

# Ireland

## Scan4Safety: Giving time back to patient care at Dublin's Tallaght University Hospital

**Challenge**  
Clinical staff at Tallaght University Hospital (TUH) were spending a large proportion of their time per week managing inventory. They found that they had little visibility into what item was used and with what patient. Also, the tracking of stock levels and expiry dates was difficult. This posed a significant risk to patient safety. In the two theatres where Scan4Safety had been initially implemented, the Clinical Nursing Manager was spending more than a day per week on re-ordering and managing stock. This was taking valuable clinical time away from patient care.

**Approach**  
While this reflects processes in many other hospitals in Ireland, the TUH team looked to address these issues by implementing barcode scanning in theatres, with the aim of improving patient safety and giving time back to patient care. This is made possible by making it easier for nursing staff to re-order products as they have greater visibility on stock levels and expiry dates. With the successful roll out of Scan4Safety across many sites in the UK, and in St. James's Hospital, Dublin, the team at TUH had many sites to reference for best practices. Added to this, with the introduction of Unique Device Identification (UDI) regulations across the world, most medical devices now have unique device identifiers—the Global Trade Item Number® (GTIN®), lot number, expiry date and sometimes serial number—enabling a simple scan at the point of care.



**Full visibility of what products were used for which patients in operating theatres**



**Increased patient safety via alerts if products have expired when scanned**



**working day saved per week to redeploy on patient care**



**Leaner inventory processes through automatic reordering**



Built in 1998, Tallaght University Hospital opened serving a community of approximately 62,000 people. Just over 20 years later, this has increased 10-fold with the hospital now serving a population of more than 640,000 people.

TUH has planned a series of developments to continue to provide quality service to patients, with patient safety always being its top priority.

At the forefront of change is the "Scan4Safety" project within the theatres, part of a new digital strategy in the hospital with the objective of improved patient safety, with the added benefits of giving time back to patient care and increased operational efficiencies.

The project was initiated by the Finance Directorate and moved quickly to a collaboration model between the areas of clinical (Theatre), Quality, Safety and Risk Management (QSRM), and non-clinical (Finance and Logistics).

Genesis Automation is the solution provider that is providing the software to implement the Scan4Safety programme. All products used in the theatres are scanned to the patient record prior to use, which is safer as the device can then be tracked to each individual patient in the event of a recall. This can also prevent the issuing of expired or recalled stock. This is enabled by modern standards-based track and trace technology to scan manufacturers' barcodes on medical products used during procedures.

Olivia Leigh & John Donovan

**By implementing product barcode scanning in the theatre, TUH aims to:**

- Return time to clinical staff to focus on patient care since the re-order process is very manual and time consuming.
- Achieve traceability, which in turn improves patient safety.
- Implement a system that is very easy to use and does not create duplication of effort.
- Provide automatic reordering and stock replenishment.
- Increase quality of data and reporting methods, which will allow more in-depth business intelligence.
- Link patient-level costing with patient activity to ensure the hospital receives the appropriate level of funding—not just for activity levels, but also for complexity of care.

*“Scan4Safety is a key priority for Tallaght University Hospital. The success of the project has been driven by the strong collaboration across clinical and non-clinical areas. Scan4Safety is demonstrating real benefits by improving patient safety and giving time back to patient care.”*

**Lucy Nugent**  
CEO  
Tallaght University Hospital

*“Scan 4 Safety will change how the Hospital manages its stocks. End to End automation of the supply chain will deliver efficiencies, and real time data. This will help TUH to reduce waste, improve our working capital, and make optimal use of our clinical resource.”*

