Deep SCAN

E-procurement is an important weapon in Derby Hospitals NHS Foundation Trust's battle for greater efficiency and the trust also believes its processes can be adapted to produce greater information about theatre costs. Seamus Ward reports

In theatres at Derby Hospitals NHS Foundation Trust, the hand-held scanner is taking its place beside scalpels, syringes and swabs. The scanner is not a futuristic piece of equipment reverse-engineered from a science fiction show – but what it lacks in diagnostic ability could be made up for in its contribution to theatre efficiency, quality and safety.

The scanners feed information to a stock management and e-procurement system and currently cover nine general theatres, including those handling urology and ENT procedures. The advantages of e-procurement are well documented. It has the potential to save the NHS hundreds of millions of pounds by, for example, facilitating a more efficient end-to-end procurement process and supporting benchmarking and price comparison.

But the Derby system adds a twist. By linking the information collected live as procedures are carried out via a data warehouse to its financial system, the trust has access to detailed, robust patient-level costs, together with valuable management and clinical information.

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James Mayne, the trust e-procurement project manager, says the system started off as an e-procurement and stock management project, but patient-level costing was quickly added.

'It's great to have this automated stock process, but at the same time to be able to attribute costs to patients,' he says. 'But then we asked: if we are doing that, what other key information could we get to close the loop?'

The system is the result of a partnership between the trust, its e-catalogue and exchange provider Healthlogistics (for ensuring accurate pricing for consumables), hTrak (for point of use data capture and stock take) and Assistive Partner's UNIQUS stock management system.

It is built around the patient. The hand-held scanners, which are about the size of a mobile phone, though thicker, record details of the patient and, in a future development, complicating factors – captured by a scan of their wrist band.

The type of procedure, including OPCS codes, is also recorded, alongside the theatre where the procedure is being performed, the staff present (scanned in via a bar code on their hospital ID), the anaesthetic used and the time elapsed. There is also an option to record delays and the reason for a later starting time.

In theatre, items used during a procedure are scanned as they are used (or perhaps

TOM LOOMES

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shortly afterwards during short operations). In other trusts this usually happens as they leave the stock room – the Derby team believe their system ensures the data is more accurate and directly attributable to the patient.

As an additional patient safety benefit, the system also signals if a scanned item has passed its expiry date.

To make the process more efficient, low-value items that might be used in a particular procedure are bundled together with a single bar code.

This has been highly successful, particularly with the help of Derby anaesthetists who have developed standard anaesthetic packs.

The quantity of individual items is set at average levels, but can be adjusted according to the number used. Trays with sterilised surgical instruments also have their own bar code and are directly referenced to the patient for traceability.

The system largely uses the GS1 barcode nomenclature, allowing the items to be identified in the trust e-catalogue. In the theatre stock rooms, the scanners can be used to book in new stock or to do a stock take in a fraction of the time. Two day stock takes have been reduced to half a day and are now regularly carried out on a monthly basis.

Many items are replenished automatically by the system using pre-set minimum and maximum levels. However, stock room staff control the levels of some low-value items.

The new processes appear to have been well accepted by front-line staff. In a room near the theatres, hTrak administrator Jayne Green is helping a member of theatre staff. A product to be used in an operation today has not been recognised by the system and she is adding it to the database.

Described by Mr Mayne as the shop floor champion of the system, Ms Green says six months after implementation, it is running smoothly. 'The involvement of clinicians and other theatre staff from the beginning has been key to this,' she says.

In the system

Theatre staff agree, describing how scanning has become almost second nature and are hoping the savings produced can support a potential business case for new staff.

Clinical director of general surgery Keith Jones, who is the senior consultant surgeon in the maxillo-facial department, says: 'Utilising the scanners in theatres provides me with extra reassurance: we're now able to capture an accurate patient-level record of exactly which consumables and instruments we have used, as well as real time recording of the procedures we have completed. The clinical coding team can now access this data to help improve the accuracy and depth of coding in the patient record. This patient-level detail is a significant step forward for the trust.'

At various points in the day, the information collected by the scanners in theatre and stock room is synced to a data warehouse and can be accessed by trust finance or clinical coding staff via a web-based portal. The usual finance process with purchase order and invoice matching through to accounts payable can then be followed.

Mr Mayne says reports can be prepared on individual procedures using the information captured by hTrak. These reports can include a detailed breakdown of consumables used, the costs of those consumables, the amount of time spent in theatre, the patient, surgeon and clinical team. The data can be manipulated in other ways – by procedure or by surgeon, for example. Deputy finance director (strategy and

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projects) Kevin Downs says the technology is not new, but the trust is applying it with the patient at the centre. 'Not only have we all the benefits of the costing of what's happening to a patient, but we are also recording the procedure codes during the operation,' he says.

'It's becoming a basis for the service-line management information coming out of the patient-level costing and information system. It enables us to give detailed patient-level costs for theatres, rather than what traditionally happened, which was to start with an apportionment of the consumables.

