DEVICE-ASSOCIATED INFECTIONS

Evidence-based Practice Remains the Best Way to Decrease HAIs
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Scanning electron micrograph of a Staphylococcus biofilm on the inner surface of a needleless connector. Photograph by Janice Carr, courtesy of the Centers for Disease Control and Prevention (CDC).
Evidence-Based Practice Drives Improvement

By Kelly M. Pyrek

Teamwork and a multi-modal approach to infection prevention and control were the driving forces behind positive change and improved patient outcomes at several institutions that were honored in late 2014 by the Fine Foundation and the Jewish Healthcare Foundation (JHF). The Fine Awards for Teamwork Excellence in Health Care recognized frontline workers in the greater Pittsburgh, Pa. area who elevate and disseminate best practices in infection control — a quality measure that influences whether providers receive incentive payments or incur penalties from the Centers for Medicare and Medicaid Services (CMS).

“Infection control prevents unnecessary pain, expense and death,” says Milton Fine, chairman of the Fine Foundation. “Working together with the energy, the creativity and the enthusiasm that we celebrate, we can reach clarity, sanity and effectiveness in our healthcare.”

“The recent Ebola outbreak in Africa, and isolated cases in the U.S.,” says JHF president and CEO Karen Wolk Feinstein, PhD, “has raised public awareness of the need to control infection, but this certainly is not a new issue — healthcare-associated infections (HAIs) have been a major threat to patient safety since there was healthcare. We do, however, know that most HAIs can be prevented through strict adherence to evidence-based practices — Progress has been made in HAI prevention; but there is still much room for improvement.”

Fine Awards winners, chosen by a national panel of experts, were required to demonstrate evidence of sustainable quality improvement. Let’s take a look at the initiatives of three winners in the infection prevention category.

ALLEGHENY HEALTH NETWORK/ALLEGHENY VALLEY HOSPITAL

The Platinum Award winner is Allegheny Health Network/Allegheny Valley Hospital for their initiative, “Eliminating Hospital-Acquired Clostridium difficile Infections.” Allegheny Valley Hospital (AVH) in Natrona Heights, Pa. is a 228-bed hospital that serves as an inpatient facility and offers a broad spectrum of programs, including medical and surgical services, inpatient psychiatric care and geriatric psychiatric care, cardiology, orthopedics and cancer care. It is part of the group of Allegheny Health Network of hospitals.

Gwyn Weil, RN, BSN, director of medical staff performance improvement for Allegheny Valley Hospital and Allegheny Health Network, describes the scope of her institution’s challenges regarding C. difficile infections: “Clostridium difficile infection (CDI) is one of the most common hospital-acquired infections and has been steadily on the rise over the last decade based on the CDC statistics. As a result of this national trend and our own increase in the CDI rate to 15.6 in fiscal year 2009, AVH identified CDI prevention as a priority quality objective and ramped up efforts, starting with the assembly of a multidisciplinary team to lead efforts to reduce/eliminate the risk and incidence of CDI. There is a high volume of high-risk and/or immuno-suppressed patients from our cancer program and our SNF population. Additionally, there was no team effort focused on the CDI problem.”

Front row: Esther Atwood, AVH vice president of patient care services and chief nursing officer; Diane Lang, AVH infection preventionist; Renee Mackenzie, AVH clinical pharmacist; Gwyn Weil, AVH director of quality; Sheila Fine. Back row: Russ Livingston, chairman of the AVH board of directors; Margaret Meals, MD, AVH chief medical officer; Milissa Hammers, nurse manager of AVH Orthopedics; Karen Feinstein, president and CEO of Jewish Healthcare Foundation; and Milton Fine, chairman and president of The Fine Foundation. Photo by Renee Rosensteel
made the difference, but there seems little doubt that collectively all these measures have contributed to our outcomes having shown significant improvement. This also underscores why is so important that we implement each individual component of the multi-modal approach which has been shown in the literature to be valid. Combined, they comprise a very effective risk-mitigating care model.”

It’s not enough to understand the clinical imperatives of SSI prevention; Kovatch acknowledges that the business case for infection prevention for SSIs is critical to process improvement. “As our healthcare environment continues to evolve, providers at all levels are becoming more aware of financial influences on care delivery and value,” he explains. “Managing costs becomes increasingly relevant in a landscape of diminishing reimbursement dollars and increased competition for performance/outcome-based payments. It is indeed helpful for clinical staff to understand the financial implications of our clinical outcomes because doing so can provide context for the processes we have chosen to implement (or not implement). Again, as with anything, understanding the ‘why’ helps improve compliance.”

CHILDREN’S HOSPITAL OF PITTSBURGH

The Silver Award winner is Children’s Hospital of Pittsburgh, Pa. for the initiative “Creating a Culture of Excellence in Central Line Care.” Teresa Mingrone, RN, MSN, NICU programmatic nurse specialist, explains that in 2009, the NICU moved to a new building — a move with unintended consequences. “We actually were expecting to see a decrease in infections,” Mingrone says. “In a brand-new building, we thought there wouldn’t be a lot of germs running around but what we saw was the exact opposite.”

Previously, the NICU was in one large open room, but it was transitioned to a new configuration of private rooms. “Although we anticipated that we would see a decrease in infections when we moved into single rooms that is not what occurred,” confirms Margaret Lamouree, unit director of the NICU at Children’s Hospital of Pittsburgh. “Immediately following the move we actually saw an increase in central line rates. We believe this increase was due to the increased amount of personal belonging that were being brought into the private rooms. On occasions parents were observed reaching into their purse, grabbing their cell phones and handling other belongings while they were holding their baby. These observations prompted us to launch a parent education campaign about the importance of parent and visitor handwashing and also highlighted the need to re-educate about re-washing after they touched any item in room and before touching the patient.”

