

United Kingdom

Connected, continuous and complete: Implementing Scan4Safety using GS1 standards at the core of the patient pathway

Challenge

Hull University Teaching Hospital (HUTH) wanted to replace its manual and paper-based processes with automated ones that would capture data at points of patient care, connecting the data and linking it directly to each patient. Routine and recall processes took significant time away from staff caring for patients.

Solution

HUTH defined a new model focused on the patient and Scan4Safety principles, implementing GS1 identification standards and barcodes throughout the entire patient care journey. Barcodes are scanned to capture information such as date, time, staff member, patient and location of interventions—from the patient's admission to discharge.



Recalls that once could take weeks now take only hours, saving significant time for medical staff



Precise, efficient asset and inventory management for increased staff productivity and improved patient care



Clinical decision-making and resource planning with fact-based data centred on individual patient care



Transparent and real-time data collected at points of care for better patient outcomes and actual costs per patient

Launched in England by the UK's Department of Health and Social Care in 2016, the Scan4Safety programme became the start of a long-standing journey of GS1 standards adoption in clinical environments.

The premise of the programme centred on the adoption of GS1 unique identifiers for every person, product, place and process at touchpoints throughout the supply chain and patient pathway.

What started with six National Health Service (NHS) trusts involved in the pilot (called the "demonstrator sites"), has since gained traction with other NHS trusts across England.

Hull University Teaching Hospital embarked on an implementation roadmap for Scan4Safety, which commenced in September 2018 as a non-demonstrator site. This marked the start of one of many implementation projects for HUTH. The aim was to bring together data and transparency to improve the digital record of the patient

and, ultimately, to enable HUTH to make great decisions based on great data.

Understanding the details of patient care

Prior to adopting Scan4Safety principles, HUTH relied on manually recording procedural details for implants, estimating its costs on average patient experiences, without real costs based on individual patient-required levels of care.

With this process in place, routine execution of product recalls proved to be a challenge as the recall process was entirely manual. When recalls did occur, this monopolised nursing-staff time, which was spent physically tracing stock instead of tending to direct patient-care duties.

Scan4Safety provided HUTH the opportunity to realise a full patient pathway—all in a single system.

Take, for example, the patient care for a cardiac patient. The patient may have procedures

carried out in the Catheter Labs, leading to a surgical intervention in the theatres (which also required anaesthetics and perfusion), before being admitted to an intensive-care unit (ICU) for recovery, and then, before being transferred to a ward and eventually being discharged home.

HUTH wanted to be able to capture all of this information at the point of care, connecting the data and linking it directly to each patient.

Clinical staff at the trust wanted to be able to understand details from patient-care and budgeting perspectives across the department, to make informed decisions such as:

- Duration of procedures
- How many primary admissions (patients admitted as an emergency via ambulance)
- How many re-admissions occurred after a particular procedure

The trust needed a solution that would allow actual patient data to be compared across multiple surgeries, highlight particular patient pathways, identify specific products used and enable comparisons of procedure, process and patient-outcomes data from different surgeons.

With this in mind, HUTH decided to adopt GS1 standards based on their prevalence, quality and renown for bringing benefits to healthcare. GS1 standards are widely recognised for their ability to capture data accurately, at the point of care and in real time. GS1 standards and early findings from the Scan4Safety programme provided the evidence needed to proceed with the project.



Capturing valuable data along the entire patient pathway

HUTH defined an entirely new model of implementation that tracked the entire patient pathway to improve transparency and provide data. The scope went much further than implementing Scan4Safety within surgical theatres; it transcended the entire care journey.

This meant implementing the core Scan4Safety principles—the “4Ps”:

- Patient identification, using the Global Service Relation Number (GSRN)
- Product identification, using the Global Trade Item Number® (GTIN®)
- Place, using the Global Location Number (GLN)
- Process, in this case, the patient pathway and the staff involved with the patient’s care

This process was then followed for each and every patient, following their respective care pathway. Rachael Ellis, Scan4Safety Programme Director at HUTH, devised a new methodology that was simply captioned as the “3Cs” for leading the development of the new model.

If it was *connected* to the patient, *continuous* in relation to the patient pathway, and made the pathway *complete*, then it would be included in the implementation plan—a contrasting model to the majority of other NHS trusts that focus their implementation models on one department at a time.

Ms. Ellis explains, “Scan4Safety is ultimately a patient-safety programme. Therefore, it should absolutely follow the patient, as the patient should be kept at the centre of the programme. At HUTH, they are!

“It is the only way to truly establish what is needed operationally to cater for each patient’s individual piece of care – and if it is not tracked, how do you know? How can you make bigger decisions around facilities, assets and resources if you do not understand where patients are going and what care they actually require? Data evidence is required to suggest trends that might not necessarily be known or reported.”

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Rachael Ellis

Scan4Safety Programme Director,
Hull University Teaching Hospital



The premise of the model was born out of early engagement with clinical teams and the trust’s senior executives from the outset. This approach made it easier to identify the direct needs and challenges of the clinical staff members. It also enabled the Scan4Safety project team to understand the problems for resolution, pinpoint data-capture requirements for particular attributes, and uncover areas where support could be provided.

