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Applying new technology behind the scenes improves patient care

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The Medical Device Reprocessing Centre (MDRC) at Sunnybrook Health Sciences Centre in Toronto provides a critical service at the heart of infection control, as it ensures all equipment used on patients is safe and sterile.

Several times a day, the MDRC receives soiled instruments, devices and hardware, such as stainless steel bowls and instrument trays, from operating rooms and clinics. The centre decontaminates, washes, disinfects, dries, packs, sterilizes and cools instruments and returns them to the operating rooms and clinics as quickly as possible, using a bar code instrument tracking system to ensure delivery to the appropriate destination.

The challenge

In 2007, the MDRC faced the substantial challenge of increasing instrument cleaning capacity to meet both current processing volume and an anticipated future 30% growth in volume — without an increase in its operating budget.



Sunnybrook Health Sciences Centre has raised productivity and cut costs by installing innovative equipment for reprocessing medical devices

The existing washers were old, and required pre-soaking for all instruments and hardware before they were loaded into a low-capacity index washer/decontaminator. The machines jammed and broke down frequently, often affecting operating room schedules. Physically hard work was required to load the machines and unload them when they jammed. Injuries and absenteeism were too frequent. Maintenance and repair costs were eating up departmental budgets. Overtime costs were rising. The steadily increasing instrument and utensil processing volume was already stretching MDRC capacity. In fact, more often than not, the MDRC was operating in crisis mode.

Finding a solution

To address these difficulties, the MDRC began looking for an efficient and cost-effective solution that would require no increase in operating budget or footprint.

Essential criteria were small machine size, high cleaning capacity, improved worker safety and reduced resource consumption, in compliance with the hospital's environmental sustainability strategy. A solution was found that met all these criteria. In October 2008, Sunnybrook became the first hospital in North America and third in the world to install a bank of three highly automated Getinge 88 Turbo washer/disinfectors and the Air Glide System, an automated basket loading and unloading system. At the same time, the MDRC installed a Getinge 9128 floor-loading cart and utensil washer/disinfectors to process items such as trays, urinals and instrument containers.

The installation of this technologically innovative equipment provided intrinsic productivity, economic and environmental benefits, and also created an opportunity to restructure the operations of the MDRC and optimize use of the technology in terms of productivity, employee work assignments and, ultimately, additional savings.

Assessing the results

Investing in the new technology achieved several key departmental outcomes. The new washer/disinfectors quadrupled capacity to 72 instrument trays per hour, and the greater load capacity (from two trays to between eight and 12) increased processing speed and reduced the number of loads required.

Automation significantly increased throughput in the department by 30% and allowed some staff to be reassigned from decontamination to the clean side. Turnaround time for reprocessing stat instruments was reduced from three to two hours, allowing the operating rooms to reduce turnover time between cases and increase the number of cases, without increasing inventory. This led to improved user satisfaction and a reduction in the use of flash sterilization in the operating room.

Reduced instrument handling, automated pre-cleaning and a high-flow, high-pressure cleaning process provided excellent cleaning quality with improved quality control and no complaints about "sterile crud" instruments. The new system exceeded Canadian CSA and met ISO standards for cleaning and disinfection.

Automation eliminated routine presoaking, the need to lift and push heavy baskets, and manual cleaning of the interior of the machines, increasing the safety and ease of work in decontamination and

decreasing noise and heat. In the year ending Sept. 30, 2008, the MDRC had reported six decontamination-related injuries. No injuries were reported the following year.



The experience of Sunnybrook's Medical Device Reprocessing Centre has been adopted as a model for infrastructure change in hospitals nationally and internationally.

The MDRC substantially reduced water consumption, by approximately 7.7 million litres annually, and electricity consumption, by 9.5 Kw per cycle. A cost-comparison model found the new system decreased operating costs, due to automation, increased cycle capacity and efficiency, and decreased use of water, electricity, and chemicals. The new washer/disinfectors reduced annual MDRC operating costs by over \$342,000, with more than \$196,000 saved in utilities and chemicals. Automation and elimination of overtime saved an additional \$146,000.

Recent developments

Since installation of the new washer/disinfectors, the MDRC has continued working to optimize the equipment processes and departmental organization and function. Automation associated with this innovative technology allowed a double sink to be removed in decontamination, facilitated work flow reorganization, and allowed the MDRC to become even more efficient, helping to improve sustainability, safety and quality.

Reorganizing work flow speeded preparation, packing and sterilization of instruments, allowing case carts to be stocked and delivered faster. The equipment, which runs from 9:00 a.m. to 3:00 a.m. daily, has proven to be reliable, with little maintenance required and few breakdowns after three years of heavy use.

Staff satisfaction and morale have increased substantially, and employees are less tired at the end of their shifts. No injuries have been reported since installation of the automated equipment (over four years). Employees are also proud to be contributing to better patient care and to be working with innovative technology.

At the same time, improvements in management and in the effectiveness of overall departmental function have further increased employee morale, efficiency and productivity. The staff take ownership and are proud to be a part of a department with leading-edge technology and management.

Installation of an enhanced instrument tracking system now allows the MDRC to track instruments through all phases of use and reprocessing, including activities in all cleaning and sterilizing chambers and instrument usage to specific patients, and helps improve quality assurance. Service enhancements have simplified instrument management for the department's customers and raised its profile and image within the hospital. As well, a new cart washer has also helped increase capacity.

The MDRC continues to track productivity, costs and savings. From 2008 to 2011, productivity increased by an additional 15%, for a total productivity increase of 45%. Increases were both planned (addition of Women and Babies program) and unplanned (new services for dentistry and St. John's Rehabilitation Hospital). Growth in work volume in 2012 is trending at an additional 14%. Despite this substantially increased volume, automation also enabled a reduction of 2.5 full-time employees. Three staff

members were assigned to manage the increased volume of clean equipment to be packed and sterilized. The tracking system is beginning to capture and analyze data.

Annual savings associated with the new system now amount to almost \$404,000, representing an additional annual savings of nearly \$62,000 since 2008, a further 18% increase in savings. Annual cart washer savings are almost \$44,000, so the total annual savings in operating costs add up to over \$500,000.

The new automated washer/disinfectors, basket loading and unloading system and cart washer continue to provide greater than the expected benefits in quality, productivity and savings. The equipment purchased in 2008 has more than paid for itself, and savings from the department are redirected to patient care, specifically to the operating rooms. The Sunnybrook MDRC experience has been adopted as a model for infrastructure change in hospitals nationally and internationally.

Adopting innovative technology provides an initial intrinsic benefit, but recognizing and capturing the resulting opportunity to optimize the operation of the technology and to reorganize work flow provide more benefits. Adoption of state-of-the-art reprocessing technology further ensures a decrease in surgical site infections and helps improve patient care and safety. ■

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