**Dermot Carter**  
Director of Finance  
Tallaght University Hospital



**Methodology**

**A phased approach**

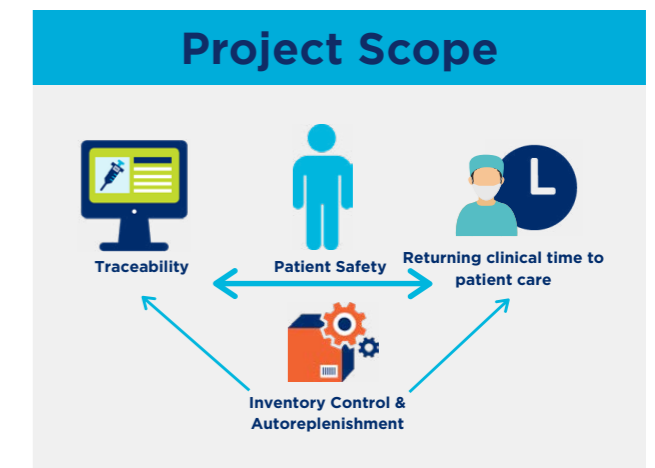
The hospital is implementing its Scan4Safety programme, taking a phased approach. They successfully went live in two theatres in General Surgery in October 2019. Throughout 2020, TUH is continuing to expand across other theatres, including the Cath Lab (which went live on the 6<sup>th</sup> of July 2020). These additional theatres will involve emergency procedures, which may add a level of complexity to the process.

An important part of the process is that products are scanned just before they are used in theatre. This enhances patient safety by allowing for active recall management, which would not be possible if scanning was to take place after the operation.

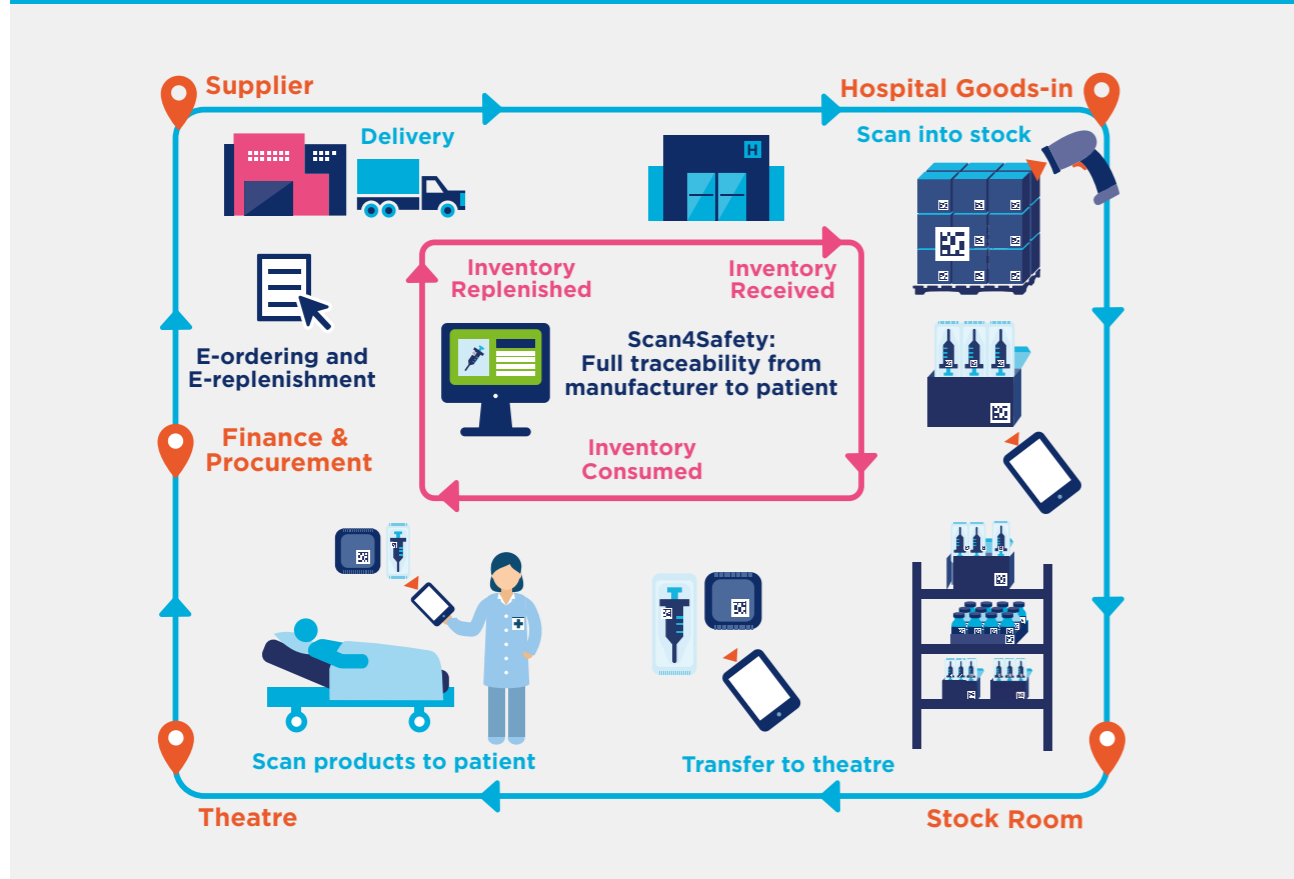
All products in theatre are scanned and linked to the patient for each procedure.

