United Kingdom

CareScan+: Enabling safer more efficient patient care while reducing costs

Challenge

North Tees and Hartlepool NHS Foundation Trust began its GS1 standards-adoption journey as one of six selected demonstrator sites involved in the Department of Health and Social Care's Scan4Safety programme.

To fully meet the requirements of the Scan4Safety programme, a point-of-care scanning solution was necessary to facilitate the convenient and practical capture and recording of events taking place during each episode of patient care. However, when implementing and using scanning at the point of care, staff found that there was no all-encompassing scanning solution available to meet their needs.

Approach

The trust decided to develop its own solution and looked to produce an easy-to-use, accessible app that staff could use for all of their scanning requirements – one where all of the data collected could be accessed and stored in one central repository so that the right investigational product and/or kit goes to the right patient.

CareScan+ has been built by the NHS, for the NHS

Patient safety benefits from the additional controls and full traceability of products

Increased efficiency and reduced time when responding to product recalls

Decision support and patient safety alerts fed back to clinicians in an instant

GS1 standards have long been a feature in retail – used to provide a standard and consistent means of sharing product data across industry.

In 2016, England's Department of Health and Social Care (DHSC) decided to apply these same standards in healthcare with the launch of the Scan4Safety programme.

North Tees and Hartlepool NHS Foundation Trust (NTH) became one of six trusts that formed part of the programme, which set out to establish the value of GS1-standards adoption across three main areas: patient identification (person), catalogue management (product) and location identification (place).

During the implementation of the Scan4Safety programme, it became clear to the trust that a point-of-care (POC) scanning solution – one that was patient-safety focused and would provide clinicians with immediate safety and decision support alerts – did not exist at the time.

Built by the NHS, for the NHS.

NTH decided the best solution would be to design and develop an app that would be able to accommodate all the trust's requirements. It is here where CareScan+ was born, the creation of a point-of-care scanning solution.

Shining a light

In 2016, NTH was selected by the DHSC to become one of only six demonstrator sites within the English National Health Service (NHS), tasked with the implementation of

GS1 standards and Pan-European Public Procurement Online (PEPPOL).

The Scan4Safety programme, as it is more commonly known, focused on improving patient safety, enabling clinical productivity and driving supply-chain efficiency. Trusts were required to standardise processes and capture data relating to people, products and places via the scanning of GS1 barcodes – the ultimate goal being to embed the "4Ps" within the organisation.

"As an organisation, our key aim is to put patients and the population at the centre of everything we do. This is no different when it comes to the development of innovative digital solutions. The challenge is to make simple solutions for complex problems, and our CareScan+ platform is such an example. We worked hard to make this simple."

Professor Graham Evans,
Chief Information and Technology Officer/ SIRO, North Tees and Hartlepool NHS Foundation Trust

CareScan+ is a POC-scanning solution designed and developed by the trust to support the Scan4Safety requirements. With software underpinned by open standards, such as GS1 standards, it is a wholly interoperable and flexible solution that has the capacity to work with any trust's existing systems – including electronic patient records (EPRs), patient administration systems (PAS) and inventory management systems (IMSs).

CareScan+ is used to track and trace products used by staff during the delivery of care to patients. It uses established GS1 barcode standards that major industries have successfully shown can be relied upon to improve logistical processes.

The software provides a quick, easy and accurate means of collecting quality data in a consistent manner, and facilitates the instant reporting of this data via a single system.

CareScan+ is able to "shine a light" on the trust's "blind spots," and affords the trust the opportunity to make informed decisions based on an accurate, rich set of data.

Collect once and use often

When starting its Scan4Safety journey, the trust soon realised that there was a gap in the market when it came to scanning technology solutions that were patient-safety focused. Available products existed, but they were predominately focused on inventory management, whereas the trust required a solution to improve patient safety and provide clinicians with immediate decision support alerts.

The challenge facing all trusts is how to quickly, easily and consistently capture data. Accurate data capture improves visibility, interoperability and traceability across the healthcare system. NHS trusts should be looking to "collect once and use often" and "collect what matters."

NTH collects significant volumes of data across many different systems and in many different formats. Some of this data is captured using barcode-scanning techniques, but in most instances, data is manually entered using a keyboard.

This leads to data that can be inconsistent in its quality, accuracy and structure. Consequently, this leads to challenges when attempting to filter, process or report on this data. This is known to result in "blind spots" across the organisation due to a lack of accurate, quality and available data.

Barcode scanning is recognised for its accuracy, rapidity and reliability, and this was something the trust wanted to capitalise on.

The goal was to understand the what, where, who and when, so the trust would be better equipped to make intelligent decisions around its selection and utilisation of staff, products, assets and locations. The aim was to help influence the design of improved patient pathways and achieve better patient outcomes.

During the early implementation stages of POC scanning, the trust established that staff needed to use multiple scanning devices, which varied based on the area and the data they were collecting.

