Bedside scanning and patient safety

Galway Clinic transforms the patient journey with GS1 standards and EPC-enabled RFID

In 2004, Galway Clinic opened its doors with a simple, yet powerful mission: To improve the health and quality of life of the individuals and communities served. Now 12 years later, this state-of-the-art hospital in western Ireland is focused more than ever on its patients. Using GS1 standards and EPC-enabled RFID (EPC/RFID), Galway Clinic has made significant progress to improve each patient's experience while in its care. And it still continues to explore new ways to use standards and technology for the benefit of patients and clinicians alike—something it calls "our amazing journey."

By Mark Sheehan

A great privilege

Galway Clinic is a hospital that welcomes patients of all faiths and cultures, providing the latest in healthcare services. With more than 120 physicians and surgeons, the Clinic has 146 in-patient beds, a same-day surgery unit, emergency room, seven operating suites, an endoscopy suite, cath lab and oncology day unit.

When visiting Galway Clinic, patients, families and guests can't help but notice its very different environment from most hospitals.

"From its infancy, our vision for the Clinic was to provide an environment of comfort coupled with the use of technology to improve the patient's journey and outcome," says Mark Sheehan, Business Development Manager. "Today we continuously work to realise our vision, guided by the belief that caring for patients is a great privilege that comes with great responsibility."

Mark Sheehan's focus on the patient is not a coincidence—it's in his DNA. His father, James Sheehan, is an orthopaedic surgeon who pioneered, in the early 80s, the use of passive RFID chips in surgical swabs. To prevent swabs from getting lost inside patients, James Sheehan

"We continuously work to realise our vision, guided by the belief that caring for patients is a great privilege that comes with great responsibility."

developed a system whereby a passive RFID chip was embedded in each swab. At the end of each surgery, the patient was scanned using a handheld RFID reader to ensure all swabs were removed. There were also stationary RFID readers installed at the entrance to the operating theatre for added scanning and safety.

Today, this innovative spirit is a part of the Clinic's daily operations as it works to transform the patient's hospital experience and eliminate inherent risks. "Patients should never wait for long periods of time for a procedure," says Sheehan. "Making patients wait who are perhaps worried is only exacerbating their anxiety and potentially making them sicker."

Sheehan also recognised that one of the biggest areas of risk in any hospital is medication management. "We started our journey six years ago, using GS1 standards and RFID for the well being and safety of our patients."

Doing the research

The Galway Clinic's initial use of GS1 standards and EPC/RFID was a 2010 joint initiative between GS1 Ireland, Georgia Tech Ireland (GTI) and the Western Vascular Institute to develop a model for tracking endovascular devices such as catheters and stents, from manufacturing site to operating room. Known as the Clinical Laboratory Automated Stockroom System, the Clinic discovered it could improve patient safety by reducing the risk of errors, out-of-stock situations and product expirations. By more effectively managing inventory, this improvement had a profound impact on the patient.

Yet, tracking a patient throughout the Clinic presented yet another challenge in 2013.

"To fully understand the patient's experience, we needed visibility into their journey and the wait times for different procedures," explains Sheehan.

The Clinic continued to research the role of RFID in healthcare with help from GS1 Ireland. During the implementation trials, Sheehan was introduced to a GS1 Ireland Solution Partner, Aerospace Software Developments (ASD) that had accomplished some impressive results in the airline industry using passive RFID. Leveraging this experience and together with the Clinic, ASD created MEDRFID, the Clinic's RFID system that now links to its electronic health record system among other systems within the Clinic.

"We needed one RFID system—not multiple ones—that could easily scale for use in different processes," says Sheehan. "For one standardised system, GS1 standards provided us the needed foundation to design and build our improved patient journey."

"Staff or caregivers at the Galway Clinic are also uniquely identified with the GSRN encoded on an EPC/RFID tag."

Tracking the patient journey

When admitted to Galway Clinic, each patient is now presented with an identification wristband with his or her own GS1 identifier called a Global Service Relation Number (GSRN). An intelligent RFID printer prints the wristband with the GSRN encoded in an EPC/RFID tag. Human readable information such as the patient's first and last name is also included.

"As patients pass through each of the points in the hospital with antennae and readers, the MEDRFID system records their movements," explains Sheehan. "We are now aware of how long a patient has been in a particular area, and we get alerts on our main administration screen as they enter and leave. We are examining the waiting-time trends in certain areas to determine how to improve our clinical processes."

Staff or caregivers at the Galway Clinic are also uniquely identified with the GSRN encoded on an EPC/RFID tag.

"A screen in Room 202, which is our live patient test room, informs patients if someone walks into their room, providing the person's name and role. This level of identification makes patients feel better, knowing who is caring for them, and it helps us better understand where our resources are throughout the hospital at any given time, and for the length of time in certain areas. We are in the process of installing these intelligent patient touch screens in every room," says Sheehan.

More than 30 years ago, James Sheehan, an orthopaedic surgeon, used passive RFID chips in surgical swabs for greater patient safety.

Pictured here is one of Dr. Sheehan's original swabs with the embedded RFID chip.