Ultimately, this data will be populated in the clinical electronic patient record (EPR) when it is rolled out for the hospital (project underway currently). The roll-out of the auto replenishment of stock is limited to high value

“nonstock” items at present. When one of these products is scanned in theatre, a replacement is ordered automatically from the warehouse so that the hospital does not run out. Additional controls help ensure that products do not go out-of-date. Consumable inventories are managed using a Kanban process, from the warehouse to the storeroom.



**The new Scan4Safety process at TUH**



**Building the team**

Prior to implementation, the team set out to learn from other healthcare providers who had already implemented scanning in theatre. They looked at guidance from successful Scan4Safety implementations across the UK. The successes of these implementations, as well as the Scan4Surgery project in St. James's Hospital in Dublin, helped them to build their business case.

A major learning from Scan4Safety in the UK was the importance of creating a multidisciplinary team with a focus on clinical leadership, and the value of someone from Finance spending time in theatre. The team at Tallaght recognised the importance of clinical endorsement. The leadership and involvement of the Clinical Director and Clinical Nurse Manager has been instrumental in the implementation of the programme.

It was important that team members in Finance and Logistics spend time in theatre, and whilst they were restricted in terms of resources, the assignment of a dedicated Scan4Safety officer

in theatre proved to be key in its success. TUH has also dedicated a Scan4Safety manager to provide oversight on the project.



**L to R:** Roshan Wijesinghe, Senior ICT Project Manager; John Donovan, Scan4safety & Purchasing Manager; Cait Tobin, Theatre Nurse Manager; David Addie, Deputy Director of Finance; Cathy Elworthy, SAP Support; Karl Doran, Scan4Safety Officer; Olivia Leigh, CNM2 General/Vascular Theatre; Conor Kenna, SAP Support; Ger Connolly, Scan4Safety Supplies Officer

## Data management

### Getting started

The hospital was required to undertake a large piece of work in order to create a master data file that links the existing data from its ERP system and SAP to the barcode information, e.g., GTIN and units of measure.

As the system is utilising an auto replenishment feature that links to SAP, it was critical that units of measure and hierarchies were accurate, not only for this feature, but also for wider inventory management and information quality. Data quality and the maintenance of master data are key components to the ongoing success of any scanning system, and members of the Scan4Safety team at TUH have been actively managing this.

The hospital worked with the team at Genesis Automation to clean the master data. Initially the hospital used Microsoft Excel to register the barcodes to the products. However, now that TUH has the Genesis system in place, it has the functionality to do this, and makes it much easier for the team to maintain existing data and handle new product onboarding. For products with no barcode, the hospital maintains a separate sheet of barcodes, which are scanned in theatre as products are used and a default lot and expiry date barcode is also scanned. **The hospital would prefer if all products had one barcode with GTIN, batch and expiry date information.**

### Interoperability

The project team recognised the value of having quality data, and the importance of maintaining this for the ease of use of the system. The project manager stated, "It should be as simple as scan, scan, scan!"



Figure 1a: Store room before Scan4Safety implementation

The link between their SAP financial management system and the Genesis scanning system is a vital component. Master data is housed in SAP and feeds in and out of the Genesis system for the ordering process. Interoperability between systems is enabled through the scan of the UDI barcode on the product packaging. Due to UDI regulations most medical devices now have unique device and production identifiers encoded in GS1 compliant barcodes.

