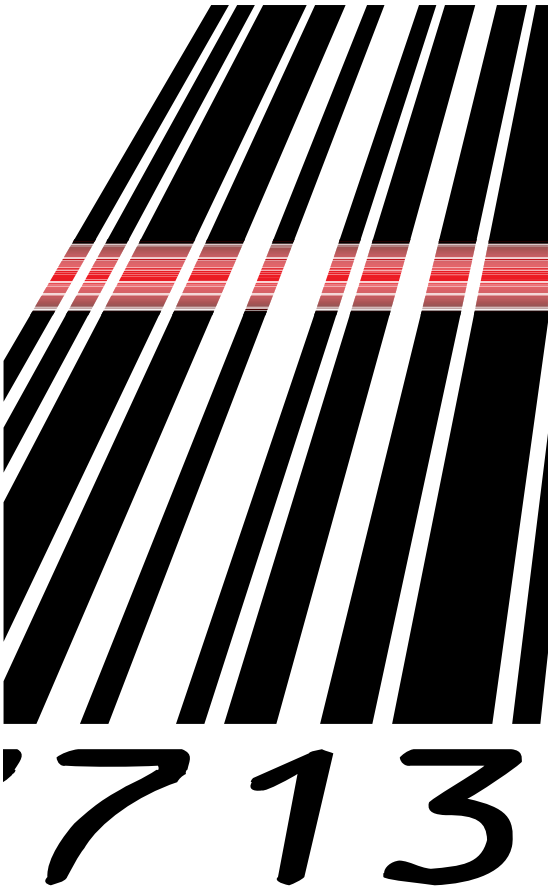
TECHNOLOGY

# HOW CODES ARE RAISING THE BAR



When a foundation trust began using barcodes to improve stock control and procurement, it soon realised that the technology was capable of helping to achieve more ambitious goals relating to safety and savings, as Alison Moore explains

Anyone who shops in a supermarket can see the usefulness of barcodes and the possibilities they offer for the NHS in areas such as stock control and procurement.

But one of the most advanced NHS trusts in the use of barcodes is finding the benefits spread far beyond this – and have an impact on patient safety.

Derby Teaching Hospitals Foundation Trust started work with barcoding in 2014 and is one of the demonstrator sites for 'Scan 4 Safety' – an NHS initiative which could eventually lead to scanning being adopted across the English NHS.

Clinical director of surgery at Derby Keith Jones says: "It started out as a programme where we were going to improve our stock control and procurement. We rapidly realised that we could use it for a lot more than just stock so we expanded the role of the project.

"Everything is linked to the patient. We can scan things really rapidly and build up a composite picture of what that patient is undergoing, when, where, how long it took, what the cost was in terms of consumable and so on."

Chief executive Gavin Boyle adds: "Barcoding might sound a bit prosaic but it is part of our everyday life – at the end of the day it is just a means by which we can gather information.

"One of my main focuses as a chief executive is how to improve safety. There are so many things that you can do with the technology that the challenge is focusing on the ones which will deliver the most value for patients."

It was director of finance and performance Kevin Downs – who has a background in manufacturing and venture capital – who led the drive to introduce barcoding and scanning after discovering NHS stock control systems often operated on a "wing and a prayer".

The initial introduction of the system back in 2014 was small scale, limited to the trust's general theatres.

"We left it in that area for about nine months,' says Mr Downs. "We got our clinicians and theatre staff involved to see what they thought they could do with the system."

## Massive database

This led to a cadre of enthusiasts for the system who were keen to promote it to their peers – something which has encouraged spread across the hospital. Over time, the system has been rolled out to other areas. It is now used in all theatres and on respiratory wards, and in cath labs and endoscopy.

Staff now scan patients' individual wrist bands in theatre: this identifies who is undergoing a procedure. From then on everything that touches the patient is scanned – including instrument sets and implants.

**'We know what set of instruments was used on a patient, which scope was used and what consumables. I know for the first time what every procedure is costing me'**

Director of patient experience and chief nurse Cathy Winfield says on respiratory wards the system can be used to track which patients have had procedures – such as a chest drain or a catheter inserted – and who carried them out. Instruments can be tracked from the store cupboard, through procedures, and which staff carried out procedures can be easily and quickly identified.

