted with an anti-splash-back device, and should ideally be operated without hand contact, that is, by elbow, knee, foot or an infra-red or similar ‘no-touch’ mechanism. Where filters are fitted to taps in place of anti-splash devices, they should be cleaned REGULARLY - a cleaning regime shall be in place.

820 .9.00 Mirrors shall not be installed at handwashing facilities in food preparation areas, nurseries, clean and sterile supply areas, scrub sinks or other areas where aseptic control would be lessened by touching hair.

Handwashing - Staff

820 .10.00 Provision for 'hands off' liquid soap dispensing should be included at all handwashing facilities. All standard basins should be fitted with 'hand cleanser' liquid soap and all scrub-up basins (clinical handwashing) with 'antimicrobial' liquid soap. Soap dispensers are to be the non-refillable type.

820 .11.00 Provision for hand drying shall be included at all hand washing facilities, except Operating Unit scrub-up troughs.

820 .12.00 Hand drying facilities shall be single use, separate and individual linen/paper units enclosed in such a way as to provide protection against dust or soil and ensure single unit dispensing.

820 .13.00 Hot air hand dryers are not recommended in Class 9a buildings or in sterile stock areas and should not be installed in staff or visitor toilet areas.

820 .14.00 A disposable glove dispenser, sufficient to hold all glove sizes, should be located in close proximity to hand basins. The dispenser should allow re-stocking without the need to touch new gloves.

Handwash Basin Types and Uses

820 .15.00 TYPE A - CLINICAL SCRUB BASIN

This is used in areas requiring clinical handwashing for sterile procedures, for example ICU Rooms, Treatment Rooms and Cardiac Catheterisation areas, Clinics and Day Procedure Rooms.

The hand basin type is a large clinical type. The taps are wall mounted, hands-free operation (elbow, foot or electronic).

820 .16.00 TYPE B - GENERAL STAFF HAND BASIN

This is used in areas requiring general staff handwashing, for example inpatient unit corridors, and 1 Bed Rooms.

The basin type is a medium wall mounted basin. The taps are either wall mounted or basin mounted with hands-free operation (elbow or wrist).

820 .17.00 TYPE C - SMALL STAFF/PATIENT/VISITOR HAND BASIN

This is used in areas requiring general staff and patient handwashing, for example patient and staff Amenities and toilet areas.

The basin type is a small wall mounted basin. The taps are either wall mounted or basin mounted.

820 .18.00 SCRUB SINK

Refers to a long sink that can accommodate one or more staff scrubbing for a sterile procedure at the one time. Refer to Part C, Ergonomics for the heights, width of space per person and type of taps.

Handwash Basin Types - Schedule

820 .19.00 The following indicates recommended basin and tap combinations for particular rooms. For rooms not listed refer to a similar area.

The waterspout should be positioned so that the water flow does not flow directly into the drain and cause a splashback to the hands of the user. It should be positioned in

a way to ensure that the water flow hits the basin in/on the front (splashback) to avoid contamination from the down pipe on to the hands of the user.

Note that a domestic style one lever operation is considered an appropriate substitute for a wrist operated tap.

ROOM/SPACE	BASIN TYPE	WALL TAP	BASIN TAP	WRIST/ LEVER	ELBOW	INFRA-RED	NOTES
BIRTHING ROOMS, PROCEDURE ROOMS	A	yes			yes	optional	
INTENSIVE CARE - ENCL ROOMS/ OPEN BAYS	A	yes			yes	optional	
CLEAN UTILITY, EXAMINATION, POST MORTEM	B	yes	Optional		yes		
ACUTE INPATIENT BEDS INCL 1 BED RMS	B	yes			yes		
HANDWASH BAYS - CORRIDOR	B	yes			yes		
ISOLATION/ANTEROOM/AIRLOCK	B	yes			yes		
RECOVERY AREAS	B	yes			yes		
PATIENT BAYS - RESUC, TRAUMA IN EMERGENCY	B	yes			yes		
CONSUTL, TREATMENT, FORMULA ROOMS	B	yes	optional	yes	optional		
BATHROOMS, CLEAN-UP ROOMS, DIRTY UTILITY	B		yes	yes			
PARENTING ROOMS, BABYCHANGE ROOMS	B		yes	yes			
BEVERAGE PANTRY, FOOD SERVERY, PATIENT DINING	B		yes				
ADL KITCHEN	B		yes				
STAFF TOILET, PUBLIC/VISITOR TOILET, PATIENT ENSUITES	C		yes				
OPERATING ROOM, PROCEDURES, SCRUB-UP	Sink/trough	yes				yes	

Handwash Basins - Placement

820 .20.00 Handwash Bays should be provided in the following ratios:

+ ICU - one per enclosed room, one per two open bays;

+ Emergency - one per four open bays;

+ Ambulatory Care - one per four open bays;

+ Inpatient Unit - as per the following tables;

+ Other patient treatment areas - generally staff should not be more than 10 - 12 metres from a Handwash Bay.

