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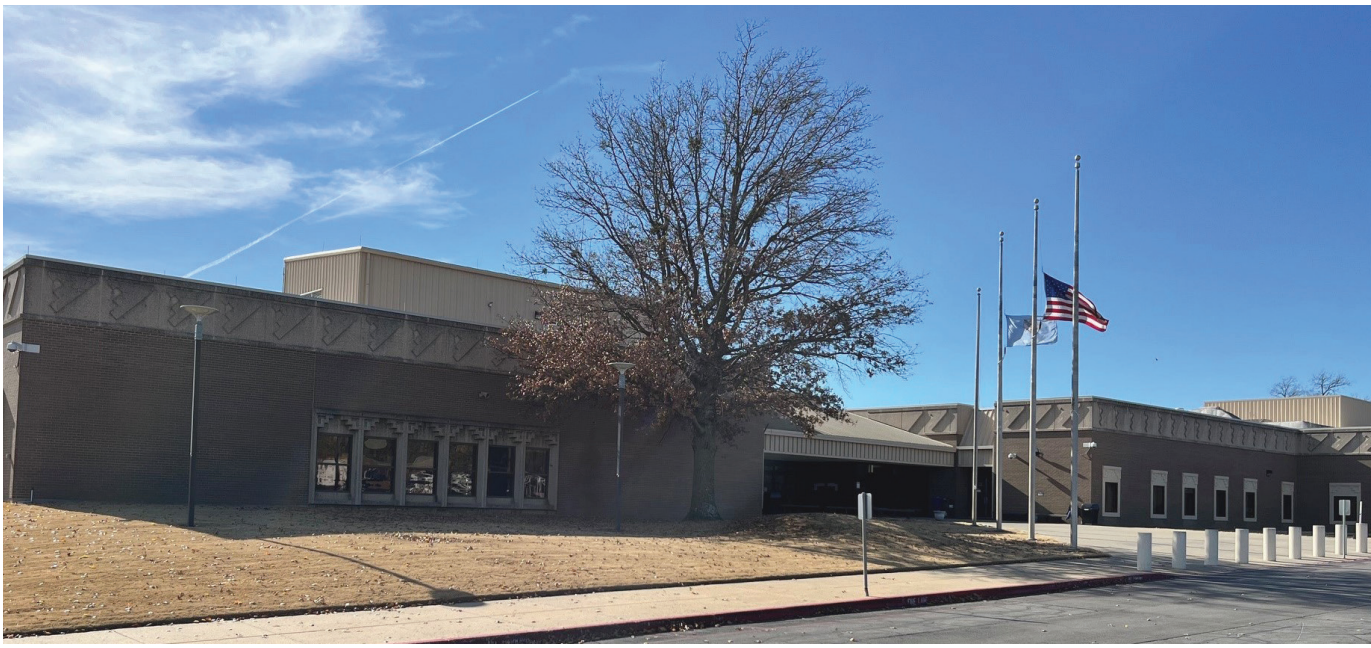
Meeting Ventilation Requirements, Achieving IAQ, and Operational Efficiency



The United States Public Health Service (USPHS) Claremore Indian Hospital (CIH), located in Oklahoma, is a 110,000 sq. ft. federally operated facility accredited by The Joint Commission. It provides emergency, acute, outpatient, and dental care to the Native-American population in the Indian Health Services Oklahoma City Area, which includes Kansas, Oklahoma, and Texas. Established in 1977, this 50-bed hospital serves at least 36,000 patients and annually conducts over 300,000 total visits.

Claremore Indian Hospital has an overall Medicare Spending Per Beneficiary score of 0.73, indicating that the cost of care at this hospital is lower than the national average. The facility has 83 providers specializing in 13 different primary specialties. In addition to providing medical care, the hospital prioritizes energy efficiency in its facilities. It continuously seeks ways to ensure building performance, maintain Indoor Air Quality (IAQ), and achieve proper ventilation to reduce the spread of infectious diseases. The hospital's wide range of services requires a healthy and pleasant environment for patients' recovery and the efficient performance of the medical staff. Poor IAQ in healthcare facilities has been recognized as a primary contributor to healthcare-associated infections (HAIs). Among the significant effects of HAIs on public health are prolonged hospital stays, long-term disabilities, high treatment costs, and excess mortality rates. Proven strategies for reducing HAI include environmental infection control and engineering controls.

