

How can a portable HEPA filter unit help control TB?

Transmission of Mycobacterium tuberculosis

Tuberculosis (TB) is transmitted through the air. A person with TB disease can release airborne particles containing *Mycobacterium tuberculosis* (*M. tb*) by coughing, sneezing, talking, or breathing. These particles, called **droplet nuclei**, are approximately 1- 5 microns in size and can cause TB infection if inhaled. (A micron is one millionth of a meter.)

When clean air is supplied to a room, it **dilutes** the concentration of airborne contaminants in the room. In the case of *M. tb*, this effect means that other room occupants are less likely to inhale one or more droplet nuclei.

High efficiency particulate air (HEPA) filter units

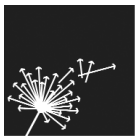
HEPA filters remove essentially all particles in the size range of droplet nuclei from the air that passes through them. They may be used in portable units to supplement a building ventilation system by providing disinfected air. The HEPA-filtered air produced helps dilute infectious particles. HEPA filter units can be used in high-risk settings to help reduce the risk of *M. tb* transmission.

HEPA filter units include a HEPA filter, a prefilter, and a fan. The prefilter helps extend the life of the HEPA filter by trapping large airborne particles. A switch controls the fan. The switch turns the fan on and also adjusts the fan speed and consequently the amount of air delivered by the unit.

The price of portable HEPA filter units ranges from approximately \$100 for a small unit to approximately \$3500 for a large unit.

HEPA filter unit selection, placement, and operation

HEPA filter units should be selected to match the room size. Small units are suitable for offices or exam rooms that may be frequented by known or suspected TB patients. Larger units are appropriate for congregate rooms serving populations in which TB is prevalent, such as clinic waiting rooms, homeless shelter TV rooms, and prison day rooms.



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

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FAQ

Frequently Asked Questions

The units can be noisy at the high speed setting. For this reason, people tend to operate them at low or medium speeds during interviews or exams. However, at lower speeds, the dilution effect is reduced because the units do not provide as much purified air. We recommend that a unit be selected based on airflow produced near the low speed setting. The units should be operated continuously while the room is occupied, and should be run at the high speed setting for approximately one hour after the client or patient has left the room.

HEPA filter units should be placed off the floor and next to staff so that the purified air they generate is delivered close to the face of the people that they are trying to protect.

HEPA filter unit maintenance

Designate a staff person to be the in-house monitor of the HEPA filter units. This person should be trained in the basic principles of HEPA filter unit operation, including effective placement and maintenance. This person should also implement a written schedule for changing the pre-filters and HEPA filters.

Maintenance consists of replacing the prefilter and the HEPA filter at regular intervals. The manufacturer's data should explain how this is done. In general, the prefilters should be replaced every six months and the HEPA filters should be replaced every one or two years.

Local regulations may require that respiratory protection be worn while changing the HEPA filters, and also that the discarded HEPA filters be disposed of as medical waste.

The Francis J. Curry National Tuberculosis Center guideline entitled ***Isolation Rooms: Design, Assessment, and Upgrade*** includes more detailed information on HEPA filter unit selection and use.

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