What are the ventilation criteria of a TB isolation room?

TB Transmission

TB is transmitted through the air. A person with TB disease of the lungs or larynx can release droplets containing *Mycobacterium tuberculosis (M. tb)* into the air by coughing, sneezing, talking, or breathing. These droplets, called droplet nuclei, can cause *M. tb* infection if inhaled by anyone who shares air with the person who has infectious TB.

Isolation Rooms

Healthcare and correctional facilities use negative pressure isolation rooms to isolate known or suspected TB patients.

A properly designed and operating isolation room uses mechanical ventilation to reduce the risk of *M. tb* transmission. The ventilation system should help ensure that droplet nuclei containing *M. tb* generated by the patient in the isolation room do not enter other occupied areas.

The ventilation system must meet the following three criteria before the room is used to isolate a known or suspected TB patient.

1. Negative Pressure

- The purpose of negative pressure is to protect people outside of the isolation room from exposure to air that may include droplet nuclei containing *M. tb*.
- Negative pressure in a room causes a continuous air current into the room under the door.
- To create negative pressure, the amount of air from a room removed (exhausted) by the ventilation system is increased to exceed the amount of air supplied to the room. (Exhaust should exceed supply by at least 100 cubic feet per minute.)
- The negative pressure effect is lost whenever the room door is open.

Francis J. Curry National Tuberculosis Center
http://www.nationaltbcenter.edu

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FAQ
Frequently Asked Questions

2. High Ventilation Rate

- Ventilation dilutes infectious particles and reduces their concentration in the isolation room.
- Guidelines published by the Centers for Disease Control and Prevention (CDC)* recommend a minimum exhaust air change rate of 12 air changes per hour (ACH) for new or renovated TB isolation rooms. For existing isolation rooms, the CDC guidelines list 6 ACH as a minimum ventilation rate, but recommend that this be increased to 12 ACH "where feasible."
- A high ventilation rate will also reduce the clearance time required between isolated patients.

3. Direct Exhaust or HEPA-Filtered Exhaust

- Exhausting air from an isolation room reduces the concentration of infectious particles in the room.
- Exhaust air removed from isolation rooms by the ventilation system must be either:
  - Discharged at a safe location outdoors, away from occupied areas, air intakes, operable windows and doors, etc. or
  - Passed through a high efficiency particulate air (HEPA) filter to trap droplet nuclei.

Conclusion

If all three of these criteria are met, droplet nuclei in the isolation room:

1. Will not migrate to other rooms in the building,
2. Will be diluted quickly, and
3. Will be safely removed from the room.

This information is available at our website: www.nationaltbcenter.edu

* Centers for Disease Control and Prevention. Guidelines for preventing the transmission of *Mycobacterium tuberculosis* in health-care facilities, 1994. Morbidity and Mortality Weekly Report 1994; 43(RR13): 1-132.