Engineering controls aim to eliminate or minimize exposure to bacteria, viruses, and microbes. The HVAC system helps achieve this in a healthcare environment through dilution, filtration, pressurization, temperature, and humidity control. The ventilation rate in an indoor environment is measured based on its air change per hour (ACH) value. This is the quantity of outdoor air volume added to a space divided by the volume of that space over one hour. Proper air change rates can maintain IAQ and reduce the risk of airborne cross-infection. The difference between the supply air rate to the space and the return air rate from the space determines room pressurization. ASHRAE 170 Standard for Ventilation

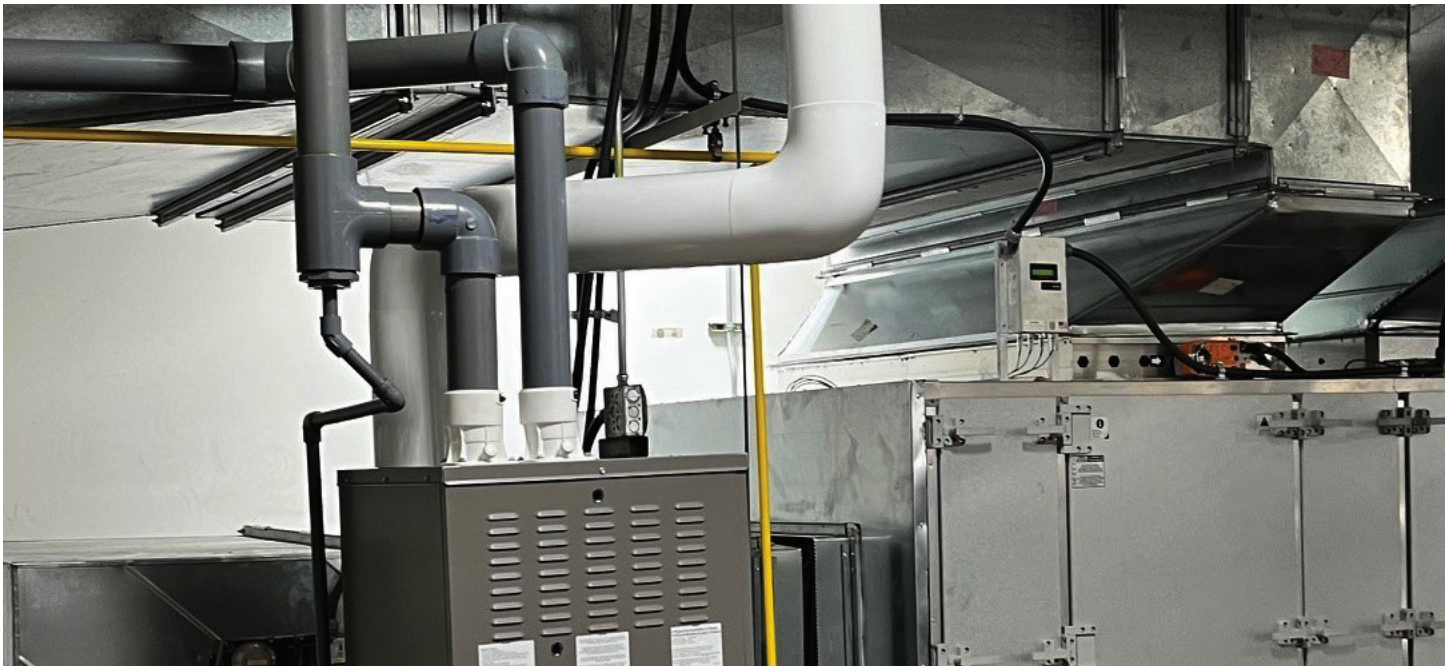
of Health Care Facilities prescribes various total and outside air change rates, pressurization relationships, temperature and humidity requirements for patient care, sterile storage, and surgical areas. Accurate measurement of total and outside airflow is critical to maintaining compliance with that standard.

Claremore Indian Hospital has undergone HVAC renovations to increase building IAQ and energy efficiency and validate airflows and change rates. Recent retrofit projects at Claremore Indian Hospital included a complete air handler controls upgrade and an air handler replacement for the warehouse area where prepackaged sterile items are stored. Charles Lewis, Electromechanical Project Manager at Claremore Indian Hospital, contacted a local vendor, Airetech Corporation, which provided the hospital with a solution for accurate airflow measurement. Air handler building automation programs were written to include service area volume calculations and calculate the necessary airflow required to meet air change rates specified in ASHRAE 170.

These airflow measurement stations have proven valuable, as they enable operation based on ASHRAE 170 required air changes by adding the space parameters and calculating the exact flow rates needed. Positive feedback from occupants and data trends show that the hospital is meeting all temperature, humidity, and room pressurization requirements. The integration of these measurement stations has addressed the need for data integration and operational transparency. The Building Automation System (BAS) extracts data to help with decision-making, trend analysis, interoperability, and issue resolution. This approach provides actionable data and control, allowing for monitoring and trending historical events to optimize outside air, supply and return air, and exhaust systems.

Accurate measurement of outdoor air temperature is crucial, and temperature measurement is utilized on all air handler outside air intakes. This redundancy ensures that outside air temperature measurements are always available, contributing to efficient operation through air and water-side economizers and determining maximum allowable outside airflow during cold weather conditions. Accurate OA temperature measurements optimize economizer staging, enabling the hospital to operate longer using free cooling. You can't manage what you don't measure.

By meeting ventilation requirements and achieving operational efficiency, Claremore Indian Hospital ensures IAQ compliance and proactively addresses potential issues. This approach provides a proper air change rate to maintain IAQ and reduce the risk of airborne cross-infection. Claremore Indian Hospital's commitment to leveraging cutting-edge technology continues to create a healthier and more efficient environment, reassuring all stakeholders of the hospital's proactive approach.



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