Using GS1 standards with EPC-enabled RFID, Galway Clinic has achieved more than a 90 percent read rate of patients wearing the wristband. Furthermore, the average patient wait time for a CT scan has been reduced from more than 20 minutes to less than 7 minutes—a 65 percent improvement.

Sheehan adds, "The patient journey is now fully visible for all of our staff, and with our MEDRFID system, we can generate automated reports that identify all aspects of the journey."

Patient movements are captured by means of RFID readers installed at doorways.

Bedside scanning for a safety match

When it comes to medication management, the Galway Clinic is also taking a creative approach to ensure the right patient gets the right medication at the right time. The Clinic introduced a new process whereby doctors can electronically issue prescriptions for patients, addressing any potential errors (or extra time spent by pharmacists clarifying instructions) that are caused by illegible instructions. Upon receipt, the pharmacist checks the order and then creates a unit dose package (using a robot) that includes the appropriate medication identifier encoded in a barcode.

The unit package dose is then sent via a pneumatic tube to the patient's bedside. As the nurse administers the medication, the patient's barcode on the wristband is scanned, along with the prescribed drug's barcode as well as the nurse's identification barcode.

The results from the new medication management solution include an estimated 15 percent reduction in spend on oral solids along with improved productivity for the two full-time pharmacists who support the entire Clinic. Medication errors have also been reduced with no litigation since its implementation.

The next leg of the journey

The next phase of the Galway Clinic's journey continues to focus on patient safety with three major projects. "We have fully integrated the patient identification data with our electronic health record system. We are now linking this data with our PACS (picture archiving and communication system) so that as the patient enters an area, their identification data is automatically logged in the systems. This is another step for reducing human errors."

A second project involves the Clinic's central sterilising department and its very labour-intensive process of sterilising surgical instruments. Before each surgery, all instruments for the procedure are counted twice before going through large sterilising units. When coming out of sterilisation, they are double counted again and after the procedure, another count is taken. According to Sheehan, the counting process takes easily two to three hours of labour per procedure by healthcare assistants, the nurse, and/or the technicians working in the operating theatre.

"Imagine if all of those instruments each had a GS1 identifier in an EPC/RFID chip. We could simply put the tray with the instruments on top of a reader that instantaneously told us the identity of the tray, the number of instruments and that all were present—and this happens in about two to three seconds. It has the potential to provide us with huge labour savings as well as a high degree of accuracy—a very exciting value proposition."

The third area of work is expanding the Clinic's stock management system using GS1 standards and the Twinbin system, a replenishment model based on RFID technology. Sheehan explains, "In hospitals, we carry a lot of stock since it is critical to have enough on hand for patients. We carry on average about €2 million worth of stock. Our goal is to reduce this amount by 50 percent using GS1 standards, which is realistic based on trial results of this solution in the radiology department."

A rock-solid foundation for the future

Implementing GS1 standards has given the Galway Clinic a rock-solid foundation on which to build its multiple EPC/RFID solutions. Sheehan also comments that GS1 Ireland's support has been invaluable based on their sharing of best practices and introduction to Aerospace Software Developments.

"Our success ultimately comes back to standardisation. Once we had a standard system of identifying what we wanted to track, we found that we could move much quicker," says Sheehan.

As Sheehan reflects on the Clinic's more-than-decade use of GS1 standards, he offers some advice for healthcare providers. "If it's the right thing to do for the patient, it's worth doing and we need to find a way. And there's always a way. We just have to be willing."

About the Author

Mark Sheehan *is the Business Development Manager for Galway Clinic. He was part of the small team that built and commissioned Galway Clinic in 2004 and has worked within the Clinic ever since. In 2013, Sheehan led the opening of the Limerick Clinic that he now manages. Passionate about using technology within healthcare to enhance the patient journey and outcomes, Sheehan has been central to the Clinic's adoption of information technology. The Galway Clinic was the first hospital in the British Isles to achieve the HIMSS Stage 6, an award that recognises organisations who use health information technology to improve patient safety, care outcomes and cost savings. Sheehan holds a Bachelor of Commerce and Master of Finance from University College Dublin.*

About Galway Clinic

The Galway Clinic is a modern hospital that provides 24-hour healthcare services, welcoming patients of all faiths and cultures. There are more than 120 physicians and surgeons who have admitting and operating privileges and some have consultant suites within the Clinic. The Clinic has an occupancy rate of 95 percent and an average length of stay of 3.6 days. It has 146 in-patient beds with a same day surgery unit and emergency room. There are seven operating suites, an endoscopy suite, a cath lab and an oncology day unit.

www.galwayclinic.com

"We carry on average about €2 million worth of stock. Our goal is to reduce this amount by 50 percent using GS1 standards, which is realistic based on trial results of this solution in the radiology department."

Using GS1 standards with EPC-enabled RFID, Galway Clinic has achieved more than a **90%** read rate of patients wearing the wristband.
The average patient wait time for a CT scan has been reduced from more than 20 minutes to less than 7 minutes—a **65%** improvement.