SCAN4SAFETY

A scan of the benefits: the Scan4Safety evidence report

Improving patient safety and saving money using point-of-care scanning in the NHS

Foreword

A foreword about barcodes is not exactly Harry Potter! Indeed, barcodes are commonplace in most industries and have been around for a long time. It is time they became commonplace in the NHS. They offer traceability, efficiency savings and greater patient safety.

This report details the experiences of the Scan4Safety demonstrator sites. Six trusts implemented scanning of people, products and places over the two-year initiative, which was funded by the Department of Health and made extensive use of unique identifiers from GS1, a not-for-profit organisation that develops and maintains global standards for business communication.

At these organisations, all patients have a barcode on their wristband which is scanned before a procedure. All equipment used for that procedure is also scanned – including implantable medical devices – and recorded against the patient and the location.

At some trusts, staff even have barcoded badges which are scanned before a procedure so making it possible to identify which teams were identified in which procedures. The result is complete traceability alongside a full understanding of costs, at patient and clinical team level.

The time taken to recall products falls to hours from days or weeks, clinical time is freed up – significant as the NHS continues to face workforce challenges – and effective stock management becomes straightforward.

As the Cumberlege review has shown us, having such an understanding is crucially important to offering the safest, most effective care to patients – and being able to act quickly when something goes wrong.

Among the results reported by the Scan4Safety demonstrator sites, were:

- The release of 140,000 hours of clinical time back to patient care
- Non-recurrent inventory reductions of £9m
- Recurrent inventory savings worth nearly £5m across the six trusts

At Derby Teaching Hospitals NHS Foundation Trust alone (now University Hospitals of Derby and Burton NHS Foundation Trust), cumulative benefits of £3,194,346 were realised by December 2018 thanks to Scan4Safety, which the trust introduced in April 2016.

Over the following pages is further clear evidence of the benefit of point-of-care barcode scanning in healthcare. That evidence is accompanied by case studies from demonstrator trusts, as well as insights from those responsible for rolling out the project within organisations. They share important lessons which will be useful to those in other trusts who are interested in how they can realise similar benefits.

We live in a world in which digital technology has already fundamentally changed the banking industry, the retail industry, and many others. It offers a similar opportunity in healthcare.

Barcodes are a small but essential part of that revolution. We need to embrace it, now!

Lord David Prior, chair, NHS England

Executive summary

In 2016, the Department of Health awarded funds to six hospital trusts in England – the Scan4Safety demonstrator sites – to investigate how consistent use of point-of-care scanning might improve efficiency and safety within the NHS.

In 2016, the Department of Health awarded funds to six hospital trusts in England – the Scan4Safety demonstrator sites – to investigate how consistent use of point-of-care scanning might improve efficiency and safety within the NHS.

At these organisations, barcodes produced to GS1 standards – meaning they are globally unique – are present on patient wristbands; on equipment used for care, including implantable medical devices; in locations; and sometimes on staff badges.

Before and during procedures, all these barcodes are scanned. This makes it possible to create a comprehensive data set of what products have been used on which patients, where they were, and which members of staff were involved.

Scanning products when they enter stock, meanwhile, ensures consistent and reliable stock management procedures – including clear sight of when products are due to expire.

The Cumberlege review has shown the critical importance of this sort of traceability.

Throughout the two-year span of the Scan4Safety demonstrator-site programme, trusts collected evidence of the difference point-of-care scanning was making. Benefits have been realised in two key areas:

Patient safety:
Through complete traceability; speedy and accurate recall; reduction of drug error and Never Events; improving routine observations and patient identification

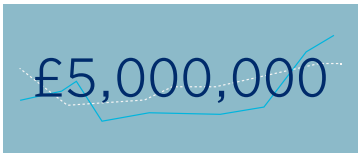
Cost and efficiency savings:
Through more efficiency and cost-effective product ordering; happier, more efficient staff; the creation of accurate patient level costings; reductions in unwarranted variation

This report details the evidence base for Scan4Safety. It is based on the results of independent audits by the Department of Health and Social Care (DHSC) which took place during the programme and on extensive interviews with those in trusts that have successfully implemented point-of-care scanning.

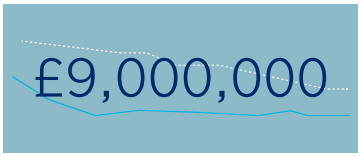
It also includes insight from Hull University Teaching Hospitals NHS Trust, where leaders independently took the decision to self-fund and implement Scan4Safety.

Among the headline findings:

140,000 hours of clinical time have been released to care

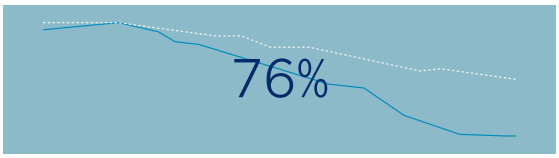


Recurrent inventory savings worth nearly £5m across the six trusts



Non-recurrent inventory reductions have amounted to £9m

At Leeds Teaching Hospitals NHS Trust, the average time taken for product recalls has fallen from 8.33 days to less than 35 minutes following the introduction of Scan4Safety. The organisation estimates it will save £84,411.07 each year on such recalls



By introducing scanning in pharmacy, Royal Cornwall Hospitals NHS Trust reduced prevented-error rates by 76 per cent, including elimination of all errors caused by wrong patient, wrong drug, wrong dose and wrong form

An introduction to Scan4Safety

The scanning of globally unique GS1 barcodes is common in a number of industries and is seen as a key way to improve efficiency, auditing and safety.

For example, when food inspectors announced that they had found traces of horse meat in frozen beef burgers, supermarkets quickly removed and recalled affected products.

Until recently, this level of track and trace was relatively new in UK healthcare – meaning that it was impossible to easily find the women in Britain who had received faulty breast implants from Poly Implant Prostheses (PIP).

These PIP implants are between twice and six times as likely to rupture as other implants. Despite being withdrawn ten years ago, it is estimated that around 47,000 British women had PIP implants fitted, most of whom are still living with them[1].

In 2016, the DHSC awarded a total of £12m, distributed between six hospital trusts in England – the Scan4Safety demonstrator sites – to investigate how consistent use of point-of-care barcode scanning might improve efficiency and safety within the NHS.

The barcodes used were all compliant with GS1 standards. These standards were chosen because they guarantee that a barcode is globally unique and also that it is both system and device agnostic, guaranteeing interoperability with a full range of devices and computer systems.

At Scan4Safety trusts:

- All patients have a unique GS1 barcode on their wristband which is scanned before a procedure
- All equipment used for the procedure – including implantable medical devices – is scanned before use and recorded against that patient
- The location in which the procedure is to take place also has a GS1 barcode which is scanned
- At some trusts, staff have GS1 barcodes on their badges which they scan prior to a procedure. This makes it possible to accurately and efficiently record which teams were involved in which procedures in contrast to other trusts that used drop-down boxes to select clinicians' names

The result is a comprehensive, real time view of stock – including that which is about to expire – as well as a complete audit trail. There is full visibility of what has been done to which patient, when, and where. As the Cumberlege review[2] has shown, this is central to being able to offer safe and effective care to patients – and to being able to act quickly when something goes wrong.