Lamouree continues, “Within our hospital, we care for many patients who require central lines due to a critical illness or injury or for long-term nutrition. This is especially true in our NICU where we care for many infants who have intestinal failure as a result of complications of prematurity, intestinal anomalies and other complex medical conditions. In infants the short distance between the central line site and sources of contamination, such as the diaper area, stomas or tracheostomy sites can significantly increase the risk of contamination and infection.”

Because handwashing is such a cornerstone of safety in the NICU setting, Children’s Hospital of Pittsburgh conducted a series of education campaigns aimed at increasing hand hygiene awareness. Signage was posted in the family waiting rooms, at the entrance to the unit and in every patient room. A brochure about the importance of handwashing and proper handwashing technique also was given to all first-time visitors to the NICU.
“A handwashing video from the CDC was added to our patient/family education channel and we asked all families to view the video within 24 hours of their child’s admission to the NICU,” says Mingrone. “Our attending physicians/fellows and NNPs incorporated hand hygiene into their discussions with families; once a family was educated about hand hygiene a hand symbol was placed on the patient’s door. These hand symbols generated additional discussion among families and served as a visual reminder to wash before entering a room. A friendly contest was held between our two NICU medical teams to determine which team had the most hand hygiene discussions with the families. Families were invited to participate in the contest and received points for performing good handwashing and helping to educate other visitors.”

“To increase transparency related to hand hygiene compliance we developed a simple hand hygiene report card which we post in both public areas of the NICU, with the results of both staff and family/visitor hand hygiene compliance,” Lamouree adds. “Although most of these activities were aimed at family and visitors, by engaging the staff in educating families, it helped raise awareness and compliance for all levels of employees.”

In concert with hand hygiene improvement efforts, Children’s Hospital of Pittsburgh launched a CLABSI-prevention bundle. Says Lamouree, “The central line bundle we developed addressed four specific areas of care: insertion, ongoing care and maintenance, accessing lines and line removal. Key elements were proper gowns, prepping, draping and for insertion as well as the need to allow adequate drying time for prep solutions, positioning lines so that the hubs were ‘up and away’ from the diaper area, the importance of occlusive dressings, scrubbing the hub and dry times before accessing ports, minimizing the number of times ports are accessed by clustering bloods draws and prioritizing which med are administrated through the central line vs a peripheral line, and the need to remove lines as soon as possible if they are no longer needed for care.”

Nurse practitioners routinely insert PICC lines in the NICU, and at Children’s Hospital of Pittsburgh they perfect their skills in a simulation lab. As part of the exercise they review a procedural checklist that addresses core components such as hand hygiene, PPE and maintenance of sterile technique throughout the procedure. A

IN INFANTS THE SHORT DISTANCE BETWEEN THE CENTRAL LINE SITE AND SOURCES OF CONTAMINATION, SUCH AS THE DIAPER AREA, STOMAS OR TRACHEOSTOMY SITES CAN SIGNIFICANTLY INCREASE THE RISK OF CONTAMINATION AND INFECTION.

key component of line care is scrubbing the hub, particularly for a prescribed amount of time — 15 seconds.

“Along with education it is important to incorporate time to practice the associated clinical skills,” Mingrone says. “Having staff scrub the hub in simulation and timing them was helpful. Most staff found it eye-opening and underestimated the 15 seconds scrub duration. Showing the demo of glow germs at 5, 10 and 15 seconds helped staff to visualize the importance of the 15 seconds. Today, staff watch the clock or recite the ABC’s to ensure 15 seconds on the scrub. Simulation training is also very helpful for teaching new clinicians appropriate gowns, peeling, draping and sterile technique for line insertion.”

Mingrone says that during rounds, the NICU teams engage in daily discussions about the need for the line for each patient. “Our clinical leaders are responsible for various aspects of monitoring lines and dressings,” she says. “They check the condition of the dressings and to see if there is a date on the dressing and to make sure it has been changed per our policy of every seven days.”

“Discussing central line care and hand hygiene every day was vitally important to changing in our unit’s culture,” says Lamouree. “Daily discussions and holding all levels of staff equally accountable provided a clear message about the importance of this issue. Daily discussions also serve to reinforce the message, we know that families as well as newer staff can be overwhelmed by the volume of new information they receive in one day, involving parents in the discussions on rounds helps to empower the families and help them to partner with the medical team.”

Beverly Brozanski, MD, medical director of the NICU at Children’s Hospital of Pittsburgh, says that prior to this initiative, the CLABSI rate was 1.29 per 1,000 central line days over a 12-month period. “Upon closer examination of our data we noted that was wide variability, sometimes achieving four or five consecutive months without a central line infections and then seeing spikes up to three to five CLABSIs per 1,000 line days in a single month,” Brozanski says. “This inconsistency confounded us and prompted us to dig deeper into our data and the consistency of our practices.”

The interventions that Children’s Hospital of Pittsburgh put into place helped drive the CLABSI rate to 0.5 per 1,000 line days. “Identifying best practices and then making them the standard of care is essential to decreasing the central line infections,” Lamouree emphasizes. “This cannot be a one-time educational effort. In large units such as ours there is a constant influx of new families, and new personnel within the hospital (staff, students, residents, consultants, etc.), so ongoing learning activities are needed to maintain heightened awareness. We communicate every month about our handwashing and CLABSI rates, we celebrate our successes (usually with food) and challenge our staff to help us achieve even better results. Using a root cause analysis method to investigate all CLABSIs has been helpful in identifying areas that need re-education as well as previously unrecognized factors that may contribute to infection risk. Data gathered from these investigations are leading us to explore additional best practices which we can incorporate into our bundles as we strive to reach zero.”