

Guidelines for Operating the Ventilation System in Negative Pressure Isolation Rooms

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Purpose

To ensure that the negative pressure isolation room is used appropriately and safely by staff caring for patients known or suspected to be infected with micro-organisms transmitted by the airborne route

These guidelines provide information on the utilisation of the ventilation system in the negative pressure isolation rooms located in the Canterbury District Health Board hospitals.

These instructions must be available in areas with negative pressure isolation rooms.

Scope/Audience

All CDHB and contracted staff

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Definitions

A Negative Pressure Isolation Room incorporates a ventilation system designed so that air flows from the corridor into the negative pressure room, ensuring that contaminated air cannot escape from the negative pressure room to other parts of the ward.

Air naturally moves from areas of higher pressure to areas of lower pressure. When negative pressure exists, a continuous air current enters the room under the door, which prevents airborne particles generated in the room from escaping into the corridor.

Associated Documents

[CDHB IPC Policy Care of Patients with Pulmonary Tuberculosis](#)

[CDHB IPC Policy Transmission Based Precautions Isolation Guidelines](#)

Burwood Hospital Policies and Procedures - Instructions to Enable / Disable Isolation Rooms Flowchart

1. Procedures

1.1 Equipment

- **Burwood Hospital**-- Key/manual operated switch & Siemens electronic keypad - contact IPC service OR afterhours contact the Duty Nurse Manager/ Clinical Team Co-ordinator
- **Christchurch Hospital** – Key/manual operated switch & Siemens electronic keypad (refer to location manual)
- Particulate respirator/N95 mask – available in a variety of sizes
- Door signage indicating Airborne Precautions

1.2 Setting up for negative pressure Isolation

There are a number of different types of negative pressure airflow systems in use within the CDHB and not all are switched off between patients.

Please check which type of negative pressure system is in place before using the room.

For rooms that have doors and windows that open to the outside of the building, ensure windows are closed and remove key for door lock, window winder and lock door bolt for as long as the room is used for negative pressure isolation.

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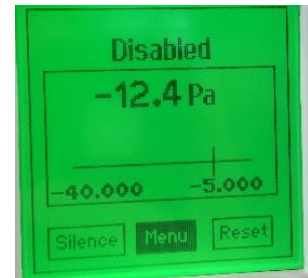
Ensure the door between the corridor and the ante room is closed.

1.2.1 Check the status of the room pressure

Siemens electronic key pad

Check Siemens display panel. If green and “Disabled” is displayed, put room into “isolation mode” before admitting patient into the room.

Burwood Hospital— contact IPC service OR Duty Nurse Manager/ Clinical Team Co-ordinator to access key pad



Before admitting patient into the negative pressure room, check that the Siemens display panel is green and “Negative Room” is displayed.



It will take approximately 2 minutes to get to negative 15pa

Key/manual operated negative pressure air flow system

Check if the negative pressure airflow system is running. If not start the negative pressure airflow system.

Turn the key/switch from ‘off’ to ‘on’.

Christchurch Hospital - Allow at least 5 minutes for the light indicator to turn green and for the pressure differential needle (if installed) to reach 10 -15 pascals.

Burwood Hospital -wait for light indicator to turn red and pressure differential needle to reach 2-6 Pascals.

If this does not occur contact maintenance and engineering (out of hours via duty management).

Once the negative airflow is established remove the key and place the key in the key storage area. The airflow must be running at negative pressure BEFORE the patient is admitted to the room.

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1.3 Accessing negative pressure isolation rooms

Before **every entry** check that there is a negative pressure operating in the room.

Siemens electronic key pad

- Check that the display panel is green and there is a negative pressure of between -10 & -15 pa.
- If room alarms, and display panel is red check that all doors are closed properly.
- If room is still alarming immediately contact Maintenance & Engineering via the Charge Nurse Manager or out of hours contact the Duty Nurse Manager/ Clinical Team Co-ordinator. Please **DO NOT** adjust the alarm at the keypad or at the nurse's station.

Key operated negative pressure air flow system

- Check the green light indicator/pressure reading is between -10 & -15 Pascals. N.B. A red light indicates there is a malfunction of the ventilation – contact maintenance and engineering.

Once the patient is in the room, access should be via the anteroom door whenever possible. Ensure both main door and anteroom door remain closed at all times. N.B. The anteroom doors are designed to allow only one door to be opened at any one time.

Put on an N95 particulate respirator/mask in the anteroom before entering the patient's room.

1.4 Discontinuing negative pressure isolation

Refer specific disease guidance for clinical indications to discontinue negative pressure isolation.

Siemens electronic key pad

- When the room is no longer required for negative pressure isolation put the room into “normal mode”:
- **Burwood Hospital** - contact IPC service or Duty Nurse Manger/Clinical Team Co-ordinator to access keypad
- Check Siemens display panel. When green and “Disabled” is displayed, room can be cleaned before for next patient admission.



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- Terminal clean is not required unless used with other transmission based precautions (refer specific disease requirements)

Key operated negative pressure air flow system ONLY

The following steps must be undertaken if the negative airflow is no longer required in the key operated negative pressure airflow rooms **ONLY** (i.e. patient is deemed to be non-infectious) or following discharge of an infectious patient.

NB The room **CAN NOT BE USED FOR NEW ADMISSIONS** until the steps have been undertaken in the following order.

