

Case study

Mountain States Health Alliance

Johnson City, Tennessee



Patient-centered care initiative drives ICU expansion, wireless infrastructure

Mountain States Health Alliance (MSHA) is a locally owned and managed healthcare system serving 28 counties in Tennessee, Virginia, Kentucky and North Carolina. The Alliance is committed to delivering the highest level of patient-centered care. With this goal in mind, MSHA selected Johnson Controls as program manager for the construction of a new ICU at its flagship hospital, Johnson City Medical Center, and to install a system-wide wireless infrastructure designed to enhance the patient and family experience.

MSHA provides a comprehensive continuum of care through nine hospitals and an integrated healthcare delivery system including 21 primary and preventative care centers and 13 outpatient care sites. The MSHA mission is to identify and respond to the healthcare needs of individuals and communities in the region and to assist them in attaining their highest possible level of health.

When MSHA decided to build a new ICU to accommodate the ever-increasing demand for services at its Johnson City Medical Center, it was only natural to turn to Johnson Controls for assistance. Johnson Controls has a long-standing relationship with MSHA, extending more than 20 years. Based on its approach, local presence and expertise, Johnson Controls was originally selected for the installation of building controls at Johnson City. Since that time, Johnson Controls has been helping MSHA implement energy conservation measures and conduct facility upgrades throughout the system.

Meeting the need for critical care



“Johnson Controls contributes to our mission by helping us make the most of our resources and continue our patient-centered care initiatives.”

DENNIS VONDERFECHT
PRESIDENT AND CEO
MOUNTAIN STATES HEALTH ALLIANCE



As a major medical referral center and the region’s only dedicated emergency medical air transport service and Top 100 Heart Hospital, Johnson City Medical Center has witnessed tremendous growth in demand for its services. The need for more critical care beds at the hospital is due to the increase of tertiary services in heart, transplant and trauma cases performed there. In fact, since 1999 the adult ICU days have increased 23.6 percent; the number of heart surgery patients has increased 24.7 percent; transplant cases increased 74.1 percent; air rescue flight services increased 23.4 percent; and acute admissions from outside Tennessee have increased 65.5 percent.

In response to this demand, Mountain States Health Alliance contracted Johnson Controls as program manager to build a 28-bed intensive care unit, renovate a 10-bed adult step-down unit, and make upgrades to the central energy plant. “Meeting the need for more ICU beds helps us improve throughput of our patients in the emergency department and with our surgery cases,” says Dennis Vonderfecht, MSHA president and chief executive officer. “The many special features incorporated into the new ICU will also continue our patient-centered care initiatives.”

ICU design reflects patient-centered care philosophy

The new ICU reflects MSHA’s patient-centered philosophy. For example, rooms are larger and have furnishings that enable family members to stay with

patients around the clock. The waiting area offers more amenities, such as computers, to families and guests to help lower stress during a medical crisis. Patient rooms have larger windows with a panoramic view of the Blue Ridge Mountain Range. There is also a healing garden – an open-air atrium filled with lush greenery situated near the waiting room.

“The ICU expansion is really our premier project for design of a patient-centered care environment. Many of the approaches taken with this project will be incorporated into future expansions at all of our facilities,” states Vonderfecht.

As the program manager, Johnson Controls was responsible for putting together a team that could deliver the project on time, on budget, and on target with the hospital’s vision. Taking a holistic approach, Johnson Controls provided a combination of planning support, pre-construction services, design assistance, procurement responsibility, construction management, coordination of vendors and commissioning. The approach ensured the building was created as a functional whole, rather than as a collection of individual systems. The early and continued involvement of Johnson Controls ensured that the hospital’s vision drove the project.

A focus on community involvement

In keeping with the vision, Johnson Controls maintained a community focus during construction of the new ICU. For example, a team of local contractors was organized by Johnson Controls to work on the project. “We knew that, given the size and magnitude of the project, it was important to the leaders

of the hospital that we keep the work within the community," says Jennifer Stenz, director of healthcare solutions for Johnson Controls. "The community feels more vested in a project like this when they are working to create a product that could have a direct impact on their lives and the lives of their loved ones."

Additionally, Johnson Controls has taken steps to ensure that its on-site staff is in-tune with the hospital's focus. Johnson City Medical Center believes that healing can exist without curing, but healing cannot exist without caring. And because Johnson Controls considers itself part of the hospital's staff, all employees who interact with staff and patients are trained on the hospital's policies and procedures, from communication to safety. This partnership approach is what makes the relationship unique.

