



# ELECTRONIC TLC: TORONTO HOSPITAL INCREASES PATIENT SAFETY WITH eCARE PROJECT

## MOTOROLA HEALTHCARE MOBILITY SOLUTIONS



North York General Hospital manages the complexities of the health care environment with a robust wireless network and safety-enhancing mobile point of care devices.

### ORGANIZATION OVERVIEW:

At North York General Hospital (NYGH) in Toronto, Canada, patient safety is paramount. With 5,000 staff, physicians and volunteers across three locations, NYGH is a community academic hospital affiliated with the University of Toronto and one of Canada's premier healthcare institutions. Years ago, the hospital recognized that fast and accurate communications are one of the most critical components in quality of care improvement. So NYGH decided to upgrade its wireless local area network and implement powerful mobile point of care solutions to help streamline manual processes, reduce medication errors and increase overall quality of care.

### CUSTOMER PROFILE

#### Company

- North York General Hospital  
Toronto, Ontario

#### Industry

- Healthcare

#### Applications

- Mobile Care Delivery
- Facility Wireless Access

#### Motorola Solution

- Motorola WLAN infrastructure including AP650 access points
- Motorola MC75A0-HC healthcare mobile computers

#### Solution Features

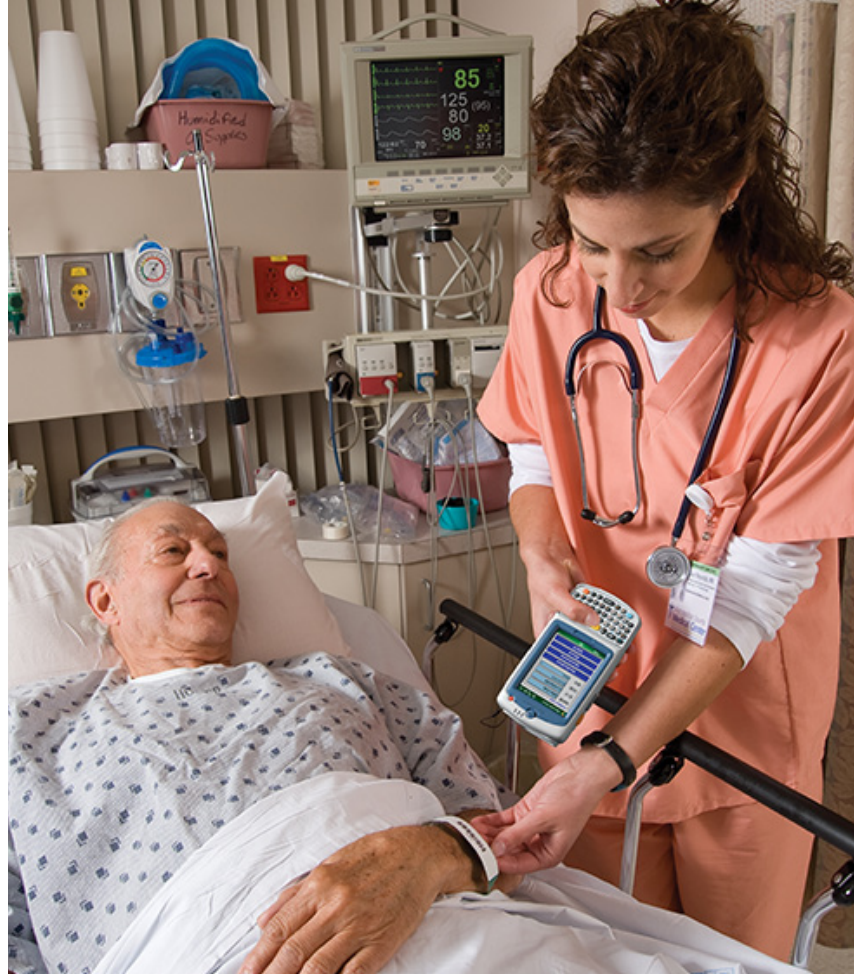
- Wireless backbone WLAN infrastructure for systemwide high-speed communications
- Closed loop automated bar code medication administration (BCMA) system
- Computerized provider order entry (CPOE) system