Alternative devices were required for patient identification, catalogue management and location identification – highly inefficient and impractical for staff to use.

Furthermore, as one of only six sites involved in the Scan4Safety programme, this also meant that there was a limited number of trusts adopting POC scanning as a major patient-safety initiative. With all trusts embarking on the journey at the same time, there were limited prior experiences to learn from.

Introducing CareScan+

In an effort to overcome this, NTH decided to develop a scanning solution that could be used by any hospital function, irrespective of which GS1 identification keys were being used. This could mean anything from capturing the Global Service Relation Number (GSRN) on a patient wristband, to scanning the Global Location Number (GLN) at the site of care.

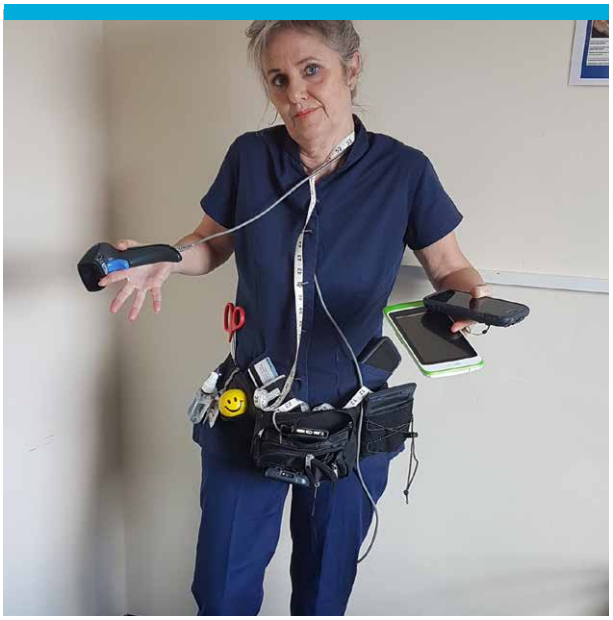


Figure 1: Multiple scanners required to scan different elements during episodes of patient care

Figure 2: Single scanner running CareScan+ app

In collaboration with key stakeholders, the POC-scanning solution, trademarked as CareScan+, was developed to support all aspects of data capture required as part of the Scan4Safety programme.

Importantly, CareScan+ was built using open-source components to ensure that the trust was not tied to any proprietary systems and could be easily integrated into other trust frameworks, e.g., EPRs or inventory management, catalogue management and purchase-to-pay (P2P) systems. However, as a stand-alone system, it could also be used independently.

"Compared to the current system, the major benefit is the ease of use. Overall, its efficiency gains are second to none.

This frees up approximately 15 minutes of a theatre personnel's time per case, which, in turn, aids the turnaround time and associated benefits that this has on our patients and for the trust."

Sarah Todd,
Orthopaedic Sister, North Tees and Hartlepool NHS Foundation Trust

CareScan+ is now used to track and trace any product used by staff via the Global Trade Item Number® (GTIN®) during the delivery of care to patients. The data collected is instantly available for reporting and auditing purposes, and provides users with immediate feedback

on product recalls, product warnings and expiry dates. The collection of this data assists the trust in rapidly identifying patients in the event of a product recall. Prior to the use of CareScan+ the time taken to identify patients was measured in weeks and months. The measure is now minutes and hours.

During the pandemic, the trust also utilised CareScan+ to track and trace non-invasive ventilators (NIVs), giving clinicians the confidence of not just knowing the location of a ventilator, but, more importantly, its actual status (available/in use/out for cleaning/out for repair).

Finance teams are then provided with more accurate and timely patient-level information costing, which also gives insight into asset, staff and space utilisation – all achieved by simply scanning the associated GS1 barcode.

CareScan+ can also advise clinicians via a screen prompt or warning, of a specific site implant to prevent a "Never Event." These are events defined in the UK as: "Serious Incidents that are wholly preventable because guidance or safety recommendations that provide strong systemic protective barriers are available at a national level and should have been implemented by all healthcare providers."

For example, one such Never Event would be the use of a left-sided implant for a right-sided procedure. Using this solution, these real-time alerts provide clinicians with the relevant information to prevent and avoid harm to the patient. In turn, this provides the trust with an enhanced level of patient safety, ensuring that the patient's journey is the safest it can be whilst in the care of the hospital staff.

With CareScan+ in place, it also provides the ability to identify unwarranted variation that can cause inefficiency and risk, so that these elements can be targeted and eradicated to enable changes in clinical practice, if necessary.

Figure 3: Scanning products using CareScan+ in theatres

"CareScan+ has the potential to shine a light on non-pay expenditure in theatres, which until now has been a blind spot in the organisation.

"The availability of this kind of highly precise data is very rare in the NHS, and will enable a greater understanding of how staff deployment and medical equipment usage impacts patient care and the associated costs."

