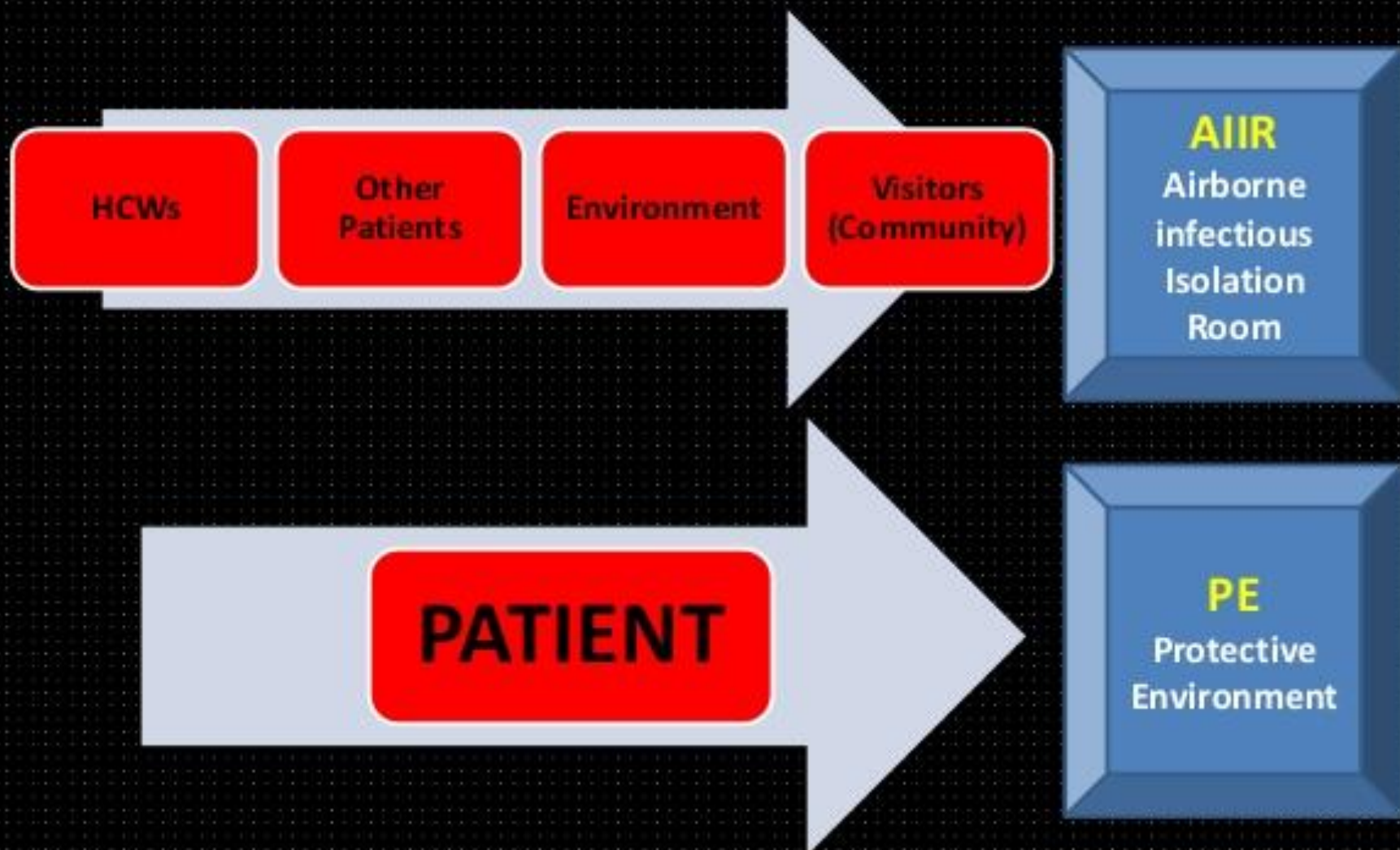


**Infection Control In
Immunocompromised
Patients,
Isolation Room**

Objectives

- Goals of isolation
- Types of isolation rooms
- Characteristics of isolation rooms

Goal of Isolation *(Protection of / from)*



Isolation

- **Reverse Isolation** refers to the practice of HCWs and visitors wearing barriers (gown, gloves, mask).
- For the majority of immune compromised persons, the use of **Routine Practices alone is effective**

Protective Environment

- ❖ Certain immune compromised clients benefit from specific additional “interventions”:
“Protective Environment”.
- ❖ Protective Environment **does not mean “Reverse Isolation”**

Protective Environment

- A specialized patient-care area, usually in hospital.
- Designed to prevent transmission of opportunistic pathogens to severely immunosuppressed patients.

Protective Environment

- A Protective Environment



Allogeneic HSCT patients



Minimize air fungus spore counts &
reduce the risk of invasive
environmental fungal infections

Isolation Facilities Types

Class S

Class P

Class N

Class Q

Isolation Facilities Types

Class S: Neutral or standard room air pressure, (**standard air conditioning**)

Class P: Positive room air pressure where an *immune-compromised patient* is protected from airborne transmission of any infection, including an Anteroom

Isolation Facilities Types

Class N: Negative room air pressure, where others are protected from any airborne transmission from a patient who may be an infection risk, including an Anteroom

Class Q: Negative room air pressure with additional barriers including an Anteroom for **quarantine** isolation.