**SITUATION:**  
**NORTH YORK GENERAL HOSPITAL (NYGH) WAS COMMITTED TO IMPROVING PATIENT SAFETY AND QUALITY OF CARE THROUGH THE IMPLEMENTATION OF ELECTRONIC POINT OF CARE SOLUTIONS**

One of today's most critical—and most publicized—issues in hospital care is the number of patients who receive the incorrect medication, often the result of manual processes prone to human error. To address these patient safety issues, North York General Hospital's clinicians, IT and clinical informatics leaders decided to design and deploy eCare, a comprehensive multi-year electronic health initiative that will help improve patient safety and quality of care, virtually eliminating repetitive manual processes and enhancing communications throughout the hospital.

**SOLUTION:**  
**THE eCARE PROJECT INCLUDED AN UPGRADE TO NYGH'S WIRELESS NETWORK AND THE DEVELOPMENT OF AN ADVANCED ELECTRONIC MOBILE POINT OF CARE SOLUTION**

To take advantage of innovative new wireless communications technology and devices, NYGH knew it needed to upgrade to a more robust wireless network capable of delivering increased coverage, bandwidth and reliability. Relying on powerful Motorola wireless infrastructure, NYGH upgraded its system-wide wireless network. The clinician-led eCare Project implemented a computerized provider order entry (CPOE) system and a closed loop bar code medication administration (BCMA) solution making use of highly reliable healthcare-certified Motorola wireless mobile devices.



**RESULT:**  
**THE eCARE INITIATIVE HAS STREAMLINED COMMUNICATIONS AND MEDICATION ADMINISTRATION, RESULTING IN THE AUDITING AND PREVENTION OF ERRORS, INCREASED PATIENT SAFETY AND GREATER OPERATIONAL EFFICIENCY**

With the wireless infrastructure providing seamless connectivity throughout the hospital and the closed loop medication administration system streamlining processes, the eCare project has been exceptionally successful. Through the use of positive patient identification, this solution has helped catch and rectify more than 1,300 instances in which patients could have been given the wrong medication during the 1st year after go-live. Just as important, the initiative empowers the hospital to audit, track and quantify when and where errors are occurring. NYGH has also unlocked important new efficiencies by leveraging the use of mobile devices resulting in improvements in patient safety and quality of care. In 2011, NYGH became one of only three hospitals in Canada to earn HIMSS (Healthcare Information and Management Systems Society) Stage 6 status.

**“The healthcare environment is getting more and more complex every day and this will only accelerate as we head into the future. We wanted to implement a communications network that would not only support today’s needs, but be positioned to support future growth as complexity increases.”**

Sandy Saggar  
Director, Information Technology and Clinical Informatics  
North York General Hospital

# PREVENTING MEDICATION DISCREPANCIES FROM BECOMING MEDICAL ERRORS

## PREVENTING MEDICATION ERRORS

Over the last few years, the spotlight has been focused on the prevalence of medication errors in hospitals of all sizes. In several studies over the last decade, medication errors have been found to be both shockingly pervasive and dangerous. A recent study reported in Health Affairs April, 2011, notes that nearly a third of hospital patients experience some sort of medication error—including administration at the wrong time, not being given a needed drug, incorrect dosage or use of the wrong drug—during their stay. About seven percent of these qualified as potentially harmful adverse drug events (ADEs). Consumers are more than aware of the situation; more than 70 percent in the survey reported that they were concerned about medication errors. So NYGH decided to proactively address the issue.

## THE eCARE PROJECT

The hospital dubbed the initiative the eCare Project. It began in 2007 with extensive research, including site visits to numerous hospitals in North America. The second phase of the eCare project which included CPOE and a Closed Loop BCMA system, became operational in October 2010. “The main reason for undertaking the eCare project was to improve safety and the quality of care for our patients,” says Sandy Saggar, Director of Information Technology and Clinical Informatics at North York General Hospital. A complementary reason for the project was to efficiently automate the clinical processes. “We wanted to implement a communications network that would not only support today’s needs, but be positioned to support future growth as complexity increases.”