Early engagement also extended to the trust’s executive team. The open and transparent culture at HUTH proved to be a significant contributing factor towards the projects’ successes. Although different members of the executive team were focused on achieving different outputs from the projects, the patient-safety outcomes were key for all concerned.

The model’s success has led to implementation projects across 19 specific care pathways, including anaesthetics, perfusion services, cardiology wards, lung function services, home ventilation services as well as ICUs.

All information that can possibly be scanned and captured is done at the point of care, recording the date, time, staff member and location of any interventions along the way, right through to the patient’s discharge details. This information is attained in real time, using GS1 barcodes, to enhance accuracy and efficiency.

Informed and speedy decisions for patient safety

There have been many benefits, but one of the most obvious advantages has been the ability to see the entire patient pathway reflected in the data, including full patient-level costing.

HUTH also scans items, including assets, which has had a profound impact on the management of product recalls. During the COVID-19 pandemic, the trust had to deal with a ventilator product recall. On receiving the recall notice, HUTH was able to very quickly

identify 100% of the affected ventilators, using GS1-barcoded asset labels.

With each of the assets scanned to the patient (identified using the GSRN encoded in a GS1 DataMatrix barcode on the patient wristband) and the location (using the GLN), the Scan4Safety team was promptly able to ascertain which asset was with a patient, which was unused and sat in a storeroom, and which was held by clinical engineering. This data was reviewed. Patients who were impacted by the ventilator recall were identified, available ventilator assets were quarantined, the product-recall flags were added to the system, and all of this happened within two hours of receiving the official recall notice.

Crucially, not a single minute of nursing time was used to physically track down each piece of equipment. Before using GS1 standards, the recall process was expected to have taken more than 70 hours of nursing resource and would have taken several weeks to complete. Despite this effort, it would have remained unclear whether all of the recalled ventilators had been tracked down.



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Clinical decision-making and resource planning can now also be done using fact-based analysis. Access to the data provides the additional details needed to see how often a patient follows a particular pathway in comparison to another. Since this is evidence-based data centred on individual patient care, it removes any level of ambiguity and speculation. Actions can then be built on timely data, which provides opportunity to analyse and act quickly.

HUTH is now in a better position to be able to make tangible decisions based on patient needs specific to the trust’s individual needs. All the data is regularly reviewed and used—a powerful tool for clinicians as all data is available at their fingertips without requesting patient notes and delaying patient care.

Clear patient data and benefits

Ms. Ellis at HUTH firmly believes that by putting the patient at the heart of a large-scale patient-safety programme, the benefits are clear to see.

The data is transparent, clinicians are able to view it, inventory can be managed much more effectively and, by digitising the patient pathway, it leads to quicker, smoother recalls of data and records. This information can then be used for producing data about the patient pathway, rather than just the patient's surgery, if conducted at department level.

Managing the enormous volume of data has been both the biggest benefit and the largest challenge. Connecting the data as part of the patient pathway builds further complexities

into the process. There is data connected to theatre, recovery, ICU, the ward and discharge information. This is then layered with product, implant and staffing data in addition to procedure details and coding requirements—all of which presents its own challenges.

HUTH has already rolled out Scan4Safety to 19 patient pathways—soon to be 20 with RFID (radio frequency identification) planned next for all assets across all three sites. Doing so will allow for assets to be mapped and located with ease, saving huge amounts of nursing and portering time. This will bring coherence to the strategy of asset buying and planned preventative maintenance across the trust's sites.

About the author



Rachael Ellis worked within the NHS in senior procurement roles before becoming the UK's first Scan4Safety programme director.

Ms. Ellis is passionate about creating exceptional patient care, and ensuring patients' respective care journeys are transparent. Her goal is to make patient information readily available for clinicians and nursing staff, to ensure the best possible care and decisions are made for patients.

Before joining the NHS, Ms. Ellis worked in both the education and private sectors, all within procurement and large-scale project delivery programmes.

Rachael Ellis
Scan4Safety Programme Director,
Hull University Teaching Hospital

About the organisation



HUTH has two main hospital sites, Hull Royal Infirmary and Castle Hill Hospital, and has an annual income of circa £560 million. The trust employs just over 7,000 full-time staff with support from 300 volunteers.

Secondary care services are provided to a catchment population of approximately 600,000 in the Hull and East Riding of Yorkshire area. The trust also provides specialist and tertiary services to a catchment population of between 1.05 - 1.25 million, extending from Scarborough in North Yorkshire to Grimsby and Scunthorpe in North East and North Lincolnshire, respectively.

In 2020, HUTH saw more than 134,000 patients in the emergency department alone, admitted in excess of 160,000 patients onto wards, had more than 780,000 patients attend the outpatient department, and delivered more than 4,700 babies in Hull Women's and Children's Hospital.

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