Mr Downs now has data for all theatres for the last nine months – and far longer in some cases. This is beginning to build into a massive database which not only allows vision of an individual patient's journey but also gives a much broader picture including data on the length of procedures and lengths of stay. "We know what set of instruments was used on a patient, which scope was used and what consumables. That allows me to

see what a patient costs," says Mr Downs. "I know for the first time what every procedure is costing me."

This has a number of effects. It allows all sorts of variations to be identified – whether it is in the cost of consumables, time taken in theatre or the number of staff involved. "We can start to have a discussion about whether someone is doing things differently," says Mr Downs.

In many cases there will be good reasons for variation. In some there will be variation which may seem more costly but are actually not – for example, Mr Downs found one surgeon liked operating with more people in theatre than others. Superficially this seemed wasteful but examination of the scanned data showed that that surgeon had a much shorter operating time. Potentially this meant more procedures could be done in a day in the theatre with a lower cost per patient.

Choices which might seem costly can also be linked to savings in other parts of the trust. "We would support a colleague using a £400 stent rather than a £200 one if, for example, there was a reduction in the length of stay of a day or more," says Mr Downs. Partial information can sometimes lead to the wrong conclusion; but the depth of information given by scanning allows a better picture with more variables examined.

A finance director raising variation with senior surgeons sounds like an argument in the making but Mr Downs finds having this level of data has helped discussions with doctors. Clinicians react to evidence and the scanning system gives it to them in buckets – and they generally accept the validity of the data, he says.

The data collected through scanning is also helping the trust code procedures more quickly and ensure that the correct work is invoiced for. In the past delays in coding could mean the trust did not receive the income it should have, says Mr Jones.

## LORD HUNT

## BARCODING CAN UNLOCK AN EXCITING FUTURE

**If you mention barcoding in a conversation, eyes often start to glaze over. It is a simple everyday technology which we all encounter when shopping. We probably realise that it has helped retailers with their stock control and supply chain but give little more thought to it – and we certainly don't see it as exciting.**

**In healthcare, however, the possibilities of barcoding have yet to be fully realised – and they are worth getting excited about. We all know the tremendous challenges the NHS faces over the next few years and the pressure it is under financially, so any measure which helps it deliver efficiencies in the supply chain is welcome.**

**Barcoding can do this but it can do so much more: it can help the NHS enhance the quality and safety of patient care. In the six demonstrator sites for GS1 – of which Derby Teaching Hospitals Foundation Trust is one – these benefits are already starting to show.**

**One example of this is wrong site surgery, a 'never event' which unfortunately happens too often – 179 times across the NHS in England in 2015-16. Using barcoding to identify patients and information about them before procedures should move us one step closer to eliminating this.**

**There will be more mundane benefits as well. As chair of a foundation trust, I was aware of the frustration staff felt when vital equipment could not be located swiftly.**

**Barcoding can help to track missing equipment and get it to the patient more quickly. This helps hospitals operate more smoothly but also improves the patient experience.**

**It has been a long campaign to introduce barcoding to the NHS but I feel the tide has now turned. Health secretary Jeremy Hunt has spoken positively about its impact, and the Carter Report on efficiency suggested use of GS1 standards could save every English NHS hospital £3m a year while also improving patient care. It offers a return on investment which will help build a case for initial funding.**

**At the grassroots, managers and clinicians are increasingly becoming aware of it – and wanting to see it in their hospitals. The promising early results from the demonstrator sites are contributing to this momentum for change.**

**Barcoding won't be a panacea to the myriad problems NHS staff have to face and overcome. But it is one of the many steps the NHS needs to take as it tackles the two pressing issues of the day – reducing costs and improving care. We are on the cusp of something great – and that is exciting.**

***Lord Philip Hunt is president of GS1***

ING IMAGE

It can also provide historical information very quickly. Mr Downs says the head of infection control was amazed when information about which patients had been operated on with certain sets of instruments was rapidly available.

Should the trust ever have a problem with a bloodborne virus, for example, it would enable easy identification of every patient who came into contact with a suspect instrument.

This could be useful when there is national recall of products as the system makes it easy to identify who has had what implant, for example. Mr Downs points out that in the 2012 breast implant scare – where some women in the UK and abroad had received implants with a risk of rupturing – it was often difficult for health systems to identify which women had been given the suspect implants.