### The process

The Genesis system consists of multiple modules that manage the process—from receipt of goods to use of products in theatre for a patient. There is a barcode manager module for adding and changing GTINs and linking them to SAP codes. The inventory management module has various stock management functions. The point of care module allows for the linking of products, processes, consultants, procedures and patients. And, there is a reporting screen that produces reports on various efficiencies. The hospital procured necessary hardware such as handheld scanners and PCs on which to install the new scanning system. The system runs on both the Windows and Android operating systems.

To date, the success of the project has been driven by the excellent engagement between the clinical and non-clinical teams. The key stakeholders have been the Perioperative Clinical Director and Clinical Nurse Manager (CNM), and representatives from Finance, SAP, Supply Chain & ICT. The CNM has been heavily involved and gives briefings to the Nursing staff so that everyone is trained on the process. There has also been a focus on having a solution that is very easy to use and where there is no duplication of work. Once products are received into the storeroom, each item is tracked directly to consumption in theatre.

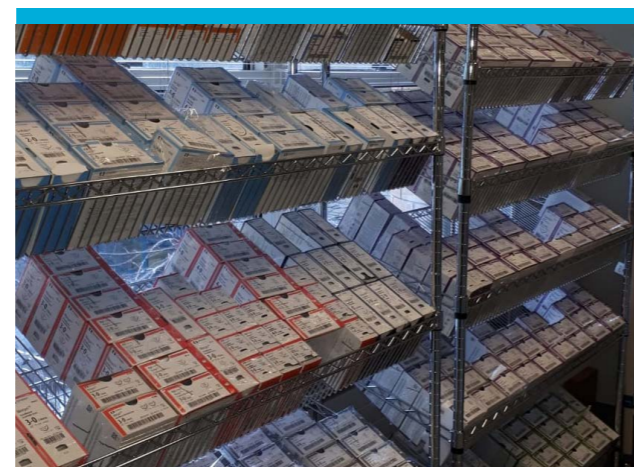


Figure 1b: Store room after Scan4Safety implementation

*"This is such a dream. I don't need to worry again. We have the products ready for when the consultant arrives. It is safer for patients, and it gives me more time for patient care."*

**Olivia Leigh**  
Clinical Nursing Manager (CNM2)  
Tallaght University Hospital

### Goods in and out

All goods are checked in by the stores team. All Scan4Safety items are sent up to theatre for receipting. Receipting is carried out on a Zebra scanner using the Genesis software. Receipting involves capturing the items relevant to the purchase order, and importantly, the lot, expiry date and serial numbers.

### General surgery storeroom

All goods are received into the store area by entering the PO number and scanning the GTIN encoded in the product barcode as well as batch and expiry date information (sometimes this can be in a second barcode). If all this information is encoded in one barcode, it is much easier to receive since it requires just one scan. Each product is received and tracked on the system, using batch and expiry dates. If a product is expired, the system will alert the hospital at any time the product is scanned prior to use.

### Call to action for suppliers

All products must have GS1 unique identifiers encoded in GS1 barcodes. The best barcodes are GS1 compliant barcodes, preferably a 2D GS1 DataMatrix barcode as all the information is easily captured in one scan!

### The need for dynamic data encoded in GS1 barcodes



GTIN (01)05391234560015  
Expiry Date (17) 151231  
Batch (10) 987654321ABCD  
Serial Number (21) ABCD1234

GTIN with Batch, Expiry Date and Serial Number encoded in a GS1 DataMatrix

### Theatre scanning

Each product that will be used is scanned in the theatre preparation room. Products that are in reserve are left unopened under the trolley, and they are only scanned if they are opened and used. This allows a tighter control of stock usage by the theatre staff. Each time a product is scanned in theatre it triggers an adjustment in the stock levels and, once stock hits a preset minimum level, a replenishment order will be sent from the Genesis system to SAP. The order is then emailed to the supplier.

