ECU AnteRoom™ for Airborne Infection Isolation

Frequently Asked Questions

Why is the ECU AnteRoom™ the best choice for creating short-term airborne infectious isolation of patients and casualties of a bioterrorism event or other public healthcare emergency?

1. **Convenience.** The ECU AnteRoom™ is a convenient alternative to building fixed anterooms for creating airborne infection isolation (AII) during a healthcare emergency. By pairing a collapsible, portable anteroom with a HEPA-filtered negative air machine, the unit enables healthcare facilities to respond rapidly during a crisis, and can easily be deployed within the facility or distributed throughout the region. With the ECU AnteRoom™, a standard patient room can be converted into an AII room in minutes. Pairing a HEPA-filtered negative air machine with the unit completes the process. With proper engineering analysis, it can also be used to convert a larger area, such as an Emergency Department, by positioning it at all points of ingress and egress.

2. **Compliance.** The ECU AnteRoom™ is a solution that satisfies HRSA Critical Benchmark #2-2 and is in complete compliance with Centers for Disease Control and Prevention (CDC) in its *Guidelines Environmental for Infection Control in Health-Care Facilities* for smallpox and viral hemorrhagic fever (VHF). According to these guidelines, the most prudent way to create airborne infectious isolation for patients is through the use of a negative-pressure anteroom configuration. As many healthcare facilities do not have adequate isolation room capacity for emergency situations, the ECU AnteRoom™ quickly and safely resolves their challenge.

3. **Cost-efficiency.** The ECU AnteRoom™ is a multifunctional containment tool that can provide substantial long-term cost savings. Unlike some emergency response equipment, the ECU AnteRoom™ won’t sit idle in a corner of a storage space. It has been designed to be used to safely contain airborne particulates when performing everyday maintenance or construction activities in patient-occupied areas. Everyday usage not only lowers the cost of purchase and increases the return on investment, but also reinforces training and improves emergency response capability.

How does the ECU AnteRoom™ differ from portable air scrubbers placed inside the patient room?

The short answer is convenience, compliance and cost—and method. The ECU AnteRoom™ takes a different approach to creating short-term airborne infection isolation (AII) rooms by pairing a HEPA-filtered negative air machine with the portable anteroom unit and positioning it immediately outside the room being converted. When used for short-term AII, the ECU AnteRoom™ creates three distinct advantages for healthcare facilities. First, the ease and convenience of deploying the unit enables healthcare facilities to respond rapidly and effectively to airborne infection isolation needs during emergency situations. Second, the HEPA-filtered negative air pressure source attached to the unit draws air from both the hospital corridor and the patient room into the anteroom, creating a functional airlock that prevents infectious airborne particulates from escaping. Finally, and most important, the ECU AnteRoom™ provides the airborne infection isolation compliance for smallpox and viral hemorrhagic fever (VHF) as recommended by both HRSA Critical Benchmark #2-2 and CDC EIC Guidelines. These convenience and compliance benefits are further enhanced...
by substantial long-term cost savings that can result from the ability of the ECU AnteRoom™ to be used for everyday construction and maintenance activities.

Using portable air scrubbers to create airborne infection isolation can present a number of challenges for healthcare professionals, particularly during unexpected healthcare emergencies when response time is critical. To create a true, negatively pressurized AII environment, portable air scrubbers require conversion kits that enable the exhausting of filtered air outside of the room. (This ducting to the outside typically involves breaching the building envelope, which carries its own challenges and risks.) Unless the conversion kits are pre-installed, rapid deployment of portable air scrubbers during a public health emergency is extremely difficult if not impossible.

The importance of proper ducting to the outside when using portable air scrubbers for AII cannot be overstated. Without it, there is a significant risk that portable air scrubber solutions may create a positive pressure environment in the patient room when the return air vent is blocked off to prevent recirculation of airborne infectious particulates throughout the portion of the hospital serviced by that air handler. Alternatively, if the discharge of a portable air scrubber (typically over 500 cfm) is ducted into a return air duct designed to handle much less volume, one of two problems may result. Either (1) the back pressure may cause the unit to exhaust much less air or (2) the extra pressure may push air and latent particulate from the ductwork into surrounding areas, causing a change in the pressure relationship and an increase in airborne particulate in these areas. Once properly vented to an outside space, portable air scrubbers (and their lengths of ducting) must be strategically positioned within the patient room to avoid impeding access to the patient (or treatment) and, more important, to prevent potentially infectious airborne particulates that may escape the draw of the HEPA-filtered machine. Otherwise, disturbances in the airflow may be caused by airflow from an supply air vent, ambulatory patients or caregivers entering or exiting the room. The ECU AnteRoom™ when paired with a HEPA-filtered avoids all these potential hazards and inconveniences by eliminating the need to discharge air outside of the building to create the negative pressure environment.