Had scanning been in place this could have been done within minutes by any trust – and would have saved many women weeks of anxiety.

On the wards it can be used to check medicines, match them to patients and check dosages. Infusion pumps can also be included in the system and it will indicate whether the dose is correct for the patient – and won't infuse if it is wrong.

"It helps to remove those potential elements of human error by standardising procedures but also adding additional checks," says Ms Winfield.

It also allows examination when something has gone wrong. The data recorded offers an audit trail of what has happened. Mr Downs has seen consultants debating what happened in the operating theatre and accept scanned data without question.

"The normal reaction would have been that the data is rubbish. But both clinicians involved took it as gospel," he says. This has helped the quality of conversations his department has been able to have with clinicians.

And it has started cultural change. One simple example of this is around instruments. Every surgeon has specific requirements about what he or she wants in theatre with them. Typically, they will take a large number of instruments or instruments sets into theatre and they will all be opened – meaning that they will all have to be sterilised even if they were not used. Scanning has changed behaviour and led to fewer sets being opened – saving on sterilisation costs.

Mr Jones points out that the original application of barcoding and scanning – for stock control – has also led to the trust keeping far less consumables in stock as replenishment is automatic.

**'Technology can be used to drive forward some of the really important reforms Lord Carter identified. It is an enabler'**

"Before that we had hundreds of thousands of pounds of stock lying on shelves and they just went out of date," he says. "Technology can be used to drive forward some of the really important reforms Lord Carter identified. It is an enabler."

### Positive results

Scanning can drive not just automatic reordering but also automatic payment. Cutting out human intervention in the invoicing and payment process can benefit both the trust and the companies it works with. Mr Downs adds it also gives him some leverage over price based on supplier savings rather than asking them to make more painful cuts.

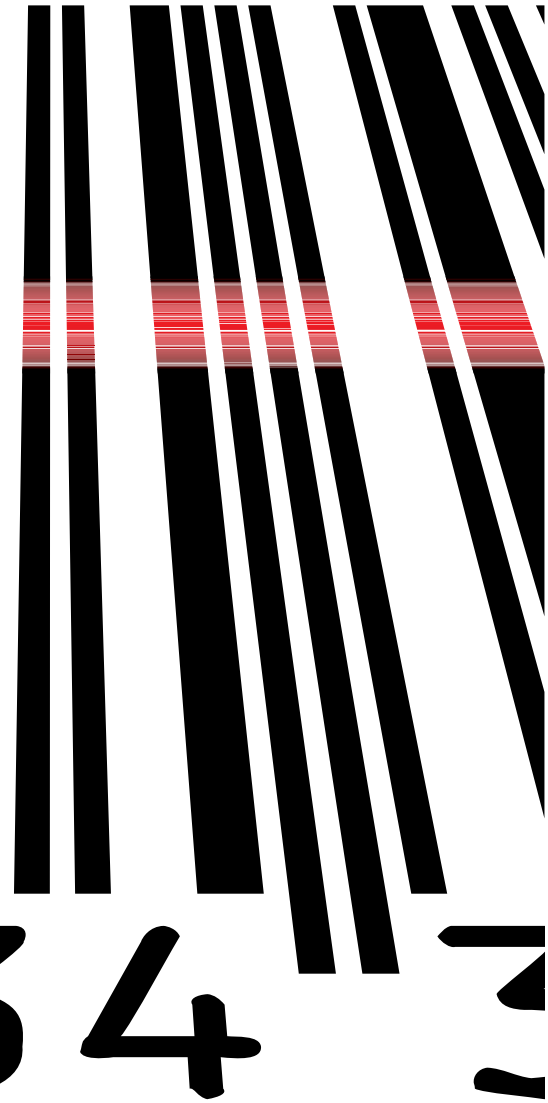
The trust rents the scanning system at £500 per month per theatre. A full year's costs across all theatres and wards would be £400,000. But the savings Mr Downs is seeing are already well in excess of that and he expects savings in a full year will be £2m.

With the NHS committed to the idea of pushing forward with scanning, more opportunities to enhance safety from bigger data sets will emerge. Bringing more hospitals on to the system could lead to data being transferred between hospitals alongside patients – making it easier for the receiving team to see what has happened to them. Data could be uploaded to an individual patient's record and move through the system with them over time.

