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GREENING THE OR™

CASE STUDY

North Suburban Medical Center: Fluid Management in the OR

Demographic Information:

North Suburban Medical Center (NSMC) is a 157-bed, acute-care hospital in Thornton, Colorado. As a cornerstone facility in the HCA-HealthONE® system, the largest provider of health-care services in the nation, North Suburban employees are committed to providing outstanding, high-quality patient care to the growing population of families living in north Denver. The hospital currently has 6 operating rooms and is undergoing a surgical services expansion.

Executive Summary Statement:

NSMC staff works to carry out the mission of the hospital by searching for ways to grow and improve their facility. This includes ensuring a safe workplace for staff while also reducing the environmental impact of the organization. NSMC staff had recently struggled with the safe management of fluid waste in the Operating Room (OR). The OR staff had experienced problems with the previous fluid management system and wanted to find a safer way to manage fluid waste in the OR. Dedicated to ensuring the safety of patients and employees, NSMC recently purchased the Stryker Neptune Fluid Management System for the hospital's 6 ORs. The new system has not only addressed the safety concerns of the organization, but it has also reduced waste, while meeting all of the needs of the OR doctors, nurses, and anesthesiologists.

The Problem:

During a surgical procedure, OR staff suction blood, body fluid, and other fluid waste from the patient using a suction device. Hospitals use various systems for managing this fluid waste. Fluid management systems such as wall suction canisters and closed system suction devices collect surgical fluid waste in the OR. At NSMC, the OR staff ran into various problems with the previous fluid management system in which wall suction canisters were used. The wall suction canisters were only available in a limited variety of sizes. During a surgical procedure, the suction canisters would occasionally fill up, forcing the OR staff to empty the canisters, risking exposure to potentially infectious fluid waste. Additionally, the wall suction canisters had poor suction strength, and did not allow anesthesiologists the chance to accurately measure the fluid loss from the patient.

THE TEAM INVOLVED IN THE DECISION MAKING PROCESS:

- *Phil Jaklich, Director of Surgical Services*
- *OR physicians*
- *OR nurses*
- *Anesthesiologists*

Phil Jaklich, Director of Surgical Services at NSMC, along with the orthopedic service line nurses, doctors, the urology department, and anesthesiologists wanted a safer and more precise way to manage and measure fluid waste in the OR.

In addition to the need for a safer and more precise way to manage fluid waste in the OR, NSMC management wanted to find ways to reduce the amount of waste the hospital generated. With the previous fluid management system in the OR, an isolizer—which solidifies fluid waste, was added to the contents of the suction canister, adding to the cost of waste disposal. The solidified waste was then disposed of as Regulated Medical Waste (RMW). NSMC treats their RMW in an onsite autoclave and then sends treated waste to the landfill.

Strategy & Implementation:

In an effort to reduce the amount of Regulated Medical Waste the facility generated, NSMC started a recycling program and in 2009, initiated the new fluid management system in the OR. In 2010, NSMC purchased three of the Stryker Neptune Fluid Management Systems. The equipment is a closed fluid waste management system. The system is comprised of a mobile device that collects surgical fluid waste without operator assistance, precisely measures the fluid, and then safely and properly disposes of the fluid to the sanitary sewer through a docking mechanism. The closed system protects OR staff and patients from exposure to bloodborne pathogens from fluid waste.[1]

Perioperative staff at North Suburban—modeling the new equipment.

The system uses an integrated canister that never has to be replaced. Compared to disposable suction canisters that need to be replaced for each surgery, the integrated canisters save the hospital on the cost of supplies. The Neptune system cleans itself after the system is emptied. A combination of water and enzymatic cleaner are rinsed through the canisters, thoroughly cleaning the system in 3-5 minutes.[2] The system uses a disposable manifold that is replaced after each patient. This is the only waste that enters the RMW waste stream related to fluid management. Each manifold weighs just 53g—it would take 77 of the disposable manifolds to compare to the weight of just one full 3-liter disposable suction canister.[3] The Neptune 2 also has a built-in smoke evacuator—an additional equipment benefit.

In order to meet NSMC goals for fluid management to increase safety of OR staff, precisely measure surgical fluid waste, and to decrease Regulated Medical Waste, NSMC began to survey various types of closed fluid management systems. OR doctors, nurses, the OR Director, and

anesthesiologists wanted a fluid management system with stronger suctioning capability, a system that could precisely measure fluid waste, and a system that was mobile. After review of several systems, the OR Director, Phil Jaklich purchased three of the Neptune Fluid Management Systems. The system was selected because it had all of the features that met the agreed upon goals of the team involved in the decision making process.

After NSMC purchased the systems, a team from Stryker came to NSMC to work with the hospital's engineering department to properly install the plumbing for the system. Stryker had the new wastewater line approved by the city and provided all of the materials necessary for installation. A representative from Stryker also held an In-Service to educate and train the OR staff on how to use the new system. Likewise, the Stryker representative trained the anesthesiologists on how to read the measurement of the fluid waste. The educator for the OR and the OR Charge Nurse are also responsible for helping to train new staff on how to use the Neptune system.

The Neptune system is only emptied when it is full, which helps speed turnover time of the OR in between surgeries. The dock for the system is located in the soiled utility room and connects to the wastewater line. All OR staff participating in docking the system. At the end of each day, and anesthesia technologists follow up to make sure that the system has been docked.

Benefits:

- The new system offers more volume capacity for surgical waste then suction wall canisters.
- The system precisely measures fluid waste increasing the safety of the patient.
- The system has a smoke evacuator and smoke detector.
- The system is self-cleaning and decreases the risk of staff exposure to bloodborne pathogens.
- The system reduces RMW related to fluid waste.

SINCE STARTING TO USE THE NW FLUID MANAGEMENT SYSTEM, NSMC HAS HAD:

- ***zero*** *staff exposure to fluid waste from splashing*
- ***zero*** *slips from fluid spills*
- ***zero*** *electrical hazards from fluid spills*

The new fluid management systems stand ready for use.

Challenges and Lessons Learned:

The implementation has been fairly smooth with no significant challenges arising. The payback period for the new system was 4 years. However, Phil Jaklich noted that the benefits of the Neptune system, including staff satisfaction, staff safety, and reduced spills were immediate. NSMC uses the three Neptune systems in all 6 ORs. They plan to purchase two more Neptune systems in 2011.

Endnotes

1 Stryker. (2010). *Stryker Neptune 2*. Retrieved March 2011, from http://www.stryker.com/en-us/products/OREquipment Connectivity/GeneralMulti SpecialtyEquipment/WasteManagement/Neptune2/index.htm

2 Stryker. (2007). *Neptune 2 Ultra* Brochure. Retrieved March 2011, from www.stryker.com

3 Personal Communication, Nate Miersma, Portfolio Manager, Stryker Corporation. March 2011.

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