

# Guidelines for Temporary Negative Pressure Isolation Rooms

## Reference:

- Airborne Infectious Disease Management, Methods for Temporary Negative Pressure Isolation, Office of Emergency Preparedness, MN Dept. of Health
- American Society of Heating, Refrigerating and Air Conditioning Engineers 170-2017 (ASHRAE)
- Life Safety Code, etc. Any temporary negative pressure isolation must still observe the state building/fire codes, licensure statutes/rules and federal certification requirements

## After reviewing the documents above, complete the following before you move forward:

1. Have a multidisciplinary team (infection prevention, facilities, housekeeping, emergency management personnel and clinical) perform infection control risk assessment (ICRA) to look at all aspects of the proposed change to physical environment.
2. Review and comply with your facilities' emergency pandemic response procedures plan.

## Converting individual bedrooms to temporary airborne infection isolation rooms

1. Select room based on ICRA and possible input from the Minnesota Department of Health (MDH) Engineering Section [healthcareengineers@state.mn.us](mailto:healthcareengineers@state.mn.us); install window adaptor; set up high efficiency particulate air (HEPA) machine and flex duct; seal return air grill & turn on HEPA machine and adjust flow to obtain proper pressures
  - a. Bedroom walls must go up to the deck or ceiling tiles must be gasketed or sealed. Verify all walls, doors and openings are properly sealed. When monitoring indicates air leakage, locate the leak and make necessary repairs.
  - b. Tape off return. Please be aware that ASHRAE 170 allows for returning air through a HEPA filter but this is not ideal when HEPA filters remove up to 0.3 micron and the SARS-CoV-2 is approximately 0.1 micron.
  - c. Remove/open window panel. Ensure tight fit. Panel over removed glass should be easily cleanable/non-absorbent material (not plywood).
  - d. Connect HEPA machine to flex duct to window adaptor. Locate the exhaust in accordance with the risk assessment to create the best airflow.
  - e. HEPA machine should be plugged into emergency power in accordance with the emergency plan and the ICRA.
  - f. If room is not equipped with a pressure monitoring device, install means to monitor air flow (regular smoke test, air strips, etc.).
  - g. Maintain continuous negative air pressure (0.01 inch water gauge) in relation to the air pressure in the corridor. Monitor air pressure periodically in accordance with the facility emergency plan.
  - h. Provide ventilation to ensure at least 12 air changes per hour.
  - i. Keep door closed at all times. Consider installing a closer. Monitor air pressure periodically in accordance with the emergency plan with audible manometers, smoke tubes at the door or with a permanently installed visual monitoring mechanism.
  - j. Consider maximizing exhaust fan in the toilet room.

- k. If toilet exhaust is not dedicated, multidisciplinary team should perform a risk assessment (we have seen in the past that at least a minimum efficiency reporting value (MERV) 14 filter -or better- installed) to determine if other mitigation strategies are necessary.
- l. Exhaust terminal located 10' away from air intakes, operable windows, sidewalks, or areas that are accessible to the public or maintenance personnel.
- m. Consider removing privacy curtains, fabric drapes, etc.
- n. Ducts and equipment should maintain clearances for egress and access.
- o. If you have an anteroom, the anteroom should be negative to the corridor and the airborne infection isolation room should be negative to the anteroom.

**Converting a wing or unit to a temporary isolation infection unit**

- a. Select wing or unit based on ICRA and possible input from the MDH Engineering Section [healthcareengineers@state.mn.us](mailto:healthcareengineers@state.mn.us) Use the same ideas listed above for single rooms except the following guidelines that pertain to temporary isolation units.
- b. The entire wing or unit must have 12 air changes per hour and maintain a negative pressure of at least 0.01 inches of water gauge.
- c. Consider using wings or units that are already separated from the building by rated walls since those walls should extend from floor to deck above and sealed to prevent air leakage.
- d. Facility should check the walls around the entire wing/unit to ensure all penetrations are sealed and air leakage is minimized.
- e. Locate HEPA machines and exhaust in accordance with the ICRA and emergency plan. Be aware of how the air will flow in the entire unit when all return vents are sealed. It may be a consideration to put HEPA machines in the rooms to create the proper airflow.
- f. When choosing a wing or unit, strong consideration should be given to wings/units that have their own air-handling unit. The unit should then go into 100% outside air (all air relieved and not returned).

**In the future, facilities should be designed with future pandemics in mind.**

- a. Designate wing or unit to be surge isolation infection units.
- b. Surge isolation infection wings or units shall have their own air handling unit (AHU) and dedicated exhaust fan (EF) with extra capacity.
- c. Use lessons learned in the temporary isolation infection unit for future plans.

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