Multidisciplinary team approach to prevent healthcare-associated infections

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Healthcare-associated infections (HAIs) in hospitalized patients are receiving more scrutiny due to Centers for Medicare & Medicaid Services (CMS) patient safety initiatives, quality reporting, and reimbursement requirements. This can be challenging in the long-term acute care hospital (LTACH). Patients admitted to the LTACH have been hospitalized for a period of time at other facilities and have medical issues that have decreased their immunity. They have received antibiotics for various infections and are transferred to the LTACH with devices and/or wounds.

Prior to 2011, WellStar Windy Hill Hospital in Marietta, Georgia, had implemented the recommended evidence-based practices to reduce device-related infections, including the central-line insertion bundle, the ventilator bundle, and the recommendations to prevent catheter-associated urinary tract infections (CAUTI). We were still facing challenges in our attempt to decrease healthcare-associated infections. Near the end of January 2011, we had a spike in CAUTIs, as well as Clostridium difficile infections (CDI). The trend continued through February.

We formed multidisciplinary teams to review trends and bundle compliance, as well as to determine other appropriate interventions. The infection preventionist (IP), performance improvement coordinator, hospital educator, and physician advisor were members of all teams. The meetings were held monthly for the first six months and continued as new information was available or investigation was needed. Multidisciplinary teams meet weekly in the LTACH environment to discuss patient progress, evaluate goals, and suggest further interventions, but use of multidisciplinary infection prevention teams was a new process.

An isolation log had already been developed to keep staff informed of isolation status and was updated daily. The IP posted this in each nurse’s station. Isolation signs were simplified to include only basic information in a picture format. The new signs were easier to see and compliance with isolation precautions increased. Signs were placed on alcohol-based hand sanitizer dispensers as another reminder to staff to use soap and water instead of alcohol-based hand sanitizer following care of CDI patients.

The IP made daily rounds throughout the hospital, ensuring that precaution signs were correct, bleach wipes were in the room when appropriate, and all staff were using appropriate precautions. The staff had an opportunity to ask questions and make suggestions as to how the process could be improved. Compliance with hand hygiene, use of gowns and gloves, and cleaning of equipment increased.

The staff were already using individual blood pressure cuffs and stethoscopes in each contact isolation room. All electronic thermometers on the automatic blood pressure machines were removed and each patient was given his or her own digital thermometer. This made a great difference in our number of CDIs because transmission is fecal-oral and the hub of the thermometer probe is close to the mouth when using the
electronic devices. The staff knew to clean the machines between patients, but there was a risk of inadequate cleaning due to the length of dry time for the wipes and the irregular surfaces of the probes.

**CDI TEAM**

The CDI team met first in March 2011 with members from the following areas: nursing, respiratory therapy, rehab services, pharmacy, dietary, lab, radiology, environmental services, and maintenance. We reviewed interactions with patients for appropriate use of personal protective equipment (PPE) and hand-washing. One of the first suggestions from the team was to place an additional sink on one unit to make access to soap and water more convenient. Over the following months, two more sinks were installed on the unit.

Team members observed patient care to determine compliance with equipment cleaning, the use of PPE, and hand-washing. The dietary staff suggested and implemented giving hand wipes to patients with trays when appropriate. The team monitored cleaning of shared equipment, such as the lift, blood glucose machine, and automatic blood pressure machines. The team looked at disposable equipment that was available to decrease the risk of contamination, and implemented disposable wash basins, lift slings, and disposable commode liners to reduce the splash that occurs when cleaning bedside commodes.

The IP developed a short version of the isolation log, with the type of precautions that were indicated to ensure staff were prepared to care for the patients. Transportation guidelines were updated and implemented.

The medical staff approved an algorithm for early identification of CDI. The team provided education regarding the algorithm, using a crossword puzzle and a PowerPoint presentation. The team developed a brochure for families of patients with CDI in addition to general infection precaution information.

The staff used workstations on wheels (WOWs) for documentation. These also carried medication and supplies. Computers were installed in each room. In August 2011, we implemented in-room documentation. The pharmacy provided individual dose medications as often as possible. Multiple dose medication that could not be converted to single dose and respiratory medication were kept locked in a cabinet in each patient room with individual pill cutters and crushers. This reduced the risk of cross contamination when preparing medication.

Respiratory therapy continued to use the WOWs for documentation of ventilator settings. In February 2013, the IP used ATP testing to determine the effect of cleaning them following each patient use. The results convinced the staff that this effort decreases contamination on the WOWs.