ROOM	PURPOSE	TYPE	LOCATION
4 BED ROOM	Patient ablutions	C	Ensuite bathroom
	Staff hand hygiene	B	Room Entry
	Surgical Scrub	Not required	Not required
ISOLATION ROOMS (ALL TYPES), 2 BED ROOM	Patient Ablutions	C	Ensuite or bathroom
	Staff hand hygiene	B	Room Entry
	Surgical Scrub	Not required	Not required
CORRIDOR HANDWASH BASINS	Staff hand hygiene	B	Within 5m of PPE Bay

INTENSIVE CARE UNIT	Staff hand hygiene	A	Adj pat bays, 1 per encl
EMERGENCY & AMBULATORY CARE	Staff hand hygiene	B	Adj pat bays, 1 per encl
OTHER PATIENT TREATMENT AREAS	Staff hand hygiene	B	Staff should not be >10-

Isolation Room/s

820 .21.00 INTRODUCTION

This Guideline describes and identifies facility spatial requirements that are appropriate for the isolation of patients with known or suspected infectious conditions and to assist the project planning teams with the planning and design of Isolation Rooms. It does not however address Isolation Rooms for the care of patients with implanted isotopes.

It has been prepared with input from stakeholders experienced in Infection Control, Microbiology, Facility Planning, Disaster Planning, Tuberculosis and Paediatrics.

Isolation Rooms when not required for the care of infectious patients can have multipurpose functions once the room is vacated and cleaned as per the Infection Control Policy of the facility/organisation.

It is critical that Operational Policies and the Functional Relationships between the Isolation Room/s within the Health Planning Unit, and the Health Planning Units within the Health Care Facility support the planning of the Isolation Rooms.

Details of engineering requirements and services for Isolation Rooms will form part of TS11, Engineering and Sustainable Services. Details of Infection Control practices and education are available in the NSW Health Infection Control Policy (Circular 2002/45, NSW Health 2002) and are not contained within these Guidelines.

820 .22.00 TYPES

Four types of Isolation Rooms are required:

Class S	Standard
Class N	Negative Pressure
Class P	Positive Pressure
Class Q	Quarantine

These types of room and their uses are described in more detail below.

820 .23.00 CLASS S : STANDARD ISOLATION ROOMS

Class S or Standard Isolation Room is a single room with a shower/toilet ensuite that is not shared.

There are no specific requirements for airconditioning. A hand basin and self-closing door are recommended. A PPE Bay should be provided outside the door.

A Class S room can be used for patients who require contact or droplet isolation, to minimise the potential for such infections being transmitted to other patients and staff.

820 .24.00 CLASS N : NEGATIVE PRESSURE ISOLATION ROOMS

Class N or Negative Pressure room is a single room with a shower/toilet ensuite that is not shared.

Sufficient and appropriate storage space should be provided for linen and waste inside the room, and for storage of gowns, gloves and masks outside in the alcove, Anteroom or Personal Protective Equipment Bay.

A Class N room can be used for patients who require airborne droplet nuclei isolation (eg varicella, measles, pulmonary or laryngeal tuberculosis) to reduce transmission of disease via the airborne route.

Negative pressure rooms operate at a lower pressure with respect to adjacent areas such as the corridor. Air in negative pressure rooms will be exhausted to the outside in accordance with AS 1668-1991 Part 2 6, to prevent air recirculation. The discharge points should be located as far as possible from air intakes, persons and animals. If external exhaust is not possible, air should be recirculated through high-efficiency particulate air (HEPA) filters. A separate exhaust system dedicated to each room must be provided. This must be separate to the building's common exhaust air system to reduce the risk of contamination.

A communication system should be provided so that staff can communicate with people outside the room without leaving the room.

Further detail is provided in Room Data Sheets and TS11.

820 .25.00 CLASS P : POSITIVE PRESSURE ISOLATION ROOMS

Class P or Positive Pressure room is a single room with a shower/toilet ensuite that is not shared.

Positive pressure rooms operate at a higher pressure with respect to adjacent areas. Air exhausted from these rooms is not infectious and therefore does not require filtration.