## CLINICIAN-LED INITIATIVE

Any project of this size and scope requires change, and to make sure the eCare initiative met the objectives of those who would be using it, the hospital decided on an innovative strategy. “We wanted to design the system around clinicians, so we had clinicians lead the project,” says Saggar. The team included a physician leader, a nursing and allied health leader, and a pharmacy leader, with the support of the Clinical Informatics and IT departments. “The interdisciplinary professional team was critical in making sure that all the handshakes and processes that occur in day-to-day practice were looked at and led by our own clinicians,” Saggar states. “That’s been a key to our success.”

## WLAN INFRASTRUCTURE

The NYGH team understood that their network infrastructure was the foundation for supporting not just the eCare Project today, but all eHealth initiatives in the future. They knew it needed to be capable of supporting the increasingly complex healthcare environment, especially with the proliferation of handheld computers and all variations of mobile communications devices. “We knew we needed a robust architecture to ensure that there were no dead zones and that mobile devices would be transitioning seamlessly from wireless access point (AP) to wireless access point.” The WLAN supports data as well as voice with the hospital using wireless IP-based voice badges to provide robust 2-way communications between staff.

**“A significant proportion of preventable errors involves medications prescribed and administered using traditional manual systems.”**

**- Dr. Jeremy Theal, Director of Medical Informatics, North York General Hospital**

## CASE STUDY

NORTH YORK GENERAL HOSPITAL

**“We knew if the backbone wasn’t there to deliver high-speed performance, the clinicians wouldn’t adopt the mobile technologies we were going to launch.”**

Sandy Saggar

Director, Information Technology and Clinical Informatics  
North York General Hospital

To ensure more robust performance, NYGH upgraded its network architecture with powerful new access points to ensure that users can use a variety of wireless devices—from mobile medication carts to laptops to handheld devices—as confidently as if they were on a wired network.

### POINT OF CARE APPLICATIONS

Once the infrastructure upgrade went live in the middle of 2010, the team turned its attention to deploying two powerful point of care applications designed to automate computerized provider order entry and bar code-based medication administration systems that would significantly reduce error-prone manual processes and enhance clinician productivity. “By implementing bar code scanning with electronic orders,” says Dr. Jeremy Theal, Director of Medical Informatics, “we are raising the bar on patient care and preventing errors to significantly improve patient safety.”

### COMPUTERIZED PROVIDER ORDER ENTRY

The eCare Project team recommended that North York General Hospital initiate one of the industry’s most effective resources in advancing electronic medical records: a computerized provider order entry (CPOE) system. With physicians entering treatment instructions and medication information into a computerized system, the old days of indecipherable handwritten and transcribed orders are becoming a thing of the past. More importantly, so are the potential treatment and medication errors caused when the clinical chain—from physicians to nurses to staff to pharmacists—is unable to read orders and instructions clearly.

CPOE will also help NYGH increase the speed of order completion, improve inter-department communications and enable order entry from any point on the network.

### ELECTRONIC MEDICATION ADMINISTRATION SYSTEM

The team also recommended that the hospital implement a closed loop medication administration system to maximize prevention of medication errors. The system provides for improved documentation of medication orders and administration; its goal is to predict, prevent and track errors. The NYGH system is based on proven bar coding technology, using bar codes on medications and patient wristbands; these codes are read by mobile handheld computers at the point of care in real time. Bar coding is being used successfully in a wide range of hospitals and medical centers, with one recent study reported by the New England Journal of Medicine to have reduced medication administration errors by more than 40 percent.

“A lot of effort went into designing the new workflows and building the medication administration system,” adds Saggar. “For example, we had to bar code more than 35,000 medications within the pharmacy department before go-live.” The medication administration process is straightforward. Using a handheld computer with a bar code scanner, a nurse selects the patient on the handheld, scans each of their medications and then scans the patient’s wristband before administering the medications to the patient. This helps to ensure that the right patient is getting the right medication in the right dosage at the right time. If there’s an issue, for instance, if the patient was about to be given an incorrect medication or an incorrect dosage, the system alerts the clinician and the error is identified and prevented. “In the past, it was difficult to even know if a medication error had occurred,” says Saggar. “Now we’re successful at preventing them from happening.”