'We know which theatre staff attended and how long they were there. We can run that against their pay rate, so we know the on-cost for that particular operation. We know the fixed costs, so we can allocate the majority of costs more accurately,' he says.

Safety element

The implementation of the system was originally meant just to improve stock usage and control information. It has now evolved into a system that improves patient safety in theatres, produces detailed patient-level costing information and has created an opportunity to gain improved coding information at the point of treatment.

Deputy finance director (reporting and systems) Scott Jarvis says: 'We also use the private finance initiative [hospital's] electronic floor area model to assign every room to a specialty or to corporate overhead.

'Rooms are weighted by being allocated a type, from office up to theatre, depending on use. Then all estate-related overheads, such as unitary charge, utilities, rates and cleaning, are absorbed at room and specialty level using this weighted floor area model. In this way, a theatre's overheads will be allocated to a patient based on time in theatre.'

The Derby team believe coding will become more accurate. Coders use patient notes completed by the consultant, and if they wish to check something with the doctor, they could be asking about a procedure performed weeks or months earlier, making accuracy difficult. However, with the OPCS codes being captured on the hand-held scanners during or soon after a procedure, coders and clinicians now have a second source of information to make their coding more accurate.

'The coders can also have more of an audit role, flushing out problems and things that might have been missed before. It helps our income stream and provides an extra level of checks,' Mr Mayne says.

This level of detail is important to a trust that is under Monitor scrutiny because of its financial position. It ended 2013/14 with a £15m deficit and the regulator said last month that this could grow to £23m by the end of the current financial year.

'We can demonstrate that on average we have around a £4m shortfall on our income due to the depth of our clinical noting and coding,' says Mr Downs. 'We are hoping the system can improve this and our hospital standardised mortality ratios at the same time by reflecting the complexity of some of the surgery we perform.

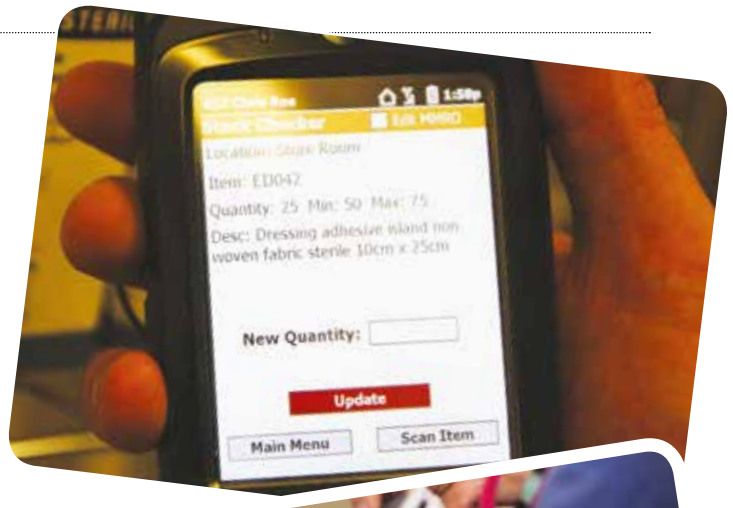
'Yes, the extra income will be a benefit, but showing a truer reflection of our performance is important too – it's a measure used by Dr Foster, for example, to assess performance.'

He also points to the system's impact on patient safety – in the event of a safety recall for a medical device, the trust can quickly track the patients affected and take action.

Shortly the trust will roll out the system to another three theatres, then its four radiology suites and then trauma and orthopaedics. 'We know it works for breast surgery, ENT, urology and we are testing it in radiology,' adds Mr Downs. 'The next step will be building the intelligence from hTrak into our patient record system Lorenzo, so the coders will be able to see and allocate the treatment the surgeon has given the patient.'

Clinical engagement

One of the biggest potential prizes is that of greater clinical engagement. The fact that the data is captured at source (and fed by valid pricing information) leaves little room for disputing the quality or accuracy of the information. 'It allows clarity, transparency and comparison when it comes to discussions on clinical variation,' he says.



Surgeons are more engaged as they are confident in the accuracy of the information being presented as they are responsible for initiating much of it. Over time, this could inform discussions about tariff accuracy, particularly where comorbidities add to costs.

Mr Downs continues: 'We are able to allocate all these costs to a patient rather than trying to apportion all the costs to general theatres and individual service lines. That will give us a large gain in credibility with clinicians.'

The trust is also talking to hospitals in the United States about the system they use in theatres, whereby a box containing the supplies needed for an elective operation is delivered the day before.

'This would mean you don't need a store room for that theatre. All you need is an area to hold the stock until the patient comes down to the theatre. You can hold a small amount of stock for emergencies, but there are potential savings here,' he says.

The barcode scanner could never replace the scalpel as a central piece of theatre equipment. But, by thinking laterally, the Derby team has produced a system that can deliver not only efficient procurement but also key clinical and financial information at patient level.