Patients with airborne transmitted infections such as varicella, measles, pulmonary or laryngeal tuberculosis are not to be accommodated in positive pressure rooms.

Class P rooms may be used to reduce the risk of airborne transmission of infection to susceptible patients such as allogenic bone marrow transplant recipients. These rooms will only be required for transplants and oncology patients.

Patients requiring precautions to prevent the transmission of pathogens by the airborne route will not be accommodated in Class P Isolation Rooms.

Evidence for a protective effect from positive pressure is largely limited to studies of patients at high risk of nosocomial aspergillosis, where laminar airflow at ultra-high airflow rates was used to create a positive pressure. Evidence for use of such rooms for other purposes is lacking. Further difficulties arise when the patient requiring protective isolation is also infectious to others, particularly with airborne-spread infections (eg renal transplant patient with varicella zoster). In these instances, consideration of placement in positive or negative pressure isolation rooms will depend on the patient's neutrophil count and should be made following consultation with infectious diseases, infection control and microbiology staff.

Further detail is provided in Room Data Sheets and TS11.

820 .26.00 CLASS Q - QUARANTINE ISOLATION ROOMS

Class Q or Quarantine Isolation Room is a single room with an ensuite not to be shared and includes all design requirements as noted in the negative pressure rooms. In addition, the Quarantine Isolation Room will require an Anteroom designed to function as an airlock.

Consideration or incorporation of good electronic communication systems (intercoms) between the isolation room and outside may assist in eliminating or reducing unnecessary traffic into the room.

One hospital in each Australian capital city will have designated Class Q rooms. Westmead Hospital is designated with the quarantine status within New South Wales, and provides facilities for patients with highly infectious pathogens such as haemorrhagic fevers, Hantavirus pulmonary syndrome. These patients require a further level of containment over and above the standard negative pressure isolation room.

820 .27.00 ANTEROOMS

Anterooms are required for staff and visitors to change and dispose of personal protective gear used on entering and leaving these rooms when caring for infectious patients.

Anterooms increase the effectiveness of the Isolation Room by minimising the potential escape of airborne nuclei into the corridor when the door is opened.

Anterooms should be provided for Class N rooms in ICU, Emergency Departments, Infectious Diseases Units, and for an agreed number of patient bedrooms within Inpatient Units accommodating Respiratory patients. The need for Anterooms for Class N rooms in other Health Planning Units should be considered on a case by case basis.

The Anteroom should not be shared between rooms. The Anteroom will not need to function as an airlock for Class N rooms with the exception of ICU.

The Class Q rooms will require an Anteroom to function as an airlock with interlocking doors (ie the two doors cannot be opened simultaneously). Anterooms in Class Q rooms will need to be large enough to incorporate additional disposal facilities as well as allowing bed movement with doors interlocked.

820 .28.00 See attached table for the functional classification of Isolation Rooms

820 .29.00 COMBINED ALTERNATING PRESSURE ISOLATION ROOMS

Combined alternating pressure rooms (enabling the room to have either negative or positive pressure) are NOT permitted due to the following concerns:

+ Difficulty in the configuration of appropriate airflow for two fundamentally different purposes;

+ Risk of operator error;

+ Need for complex engineering;

+ The absence of failsafe mechanisms.

820 .30.00 CALCULATION OF NUMBERS OF ISOLATION ROOMS

GENERAL:

In the redevelopment of Health Care Facilities, Project Planning Teams should use available service planning and incidence data to determine the number and type of Isolation Rooms required. They will need to collect data from existing facilities progressively during the service planning phase to assess the actual demand for the use of facilities to isolate patients known or suspected to have an infection that requires a particular form of isolation.

Assessment of actual demand to isolate patients should include:

+ Number of patient admissions with infections known or suspected to require isolation;

+ The duration of isolation required;

+ Clustering of cases that may be influenced by seasonal and other trends;

+ Type of unit where patient isolation may be necessary;

Estimates of numbers and types of isolation rooms should consider the following:

+ Trends in disease in the general population and the particular population served by the facility;

+ Demographic trends in the population served by the facility;

+ Specialties of the Health Care Facility, along with any projected changes in the facility's activities.

Data collected over one year or longer provide more reliable estimates and will assist in determining peak needs for diseases with marked seasonal variations.

Retrospective data (based on discharge) should be used with caution as the data may not include suspected but unconfirmed cases of certain infections requiring isolation, thereby causing an underestimation of requirements. For planned new facilities, data from comparable facilities serving comparable populations may be available in place of retrospective data.