- Maintain negative pressure airflow in the room for at least 60 minutes before switching to Normal/Off mode. If ward/unit staff or contracted staff enter the room during this period they must wear a N95 particulate respirator/ mask
- After 60 minutes, turn the key on the panel to 'normal/off'. The green light will go off and the red light switch on. The pressure gauge will move to zero.
- There will still be some ventilation coming into the room while turned off but it will no longer be negative pressure.
- Remove the key and return to the key storage area.

Terminal clean is not required unless used with other transmission based precautions (refer specific disease requirements).

Refer also to [CDHB IPC Policy, Transmission-based precautions, Airborne Precautions](#)

1.5 Using negative pressure rooms for induced sputum procedures (suspected or confirmed infectious pulmonary tuberculosis cases)

Induced sputum procedures generate aerosolised particles. For patients suspected or confirmed with infectious pulmonary tuberculosis, induced sputum procedures shall be undertaken in a room that operates negative pressure ventilation.

The physiotherapy department is responsible for locating a suitable room and undertaking the procedure using airborne precautions.

At the end of the procedure, after the patient has left the room, the physiotherapist will wipe down surfaces and place a sign on the exterior or the room door, indicating the down-time when the room cannot be used. The down time is dependent on the number of air changes that the ventilation system is set at and may differ between rooms used.

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The following down-times are applicable for induced sputum procedures:

- Bronchoscopy Suite (Endoscopy Unit, Christchurch Hospital) – 30 minutes after end of procedure
- Ward 25 Rooms 1 & 2 - 30 minutes after end of procedure
- All other negative pressure rooms including those in AMAU -60 minutes after the end of the procedure

2. General notes

- The exhaust grills and filters are changed when required as monitored by Maintenance and Engineering. Maintenance and Engineering staff will make contact with ward staff when this is due.
- An alarm will appear on the Building Management System (BMS) if there are any problems with the negative pressure mode. Staff in the area will be alerted to this by Maintenance and Engineering staff and again when the problem has been resolved.
- If negative pressure is compromised or if staff are informed of problem by maintenance staff, consider moving patient to an alternative room within 30 minutes and place surgical mask on the patient in the interim.

Measurement/Evaluation

Staff awareness of procedure during environmental audits.

Maintenance dept. records of work carried out according to schedules. When in use rooms are monitored by BMS in engineering and are verified every 12 months by an external independent audit company.

References

1. Centres for Disease Control and Prevention. Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings 2007.
2. Occupational Safety and Health Services of the Department of Labour 2000. Managing Health and Safety Risks in New Zealand.
3. Ministry of Health. Guidelines for Tuberculosis Control in New Zealand 2010

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Appendix: CDHB patient rooms with negative or positive pressure air handling function

Ward/ Unit	Room number	Room ID number e.g. E533	Type of pressure*	Type of controls	Ante room	Other information
Christchurch Hospital						
Ward 25	1, 2		Negative (gauge)	Key switch		
ED						
CHOC	All unit	N/A	Positive	N/A	N/A	
CHOC	Room 1	LGE112	Negative	Electronic (Siemens)	Yes	
CHOC	4,5,9,10	LGE 27, 29, 37 & 39	Positive	Electronic (Siemens)	No	Shared open ante area
Ward 21	14, 15	None	Positive	None visible	Yes shared	Also humidified air units x 2
BMTU	All unit	N/A	Positive	N/A	N/A	
BMTU	7	LGE14	Both	None visible	Yes	
ICU	11, 12		Negative		Yes	
AMAU	11,12,13	G369, G339, G343	Negative (gauge)	Key switch	Yes x3	
Ward 10	8	2.145	Negative	Electronic (Siemens)	Yes	Disabled when not in use
Ward 11	8	3.143	Negative	Electronic (Siemens)	Yes	Disabled when not in use
Bronchoscopy Suite	Procedure Room 2	2/220	Negative	Over-ride switch only	No	No visible pressure recording
Christchurch Women's Hospital						
Level 5	511, 510	?/5010	Negative	Key switch	Yes	
Level 4	Rm 2	4004	Negative	Key switch	Yes	
Level 2	216, 217	2101B/2102B	Negative	Key switch	Yes	
Burwood Hospital						
Ward AG	Room 23	G442	Negative	Electronic (Siemens)	Yes	Disabled when not in use
Ward BG	Room 11	G370	Negative	Electronic (Siemens)	Yes	Disabled when not in use
Ward CG	Room 3	G253	Negative	Electronic (Siemens)	Yes	Disabled when not in use
Ward DG	Room 23	G370	Negative	Electronic (Siemens)	Yes	Disabled when not in use

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Ward B1	Room 2	1297	Negative	Electronic (Siemens)	Yes	Disabled when not in use
Ward C1	Room 21	1139	Negative	Electronic (Siemens)	Yes	Disabled when not in use
Ward D1	Room 23	1035	Negative	Electronic (Siemens)	Yes	Disabled when not in use
Ward B2	Room 2	2287	Negative	Electronic (Siemens)	Yes	Disabled when not in use
Ward C2	Room 21	2128	Negative	Electronic (Siemens)	Yes	Disabled when not in use
Ward D2	Room 23	2028	Negative	Electronic (Siemens)	yes	Disabled when not in use
Ward FG	14a & 14b	G64, G65	Negative	None visible	Yes	
Ward GG	Rooms 4 & 5	G21 G26	Negative (gauge)	Key switch	Yes	Disabled when not in use
Ward HG	Rooms 12a & 12b	G10, G20	Negative	None visible	Yes	
Ashburton Hospital						
AAU	Bed 7		Fan-assisted air extraction only. Not officially classed as either a negative or positive pressure room		No	
Other CDHB facility						

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