The following drawings demonstrate these effects more clearly.

### Airborne Infectious Isolation with ECU-AnteRoom

<table>
<thead>
<tr>
<th>CORRIDOR</th>
<th>PATIENT ROOM</th>
<th>BATHROOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECU AnteRoom</td>
<td><strong>SUPPLY</strong> 250 cfm</td>
<td><strong>RETURN</strong> 0 cfm</td>
</tr>
<tr>
<td>HEPA-filtered Exhaust</td>
<td><strong>EXHAUST</strong> 100 cfm</td>
<td></td>
</tr>
</tbody>
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**Arrows indicate air flow**
Is it safe to recirculate HEPA-filtered air back into the hospital?

Yes. The CDC EIC Guidelines expressly permit recirculating HEPA-filtered air in patient-populated hospital areas. (“Guidelines for Environmental Infection Control,” MMWR, Vol. 52, June 6, 2003, 12) A typical hospital corridor is filtered at 80% efficiency; much lower than when filtered through a HEPA filter, which captures 99.97% of all airborne particulates. HEPA-filtered air is of same quality as that used in bone marrow transplant rooms, cardiac and orthopedic operating rooms.

The ECU AnteRoom™ isolates airborne infectious contaminates and filters them through HEPA-filtered negative air equipment, after which the air can be safely recirculated back into the hospital corridor. This system eliminates the need to have the filtered air ducted into an existing return air or exhaust system, as required when using a portable negative air machine inside the patient room.

Does the ECU AnteRoom™ need to be tested with a pressure device after it is initially set up?

Yes. The CDC EIC Guidelines require every isolation room to have its pressurization checked before a patient is placed in the room, and then daily when the room is occupied by an infectious patient. This test can be accomplished using a flutter strip, smoke tube, or a handheld manometer.

How does the ECU AnteRoom™ meet the new CDC Environmental Guidelines for Infection Control in HealthCare Facilities?

The CDC recommends the use of airborne infectious isolation rooms, preferably with an anteroom, for person with diagnosed or suspected airborne infectious diseases. The ECU AnteRoom™ is a
short-term anteroom, and functions in the same way as a permanent installation anteroom, with a HEPA-filtered negative air machine replacing the air intake grill.

**When using the ECU AnteRoom™ to convert a standard room into a short-term isolation unit what must I do to the return air inlets?**

To keep any infectious particulates from entering into the return air system and being recirculated back into the general airstream, the patient room return air grills will need to be blocked off with a nonporous material or covered with a HEPA filter medium. The use of HEPA filters will depend on the volume of supply air into the room. If the supply volume is too great, either the negative air machine exhaust volume will need to be increased or the return grilles will need to be covered with the HEPA so some air is being exhausted from the room. This is a condition that should rarely exist as the negative air machine exhausts over 425 cubic feet per minute.

**Will the ECU AnteRoom™ violate the NFPA’s Life Safety Code referenced by the Joint Commission and Centers for Medicare and Medicaid Services?**

No. The ECU™ is only 28” wide, and in a standard 8’0” corridor there will still be plenty of room to maneuver beds, gurneys, environmental service equipment, crash carts, etc. Given the short-term nature of the solution, and the wheels on the ECU™ moving it will not be a problem in times of crisis or special needs. The healthcare organization will need to implement interim life safety measures and have an action plan to move the ECU™ in the event of a fire. The ECU™ containment envelope material is constructed using a durable, 8 mil PVC fabric that is rated flame-resistant by the California State Fire Marshall.

**How can the room be resupplied with the ECU AnteRoom™ in place?**

The ECU AnteRoom™ has four doors built into the unit, one on each side. One wide door leads into the room and is typically secured in the up position; the two narrow side doors allow for flexibility in placement of the negative air machine on one side, while the opposite door is used for exiting and entering; and the fourth door is a wide door in the front of the ECU™ opposite the patient room door which permits a gurney, supply cart or housekeeping cart to be rolled into the room. The narrow width of the unit typically requires both wide doors to be open simultaneously. To prevent the opportunity for potentially harmful airborne contaminants from being released into the occupied space, this wide door should not be used if the room is occupied by a patient requiring isolation.

The room should to be stocked with typical supplies at the time the patient is being placed in the room. If the room needs restocking the patient will need to be masked and the room ventilated through the HEPA filter of the ECU™ for approximately one hour before the large door is opened for carts. Minor restocking of smaller items can be hand carried through the zippered opening on the side opposite the negative air machine or hand carried (such as meals) into the ECU™ through the side door before opening the patient room door.

**How can you tell when the negative air machine HEPA filter needs to be changed?**

There is a static pressure gauge built into the negative air machine, which gives a constant visual indication of the condition of the filter.