1 Further information on PIP breast implants can be found on the NHS website at: https://www.nhs.uk/conditions/pip-implants/

2 The Cumberlege Review is the independent Medicines and Medical Devices safety Review chaired by Baroness Julia Cumberlege for review into how the health system responds to reports from patients about harmful side effects from medicines and medical devices.

"High profile events in recent years such as faulty breast implants, metal-on-metal hips and meshes for repair of vaginal prolapse have set new challenges" "there needs to be better processes to 'track and trace' patients who have received a device when a problem arises. Clear strategies and channels are needed to inform patients, the public and clinical professionals to help improve safety."

Professor Sir Terence Stephenson, Nuffield professor of child health, UCL Great Ormond Street Institute of Child Health; honorary consultant paediatrician, University College Hospital and Great Ormond Street Hospital, and chair, Health Research Authority for England

The Scan4Safety demonstrator sites

- Derby Teaching Hospitals NHS Foundation Trust (now University Hospitals of Derby and Burton NHS Foundation Trust)
- Leeds Teaching Hospitals NHS Trust
- North Tees and Hartlepool NHS Foundation Trust
- Salisbury NHS Foundation Trust
- Royal Cornwall Hospitals NHS Trust
- University Hospitals Plymouth NHS Trust

This report also contains insight from Hull University Teaching Hospitals NHS Trust, where leaders independently took the decision to implement Scan4Safety.

"Things like GS1 and other technology innovations are where – like in the aviation, nuclear, chemical industries – we can create a failsafe, where you don't just exhort people: 'Don't put that wrong arterial stent in again'; you actually engineer out the risk."

Professor Sir Terence Stephenson, Nuffield professor of child health, UCL Great Ormond Street Institute of Child Health; honorary consultant paediatrician, University College Hospital and Great Ormond Street Hospital, and chair, Health Research Authority for England

"We know the adoption of GS1 standards can save lives and save money and can do it quickly."

Lord Philip Hunt, president, GS1 UK, and former health minister

"The NHS has been grappling with medication errors, wrong site surgery, wrong implants – all of these sorts of problems – for years. Actually, the solutions to these intractable problems are close at hand. We're not talking about some obscure, exotic, science or technology. Scanning is what you get at a checkout at the supermarket. When was the last time you checked your bill from a supermarket? You don't have to. They're not going to make any mistakes because it's all been scanned."

Gavin Boyle, chief executive, University Hospitals Derby and Burton NHS Foundation Trust

"With barcode scanning, we record everything that touches the patient and that database has a multiple of recipients – procurement, who look at what we're using and discuss it with the supplier; patient safety, who can actually trace the product at the touch of a button; finance, with accurate costing information per patient; and clinicians for discussions about clinical improvement in practice."

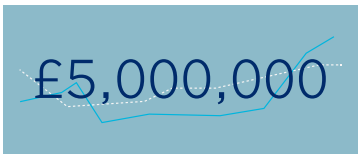
Kevin Downs, executive director of finance and performance, University Hospitals of Derby and Burton NHS Foundation Trust

Established foundations

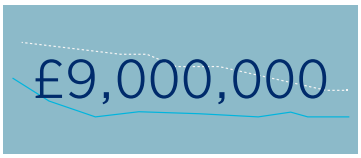
- A licensing agreement already in place between GS1 UK and NHS Digital (lasting five years from 1 April 2019) means all trusts in England can generate GS1 barcodes at no additional cost. These standardised barcodes allow for clear and unique identification of every person, every product, and every place.

General data headlines

140,000 hours of clinical time have been released to care



Recurrent inventory savings worth nearly £5m across the six trusts



Non-recurrent inventory reductions have amounted to £9m

Trust-specific data headlines

- North Tees and Hartlepool Hospital NHS Trust estimated Scan4Safety had released 22,000 hours of time to care over the course of the programme. This was through reduction in adverse drug effects and reduction in incident reporting time
- At University Hospitals of Derby and Burton NHS Foundation Trust, consumption reduction supported by the introduction of Scan4Safety in April 2016 led to £1.1m savings by May 2017 alone. By December 2018, cumulative benefits of £3,194,346 had been realisedThe location in which the procedure is to take place also has a GS1 barcode which is scanned
- In the first year of the Scan4Safety demonstrator project (2016/17), University Hospitals Plymouth NHS Trust realised £209,000 of net savings
- By December 2017, Leeds Teaching Hospitals NHS Trust had reported £2,316,336 of cumulative savings from Scan4Safety
- Leeds Teaching Hospitals NHS Trust estimates it will save £84,411.07 each year on product recalls thanks to the introduction of point-of-care scanning
- From October 2016 to March 2017, Leeds Teaching Hospitals saved £83,548.41 by standardising and rationalising the items in the surgical trays used for the five most common procedures. This was made possible by scanning
- By December 2018, North Tees and Hartlepool NHS Trust had saved £1,081,280 from its balance sheet thanks to Scan4Safety
- By February 2017, Salisbury NHS Foundation Trust had already reported cumulative savings of £1.3m through cash releasing benefits and cost avoidance
- By May 2018, Salisbury NHS FT had released time to care in two areas that amounted to £30,000
- In cardiac catheterisation labs at University Hospitals of Derby and Burton NHS Foundation Trust, one and a half band 7a nurses were entirely freed up from stock-control work and released to patient care following the implementation of Scan4Safety

Section 1: The cost and efficiency benefits

"From a financial point of view, it makes sense."

Kevin Downs, executive director of finance and performance, University Hospitals of Derby and Burton NHS Foundation Trust

"Scan4Safety is a pioneering initiative to bring 21st century data standards to our everyday work in the NHS. I'm proud that at Leeds Teaching Hospitals, we were one of the original demonstrator sites and it has shown improvements in how we track patients and equipment around our seven hospitals, and, crucially, frees up staff time so they can spend more time focusing on patient care. Initiatives such as Scan4Safety are crucial for becoming an efficient, modern teaching hospital."

Julian Hartley, chief executive, Leeds Teaching Hospitals NHS Trust

Better stock management, increased staff efficiency, view of unwarranted variation

The evidence shows that Scan4Safety trusts see a reduction in costs and an increase in efficiency by virtue of scanning at point of care. That includes through vastly better inventory management.

Products are ordered just in time rather than just in case, in the quantities actually needed, and are used before they expire. This, in turn, frees up clinical staff from burdensome stocking duties and gives them more time to care.

Meanwhile, precise information about which products and tools are being used for which procedure and by which teams, engenders the creation of a clear dataset which can be used to identify and eliminate unwarranted variation. With scanning, patient-level costings become precise, quicker to create, and entirely robust.