### OVER 1,300 “GOOD CATCHES”

In the past, we would not be able to accurately identify when and where medication errors were occurring. Even with the system in place for just one year, results are already substantial and encouraging. “When we identify and prevent a medication error, we call that a ‘good catch,’” continues Saggar. “In the first year of operation, our new medication administration system helped us have more than 1,300 ‘good catches.’” That’s significant, and NYGH has been very happy with the outcomes of the project thus far.

## CASE STUDY

NORTH YORK GENERAL HOSPITAL

### HANDS-ON TRAINING

"Change is exciting, but it can be challenging, especially for healthcare professionals who aren't as familiar with technology and are comfortable with their current workflow," states Saggar. "This is why we conducted a broad-based training program many weeks before our 'go-live' date. During the program, a dozen trainers worked closely with physicians, clinicians and staff to help them learn the system and get hands-on experience with the actual technology that was going to be introduced such as mobile medication carts and handheld devices."

Overall, compliance has been very good. Currently, physicians are entering about 92 percent of all their orders electronically. For medication administration, compliance is now 83 percent and rising. Rather than force the use of the new handheld devices in every instance, clinicians still have the option of entering data into the electronic medical record (EMR) directly from a computer. "Although the system is our new standard of practice and our goal is to increase compliance," Saggar explains, "we must also provide the flexibility to allow for special cases, for example, during a medical emergency."

### PARTNERSHIP IN IMPLEMENTATION

North York General Hospital has a long-standing partnership with Motorola. When it came to upgrading the hospital's infrastructure foundation, the team chose to add powerful Motorola AP650 access points. These help provide the seamless high-speed connectivity and the bandwidth to not only handle the new point-of-care solutions, but also to serve the proliferation of mobile devices that need network access.

The hospital had been using Motorola handheld mobile computers for a number of years, and as the new systems were implemented, the team also recommended utilizing

the MC75A0-HC, a new healthcare-optimized device that is disinfectant ready and able to withstand standard infection control procedures.

"We have a great partnership with Motorola," says Saggar, "and we're looking to the continual evolution of the relationship as we continue to optimize our network to support our eHealth solutions in the quest for ongoing improvements in patient care."

### MEDICAL DEVICE INTEGRATION

NYGH has a number of initiatives planned for the future. "What's next," says Saggar, "is implementing a medical device integration platform to automate crucial tasks by pulling data from medical devices such as vital signs monitors, ventilators, IV pumps and smart beds. These medical devices will automatically populate the EMR with real-time patient data so clinicians don't have to continually monitor and chart from devices manually. This will both help increase patient safety and save time and effort, allowing clinicians to spend more time with the patient at the bedside."

### HIMSS STAGE 6 RECOGNITION

Another result of North York General Hospital's eCare Project is that the hospital has become the first community teaching hospital—and one of only three hospitals in Canada—to achieve HIMSS Stage 6 status. The Healthcare Information and Management Systems Society (HIMSS) is a respected U.S.-based advocacy group that has developed a seven-stage system to rank how hospitals rate in adoption of electronic health records. "We look at HIMSS 6 certification," Saggar concludes, "as an important verification that we are an organization in which our physicians, clinicians, IT staff and Clinical Informatics team all work together in utilizing healthcare information technology to provide the best care for our patients."

**"This hospital-driven initiative is the result of outstanding teamwork involving informatics personnel, nurses, pharmacists, physicians and more. The eCare Project is a significant step forward in patient safety, quality of care and achieving a paperless medical record."**

**- Dr. Tim Rutledge, President and CEO, North York General Hospital**

**CASE STUDY**  
NORTH YORK GENERAL HOSPITAL

For more information on how Motorola's healthcare mobility solutions help improve patient safety and the quality of care in your facility visit us on the web at: [www.motorolasolutions.com/healthcare](http://www.motorolasolutions.com/healthcare)

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