

## Infection Containment **With** Engineering Controls

**1.** Many of the facilities use the ultra violet lights in emergency/ intensive areas and not necessary in ducts. These sponce light application does not require significant power. I am sure that ventilation design and power needs are not necessarily related.

I have come across a number of facilities with high probabilities of TB in Mc Allen (Texas), Laredo (Texas) and JMH in Miami. There are number articles that you should read. Since it is highly contagious, the rooms are 100% exhausted and there are number experiments and theories on the use of ultra-violet lights in controlling it. Typically the patients are isolated in totally exhausted patient units. I know that Jackson Memorial Hospital in Miami was always dealing with it because of Jamaican and South American patients. I believe that discussing this issue with an infection control specialist in a major facility like JMH would be a good start.

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**2.** The only thing that comes to mind, to me, is that the exhaust side should be non-accessable so that humans nearby don't get contaminated. Maybe there's some type of natural filter/germicidal irradiation before release, or the use of heat somehow to destroy the micro-organisms before release.

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**3.** I'm afraid trying to reduce the incidence of "conversions" in a clinic by the use of natural ventilation would be wishful thinking. I designed a modification to a drunk tank some years ago in Portland that had this problem and it's also a common issue in jails. A sizeable portion of the population can be TB positive and the concern is with "conversions" or infections passed within the population in the facility. Virtually all of

the protective HVAC is based on rather expensive solutions that may include 100% OSA systems, high air change rates, HEPA filtration, and UV sterilization.

The only low tech approach I can think of would involve a requirement that everybody wears face masks to prevent aerosolizing the bacteria. As you know natural ventilation and filtration are incompatible so that's out. Getting sufficient air velocity to carry moisture droplets from a coughing person away from other people using natural ventilation is not likely.

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**4.** There's not much that you can do with natural ventilation. I had some suggestions in my new book, *Aerobiological Engineering* (McGraw-Hill). You can maximize the volume, maximize the sunlight and fenestration, and attempt to create a natural airflow path to take the contaminated air out of the area. Upper room UVGI might be the only decent option or cleaning the air. An "outdoor" waiting area might be a good idea -- using a canopy for shade and rain.

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**5.** About the UK - they have very sophisticated isolation measures due to the prevalence of NATO forces stationed fairly close - the most severe cases are taken to Europe. Those systems used forced air ventilation that I saw - maybe they have some "natural" means, too. Need a new way of thinking about, maybe.

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