Class S—Standard Pressure

- A Standard Pressure room is used for patients requiring contact isolation
- Normal air conditioning
- Standard pressure Isolation rooms may be used for other patients when not required for isolation purposes.

Class S—Standard Pressure

- Recommended elements for Class S isolation rooms

- A clinical handwash basin within the room
- An ensuite shower and toilet
- A self-closing door
- Labeling as a standard pressure isolation room
- A pan sanitizer located near the room is an optional element

Anteroom

- The Anteroom will require sufficient space to allow for storage of PPE.
- Be of sufficient area to allow for the donning or removal of personal protective equipment, or clothing and hand washing basins.

Anteroom

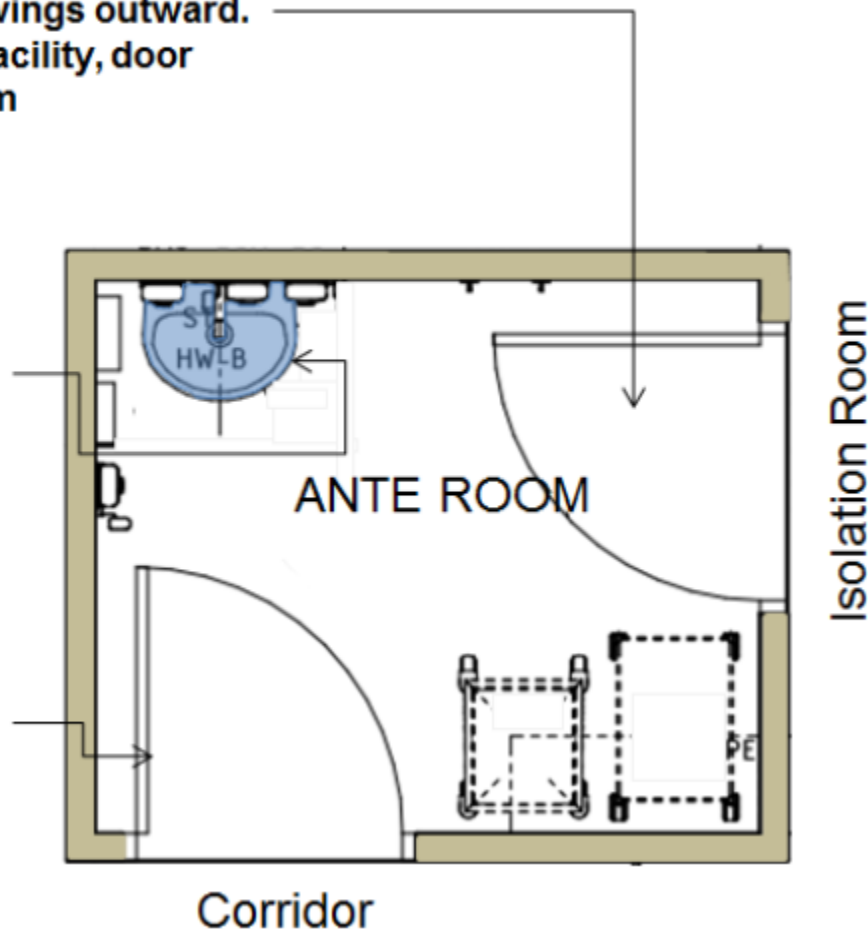
- Anterooms must be provided with self-closing doors.
- Anterooms should not be shared between Isolation rooms