"It has been my privilege, as chair of the GS1 UK healthcare advisory board, to observe the tremendous benefits that the Scan4Safety initiatives delivered, especially in patient safety and efficiency. I spent several weeks as an inpatient at South Warwickshire NHS Foundation Trust (Warwick) recently and was able to observe at first-hand how barcoding added to my continuity of care."

Professor Duncan Eaton, chair, GS1 UK healthcare advisory board, and past CEO, NHS Purchasing and Supply Agency (PASA)

More efficient and cost-effective ordering of products

Most trusts have a manual reordering system for the thousands of items needed to care for patients – from catheters used on the wards, to the pins and implants used for orthopaedic procedures. Managing that is immensely time consuming, often pulling clinical staff away from their care duties to deal with stock checks and ordering.

When more expensive items are ordered, this often has to be signed off by a more senior member of staff. Should that person be on holiday or sick, the result can be a lack of approval for the order. As one orthopaedic consultant interviewed for this report put it, "the loneliest place in the world is in an operating theatre when they say: 'No, we don't have that'."

To avoid this, the tendency may be to over-order items. But that means waste as stock goes out of date – or potential risk if it is used in a patient regardless. At Salisbury NHS Foundation Trust, the re-organisation of stock and stores enabled by Scan4Safety revealed that six per cent of orthopaedic implants on their shelves were already out of date.

"We had six per cent of error sitting there just waiting for someone to make a mistake, for someone to walk into that trap – because everyone's brain plays tricks on them, particularly if you're in a high-pressure environment such as theatre," says Lorna Wilkinson, the trust's director of nursing and midwifery during the Scan4Safety demonstrator programme.

In the programme's first year, the trust gained £65,676 by reducing the unnecessary stock that it held in theatres. In pharmacy, that figure stood at £264,101 released by reducing wastage and sending products for recycling.

And at University Hospital of Hartlepool, better stock management led to £154,939 of savings in orthopaedic theatres by July 2017. At the end of the two-year Scan4Safety demonstrator project, the trust as a whole had realised £1,116,788 of savings.

At Leeds Teaching Hospitals NHS Trust, the better stock management enabled by Scan4Safety led to a £2m reduction on the balance sheet.

"We could demonstrate that in every theatre we went into [with point-of-care barcode scanning] we were making substantial savings."

Nick Thomas, deputy chief executive and director of planning and site services, University Hospitals Plymouth NHS Trust

Reducing the costs of maxillofacial surgery at University Hospitals of Derby and Burton NHS Foundation Trust

Fixation screws are a frequently used item in maxillofacial surgery, to fix broken jaws or cheekbones. They come in different sizes and a number will be used in every procedure.

At University Hospitals of Derby and Burton NHS Foundation Trust, these used to be supplied unsterilised and placed into a tray of 200. The tray would be sterilised, the relevant screws selected for the procedure, those screws replaced, and then the tray sterilised all over again.

But since introducing Scan4Safety, the trust has worked with its supplier and now uses pre-sterilised screws. These are scanned before use, meaning complete traceability of the items and no need to sterilise the tray again. Each item costs about 50p more, but £36 is saved on sterilisation costs.

Happier, more efficient staff

"Artificial intelligence, robotics, GS1 data entry can free up the time of people like me – practicing doctors, nurses and pharmacists – to do what we're trained to do. We're not being paid to enter data into a system. We can spend time with people talking to them, hearing about their world."

Professor Sir Terence Stephenson, Nuffield professor of child health, UCL Great Ormond Street Institute of Child Health; honorary consultant paediatrician, University College Hospital and Great Ormond Street Hospital, and chair, Health Research Authority for England

Few clinicians go into their field out of a desire to become expert in stock ordering and management. But the reality is that this is often a time-consuming and frustrating part of life as a senior nurse, reducing the amount of time that individual has to do the high-value part of their work – patient care.

Salisbury NHS Foundation Trust has two cardiac catheterisation labs. A band 6 nurse was spending two hours a week on stock management, which was eliminated by the introduction of Scan4Safety.

Rather than having to manually check and order stock, it is scanned the minute it arrives in the trust, once it goes to the lab, and once it is used – and then reordered as needed.

In orthopaedics, close to eight hours a week is being saved. A lot of that time was spent looking for kit, but six per cent of it was already out of date due to problems with stock management.

"Imagine the frustration of going to your implant and it's out of date, so you need to find another implant which might be out of date too. Or, the worst happens, and that out-of-date implant gets through to the patient," says Lorna Wilkinson, the trust's director of nursing and midwifery during the Scan4Safety demonstrator project.

She argues it has a knock-on impact for staff satisfaction, but also that the resulting stress could further affect safety. "You don't want your theatre staff or your cardiac lab staff doing the runaround looking for kit and implants – it should just be there."

At Salisbury NHS Foundation Trust, the introduction of Scan4Safety has resolved the issue. Scanning every item used for every procedure on every patient means a detailed picture has been built of exactly what equipment is needed for which operation on which individual. This in turn made it possible to do "surgical kitting".

"From the wealth of thousands of procedures, we know exactly what is needed for a total hip replacement or a knee replacement, even down to knowing what kit is needed for Mr Jacob's ankle reconstruction," explains Ms Wilkinson.

"Our theatre staff come in in the morning and trolleys are there already set up for the day with all the kit and consumables that that operating list needs."

"The technology has been the easiest part of all, which is unusual for a digital project. Our theatre staff initially thought hang on, you've given me more work. But they are so used to scanning in supermarkets, it's such a well-known sort of technology, that is very easy to use."

Lorna Wilkinson, director of nursing and midwifery during the Scan4Safety demonstrator project, Salisbury NHS Foundation Trust

"If you go down to theatres and actually talk to the staff who scan the prosthetics, scan the patients, scan the location, they just say: 'Well, it just works, doesn't it, and makes our life easier'. We used to use pieces of paper – you'd use an item, complete the restock piece of paper, if it didn't find its way back to where it needed to get to, you'd have stock outs. So you might have had 80 patients a year who couldn't have a procedure because we'd stocked out of the item. Point-of-care barcode scanning has got rid of those."

Nick Thomas, deputy chief executive and director of planning and site services, University Hospitals Plymouth NHS Trust

Patient-level costing and reductions in unwarranted variation

Chris Tulloch has managed patient-level costings at his trust for many years. But it wasn't until Scan4Safety was introduced that he had confidence in the accuracy of those costings.

"For about 80 operations now we have the absolute breakdown of what I spend to do a procedure and what my colleagues spend," says Mr Tulloch, consultant orthopaedic surgeon at North Tees and Hartlepool Hospital NHS Trust.

With every item scanned – and linked to the patient and staff, who also have barcodes scanned – there is a complete understanding of how much operations cost.

That means it is much easier to identify when unnecessary expenditure is being encountered and then to take action to reduce that unwarranted variation.