*"When a product is scanned to the patient, a replacement is ordered automatically, which means we do not run out of products and products do not go out-of-date."*

**John Donovan**  
Purchasing and Scan4Safety Manager  
Tallaght University Hospital

## Outcomes and benefits

### Increased patient safety through batch-level traceability

The primary aim of the Scan4Safety programme at TUH is to increase patient safety through standards-based traceability. Prior to the implementation of Scan4Safety, there was little to no visibility of what products were in stock and what products were used, with which patient. Now, the hospital has full visibility of what product (including batch traceability) went to which patient in the theatres where Scan4Safety has been rolled out. If a product is expired, the system will alert them at the time the product is scanned prior to use on the patient.

### Returning time to clinicians for patient care

Patient safety is also improved by returning time to clinical staff for patient care. Previously, the management of the inventory was managed by the Nursing department with support from supply chain. Through the implementation of Scan4Safety in two theatres, the hospital estimates that one working day per week has been returned to the Clinical Nursing Manager.

This is recognised not only as a time saving, but an increase in the overall quality of care. As this is rolled out across more theatres, TUH is expecting that more clinical time will be released to concentrate on patient care.

### Operational efficiencies

As the implementation of Scan4Safety continues across more theatres, the team at TUH recognises the value of operational efficiencies, financial reporting accuracies and business intelligence capabilities. The hospital plans to realise these as the roll out continues.

Such benefits include:

- Automatic stock replenishment
- Reduction in wastage
- Space optimisation
- Streamlining and control around the new product introduction process

### Education and hospital-wide approach

As Scan4Safety is being rolled out in TUH, the concept of scanning in theatre and the terminology "Scan4Safety" is becoming the "normal way of working." This is further evident as a Scan4Safety module has been built into the nursing induction programme. Communication and staff involvement have proved key to the success of Scan4Safety. The team regularly run breakfast education sessions for theatre staff and there is an open invitation to all involved.

As a result, there is high staff engagement throughout the hospital with many staff taking the initiative to share their learnings. For example, when scanning in theatre began, a nurse produced a phone video of the process to share with colleagues.

### Collaboration

New inter-departmental relationships have been developed as a result of the Scan4Safety implementation. The strengthened links between finance, supply chain and clinical personnel have proven very beneficial with significant knowledge gained and shared. Members of the project team have stated that it "should have happened years ago," now that they see the profound benefits of having the ability to analyse data and report on stock usage.

## Challenges

### 1 The need for 2D barcodes

An integral part of the process is the receipt of product into the theatre storerooms, by entering the PO number and scanning the GTIN in the product barcode, including batch and expiry date. The hospital's preference is to have this information in one barcode, which makes the scanning of products in theatre simpler and quicker for clinical staff. Some products don't have a barcode or GTIN. In these cases, the team has created a look-up folder where it has a picture of the product combined with the internal code for the product in a 2D barcode. When the product is used, the barcode in the folder is scanned and linked to a "default" batch and expiry date. The hospital doesn't want to add any extra work for the clinical staff so this is seen as the best compromise. **The preference is for suppliers to provide scannable GS1 barcodes, preferably in 2D format with a GTIN, batch number and expiry date.**

### 2 Resources

The biggest challenge was executing the project, using existing resources. One of the project's key successes, to date, has been the strong clinical leadership. The nursing staff have been actively involved in adopting Scan4Safety. The hospital found that there was a high level of digital maturity among staff, which meant that they appreciated the benefits of implementing scanning in theatre.

### 3 Knowledge

The hospital understood the importance of using GS1 standards for traceability and as a foundation for its wider digital strategy. TUH engaged with GS1 Ireland at an early stage in the implementation process. This started with GS1 training warehouse staff for inventory management and location management. This enabled them to better engage with suppliers and confirm that products entering the warehouse were identified, using GS1 standards-based identification. As a result of these learnings, TUH has specified in tender documents that products need to be identified using GS1 standards. This requirement is further supported by the fact that the implementation of UDI across Europe means that most products will use compliant identification methods.

### 4 Software and interoperability

TUH recognised the importance of choosing a software provider that was GS1 compliant and could integrate with legacy systems across the hospital as well as patient information systems.

