

# SickKids pharmacy automation transforms medication management

BY JUSTIN FAIOLA

**T**ORONTO – When a patient is admitted to a hospital and administered medication, they depend on their healthcare team to order, prepare and administer the right medication in the correct dosage exactly when they need it.

This process may seem straightforward to the patient, but with close to half a million medication orders per year and millions of doses dispensed, staff at The Hospital for Sick Children (SickKids) know the process is in fact quite complex.

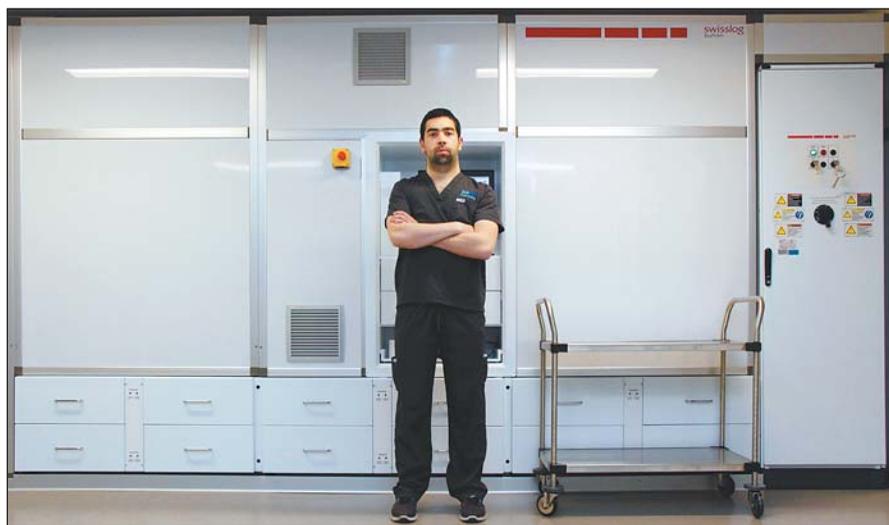
Through a \$30 million, multi-year, multi-project program called Program Dose, SickKids is transforming its complicated, manual medication management process into a modern, medication management system. This new system leverages technology and the unique knowledge and skills of hospital staff to streamline pharmacy workflows and deliver safer, more efficient, high-quality care.

“When we launched this transformation of our medication management process and technologies five years ago, it was the single largest investment in patient safety undertaken by SickKids,” said Marilyn Monk, Executive Vice-President, Clinical Services and Program Dose Executive Sponsor.

One of the key objectives of Program Dose is to enhance patient safety by automating pharmacy dispensing services. Automated dispensing cabinets (ADCs) were rolled out across SickKids to ensure all medications, including high-risk medications such as narcotics, could be securely stored and properly dispensed by nurses in patient care areas.

Similarly, Anesthesia Workstations (AWS) – systems designed for secure storage and point-of-care access to anesthesia medications and supplies – were implemented in every operating room, making SickKids one of the first paediatric hospitals in Canada to achieve this milestone.

The AWS and ADCs both come equipped with a labelling system that improves patient safety by reducing medication labelling errors, as well as barcoding technology to ensure that the right drug is



Justin Robillard, Registered Pharmacy Technician at SickKids, stands in front of a BoxPicker in the clean room.



Members of the SickKids Program Dose team at the official opening of the clean room in March.

dispensed.

The cornerstone of SickKids' pharmacy services transformation has been the recent construction of an 11,000 square-foot sterile compounding clean room – a highly controlled environment that leverages an integrated workflow where the latest technology and aseptic techniques are combined to ensure the integrity of compounding products, such as chemotherapy and other IV medications.

“The opening of the clean room is one of the most exciting milestones of this transformative journey,” says Joshua Hamid, Pharmacist, SickKids. “Centraliz-

ing most of our medication preparation activities in the clean room provides a more efficient workflow for staff and a much safer practice for our patients.”

In the clean room, pharmacy staff use a BoxPicker, a high-density medication storage and retrieval system to manage inventory and barcode scanning to facilitate more accurate selection of medications – the first of its kind in Canada to be implemented in a clean room.

