

Policy & Procedure (P& P)

Policy Title :

Negative Pressure Room Monitoring

Department	Index N°	Scope
Infection Control	ICD-80	Hospital wide
Issue Date	Revision N°	Effective Date
5/5/2020	New	20/7/2020
Review Due Date	Related Standard N°	Page Number
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1. Policy:

Negative Pressure Room should be monitored daily and in regular basis.

2. Definitions and Comments:

- 2.1. Negative pressure room or AIIR is defined as a single-occupancy patient-care room used to isolate persons with a suspected or confirmed airborne infectious disease. AIIRs provide negative pressure in the room (so that air flows under the gap into the room) with a pressure differential of >-2.5 Pa (Pascal) or $>- 0.01$ " water gauge; an air flow rate of >12 air changes per hour (ACH) for renovation or new construction; and direct exhaust air from the room to the outside of the building; or recirculation of air through a HEPA filter before returning to circulation.
- 2.2. High-efficiency particulate air (HEPA) filter is an air filter that removes $>99.97\%$ of particles $>0.3\mu\text{m}$ at a specified flow rate of air. HEPA filters may be integrated into the central air handling systems, installed at the point of use above the ceiling of a room, or used as portable units.
- 2.3. Maintenance Log: Used for keeping records of all malfunctions of negative pressure room monitors. The log should be kept in the ward and be accessible to all staff. Forms must be completed whenever the alarm system is activated (Appendix 1: Negative Pressure Room Maintenance Log).
- 2.4. Activation of the alarm system when negative pressure ventilation fails: Visible red flashing lights and/or audible sound comes from the monitor.
- 2.5. For the safety of healthcare workers, patients, and visitors, negative pressure rooms occupied by patients requiring airborne isolation must be checked daily (Appendix 2; tissue test).

3. Purpose :

To provide instructions on the monitoring and maintenance of the negative pressure rooms or airborne infection isolation room (AIIR) to the Nursing Services, Operation and Maintenance (O&M) Department, and Infection Preventionist (IP).

4. Procedures :



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4.1. Routine Monitoring of Negative Pressure Rooms

4.1.1. Negative pressure room and ventilation requirements. Operation and Maintenance (O&M) section must:

- 4.1.1.1. Conduct and document annually and monthly checks on all negative pressure rooms for air pressure and air changes (Appendix 3).
- 4.1.1.2. Use a manual device to monitor pressure differentials in rooms where no monitor is installed.
- 4.1.1.3. Follow the procedure of this policy if any room fails inspection.
- 4.1.1.4. All documentation must be forwarded to an environmental/public health section of the Infection & Prevention Control (IP&C) Department.

4.1.2. Negative pressure rooms in use:

Nursing staff must:

- 4.1.2.1. Conduct visual checks for the direction of air flow (using flutter strips) on all rooms where patients are in airborne isolation for query and confirmed airborne transmissible diseases (e.g., Pulmonary Mycobacterium tuberculosis, measles, chicken pox, COVID 19 ...) when patients are in this room.
- 4.1.2.2. Prior to admitting patients needing airborne isolation, check and ensure that negative pressure rooms are functioning well. For those designated isolation rooms without monitor, call O&M to check if the room is maintaining its negative pressure.
- 4.1.2.3. Follow the procedure of this policy in any room that fails inspection.
- 4.1.2.4. All documentation must be sent to the IP&C Department.

4.2. Negative Pressure Ventilation Failure

4.2.1. Unit staff must respond to negative pressure failure.

4.2.2. Nursing staff will:

- 4.2.2.1. Place a surgical mask on the patient in airborne isolation.
- 4.2.2.2. Keep the door closed at all times.
- 4.2.2.3. Notify the Operation & Maintenance (O&M) Department of the location and problem.
- 4.2.2.4. Notify IP&C during the regular work week by paging the IP that is covering the unit/area.
 - i. If an event occurs at night or on weekend, IP&C will be notified on the next working day.
 - ii. Follow steps listed in item #4.2.3 below.