Typical Anteroom Plan

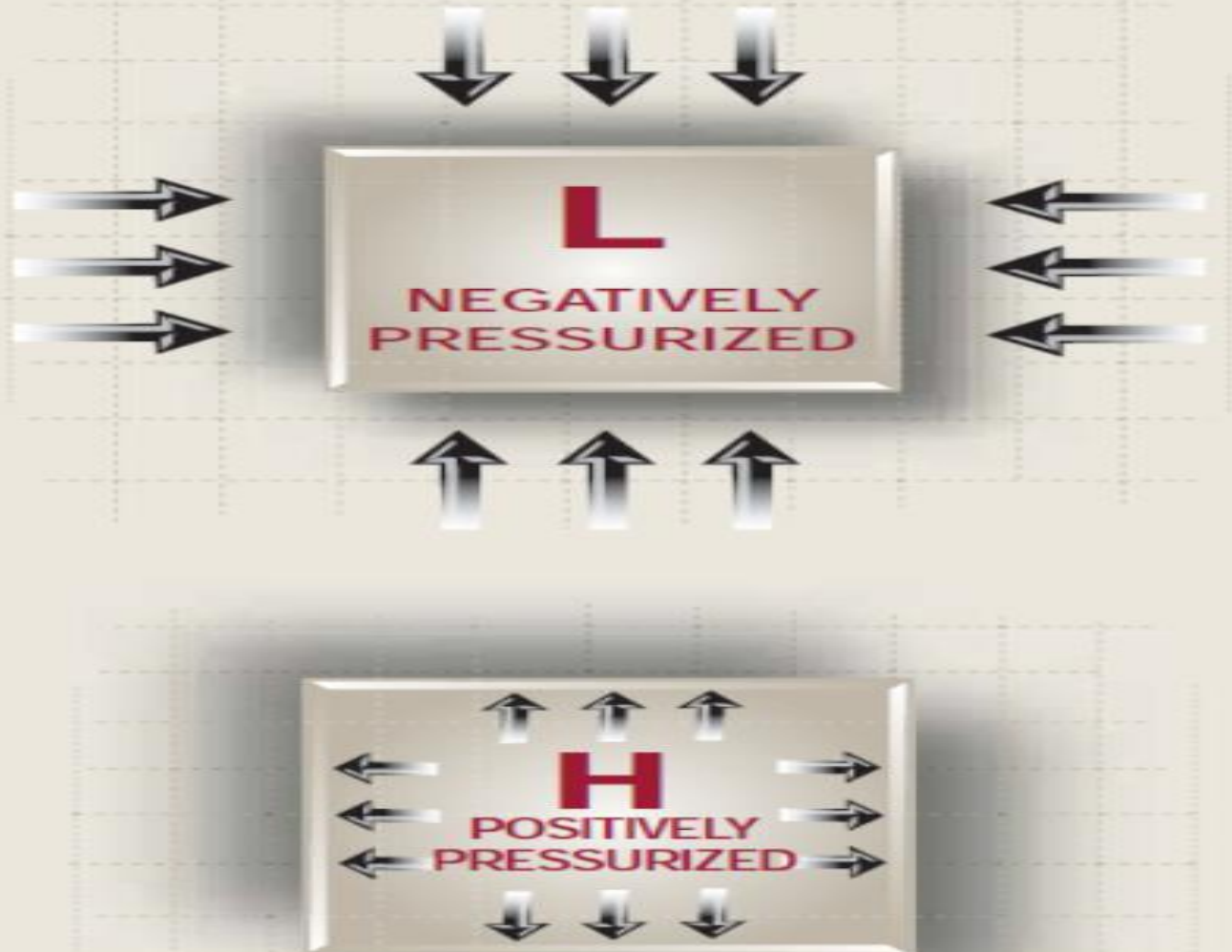
Self closing door between anteroom and isolation room indicates negative pressure room as door swings outward.
(For a positive pressure facility, door swings into isolation room)

All soap dispensers to discharge over Hand Washbasin type B

Self closing door from corridor to swing into ante room



Negative/Positive Pressure



Class P: Positive Room Air Pressure

- Also known as ‘**protective isolation units**’ or ‘**protective environment**’ rooms (PE rooms).
- Positive pressure Isolation Rooms, relative to the ambient pressure are used to isolate immunocompromised patients, for example oncology and some transplant patients.

Class P: Positive Room Air Pressure

- The intent is to reduce the risk of airborne transmission of infection to a susceptible patient.
- The Isolation room is provided with a higher pressure in relation to the adjoining rooms or spaces.
- An Anteroom is required.

Positive Pressure Isolation Rooms

- **An Anteroom** that operates as an **airlock** with interlocking doors; both doors must not open at the one time; the Anteroom must be large enough to permit bed movement in and out of the Isolation Room if direct doors from corridor to Isolation Room is not provided.
- **Alarm** to be activated on loss of differential pressure; time delay may be required to permit entry/ exit from Isolation Room

Positive Pressure Isolation Rooms

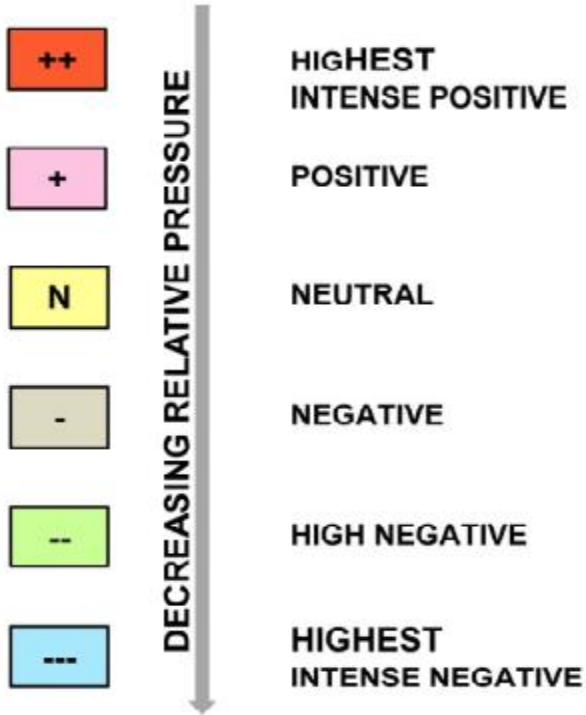
- A clinical **handwash basin** with ‘hands free’ operation in the Isolation Room and the Anteroom
- **An Ensuite** shower and toilet
- **Self-closing doors** with interlocking doors to Anteroom