Because cleaning supplies need to be readily available, nursing staff and EVS maintain sanitizing wipes, and bleach wipes as needed, for decontamination of the bedside equipment. The team implemented a checklist for terminal cleaning of the room to include all steps of the process including removing equipment from the room, cleaning, use of hydrogen peroxide vapor/ultraviolet light (after August 2012), engineering checks, etc. This ensured proper cleaning and maintenance.
In April 2013, the team met to review the latest APIC recommendations. The team decided to encourage both types of hand hygiene after contact with a patient with CDI. Hand hygiene surveillance continued and each department completed 10 observations per month.

The rates of CDI have consistently decreased from a high of 53 per 10,000 patient days in the first quarter of 2011 to 7.7 per 10,000 patient days in the second quarter of 2015.

CAUTI TEAM

The CAUTI team started meeting in April 2011. Members included all levels of nursing personnel. The urinary catheter bundle surveillance indicated that bundle compliance was good. Silver alloy catheters had been implemented in November 2010, but use was discontinued in May 2012 due to lack of evidence of effectiveness. Due to the weight and immobility of the patients, the team was concerned about patient cleanliness. Competencies included a review of proper cleaning for the clinical care partners. Each supervisor did weekly surveillance to ensure cleanliness, as well as compliance with other aspects of the bundle. In August 2011, we implemented the use of disposable wash basins after agreement with the CDI team as well as the CAUTI team. The nurse completed a daily necessity form for each patient with a catheter. Urinary catheter needs, as well as central-line needs, were discussed each week in multidisciplinary team meetings.

In May 2012, the team evaluated a new brand of male external catheters as an alternative to indwelling catheters in men. Superabsorbent pads were implemented to keep patients’ skin dry and intact when catheters were not used. With the interventions presented, the CAUTI rate has decreased from a high of 7 per 1,000 catheter days in the first quarter of 2011 to 3.3 per 1,000 catheter days in the second quarter of 2015.

CLABSI TEAM

The central line-associated bloodstream infection (CLABSI) team also started meeting in April 2011. This team included bedside nurses, as well as nursing supervisors, pharmacy, and lab. The recommended central-line bundle had been implemented long before and compliance with insertion criteria was consistently met. Chlorhexidine gluconate (CHG) dressings had been implemented in November 2010. Nurses routinely changed dressings every weekend, and the team discovered that nurses who were not routinely doing dressing changes were not comfortable with the procedure. The team educated nurses on the proper way to “scrub the hub” and clamp and flush ports. We implemented CHG baths for all patients in November 2011 to provide consistent care and possibly reduce other types of infections as well.

Port protectors with alcohol had been trialed in 2010 and fully implemented in May 2012. In October 2012, two nurses were designated to round on all central lines once per week, ensuring that the dressings were intact and clean, and the lines flushed properly; they provided education when indicated. The rate of CLABSI has decreased from a high of 1.8 per 1,000 central-line days in the second quarter of 2011 to 0.6 per 1,000 central line days in the first quarter of 2015. We continue to work on this as we target zero.

VAP TEAM

The ventilator-associated pneumonia (VAP) team—consisting of respiratory therapists and nursing personnel—started meeting in July 2011. WellStar Windy Hill Hospital had few VAPs, and the only elements of the bundle that showed a need for reinforcement were oral care and maintaining
the head of bed at a minimum of 30 degrees. The team outlined who would do each oral care throughout the day and what procedure would be used. Respiratory therapists perform oral care on ventilator patients at the beginning of each shift, and the nurses do oral care the other two times, once with CHG. The team worked together to educate staff and monitor use of the oral care kits, schedule of oral care, and use of CHG.

The team worked with staff, patients, and families to emphasize the need to keep the head of bed up. When new beds were purchased, they had a lock-out feature that was used to maintain head of bed elevation.

The definitions of VAE have changed, so it is difficult to evaluate progress. The VAP rate at the end of the second quarter of 2011 was 2.25, and the probable VAE rate at the end of the second quarter of 2015 was 0 with an IVAC rate of 0.3.

OTHER FACTORS

Antibiotic stewardship is an intervention that is used to decrease multidrug-resistant organisms and C. diff. The hospital has at least one clinical pharmacist on the units every day, reviewing every culture and sensitivity test, antibiotic usage, and making recommendations regarding appropriate use of antibiotics.

The teams identified that another factor in preventing infection is a decreased ratio of patients to nurses and clinical care partners. Proper staffing is a constant challenge, but administration has continuously supported appropriate staffing.

Staff awareness and education are essential to reducing infections. We maintain a communication board for our staff, which is updated daily. It includes new healthcare-associated infections and the number of days since the last event. It is a picture of our progress.

The multidisciplinary teams continue to identify opportunities for improvement and implement change. Most suggestions have been implemented, and this keeps the staff involved and interested.

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**References**
