Breath of FRESH AIR

Indoor air quality critical to effective infection control

By Laura Rygielski Preston

January and February are historically the peak months of seasonal flu activity in the United States, according to the Centers for Disease Control. So it is no surprise that healthcare facilities across the country are reinforcing infection control processes and procedures and enlisting medical professionals, hospital staff, patients and visitors in their efforts.

The annual cost to healthcare consumers and taxpayers is $24-$45 billion, according to the CDC, which estimates that 70 percent of hospital-acquired infections cases are preventable.

The hospital design, construction and facilities-management communities play a crucial role in preventing HAIs and creating a physical environment that supports quality care and positive patient outcomes. The Center for Health Design analyzed more than 120 independent studies before concluding that clinical outcomes improve when patients receive quality-centered care in a healthcare facility where the temperature, humidity and indoor air quality are effectively managed.

HVAC TECHNOLOGIES HELP REDUCE AIRBORNE INFECTION THREATS

Modern HVAC systems help hospitals control the spread of the airborne pathogens that cause more than 30 percent of HAIs, according to the CHD.

For example, maintaining operating room temperatures between 55 and 65 F and using desiccant dehumidifier technology to control moisture can help hospitals prevent the spread of pathogens, which grow best in warm, damp conditions.
To be effective in a healthcare setting, ventilation systems need to meet the specific requirements of hospital units, patient rooms and common areas. Proper ventilation is critical since one-third of all infection threats are airborne.

> Temperature affects patient, staff and visitor comfort. Maintaining the right temperature can also help create an indoor environment that promotes healing and makes it harder for pathogens to grow and spread.

> Moisture can also encourage the growth spread of pathogens, which thrive in a warm, humid environment. Desiccant dehumidifier technology can help hospitals maintain the proper humidity levels to impede the growth of bacteria and other pathogens.

> Pressure levels need to be appropriate for each unit to restrict the spread of airborne pathogens — keeping infectious agents out of surgical suites, for example.

> Monitoring for bacteria, viruses, particulates, pressure and moisture enables hospitals to stay in compliance and act quickly if problems occur.

versely, positive pressure in surgical units keeps pathogens and other contaminants out of operating rooms.

Integrated HVAC control systems use sophisticated sensors to detect the presence of contaminants and keep tabs on temperature, humidity and pressure levels. The system automatically addresses problems, enabling the hospital to respond quickly and effectively to indoor air quality concerns.

AIR CLEANING SYSTEMS INSTRUMENTAL IN AIR-QUALITY IMPROVEMENTS

Advances over the last decade have made air-cleaning systems one of the most important technologies healthcare facilities managers can use to improve indoor air quality and support infection-control efforts. The most effective are catalytic air cleaning systems that have set new standards by removing virtually all contaminants and odors from hospital air.

Catalytic air cleaning systems integrate three distinct technologies:

> Air passes first through a highly efficient air filter, rated minimum efficiency reporting value 13 or higher.

continued on page 54 >>
DEFERRING MAINTENANCE MAY ADD TO RISK OF HAI

HVAC systems that are not performing at peak efficiency can seriously affect a hospital’s environment of care by allowing indoor air quality to deteriorate. For example, a faulty dehumidification system could create a humid environment where problems and pathogens can grow.

Cases cited in a Center for Health Design study traced an outbreak of MRSA, or methicillin resistant staphylococcus aureus, to a hospital ventilation system and the source of another infection to faulty ventilation ducting.

Conducting an HVAC critical system audit, or CSA, can help hospital facilities managers identify potential reliability and performance problems, reduce the chance of unplanned system failure and identify energy saving opportunities.

A CSA almost always pays for itself in energy savings, improved reliability, reduced maintenance and better use of facilities department personnel. Hospital facilities managers often engage an independent engineer or energy service company to help perform the CSA.

Information on conducting a CSA can be found at www.ashrae.org and in other locations online. The National Association of Energy Services Companies www.naesco.org and other sources are available to help facilities managers select an ESCO to help with an audit.

Advances over the last decade have made air-cleaning systems one of the most important technologies healthcare facilities managers can use to improve indoor air quality and support infection-control efforts.

Laura Rygielski Preston is vice president, Global Healthcare Practice, for Trane Commercial Systems. She is responsible for customer satisfaction, market growth and expansion of offerings to meet the evolving needs of the healthcare industry. She is a Fellow in the American College of Healthcare Executives and is Board Certified in Healthcare Management.