Class P: Positive Room Air Pressure

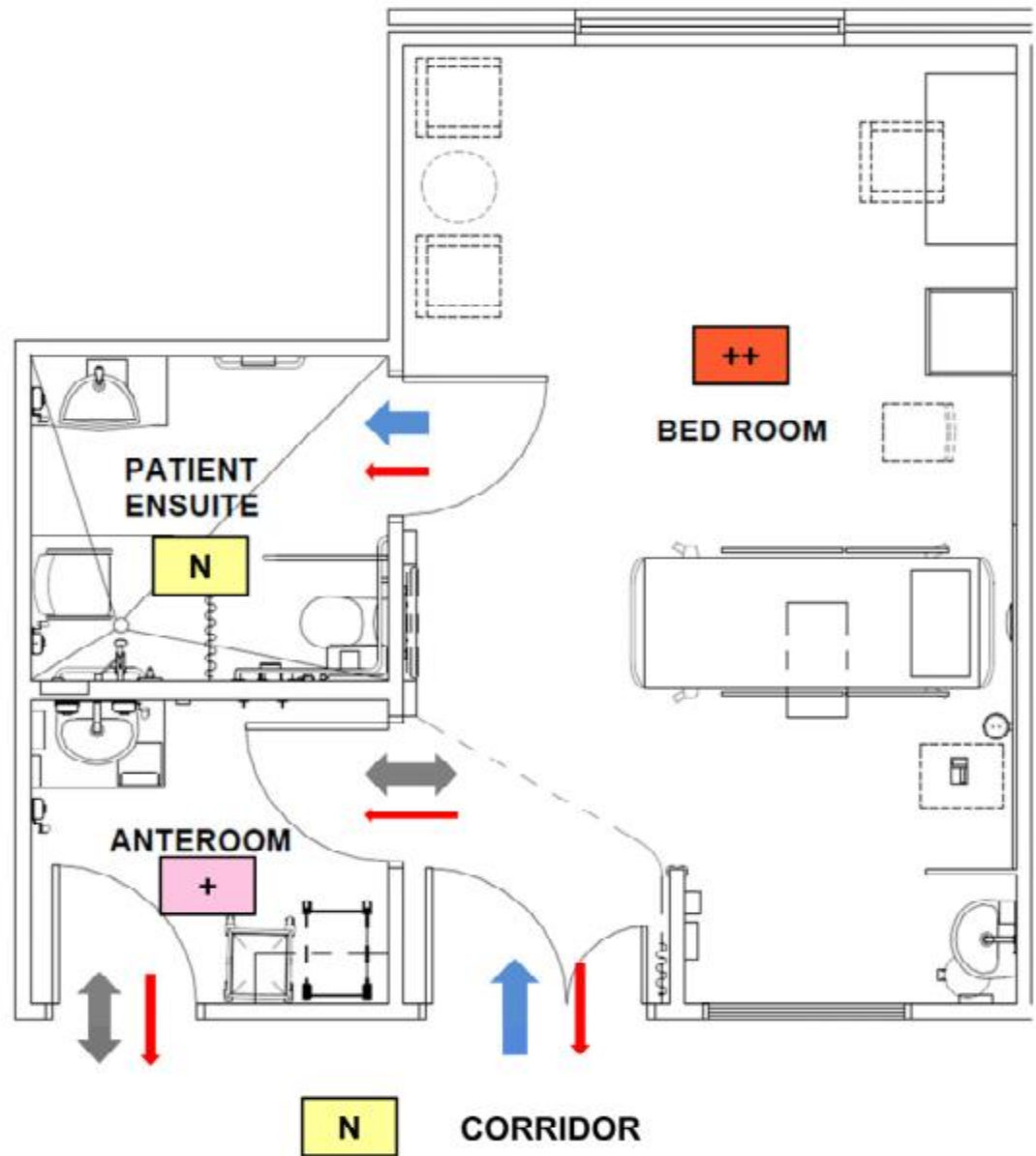
- A HEPA filtration system provided to the supply air duct to protect patients from unfiltered air
- Low level exhaust ducts approximately 200 mm above floor level.
- A HEPA filter however must be fitted to the supply air inlet.
- A HEPA filter is not required to the exhaust air, as the exhaust air is not considered infectious.

Class P: Positive Room Air Pressure

RELATIVE PRESSURE LEGEND



TRAFFIC & AIR FLOW LEGEND



Recommended Pressure Gradients

- Where an isolation room is **not provided with an Anteroom**, the recommended minimum differential pressure between the isolation room and adjacent spaces should be 5 Pa.
- If however an **Anteroom is provided**, the recommended minimum differential pressure between isolation room and ambient pressure should be 10 Pa.

Recommended Pressure Gradients

Type of Pressurization *	Isolation Room	Anteroom	Ensuite
Class S (Standard pressure)		Not required	
Class N (Negative Pressure)	- 10 Pa	- 5 Pa	- 15 Pa
Class P (Positive Pressure)	+ 10 Pa	+ 5 Pa	0 Pa