Wireless infrastructure aids in patient-centered care

The in-building wireless distribution system provides complete wireless coverage for a variety of voice and data services that are essential to facilitate patient care. The wireless distribution system will be installed throughout the healthcare system within a 13-month period.

The wireless infrastructure will support an electronic clinical documentation system that allows medical orders, notes and prescriptions to be entered into a patient's medical record at the bedside, through handheld devices such as PDAs and tablet PCs. All the medical professionals participating in the patient's care are able to access the information in real-time. And, the

system records and double-checks the administration of medications. At Johnson City Medical Center, the wireless distribution system supports the new ICU and the articulating arm service columns within each room. These columns hold all patient monitoring equipment and data connection so that a patient's bed can be moved around the room for treatments, testing or family interaction.

The wireless infrastructure is configured to support future applications including wireless LAN, paging, voice-over IP telephone and energy management using existing Johnson Controls Metasys® building management systems. "We wanted a wireless network that we could install once and that would support future applications. We found this with the Johnson Controls wireless solutions," says Mark Moody, senior director, engineering services for MSHA. "We have always been on the leading edge of new technologies that help us deliver better patient care, and we believe the Johnson Controls system will help us do that."

"We explored several types of wireless initiatives; using a traditional system would have required that we install several wireless infrastructures," states Richard Eshbach, CIO and assistant vice president, information systems for MSHA. "With Johnson Controls we could install one infrastructure that gives us universal coverage and allows us to easily modify and expand without intrusive changes."



"We explored several types of wireless initiatives. With the in-building wireless distribution system, we could install one infrastructure that gives us universal coverage and allows us to easily modify and expand without intrusive changes."

RICHARD ESHBACH
CIO AND ASSISTANT VICE PRESIDENT,
INFORMATION SYSTEMS
MOUNTAIN STATES HEALTH ALLIANCE





Selected for approach, local presence and experience

Johnson Controls relationship with MSHA dates back to 1976 when it installed a Metasys system upon construction of the Johnson City Medical Center. Later when MSHA decided to develop a system-wide energy conservation program, Johnson Controls was chosen to lead the effort. "As with the recent ICU construction and wireless projects, we originally selected Johnson Controls for the energy conservation program due to their approach, process, team strength, healthcare experience and local presence," indicates Moody.

In 2001, MSHA entered into a 10-year performance contract with Johnson Controls to conduct improvements throughout its facilities. Improvements included lighting retrofits, mechanical equipment upgrades, water conservation measures, streamlined waste management practices and expansion of the Metasys system. Annual savings of \$655,000 are guaranteed over the life of the contract, which is augmented by a 10-year service agreement that ensures the guaranteed annual savings are reached or exceeded.

Johnson Controls and the MSHA energy management team evaluated operations practices at each facility. As a result, the team now views all of its facilities as one system from an operational level. "We were doing the same thing in many different ways throughout the facilities," says Moody. "By working as a team we identified areas where operations methods and devices could be standardized across all hospitals.

The resulting overall savings in operations costs allow us to direct more resources toward improving the environment and quality of healthcare."

Water consumption was decreased through a reduction of water-cooled devices and plumbing fixture retrofits. By installing deduct meters, Johnson Controls was able to negotiate savings in water and sewage costs with utilities. "The waste management program was the icing on the cake for the energy management proposal," says Moody. Under the program, each facility's disposal practices were audited. Employees were trained on the proper separation and disposal of general and hazardous waste. And, facility performance is monitored on an ongoing basis and additional instruction given if necessary. To date, the waste management program is responsible for nearly one-third of the overall savings.

With the latest projects completed, installation of the wireless distribution system and the ICU construction, Johnson Controls is helping Mountain States Health Alliance plan for utility and maintenance costs by providing life cycle analysis and projection of the building's operational costs. They are also presenting financial options for preserving capital dollars and investigating future infrastructure changes to ensure regulatory compliance and emergency preparedness. "Johnson Controls continues to contribute to our mission by helping us make the most of our resources and continue our patient-centered care initiatives," says Vonderfecht.

"We originally selected Johnson Controls for their approach, process, team strength, healthcare experience and local presence. The resulting savings in operations costs allow us to direct more resources toward improving the environment and quality of healthcare."

MARK MOODY
SENIOR DIRECTOR, ENGINEERING
SERVICES MOUNTAIN STATES
HEALTH ALLIANCE



Indian Path Medical Center