Neill Waters,
Senior Cost Accountant, North Tees and Hartlepool NHS Foundation Trust

The CareScan+ app is more than just about scanning GS1 barcodes; it is ultimately about driving patient-safety improvements through real-time access to vital data for each episode of patient care.

"CareScan+ enables us to know 'who does what to whom, where, when and using what."

Chris Tulloch,
Deputy Medical Director & Orthopaedic Surgeon, North Tees and Hartlepool NHS Foundation Trust

Real-time, valuable data

Using CareScan+ enables valuable data to be captured in real time, and because it is captured at the point of care, it provides improved data quality for anyone that needs it. Instead of being collected and transcribed later, or being collated across several different devices, everything is captured, held and processed in one place, so there is a central repository for all data needed. This provides staff with greater oversight of all information, enhancing traceability and audit processes across the trust.

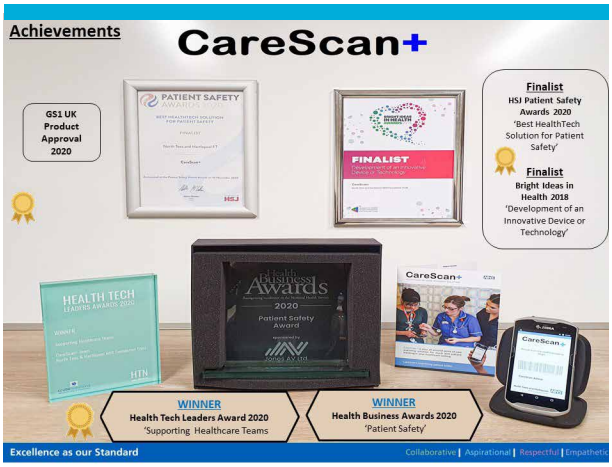
Data collected is instantly available for reporting and auditing purposes and will facilitate an immediate response, to both patients and care providers, in the event of a Class III product recall.

Additionally, the instant alert feedback means that before a product or device is administered or used, the clinician is made aware if the product has been recalled, preventing unnecessary harm to patients.

Since its implementation, NTH has been able to improve the speed and efficiency of its product recalls, providing additional insight to procedure costs, and has a greater awareness of product consumption and asset utilisation.

An example of how valuable asset utilisation monitoring has been for the trust, can be seen throughout the coronavirus pandemic, in the form of understanding the capacity, availability and locations of non-invasive ventilators throughout the hospital.

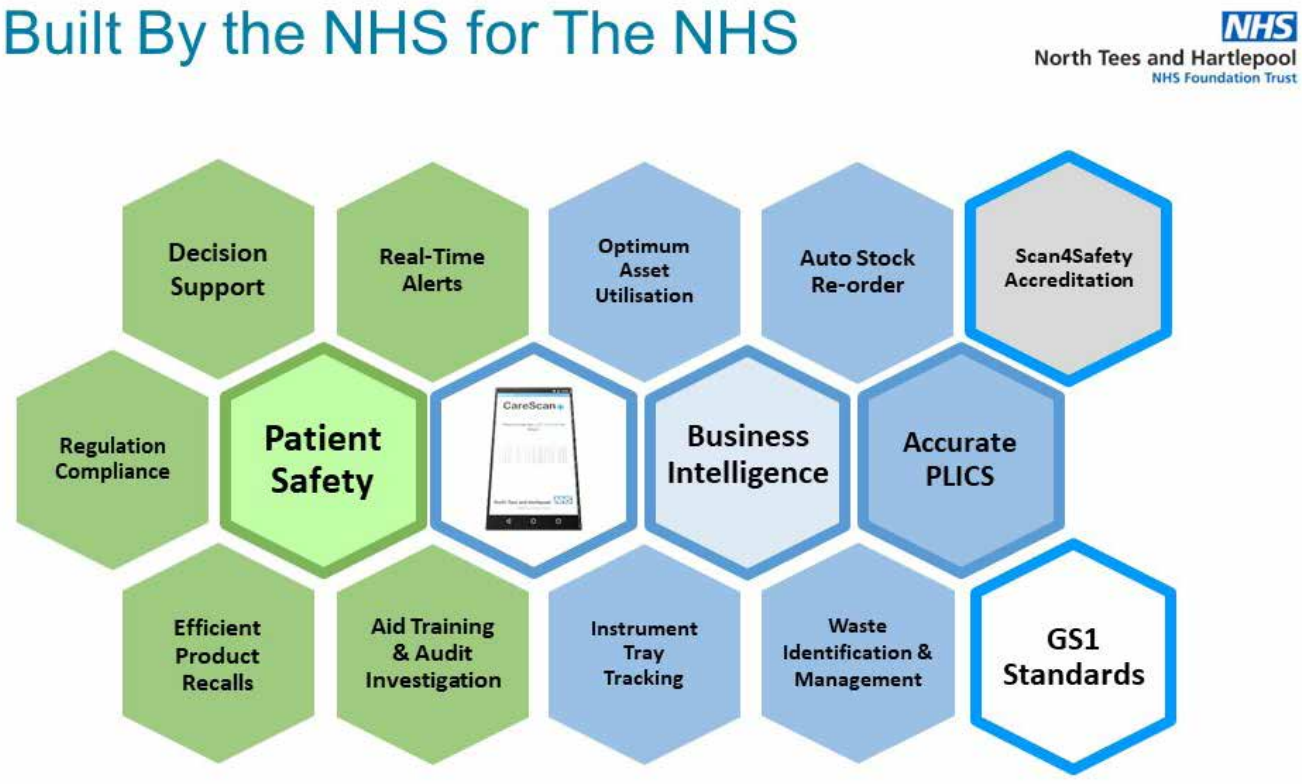
The team rapidly adapted the CareScan+ software and produced a reporting dashboard to provide clinicians with insight into the location and status (availability) of the non-invasive ventilators (NIVs) throughout the organisation, which helped to coordinate the fight against COVID-19.