Negative Pressure Isolation Rooms

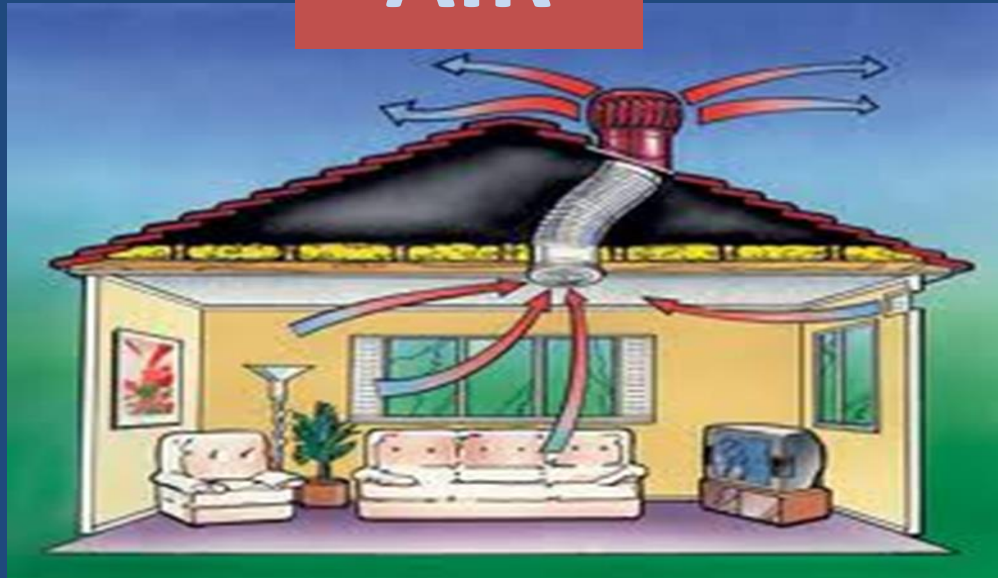
- For patients who require **airborne droplet nuclei** isolation:
- Measles,
- Varicella zoster (chicken pox),
- Legionella,
- Tuberculosis

Also be known as
“airborne infection isolation” rooms
or
“infectious isolation” facilities.

Negative Pressure Isolation Rooms

- The aim: to reduce the risk of infection via airborne transmission to other persons.

AIR



Negative Pressure Rooms

- **Negative pressure rooms should be located at the entry to an Inpatient Unit**, so that the patient requiring isolation does not need to pass other patient areas to access the Isolation Room.
- **An Anteroom must be provided** for a Negative Pressure Isolation Room.
- The air pressure in the Isolation Room must be **lower than** the adjoining rooms or the corridor.

Class N—Negative Pressure

- A dedicated exhaust system should be provided to the negative pressure isolation room.
- The exhaust air duct should be independent of the building exhaust air system.
- The Isolation Room Ensuite exhaust should not be connected to the building toilet exhaust system.

Negative Pressure Isolation Rooms

- **An Anteroom** that operates as an **airlock** with interlocking doors; both doors must not open at the one time; the Anteroom must be large enough to permit bed movement in and out of the Isolation Room if direct doors from corridor to Isolation Room is not provided.
- **Alarm** to be activated on loss of differential pressure; time delay may be required to permit entry/ exit from Isolation Room

Negative Pressure Isolation Rooms

- A clinical **handwash basin** with ‘hands free’ operation in the Isolation Room and the Anteroom
- **An Ensuite** shower and toilet
- **Self-closing doors** with interlocking doors to Anteroom

Negative Pressure Isolation Rooms

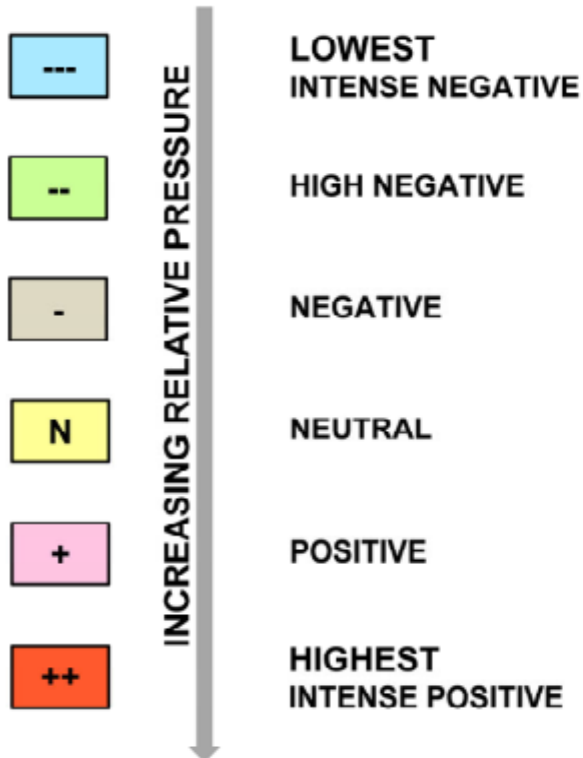
- **100% outside air ventilation** (i.e. no return air permitted), with low level exhaust ducts approximately 200 mm above floor level to discharge vertically to the outside air.
- Supply air ducts are to be independent of the building supply air system.