"It gives us visibility and control over what we're paying, and also visibility and control over what we're doing. I ask my colleagues why they are using a more expensive implant when there's no evidence that it is of benefit for the age group in which they are using it."

They might be able to put together a good argument, Mr Tulloch says, but if they can't, there can be a discussion about standardising around a cheaper – but no less beneficial – prosthesis.

Kevin Downs – the executive director of finance and performance, University Hospitals of Derby and Burton NHS Foundation Trust – also says Scan4Safety has transformed discussions about product choice and variation, with associated cost savings.

"One of the things I'd found is you can't introduce patient level costing, PLICs, unless you've got accurate information. And the only way you can do that is to have someone stood alongside the surgeon scanning the items that that surgeon is using at the time. Otherwise you're into an apportionment basis.

"With the introduction of point-of-care scanning, there's no argument no about the accuracy of data, because they see that data being scanned alongside them. So nobody questions when I say: 'Your costs for operating on that patient were x, y and z,' because they've been there, they've seen it, it's actually their data, not mine."

By May 2017, the consumption reduction alone – supported by point-of-care barcode scanning – had led to £1.1m of savings at the trust.

"Doctors love numbers. If they can see their own numbers and practice – and you can say it's absolutely correct because we can even tell you the label of the thing you used – then all of a sudden, you're changing the dialogue with the doctors. That, for me, was the most powerful compelling part of Scan4Safety – not necessarily the streamlining of my procurement processes – that's a byproduct. I want to be able to have a better conversation with the doctors."

Lee Bond, chief financial officer, Hull University Teaching Hospitals NHS Trust

"With Scan4Safety, you can start to highlight to clinicians that colleagues who are doing the same procedure may be having shorter length of stay, may be doing it at much lower cost because they're using this particular product as opposed to that particular product. And it's real evidence now as opposed to anecdotal evidence and, therefore, clinicians will enter into conversations about it. You're able to have conversations about product choice, product type, cost of product etc, because you've got the real data at your fingertips."

Chris Slater, associate director, commercial and procurement, Leeds Teaching Hospitals NHS Trust

"Whenever something goes wrong in the NHS, people are always looking to find solutions to prevent it happening again. GS1 standards and the use of barcodes to facilitate the use of those standards are a simple, proven and highly effective way to improve patient safety and reduce costs. Winning the hearts and minds of staff is probably the biggest challenge when implementing this technology, as change is always hard for busy clinical staff. Once the benefits have been seen, though, everyone 'gets it' and they see how it makes the NHS a safer and more efficient place to work. Most people then ask, 'why didn't we do this sooner?"

Professor Andrew Goddard, president, Royal College of Physicians

Visibility of the total patient pathway at Hull University Teaching Hospitals NHS Trust

Leaders at Hull University Teaching Hospitals independently took the decision to implement Scan4Safety, taking the opportunity to draw on the experiences of the demonstrator sites. When it came to the approach to the project, they made another very deliberate decision – to follow the patient throughout his or her entire journey. That means scanning patients and items on the ward pre-surgery, when anaesthetic is administered, when the operation takes place, and post-surgery, including in intensive care units. The patient is also scanned when he or she is discharged.

That means visibility – and costings – for every part of the patient pathway in the specialities for which the approach has been implemented. Staff, patients, products, rooms and procedures all have barcodes which are scanned by the clinicians giving care.

For procedures in which Scan4Safety has been implemented, a database shows:

- The patient identifier
- The name of the procedure and its clinical code
- Which theatre the procedure took place in
- How long the procedure lasted
- The names of the members of staff who were present, with the lead surgeon identified
- All the products used
- The total cost
- Similar details for any secondary procedures that were necessary

It means complete and comprehensive patient level costing and length of stay data, all of which can be filtered by types of products used and even by teams so as to identify and reduce unwarranted clinical variation.

The Scan4Safety programme director at the trust suggests that, were other trusts to implement a similar process, it would become much easier to establish best practice across the NHS.

“If everybody did the same, we would be able to compare with our neighbouring trust in Leeds or York and say: ‘If you did a coronary artery bypass graft with one single graft using these products, what was your length of stay?’” argues Rachael Ellis.

> "For me, Scan4Safety delivers transparency of data and with great data you can make excellent decisions," she argues. "Without that data, I don't think you're fully informed."

In the West Yorkshire Association of Acute Trusts[3] (WYAAT), of which Scan4Safety demonstrator, Leeds Teaching Hospitals, is a part, this is the aim. The success at Leeds means that, in recent weeks, a decision has been taken to roll out Scan4Safety across the five other trusts in the association following the security of central funding via the integrated care system.

There will be one inventory system across all six trusts and a central catalogue management system. "We'll all be talking the same language and my vision is that instead of having stock replicated across the patch we can have a regional view of inventory," reports Chris Slater, associate director, commercial and procurement, Leeds Teaching Hospitals NHS Trust.

3 Six trust in the region make up WYAAT – they are: Calderdale and Huddersfield NHS Foundation Trust, Bradford Teaching Hospitals NHS Foundation Trust, Harrogate and District NHS Foundation Trust, Airedale NHS Foundation Trust, The Mid Yorkshire Hospitals NHS Trust and Leeds Teaching Hospitals NHS Trust

Section 2: The patient safety benefits

"One of the surgeons once asked me: 'Would you have surgery in a hospital that didn't scan' and I firmly said: 'No. I wouldn't.' I wouldn't want surgery in a hospital that didn't scan. How do they know what they're putting into me, and where is that in my record for any future recall or any complication?"

Lorna Wilkinson, director of nursing and midwifery during the Scan4Safety demonstrator project, Salisbury NHS Foundation Trust

"GS1 standards support tried and tested technology and in the healthcare environment its strength is that you can collect and cross-reference data without human error. That's useful in all sorts of situations, whether: 'Have I got the right patient, right drug and the right dose?' or 'Have I got the right implant in the right eye for the right patient?"

Gavin Boyle, chief executive, University Hospitals Derby and Burton NHS Foundation Trust

"All of the safety improvements were free, because we'd already paid for the Scan4Safety team [through better organisation of stock]. All of this good work on safety was being done on the back of the bread and butter savings which you get straight off the top."

Nick Thomas, deputy chief executive and director of planning and site services, University Hospitals Plymouth NHS Trust

Complete traceability of every item, with simple and speedy recall, as well as reduction of error

At many of the demonstrator sites, Scan4Safety was initially seen just as a means of improving procurement and inventory control. The focus was on gaining the sort of efficiencies commonly seen in other sectors in which scanning is used.

However, what very quickly became clear – and what has been key to enthusiasm about scanning within trusts that have implemented point-of-care scanning – is the significant boost to patient safety.

At Scan4Safety trusts, patients have a GS1 barcode on their wristband which is scanned before a procedure; all equipment used – including implantable medical devices – is scanned before use and recorded against that patient; the location in which the procedure takes place is scanned; and, at some organisations, staff have barcodes on their badges which are also scanned.