Built by the NHS, for the NHS

The Independent Medicines and Medical Devices Safety (IMMDS) Review, led by Baroness Cumberlege, published in July 2020, said that "a central patient-identifiable database should be created by collecting details of the implantation of all devices at the time of operation."

NHS Digital is developing an information system to collect, curate and analyse surgical device and implant data related to patients receiving surgical care in the UK. The system is known as the Medical Device Information System (MDIS) and forms part of a wider Medical Device Safety Programme (MDSP) – a collaboration between Getting It Right First Time (GIRFT), NHSX and NHS Digital. These organisations work jointly to enable the better use of technology to improve patient safety where medical devices are used.



[1] *First Do No Harm.* (8 July 2020). Retrieved from: https://www.immdsreview.org.uk/Report.html

Based on successful trials, CareScan+ is already demonstrating the capability to provide high-quality data for submission, according to the emerging MDIS data set standard. With one scanning solution in place, staff are no longer bound by the constraints of multiple devices, so they are able to work with a greater level of operational efficiency.

The trust's efforts were recognised in 2020 when CareScan+ won two prestigious awards; the HTN Health Tech Leaders Award 2020 for Supporting Healthcare Teams and the Health Business Awards 2020 for Patient Safety.

CareScan+ has been developed "by the NHS, for the NHS," and because of this, it has received great feedback from staff. In the future, NTH hopes to be able to make this available to other NHS trusts on their own adoption journey. The CareScan+ solution has also recently become a GS1 UK-approved product, as part of the GS1 UK partner programme.

About the authors

Anthony Kennerley,
CareScan+ Project Manager, North Tees and Hartlepool NHS Foundation Trust

Anthony Kennerley has more than 30 years of experience in NHS procurement and supply-chain management. He joined the North Tees and Hartlepool NHS Foundation Trust in 2000, and has led numerous high-profile projects, including the successful adoption of e-procurement and e-tendering within the organisation. He was deputy head of procurement and supplies prior to his secondment into the Scan4Safety project in 2016.

A procurement professional with a proven track record of improving operational efficiency and delivering significant cost savings for the NHS, Mr. Kennerley brings with him a wealth of knowledge and experience of implementing e-procurement solutions and change management processes within the healthcare sector. He was influential in the trust achieving the Scan4Safety accreditation in 2018, and has been central to the design, development and successful implementation of CareScan+ within the trust.

Tony Naylor,
Associate Director of ICT and CareScan+ Project Lead, North Tees and Hartlepool NHS Foundation Trust

Tony Naylor became the Associate Director of Information and Communication Technology (ICT) for NTH in 2008 having joined the trust in 2001 as Head of Information Technology (IT). This followed 14 years experience gained developing and supporting accounting and process management software applications within the private sector.

Working with an excellent team to implement and support myriad systems with optimum availability and resilience is not without its rewards, but Mr. Naylor will tell you that what motivates him most is applying technology to improve patient safety.

Mr. Naylor was the chief architect of CareScan+ and is credited with producing the original concept and design. He has been instrumental in successfully introducing point of care scanning into the trust.

He is a self-proclaimed Scan4Safety evangelist.

About the organisation

North Tees and Hartlepool NHS Foundation Trust is an integrated hospital and community services healthcare organisation, serving around 400,000 people in Hartlepool, Stockton and parts of County Durham.

Services are primarily offered from the University Hospital of North Tees (Stockton-on-Tees) and University Hospital of Hartlepool, with support from a wide range of community-based services.

In 2018, the trust was rated "Good" from the independent health and social care regulator, the Care Quality Commission (CQC), with elements of its A&E services being rated "Outstanding."

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