820 .31.00 CLASS N ROOMS:

When calculating requirements for persons known or suspected of having infections that require airborne precautions (such as chicken pox, measles, infectious pulmonary and laryngeal infections) it is also important to collect data on patients suspected of having tuberculosis. Patients will require isolation until confirmed as un-infected by clinicians or until the treatment renders the patient non-infectious.

820 .32.00 CLASS P ROOMS:

Requirement for such rooms should be determined by collecting data on local threats from pathogens such as Aspergillus, as well as evidence (from within and beyond the facility) on the role of particular environments in protecting vulnerable patients.

The final assessment of the requirements for numbers and types of Isolation Rooms should be made in consultation with clinical specialists and the Infection Control Committee.

820 .33.00 PERSONAL PROTECTIVE EQUIPMENT BAYS

Personal Protective Equipment (PPE) Bays shall be provided immediately outside all Isolation Rooms - including Class S.

A PPE storage unit should be provided in the purpose built bay for the storage of gloves, goggles, faceshield masks, gowns and waterless alcohol-based handrub dispensers.

A PPE Bay may be shared between two rooms.

See room data sheets and room layout sheets for more detail.

820 .34.00 AREAS REQUIRING CLASS N ROOMS

Health Planning Units that require either one or more Class N rooms include:

+ Emergency Unit;

+ Intensive Care Unit;

+ Infectious Diseases Unit;

+ Procedure areas such as bronchoscopy units or sputum induction rooms.

Paediatric areas may also have a need for Class N rooms.

820 .35.00 DESIGN PRINCIPLES FOR ISOLATION ROOMS

820 .35.00

The aim of environmental control in an isolation facility is to control the airflow so as to reduce the number of airborne infectious particles such that they are unlikely to infect another person within the environment of the Health Care Facility. This is achieved by controlling the quality and quantity of intake and exhaust air, diluting infectious particles in large volumes of air, maintaining differential air pressures between adjacent areas and designing patterns of airflow for particular clinical purposes.

The location and design of the Isolation Rooms within a Health Planning Unit (Department or Ward) should enable isolation of rooms from the rest of the Health Planning Unit. Where possible a different route could be provided for the transport of contaminated waste and linen away from the main traffic area.

Multiple Isolation Rooms should be clustered and located away from the main entrance of the department.

When Health Care Facilities are developed, consideration should be given to one whole floor level, or a defined section, of inpatient accommodation being designed with separate airconditioning and exhaust. This will enable Health Care Facilities to accommodate an infectious outbreak incident within the Area Health Service.

Planning should consider:

+ Sufficient and appropriate storage space for linen and waste containers inside the room and for gowns, gloves and masks inside or outside the room;

+ Use of an observation window will allow staff to observe patients without opening and closing the door of the Isolation Room, thus ensuring good visual observation for staff and privacy for patients;

+ For privacy, a blind within double glazing should be considered;

+ Provision of a communication system such as a phone or intercom to allow communication between staff, patients, interpreters, visitors, etc without leaving the room.

+ Should both Class N and P rooms be needed within the same facility they should be planned to minimise the likelihood of these patients using, or meeting in, the same corridors or circulation paths.

820 .36.00 POSITIVE AND NEGATIVE PRESSURE IN OTHER AREAS

A number of other areas of a Health Care Facility may require either positive or negative pressure, these could include:

+ Operating theatres;

+ Procedure rooms;

+ Mortuary.

The airconditioning requirements for these areas are described in TS11.

FUNCTIONAL CLASSIFICATION OF ISOLATION ROOMS

	CLASS S	CLASS N	CLASS P	CLASS Q
KEY VENTILATION CRITERIA	No air pressure difference between room and the adjacent corridor	Lower air pressure in the room than in the adjacent corridor or anteroom	Greater air pressure in the room than in the corridor	Lower air pressure in the room than in the adjacent corridor
TRANSMISSION-BASED PRECAUTIONS	To prevent contact or droplet transmission	To prevent airborne transmission	To prevent transmission of pathogens from the outside environment to profoundly immuno-compromised persons	To prevent airborne transmission
EXAMPLES	VRE, gastroenteritis, cutaneous anthrax, hepatitis A.	Measles, varicella, suspected or proven pulmonary or laryngeal tuberculosis, suspected contact of measles, varicella, SARS, etc.	Prevention of aspergillosis in bone-marrow transplant recipients	Highly infectious pathogens such as haemorrhagic fevers, Hantavirus pulmonary syndrome