All of this information is automatically recorded within a database which can subsequently interrogated, making it possible to immediately trace what has been done to which patient, where, and by whom.

It also makes it possible to prevent errors before they occur. Scanning an out-of-date item, for instance, or a right hip prothesis when the patient and procedure barcode indicate it should be a left hip replacement, can generate an immediate alert advising the clinician of the issue.

Established foundations

- At Leeds Teaching Hospitals NHS Trust, the average time taken to recall a product has fallen from 8.33 days to less than 35 minutes following Scan4Safety. The organisation reported £84,411 of staff efficiency savings on recall from January 2016 to December 2017 alone
- Recently, a recall was issued for an item used by the catheterisation labs at Hull Teaching Hospitals NHS Trust. More than 60 patients were affected and some of the items remained in stock within the trust. Since the organisation uses point-of-care barcode scanning within the labs, it was possible to segregate the affected stock within two hours and place a red flag on the system which would alert were that stock scanned at any point in the future. Within eight working hours, all consultants who had performed a procedure using that item had been notified and told of the patients affected. They then were able to check on every patient

- By introducing scanning in pharmacy, Royal Cornwall Hospitals NHS Trust reduced prevented-error rates by 76 per cent, including elimination of all errors caused by wrong patient, wrong drug, wrong dose and wrong form

"We started on a journey that began with inventory management that absolutely absorbed patient safety, but then you're into operational efficiencies and productivity. You get it all."

Nick Thomas, deputy chief executive and director of planning and site services, University Hospitals Plymouth NHS Trust

Speedy and accurate recall

When Lorna Wilkinson first heard her trust was introducing barcodes and inventory management, she admits she did not see how it was relevant to her as a director of nursing and midwifery. However, the minute she heard about the ability to do swift product recalls, her interest was immediately piqued.

"The ability to be able to link product and patient was what really hooked me in," says Ms Wilkinson, who worked at Salisbury NHS Foundation NHS Trust during the Scan4Safety demonstrator programme.

"I've always had a very keen interest in patient safety and was a head of risk for eight years. So I had been involved in product recalls, I had been involved in blood-borne virus incidents where I'd had to chair investigations and, honestly, some of those took years to do because we had to go through manual paper ledgers and notes and everything else."

Since Scan4Safety involves scanning a product to a patient – or into stock until it's used – complete traceability is available at the click of a mouse. This means not only significant patient safety improvement but also that, in the event of a recall, staff spend much less time identifying products and patients. "We know exactly what implants we have used on which patients and we can tell you pretty quickly," says Gavin Boyle, chief executive of University Hospitals Derby and Burton NHS Foundation Trust.

"If you take the surgical mesh issue, we can tell you exactly which women have had which mesh implanted and which batch number, as we demonstrated when Baroness Cumberlege came to see our Scan4Safety traceability methodology in action. Most hospitals would be pulling all the paper notes of hundreds of patients and would sit somebody in an office to go through them and see if we can find it out – and that literally can take weeks."

At Leeds Teaching Hospitals NHS Trust, staff deal with around 500 product recalls a year. Since the introduction of Scan4Safety, the average time taken to recall a product has fallen from 8.33 days to less than 35 minutes.

Reduction of drug error

Drug errors are a common cause of harm to patients. A 2018 study by researchers from the Universities of York, Manchester and Sheffield, estimated 237 million such errors occur in the NHS in England each year, with avoidable adverse drug reactions causing hundreds of deaths[4].

At Royal Cornwall Hospitals NHS Trust, the pharmacy team has implemented scanning procedures in the dispensing of drugs. Barcodes have been introduced onto the medication requests that come from the ward so that, when they are scanned in pharmacy to dispense the drugs, the patient name and other information automatically appears. There is no need for pharmacy staff to rekey any data, and so the potential for error is reduced.

A study[5] showed that the scanning setup had reduced prevented error rates by 76 per cent. Anything that related to the patient, the product, or the route of administration for the drug, had absolutely no errors at all – in other words, these errors were eradicated by the use of barcode data entry. Some 97 per cent of staff surveyed about the new process agreed it reduced the risk of error.

The process was also found to be seven per cent faster. Consider that the pharmacy dispenses more than 40,000 items a month, and this becomes a significant time saving.

Reduction of Never Events

Never Events are serious incidents that are considered preventable because reliable means of stopping them have been identified at a national level and should have been implemented by all healthcare providers.

According to NHS Improvement, 445 Never Events occurred in the English NHS in 2015/16[6]. Of those, 189 were instances of wrong site surgery. These are occasions on which surgery has been performed on the wrong patient or on the wrong site – for instance, a patient who needs a left knee replacement is given a right knee replacement, or one who needs a mastectomy of the left breast has the right breast removed.

Another common error is misplacing nasogastric tubes. These are used to give nutrition or to remove obstructions from the stomach, but when misplaced can cause serious harm.

Scan4Safety helps protect against such events. At North Tees and Hartlepool Hospital NHS Trust, for instance, scanning a nasogastric tube displays a patient safety alert detailing the potential risks. Once the tube has been placed, the clinician is also required to confirm a pH test has been conducted – this is a key indicator of whether the tube is in the right place.

4 Elliott R, Camacho E, Campbell F, Jankovic D, Martyn St James M, Kaltenthaler E, Wong R, Sculpher M, Faria R, (2018). Prevalence and Economic Burden of Medication Errors in The NHS in England. Rapid evidence synthesis and economic analysis of the prevalence and burden of medication error in the UK. Policy Research Unit in Economic Evaluation of Health and Care Interventions. Universities of Sheffield and York

5 These results were attained during a study conducted by Iain Davidson, chief pharmacist, Royal Cornwall Hospitals NHS Trust as part of a thesis entitled "The adoption of barcode scanning technology in an acute NHS hospital pharmacy"

6 NHS Improvement (2018) Never Events reported as occurring between 1 April 2016 and 31March 2017 – final update

In the trust's orthopaedics department, barcodes help ensure the correct patient is listed for the correct operation on the correct side. All items and implants are scanned before use. If the incorrect prosthesis is selected – for example, a right knee implant for patient whose operation is supposed to be on the left knee – then the barcode scanner buzzes and flashes, immediately notifying of the potential error.

The insertion of the incorrect lens during cataract surgery is one of the most common causes of surgical Never Events. There are many different types of lens and, traditionally, the prescription code for the appropriate lens for a patient has been on a screen in the theatre. It then has to be manually cross checked against the code on the box.

At Salisbury NHS Foundation Trust, there are plans to use barcode scanning to make the process easier and less prone to human error. The organisation is working with the supplier of its ophthalmology software to introduce barcodes to prescriptions.

When scanned, it will automatically link through to the inventory-management system to ensure the right product is in place, with the ultimate aim of having scanning in place from prescription to product to patient.