Following engagement with many providers, they carried out a pilot with Genesis Automation, a GS1-certified solution provider that resulted in the implementation of the Genesis solution in the hospital to be rolled out for its Scan4Safety programme.

## Next steps

Following the success of the go-live in two General Surgery theatres, the TUH team will continue to expand implementation of Scan4Safety into other theatres in 2020, including both general and specialised surgical areas, and the Cath Lab (which went live on the 6<sup>th</sup> of July 2020). The campus is expanding and the new implementations—dedicated day surgery for elective procedures—brings opportunity to build in traceability from the start, and possibly look at the transition to fully sterile implants.

For example, some theatres in orthopaedics have proprietary scanning solutions for a couple of individual suppliers. This is not a sustainable solution as it means the theatre has to manage multiple proprietary scanning solutions. It has been proven that scanning at the point of care needs to be simple and supplier agnostic. There is also a national joints registry (hips and knees) being set up for clinical audit purposes, and the hospital

would like to be able to share a file for the audit from its scanning system. Added to this, the hospital is in discussion with other hospitals to look at a joint approach to managing their product catalogues.



**TUH estimates that the Scan4Safety solution has reduced €7,000 worth of stock waste in the first phase.**

## Conclusion

While the focus is on patient safety, TUH has experienced a number of operational efficiencies. Previously, there was a significant amount of waste with sutures. Since they were all ordered under a "bucket code," there was very little visibility on stock levels and usage related to sizing.

Now, because the hospital has this data, it can return surplus stock to suppliers when needed. TUH estimates that the Scan4Safety solution has reduced €7,000 worth of stock waste in the first phase.

The hospital recognises the importance of GS1 standards for the identification at all possible sources, including not only product and batch traceability, but also the identification of patients, staff, locations and assets. The TUH team will continue to

work with GS1 Ireland for guidance on best practices during its further implementation of Scan4Safety.

*"This is a new digital strategy which has improved patient safety, increased operational efficiencies and reduced costs. All products used in the theatres are scanned to the patient. If needed all products can be traced electronically to the specific patient episode."*

**David Addie**  
Deputy Director of Finance  
Tallaght University Hospital





### About the authors



**Olivia Leigh**  
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Olivia Leigh is currently Clinical Nursing Manager (CNM2) in the General and Vascular theatres in Tallaght University Hospital since 2013. Olivia qualified as RGN in 1996 from Beaumont Hospital in Dublin and Post Graduate Diploma Specialist Nursing (Perioperative) Trinity College Dublin in 2005. She has worked in both operating theatres and wards in Guernsey, Saudi Arabia, Meath and Beacon Hospitals. She is passionate about safe surgery.



**John Donovan**  
Purchasing and Scan4Safety Manager  
Tallaght University Hospital

John Donovan is an accomplished Supply Chain & purchasing Finance Manager with 34 years of diverse experience gained in the Irish healthcare industry. A track record of managing complex, high scale projects on time and within budget in the purchase and materials management area. He has over two decades experience at Tallaght University Hospital. During this time John has worked in numerous management roles within Supply Chain, Purchasing and Finance. He has gained huge experience across multiple roles and is now one of the most senior and experienced managers within the Finance directorate.



### About the organisation

**Tallaght University Hospital** provides access for patients to over 20 medical and surgical specialities, with comprehensive on-site Laboratory and Radiology support services. Currently, there are 495 adult beds and 67 paediatric beds, 12 theatres and 14 critical care beds in operation. The hospital has in excess of 420,000 patient attendances a year and has one of the busiest Emergency Departments nationally with a catchment population of approximately 640,000 people (80% of which are located in South Dublin and parts of Kildare). It serves approximately 200 General Practitioners in surrounding communities. In addition, Mental Health services operate an on-site inpatient unit under HSE governance structures, with close operational alignment to Tallaght adult services. The campus is 31 acres in size, with significant future development capacity. Tallaght University Hospital has a diverse and experienced team of staff, employing over 3,000 people from over 40 different countries across the world.

[www.tuh.ie](http://www.tuh.ie)