Negative Pressure Isolation Rooms

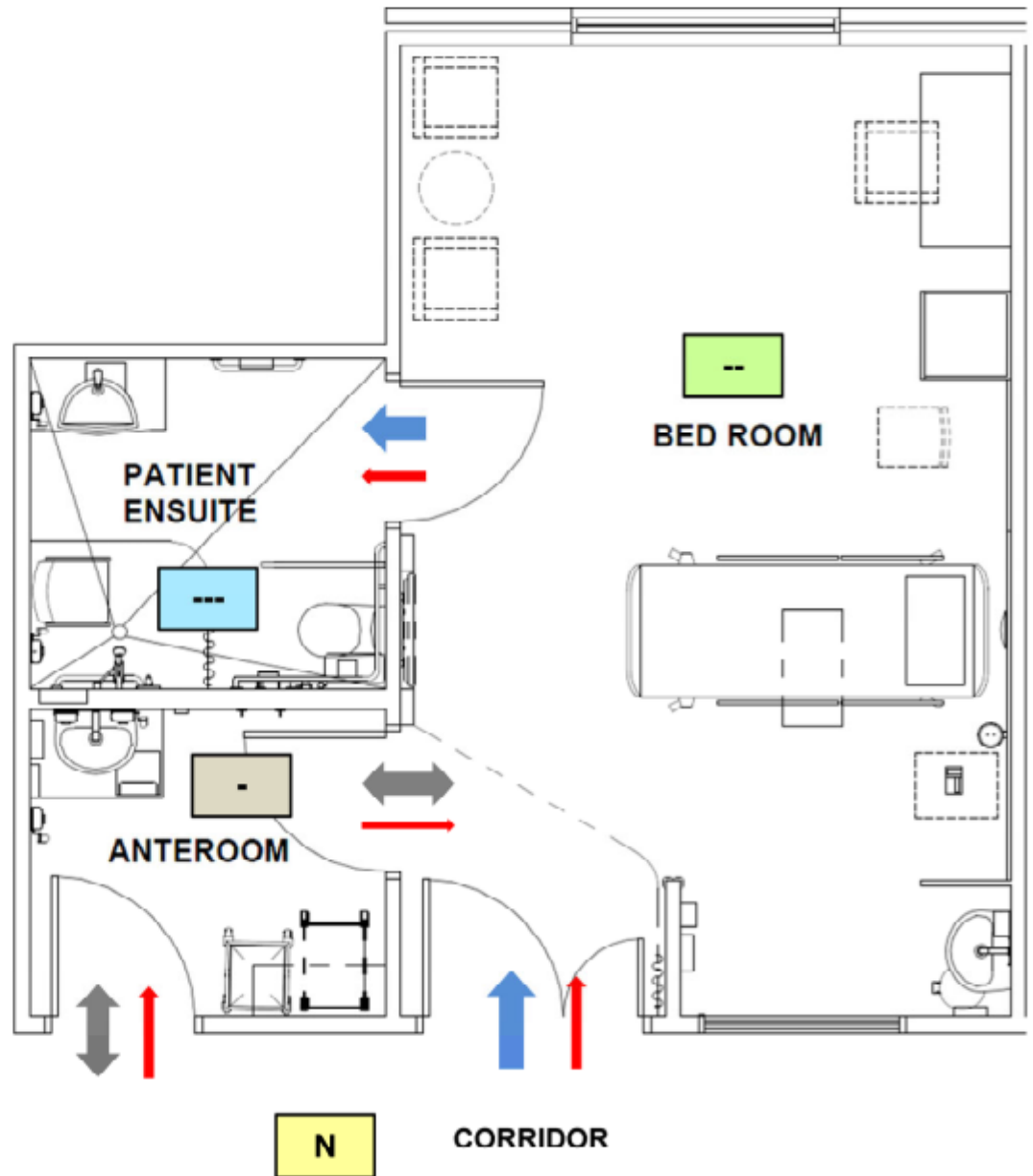
- For immunosuppressed and infectious patients, a HEPA filtration system should be provided on the supply air ducting to protect the patient from unfiltered air.
- Exhaust air should be HEPA filtered and provided with UV irradiation.
- Provision of a Pan/ Utensil Sanitiser is optional. If provided, it should be located within the Ensuite. Alternatively, disposables can be considered.