Improved observations and patient identification

Salisbury NHS Foundation Trust has also undertaken work to link ensure observations are always entered for the correct patient. The trust has an electronic observations system, whereby key information about a patient's condition – blood pressure, pulse, respiratory rate and so on – is recorded electronically on a handheld device rather than on paper.

Nurses now use the handheld device on which they enter the data to also scan a patient's wristband barcode. This means certainty that the right information is being recorded for the right patient.

There is also a full blood-tracking system, where a barcode is scanned from a blood bag and then the patient barcode scanned before the blood is given. Again, this ensures the right blood is being transfused to the right patient and ensures easy tracking.

At University Hospitals of Derby and Burton NHS Foundation Trust, there has been similar use of barcode scanning to improve the process of taking observations.

The trust uses a machine which automatically measures a patient's vital signs – there is no need for nurses to manually take blood pressure readings, measure oxygen saturation levels or take a temperature. The readings from the monitor are automatically transferred into software which helps calculate whether the patient's condition is stable or deteriorating as well as into the electronic patient record.

Before using the machine, the nurse scans a barcode on the patient's wristband and his or her own barcode. This ensures the right observations are recorded in the right patient's record.

The trust reports the average time taken to complete observations for each patient has been reduced by 35 per cent – from five minutes 11 seconds to three minutes 22 seconds. That works out at approximately 20 nurses' worth of time saved every day for the trust, and to 3,800 nurses' worth of time saved across the NHS in England.

Section 3: Imagining the future

"The demonstrator sites put time, effort and investment in people into this and it very much yielded the results and the ongoing benefits that we're seeing today."

Chris Slater, associate director, commercial and procurement, Leeds Teaching Hospitals NHS Trust

"When we completed the Scan4Safety demonstrator programme, it wasn't a question of: 'Well, we'll stop now.' It's a part of the way we work; built into our business process. So it wasn't a question of stopping."

Gavin Boyle, chief executive, University Hospitals Derby and Burton NHS Foundation Trust

"What we can do with Scan4Safety is only limited by our imagination."

Chris Tulloch, consultant orthopaedic surgeon at North Tees and Hartlepool Hospital NHS Trust

As the evidence and experiences in this report demonstrate, Scan4Safety has already yielded significant benefits at the organisations in which it has been implemented. Financial savings have been made, clinical time released, and patient safety bolstered.

That said, those working in these organisations are clear that there are many other potential applications for this approach. There is a sense that further safety and quality improvements can and will be made as Scan4Safety becomes part of more processes – and a variety of ideas about where it can add value.

Tracking of medication from pharmacy to ward

At the end of a hospital stay, many patients will need to be discharged with medication to use when they return home. It's a process which can be prone to delays. A prescription first needs to get from a doctor to pharmacy, the pharmacy then needs to dispense the medications, and the medications then need to reach the patient on the ward.

Ideally, this all needs to be timed to happen so that the medications are with the patient as soon as he or she is ready to leave the hospital.

At University Hospitals Plymouth NHS Trust, tracking software based on GS1 standards already makes it possible to fully trace a prescription through the dispensing process. Now work has begun on extending the system so that it is possible to also track the medication from the point it leaves pharmacy until it arrives on the ward.

This will mean that pharmacy staff will be able to let ward staff know when to expect a product to arrive for a patient, allowing for better discharge planning. Should a patient's location have changed, the system will notify pharmacy. It is expected this will reduce lost medication and the need to re-prescribe items – so saving money and time – and lead to much greater efficiency and patient flow.

More informed staffing ratios

At Hull University Teaching Hospitals NHS Trust – where leaders independently took the decision to implement Scan4Safety – the expectation is that point-of-care barcode scanning may make it possible to make more informed decisions on staffing mix and ratios on wards.

"We ran a couple of ward pilots using the Scan4Safety technology to do effective time and motion studies," explains Lee Bond, the trust's chief financial officer. "We think that could help revolutionise the way in which we staff our departments."

Further improving patient flow

At Leeds Teaching Hospitals NHS Trust, data from Scan4Safety is already linked through to the electronic patient record and the patient administration system (PAS). This means clinicians have a real time view of where patients are in the organisation – for instance, it's possible to know if a patient is currently in radiology for tests rather than on the ward, and so plan ward visits accordingly. Efficiency is increased a result.

In the longer term, the aim is to use scanning to precisely identify bed state. "We know if a bed is occupied or not occupied, but could we have a situation in which the patient leaves the bed and we scan that bed to show it's ready for cleaning?" Asks Chris Slater, associate director, commercial and procurement at the trust. "So then our estates people can say: 'Right, I've got 50 beds that need cleaning and the hotspots are A, B, C, so we'll put our forces to that particular area and flip the bed over from a cleaning state to a ready state.'

"The possibilities become endless when you start to think about how you would want to work details of people, place and product into various systems" he suggests.

At the centre of two new hospitals

Executives at Leeds are so convinced of the virtue of point-of-care scanning that it will be present from the very start on new two hospital sites. A new adult and new children's hospital – currently being planned – are both intended as state-of-the-art facilities, and scanning is seen as crucial to ensuring efficient and safe care.

"The benefits for patient safety fromScan4Safety have been demonstrated and now embedded here at Leeds Teaching Hospitals. The ability to rapidly perform product recalls and safety alerts including implants improves patient safety. Patient and equipment tracking allow more cost effective and timely interventions, more efficient stock control and the ability to manage this across sites and organisations. We are continuing to embed the technology across our services and our new children's hospital will have GS1 standards built in from the very beginning."

David Berridge, deputy chief medical officer, medical director – operations, Leeds Teaching Hospitals NHS Trust

Improved monitoring of cannulas and catheters

At Salisbury NHS Foundation Trust, conversations with ward leaders, sisters and staff nurses have led to plans to use scanning to help with monitoring of cannulas and catheters.

These tubes are used for a wide manner of purposes including for taking blood samples, delivering nutrition or medication, or draining urine from the bladder. They need careful monitoring to reduce the risk of infection and even sepsis, and there are well defined processes to do this. These are called care bundles.

The plan at Salisbury NHS Foundation Trust is for nurses to scan a barcode on the cannula or catheter when it is used on a patient. This will then automatically record the device against the patient's record, but also ensure the care bundle is generated automatically. The nurse's handheld device will alert whenever that patient's cannula or catheter needs checking or changing.

The aim is to increase patient safety and while reducting the number of hospital acquired infections.

Researching the value of therapy dogs

University Hospitals Plymouth NHS Trust has been investigating the use of therapy animals to support patients being cared for by the intensive care rehabilitation team. Hovis is a regular canine visitor to the unit, encouraging patients to become more active – by throwing a ball for him, for instance, or walking with him around the department.

He now has his own staff badge, complete with barcode, which is scanned so that it is possible to know which patients he has interacted with. The idea is that it will then be possible to examine how a patient's outcomes are affected by interaction with Hovis.