In the longer term there may be opportunities to compare clinical practices between hospitals – Derby is already getting regular visits from managers and clinicians from other trusts, showing the extent of interest in the UK.

Introducing this sort of technological change is not always easy. It can involve changes in processes which people are used to and can be seen as a threat to them. From the start, Mr Downs stressed that the systems would free staff from administration and bureaucracy and give clinicians more time to do what they were trained for. Showing positive results has also been important.

Ms Winfield is keen that the scanners used should fit in with the way nurses work and the existing technology they will use on the wards. Work is now ongoing to see how this could happen on the wards.



"Nurses working in a busy environment want equipment that is not going to add complexity to the care they are already providing," she says. "The key thing is about working with clinicians and not doing things to them."

Rollout is likely to be specialty by specialty, with potentially some variations in how different areas want to use the technology.

But overall scanning seems to be the future for the trust – with the benefits ranging from safety to controlling costs. "It is doing a hell of a lot more than anyone envisaged," says Mr Downs. "The possibilities are endless." ●

## SOME TIPS FOR EFFECTIVE IMPLEMENTATION

Mr Downs says this can be helped by several factors.

- Finding champions who want to use the technology and could influence others.
- Remembering clinicians are influenced by other clinicians more than managers.
- Asking staff what use they would like to make of the systems.
- There are ways in which scanning and barcoding can free staff to spend more time doing what they are trained for – rather than admin and stock control. These can be selling points with staff.
- Improving patient safety is a strong driver for clinicians.
- Look for evidence of success to build confidence.

## BARCODES TAKE ENDOSCOPY TO A NEW LEVEL

For hospitals, endoscopy tends to be a high volume area with significant costs on consumables. Using barcoding may therefore offer stock control advantages – but introducing it in the endoscopy department at Derby Hospitals has led to benefits which go far beyond this.

The department carries out 16,000 procedures a year ranging from straightforward gastroscopy through to much more complex procedures such as removing polyps or removing gallstones from bile ducts. Most of the patients attend as outpatient cases but some of the sickest ones are inpatients.

Consultant physician Dr Andrew Goddard says that in the past information tended to be recorded about what happened when patients were in the endoscopy department but co-morbidities – which could affect a patient's outcome – were not always coded for and what happened after a patient had left the room might not always be fed back to the endoscopy department.

This meant there was often a very partial picture of a patient: if they bled during a procedure, it would be immediately obvious: but bleeding later on would not necessarily be fed back.

"I wanted to know how we could make things run better," explains Dr Goddard, who is also registrar at the Royal College of Physicians. This would allow doctors to know more about each patient but also to identify potentially useful information such as whether certain pieces of equipment were prone to problems more often than others.

Introducing barcoding has meant that complications are more likely to be recorded. The new rates recorded have been well within normal parameters but do allow doctors to give patients a more accurate picture of the risks they may face with the procedures.

Some of the procedures done are highly specialist and do carry a small risk of perforation, for example, so patients' informed consent is important.

By barcoding and reading consumables, the department gained a very good grasp of what consumables were in stock and what needed reordering. Previously the system was very human dependent, with a sister spending up to a day a week sorting out and reordering stock: barcoding has reduced this to just an hour a week.

The technology to barcode and scan was introduced in June last year. At first, there was some hesitation among nurses and healthcare assistants but they quickly came on board. Doctors took longer to come on board and were less enthused by the improved use of resources which was one of the benefits.

"It did not float their boat," says Dr Goddard. What made the difference to them was evidence on complication rates.

Dr Goddard adds that a scattergun approach was used with barcoding initially before its use was more focused. "We started using barcodes to tick various boxes... but we found that was too time-consuming and needed to focus on whether the juice was worth the squeeze. It has been an iterative process."

It was initially used with the riskiest procedures and he is now beginning to look at the data around complications with inpatient cases – which tend to be some of the sickest patients seen in the department.

He is uncertain whether it will be used for the much more routine and numerous gastroscopy patients.

But ultimately the system should give real world data on outcomes from procedures performed on 'normal' patients rather than the subset often used for research and therefore reflected in academic papers.

Dr Goddard points out that in the past across healthcare systems some procedures were done which did not improve outcomes for particular groups of patients: better data should enable clinicians to make more informed decisions about what does and doesn't improve outcomes.