Class N: Negative Pressure Isolation Room

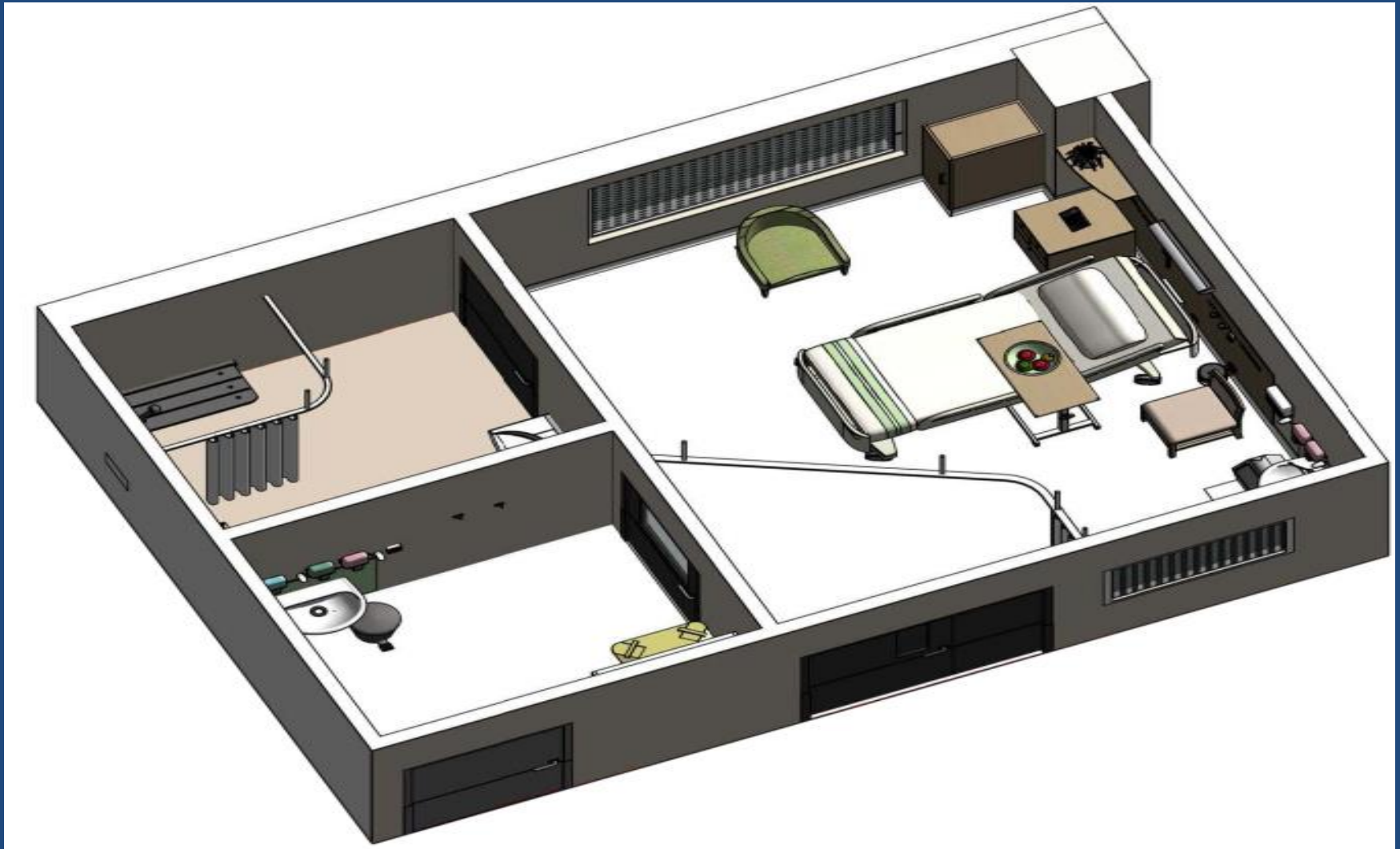
RELATIVE PRESSURE LEGEND



TRAFFIC & AIR FLOW LEGEND



Negative Pressure Isolation Rooms



Schedule of Isolation Room Requirements

Component	Standard Pressure Class S	Negative Pressure Class N and Class Q	Positive Pressure Class P
Anteroom	Not required	Yes	Yes
Ensuite (shower and toilet)	Yes	Yes	Yes
Hand basin with hands free operation	Yes	Yes	Yes
Pan Sanitiser (disposables are acceptable as alternative provision)	Optional	Optional for Class N Required for Class Q	Optional
Self-closing door to room	Yes	Yes	Yes
Grille flap to control room air flow	-	Yes	Yes
Independent air supply	-	Yes	-
100% intake of fresh air	-	Yes	-
Low level exhaust 200mm above floor level	-	Yes	Yes
HEPA filter on supply air	-	-	Yes
HEPA filter on exhaust air	-	Yes	-
Pressure monitoring	-	Yes	Yes

Class A - Alternating Pressure

- **Rooms with reversible airflow mechanisms, which enable the room to have either negative or positive pressure, should NOT be used.**



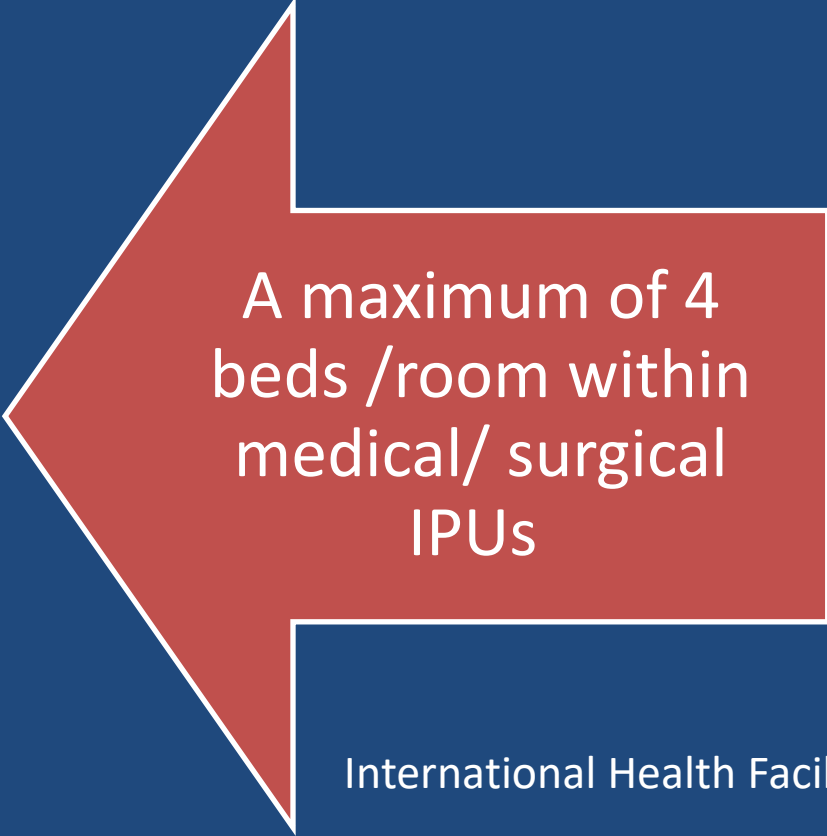
Number of Isolation Rooms

A minimum of 60% of the total bed complement in overnight stay Inpatient Accommodation Units (IPUs) across the whole facility