Section 4: The lessons learned

The purpose of the demonstrator sites was not only to gather evidence of the difference Scan4Safety can make. It was to offer lessons which other organisations might be able to apply in implementing a similar setup.

The final section of this report details those lessons, as relayed by staff in a variety of roles from across all of the demonstrator sites. Their insights should help develop a "blueprint" to support the further spread of Scan4Safety.

Making the case

1. **Contact the demonstrator sites**

   Site visits can be a valuable way of more deeply understanding the technology, how it should be implemented, and what some of the obstacles can be along the way.

2. **See non-executive directors as potential influencers**

   At University Hospitals of Derby and Burton NHS Foundation Trust, much of the push to implement scanning at the trust came from non-executive directors. Like the then-deputy director of finance, they had come from the private sector and had a view that stock control was a huge area of potential improvement and saving for the trust.

3. **"Burst into the bubble" by talking to fellow senior leaders about the technology's applications, not the technology itself**

   Many senior leaders at the demonstrator trusts admit their initial reaction to the idea of barcode scanning was lukewarm – on the face of it, such technology did not seem immediately relevant to their priorities.

4. **Decide on the initial angle that resonates most**

   In suggesting the introduction of scanning in an organisation, it is helpful to decide which of the main potential benefits is most likely to initially grab the attention – which is the current biggest problem in the organisation that Scan4Safety might successfully address?

5. **If money is an issue, explore renting the technology rather than buying outright**

   When University Hospitals of Derby and Burton NHS Foundation Trust was seeking to implement barcode scanning, the organisation was facing a deficit. There was little capital to invest and so the decision was taken to rent rather than purchase the technology needed to implement point-of-care barcode scanning. That meant signing up for a 12-month period to cover nine theatres, at a cost of only £45,000 and the knowledge that it would be possible to cancel at the end of the year if there had not been a return on investment.

6. **In selecting computer systems, understand what they can actually do with the data**

   A GS1-compliant system is only half the story. The real issue is that particular system's ability to then do something with the data. Ask vendors about how data that is collected from a barcode scan can then be manipulated or interrogated within the system – and transferred to other systems.

Creating a governance structure

1. **Appoint an executive lead, but think carefully about who it should be**

   The natural inclination, particularly if the initial or main focus is on money savings, may be to select the director of finance and have the project led by procurement and technology teams.

   However, in the slightly longer term, some of the demonstrator trusts found selecting a clinician was helpful. At Salisbury, for instance, the director of nursing and midwifery became the lead once the catalogue and inventory management were in place and rollout began in theatres and cardiac catheterisation labs.

2. **Have dedicated project management**

   Executive leadership is important, but many demonstrator sites report that having a dedicated project manager made a huge difference to the success of the project. While clinicians will be clear on the patient safety benefits, they are unlikely to have the bandwidth to develop a full business case and then manage a rollout. For that, a dedicated project manager is key.

3. **Ensure the project team is multidisciplinary**

   Approaches to Scan4Safety teams varied between demonstrator trusts. Regardless, the strong feeling was that those involved in Scan4Safety need to be drawn from multiple disciplines – IT, procurement and clinical transformation in particular.

4. **Carefully consider the resourcing for the project, while being cognisant of the risk of making it feel "separate"**

   While some demonstrator sites appointed specific Scan4Safety teams and new members of staff, others added the project to existing commitments. Resourcing up front is key, but bear in mind that – once everything is up and running – it may be possible to scale back the team.

Creating clinical engagement

1. **Make clinical engagement a priority**

   The natural inclination, particularly if the initial or main focus is on money savings, may be to select the director of finance and have the project led by procurement and technology teams.

   However, in the slightly longer term, some of the demonstrator trusts found selecting a clinician was helpful. At Salisbury, for instance, the director of nursing and midwifery became the lead once the catalogue and inventory management were in place and rollout began in theatres and cardiac catheterisation labs.

2. **Consider which benefits will be most compelling for which specialties**

   At Salisbury NHS Foundation Trust, the executive lead not only concentrated on messages for clinicians, but on which specific messages would resonate most strongly for which specialties. In cardiology, that was the ability to identify variation in practice – it was possible for the lead clinician to discover instances in which high cost stents were being used but may not be necessary.

   It became possible to scrutinise individual practice and develop agreed procedures. In orthopaedics, the interest was in Scan4Safety's ability to reduce the risk of wrong site surgery. More recently, North Tees and Hartlepool found promoting the system's ability to give a complete sense of how many ventilators there were in the organisation and where – particularly crucial during Covid 19 – led to even greater clinical engagement.

3. **Encourage clinicians to feel that the system is "theirs"**

   At University Hospitals of Derby and Burton NHS Foundation Trust, the scanning setup was intentionally placed in general theatres for nine months before any expansion. During this time, the clinical team was able to report back on any further information they felt would be helpful to record via barcode scanning – and then the system was updated accordingly before being rolled out anywhere else. The finance director reports this led to a sense of clinical ownership of the system.

Working out the best starting point

1. **Start where value can be most powerfully demonstrated and then build up**

   Consider starting scanning work in specialties or departments for which the difference will be most easily seen and proven – this is likely to be cardiac catheterisation labs and orthopaedic surgery.

   The former CIO at Leeds suggests this makes it possible to "test your mettle" and ensure everything is in place. He then suggests going to a more difficult area, so proving that Scan4Safety is beneficial even in areas where its implementation is more challenging.

2. **Give visibility of data and the changes made as a result of early implementations**

   At Salisbury NHS Foundation Trust, a dashboard was developed so that clinicians could see how scanning had influenced clinical decisions around variation. This made it possible to get a sense of the way in which Scan4Safety was benefiting clinical practice.

Progressing the work

1. **Once proof of concept exists in the contexts which were an initial focus, look at possible areas for expansion of the technology and approach**

   Every transformation project should begin with the question of whether scanning technologies might help. This helps embed the approach as part of business as usual, rather than feeling like a separate add-on only relevant to efficiency and/or patient safety.

2. **Bear in mind savings and improvements won't be instant**

   Those involved in Scan4Safety at Leeds argue it's necessary to leave 24 months to see return on investment. It will take time to change processes and people's ways of working.

All demonstrator sites emphasised that there is no need to reinvent the wheel when it comes to implementing Scan4Safety at further organisations – the lessons, plans and blueprints already exist.

As part of the demonstrator programme, documents were created which discuss – step by step – how to go about implementing Scan4Safety. These are available at ;

- gs1uk.org/sites/default/files/Scan4Safety_Patient__How_To_Guide.pdf
- gs1uk.org/sites/default/files/Scan4Safety_Product__How_To_Guide.pdf
- gs1uk.org/sites/default/files/Scan4Safety_Place__How_To_Guide.pdf

The shape of things to come

Although, the Scan4Safety demonstrator programme has successfully reached completion, there are many projects underway across multiple trusts, with more in the pipeline. As the benefits to patient safety and the value of point-of-care scanning come to light, the momentum grows.