In addition, a new IV workflow management system also provides pharmacy technicians with a “guided digital recipe book” to prepare parenteral compounds,

error-free, step-by-step.

Using a combination of barcode verification and gravimetric (weight-based) measure, technicians are able to ensure the right drug, concentration and correct volume are selected.

Pharmacists are then able to verify that all products are compounded accurately through a remote verification feature that takes advantage of an overhead camera that records a picture of every compounding step. Each of these new features has increased efficiencies and reduces potential critical errors when compounding IVs and hazardous mixtures.

The clean room meets the latest Ontario provincial pharmacy regulatory standards, United States Pharmacopeia (USP) 797 and 800, and the National Association of Pharmacy Regulatory Authorities standards that specify criteria for sterile compounding and safe handling of chemotherapy and other hazardous drugs.

While leveraging new technologies has been crucial, other ingredients have contributed to the recipe that has made this multi-year transformation of pharmacy services a success.

LEAN methodologies, including Value Stream Mapping and optimization approaches using Discrete Event Simulation were used to redefine pharmacy dispensing workflows to further support the implementation of just-in-time delivery and reduce the amount of wasted medication.

These techniques have allowed SickKids to reduce its pharmacy inventory by 15 percent, while simultaneously increasing the number of unique medications available closer to or at point-of-care.

Pharmacy technicians are also now spending on average 81 minutes less per day checking medication orders that have been modified and filled.

Another critical success factor to this transformation was the establishment of a program governance structure and framework to ensure the successful delivery of the 17+ projects which made up Program Dose.

“At SickKids, delivering the best, safest and most efficient patient care is at the heart of our values,” said Ihtisham Qureshi, Program Dose Director. “With a stellar team and framework, we were consistently able to deliver our projects on time, on budget and in a high quality way. Program Dose’s success is rooted in the dedication and close collaboration between our Pharmacy, Nursing, Anesthesia, IMT, Facilities Development, Plant Operations and Process Improvement teams.”

“With the implementation of Epic, our new hospital information system and barcode medication administration in summer 2018, SickKids will implement the final component needed to achieve closed loop medication management,” said Jimmy Fung, Director, Pharmacy. “Together, we are ensuring that our new medication management system supports the very best care and outcomes for our patients, enabled by state-of-the-art facilities and technology solutions.”

Interested in learning more about Program Dose and SickKids' transformation of pharmacy services? Contact program.dose@sickkids.ca.

## Study leads to a dramatic drop in surgical site infections

**M**ONTREAL – A pioneering team from the infection prevention and control service, infectious diseases unit, surgical teams and pharmacy have significantly impacted the healthcare environment for surgical patients at the McGill University Health Centre (MUHC).

The team has slashed the number of infections by more than half in cardiac and transplant surgeries and they expect to keep trending in that direction until the MUHC is positioned as a Canadian leader in limiting SSIs.

They are well on their way, and they have already begun to share their advances with institutions from across Canada.

Dr. Charles Frenette, Director of Infection Control, MUHC adult sites, and

the four-person team is using a variety of measures to battle surgical site infections (SSIs), including long-term data analytics, a remodeling of surgical pro-

**The team has already reduced the number of infections by more than half in cardiac and transplant surgeries.**

ocols, and a revision of surgical prophylaxis to achieve its goals.

SSIs are a by-product of surgery and these infections can lead to complications such as increased chances of morbidity, mortality, C. difficile infections and longer hospital stays.

The team is made up of Daniel Thiron, Pharmacist; Yveta Leharova, Research Coordinator, Infection Control; Connie Patterson, Infection Control Professional; Sylvie Carle, Associate Head of Pharmacy Education; and Dr. Frenette.

“There has been a substantial drop in SSIs, which has kept patients from unnecessary stays and has saved the MUHC millions of dollars. This benefits the patients, the hospital, and society, and is highly cost effective as the money can be used for other patients,” said Dr. Frenette. Anique Decary from the MUHC also reached out to the Université de Montréal’s Daniel Thiron, who worked as the pharmacist involved in improving prophylaxis.

Limiting SSIs in solid organ transplants

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