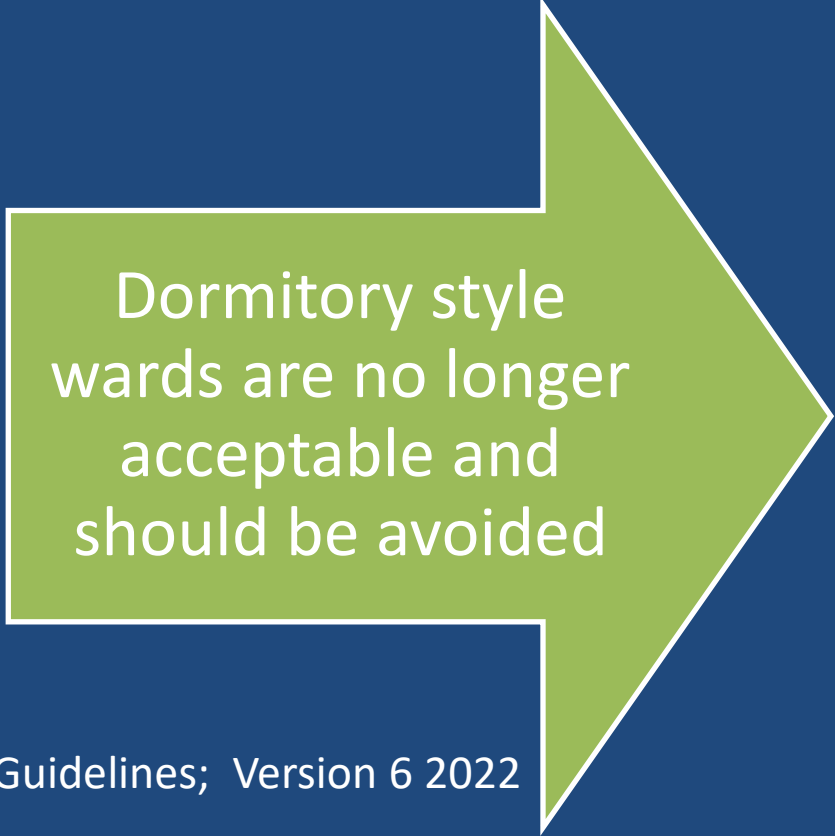
Single Bedrooms or Class S Rooms



Number of Isolation Rooms



A maximum of 4
beds /room within
medical/ surgical
IPUs



Dormitory style
wards are no longer
acceptable and
should be avoided

International Health Facility Guidelines; Version 6 2022

Number of Isolation Rooms

- All IPUs providing overnight accommodation should provide at least one ‘Class S – Standard’ Isolation Room.
- Facilities should provide at least two ‘Class N negative pressure’ Isolation Room per 60 overnight IPU beds.

Number of Isolation Rooms

- There is no set standard for the provision of positive pressure (Class P) Isolation Rooms.
- However, at the minimum, there should be two 'Class P positive pressure' Isolation Room per every 60 overnight IPU beds.

Transport of Infectious Patients

- It is recommended that transport of infectious patients is limited to movement considered medically essential by the clinicians, e.g. for diagnostic or treatment purposes.

Transport of Infectious Patients

- Where infectious patients are required to be transported to other units within the hospital or outside the following precautions may be implemented:
- *Infected or colonised areas of the patient's body are covered:*
 - For contact isolation this may include a gown, sheets or dressings to surface wounds;
these patients are transferred to a Standard Pressure or Protective Environment Isolation room.

Transport of Infectious Patients

- Where infectious patients are required to be transported, the following precautions may be implemented:
- *Infected or colonised areas of the patient's body are covered:*
 - For respiratory isolation the patient is dressed in a high filtrating mask, gown and covered in sheets; these patients are accommodated in a Negative Pressure Isolation Room.

Transport of Infectious Patients

- Where infectious patients are required to be transported, the following precautions may be implemented:
- *Infected or colonised areas of the patient's body are covered:*
 - For quarantine isolation the patient may be transported in a fully enclosed transport cell or isolator with a filtered air supply and exhaust; these patients are accommodated in a high level quarantine isolation suite.



Positive Pressure Room

Pressure differentials	2.5 Pa (0.01 in-water gauge) > 15 Pa
Air changes per hour (ACH) Humidity	>12 30% winter min, 60% summer max
Filtration efficiency	Supply 99.97% @ 0.3μm DOP Exhaust – None required
Room airflow direction	Out to the adjacent area
Clean-to-dirty airflow in room	Away from the patient (high risk patient or immune-suppressed patient)
Ideal temperature	24 c