At North Tees and Hartlepool Hospitals NHS Foundation Trust, they harnessed this momentum to drive innovation. Built by the NHS, for the NHS, they have developed CareScan+ to support their trust requirements.

The trust is now expanding Scan4Safety to encompass:

- Electronic patient record/electronic prescribing and medicines administration for medicines optimisation
- Community medical-equipment tracking
- Surgical-instrument tracking
- Medical-record tracking
- Implementation in pathology
- Using Electronic Product Code Information Services (EPCIS) for tracking physical movements and status updates

Beyond the trust, they are reviewing plans to roll out point-of-care scanning to the wider sustainability and transformation partnership (STP).

For Leeds Teaching Hospitals NHS Foundation Trust, much of the upcoming focus centres on the tracking of assets across the hospital including:

- Bed tracking
- Blood tracking
- Patient tracking, including infection control

The trust is also expanding its work to pathology and has embedded GS1 standards into the development for their new children's hospital.

At University Hospitals of Derby and Burton NHS Foundation Trust the next phase of their plan is to implement the Scan4Safety core enablers – patient identification, catalogue management and location identification – to the Burton hospital site.

There will also be a continuation of the electronic observations work established in their original pilot. Having made the switch from manual to electronic observations, the trust was able to reduce the time taken for each observation from five minutes 11 seconds to three minutes 22 seconds.

If expanded across the entire trust, that works out at approximately 20 nurses' worth of time saved every day for the trust, and to 3,800 nurses' worth of time saved across the whole NHS in England.

On a wider scale, they have also started development work in collaboration with the National Joint Registry and the MHRA. This project will ensure that data and decision support is available at point of care by confirming that the correct device combinations are being implanted into the patient ahead of surgery.

Salisbury NHS Foundation Trust will be continuing their "surgical kitting" project to reduce clinical input to prepare for operations.

They are also working with a solution provider to digitise the World Health Organisation (WHO) surgical checklist alongside work in ophthalmology, to prevent wrong lens, wrong eye, Never Events by linking the prescription to the procedure.

The widespread adoption of GS1 standards has also been included in the digital strategy for the STP as they plan to expand the scope of the programme.

At University Hospitals Plymouth NHS Trust, the trust in the process of developing a Pharmacy TTA (to take away) tracker to reduce the frequency of delayed patient discharges due to unavailable medicines. This application is based on EPCIS.

They are introducing product sided attributes, by scanning at the point of care within theatres as a measure to prevent wrong site surgery Never Events. For the trust this has centred on accurate product identification, mainly implants, to ensure that the right implant is used for the right patient and is for the right surgical site.

More recently, the trust has begun to implement passive radio-frequency identification (RFID), to track and trace medical equipment and surgical trays.

For Royal Cornwall Hospitals NHS Trust, their two main programmes of work will centre on inventory management and preventing Never Events. Their inventory management work will focus on improving reporting for their KPIs such as availability of stock, managing waste, managing over stocking of products as well as compliance/governance and spend. Their Never Event work centres on prevention through real-time point-of-care scanning, ensuring the right product, for the right procedure, and the right patient.

Hull University Teaching Hospitals NHS Trust are currently working on evolving their current workplan to encompass medical record and asset tracking and has successfully implemented scanning for patient pathways and are planning to roll out to all pathways.

At the wider Leeds trusts (WYAAT) the Scan4Safety project leads are collaborating on an inventory-management programme of work to improve the visibility of stock across each of the six acute hospitals within the association.

Additionally, WYAAT are currently implementing the three core enablers to provide the foundations for Scan4Safety across the region.

Across the Greater Manchester Health and Social Care Partnership, GS1 standards implementation has been integrated into their three-year digital strategy 2019–2022. This will enable the teams to drive adoption across the partnership's entire footprint area.

Royal Papworth Hospital NHS Foundation Trust are embarking on introducing asset management tracking with the purpose of locating any "missing" equipment across the trust. To do so, the trust has begun to implement passive RFID tags to facilitate tracking.

These future use cases of Scan4Safety are shaping the way healthcare organisations work at local, regional, and national levels.

Furthermore, with the publication of the Cumberlege review firmly highlighting the need for unique identifiers in healthcare, their use will serve as a catalyst to drive improvements to traceability in a clinical setting.

As Lord Prior stated, “Barcodes are a small but essential part of [the digital technology] revolution. We need to embrace it, now!”

Unique identification and point-of-care scanning will undoubtedly have a role to play in this digital revolution. The work of trusts, suppliers and solution providers in this regard, should continue to shape the transformation of the NHS for years to come.

Acknowledgements

Thanks to the following individuals who generously shared their time and expertise to inform this report:

- David Berridge, deputy chief medical officer, medical director – operations, Leeds Teaching Hospitals NHS Trust
- Lee Bond, chief financial officer, Hull University Teaching Hospitals NHS Trust
- Gavin Boyle, chief executive, University Hospitals Derby and Burton NHS Foundation Trust
- Richard Corbridge, former chief digital officer, Leeds Teaching Hospitals NHS Trust
- Iain Davidson, chief pharmacist, Royal Cornwall Hospitals NHS Trust
- Kevin Downs, executive director of finance and performance, University Hospitals of Derby and Burton NHS Foundation Trust
- Professor Duncan Eaton, chair, GS1 UK healthcare advisory board, and past CEO, NHS Purchasing and Supply Agency (PASA)
- Rachael Ellis, Scan4Safety programme director, Hull University Teaching Hospitals NHS Trust
- Dr Graham Evans, chief information and technology officer/SIRO, North Tees and Hartlepool NHS Foundation Trust
- Professor Andrew Goddard, president, Royal College of Physicians
- Julian Hartley, chief executive, Leeds Teaching Hospitals NHS Trust
- Lord Philip Hunt, president, GS1 UK, and former health minister
- Melinda Johnson, commercial director, Department of Health and Social Care
- Tony Naylor, associate director of ICT, North Tees and Hartlepool NHS Foundation Trust
- Lord David Prior, chair, NHS England
- Chris Slater – associate director, commercial and procurement, Leeds Teaching Hospitals NHS Trust
- Professor Sir Terence Stephenson, Nuffield professor of child health, UCL Great Ormond Street Institute of Child Health; honorary consultant paediatrician, University College Hospital and Great Ormond Street Hospital, and chair, Health Research Authority for England
- Nick Thomas, deputy chief executive and director of planning and site services, University Hospitals Plymouth NHS Trust
- Chris Tulloch, consultant orthopaedic surgeon, North Tees and Hartlepool Hospitals NHS Trust
- Lorna Wilkinson, former director of nursing and midwifery, Salisbury Hospital NHS Foundation Trust

Hasilwood House
60 Bishopsgate
London.
EC2N 4AW

T +44 (0)20 7092 3501
E healthcare@gs1uk.org

www.gs1uk.org