Operating Room Air Distribution
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1. The HVAC system serving the operating rooms (OR) requires careful design to reduce the concentration of airborne contaminants. The greatest amount of the bacteria found in the operating room comes from the surgical team and is a result of their activities during surgery.
2. Dedicated supply and exhaust systems are required for operating rooms to maintain inside design conditions as required according to VA design criteria. The supply air is delivered through a low velocity, single duct, constant volume reheat terminal units.
3. The air handling units (AHU) serving the surgery suite must be equipped with prefilters, after-filters, energy recovery coil, cooling coil, central humidifier and a variable speed fan for air volume control. After-filters shall be located downstream of the fan with a diffuser section in the middle for uniform air distribution across the filter surface. The supply air duct downstream of after-filter shall be stainless steel.

Air Distribution

The air distribution in each OR shall have stainless steel multiple slot panel diffuser positioned around the operating table to discharge 60% of the supply air in a vertical air stream inclined at a 15° outward angle. The remaining 40% of the supply air shall be delivered through perforated panels in a downward vertical direction over the operating table without obstructions. Provide two exhaust registers in each OR located in the walls diagonally opposite from each other, seven inches above floor. Air should be supplied at a lower velocity above the operating table and at a higher velocity at the perimeter of the operating table. The objective is to draw the low velocity air into the outer higher velocity air and then exhaust it. Also, a final HEPA filter at the terminal unit is provided for each operating room. This arrangement removes most contaminants emitted at the table and provides a satisfactory clean environment in operating

rooms. **The terminal unit shall be constructed from welded stainless steel and the reheat coil shall be provided with copper tube and fins.**

Operating Room Chilled Water System

1. With Central Chilled Water Plant

Two banks of cooling coils arranged in series in the dedicated air-handling unit serving the surgical suite shall be provided. The first stage of cooling shall be performed with the water from the central chilled water plant with the supply water temperature at 44 deg F. The second stage of the cooling shall be performed with the water from the dedicated chiller serving the surgical suite with the supply water temperature at approximately 41 deg F.

With this arrangement, the surgical suite chiller size shall be reduced considerably and the central chilled water plant will not have to operate at 41 deg F. Chilled water at 41 deg F is required to maintain inside design condition of 62 deg F and 60% relative humidity.

2. Without Central Chilled Water Plant.

Where central chilled water plant is not available, dedicated chiller shall be sized to meet the following requirements:

- Total cooling demand of the surgical suite.
- Inside design conditions with appropriate chilled water temperature and flow through a single bank of cooling coils.

For more information, contact the Consulting Support Service (003C5), Asesh Raychaudhuri at 202-632-5476, or Don Walden at 202-632-5661.