- 4.2.2.5. Document all information on the Negative pressure room or AIIR Maintenance Log form.
- 4.2.2.6. Notify IP&C regarding the findings and required follow-up.

4.2.3. O&M staff must respond immediately to the area and:

- 4.2.3.1. Assess whether the room(s) is/are maintaining negative pressure.
- 4.2.3.2. Communicate their findings to the Nurse Manager or designee.
- 4.2.3.3. Document their findings on the Negative Pressure Room Maintenance Log form.

4.2.4. Nursing staff

If O&M declares the occupied room is no longer maintaining negative pressure, follow these steps:

4.2.4.1. For patients who are in airborne isolation (for pulmonary MTB, chicken pox, measles or hemorrhagic fever), contact IP&C immediately.

- i. The patient must be transferred to another negative pressure room immediately.



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ii. Put a surgical mask on the patient before transporting. Refer to policy ICD-046 Transporting Patients on Isolation Precautions.

iii. O&M can then proceed with repairs.

4.2.4.2. If the patient is not in isolation:

i. The patient can be moved to another room.

ii. O&M can proceed with repairs.

4.2.4.3. If the room is unoccupied, then O&M can proceed with repairs immediately.

4.2.4.4. The IP&C Department will:

4.2.4.4.1. Assess the patient/situation with regard to infectious risk.

4.2.4.4.2. Provide infection control recommendations based on the risk assessment to minimize transmission of the disease.

4.2.4.4.3. Document all information on the Negative Pressure Room Maintenance Log form and patient chart (as required).

4.2.4.4.4. Complete any follow-up with the unit staff and the maintenance log form is kept in the Infection Prevention and Control Department.

4.3. Terminal cleaning

Terminal cleaning should occur after sufficient time has elapsed for enough air changes to remove potentially infectious particles (23 minutes if Air changes/hour=12).

5. Responsibilities :

- 5.1. Nursing staff
- 5.2. Operation and Maintenance department
- 5.3. Infection control department
- 5.4. Public health

6. Equipment & Forms

- 6.1. Appendix 1: Negative Pressure Room Maintenance Log
- 6.2. Appendix 2: Negative Pressure Room Daily Air Exchange Monitoring (tissue test)
- 6.3. Appendix 3: Negative Pressure Room Annually / Monthly Air Exchange Monitoring

7. Attachments :

See forms

8. References

- 8.1. The GCC the Infection Prevention Control Manual. 3 rd edition 2018.
- 8.2. Negative Pressure Patient Room Options (Updated: 03/23/2020): <https://www.ashe.org/negative-pressure-rooms>
- 8.3. Guidelines for Environmental Infection Control in Health-Care Facilities (2003). Appendix B. Air. <https://www.cdc.gov/infectioncontrol/guidelines/environmental/appendix/air.html#table1terminal>



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Appendix 3: Negative Pressure Room Annually / Monthly Air Exchange Monitoring

Department: Room:

MONITOR SETTINGS

Normal pressure reading (monitor reading with door closed) kPa
Alarm will sound if pressure differential drops to kPa
Time delayseconds
Air changes per hour (ACH)ACH
Remote alarm location(s)

ANNUAL MONITOR CHECKS

TASK	Date completed	Signed off by
Monitor calibrated in accordance with manufacturer's requirements		
Confirmed negative pressure using smoke trail testing (this test should be repeated monthly & sign off below)		
Verified alarm operation (by holding door open or blocking off exhaust grille)		
Alarm sounded after seconds		
Pressure reading at alarm kPa		
Monitor use and functions demonstrated to all floor staff		

MONTHLY NEGATIVE PRESSURE CHECK

Date / signature	Date / signature	Date / signature	Date / signature
Date / signature	Date / signature	Date / signature	Date / signature
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