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Ensuring efficiency
and safety in theatres

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Derby Teaching Hospitals recently provided an insight into implementing GS1 standards in theatres. The barcode scanning of theatre equipment, patients and staff is reported to be helping to improve clinical effectiveness and efficiency, as well as delivering financial benefits. **Louise Frampton** reports.

GS1 barcoding technology is currently being rolled out at Trusts across the UK, following a national drive to standardise on GS1 identifiers and barcodes to enable the tracking and identifying of surgical instruments and medical devices; to improve inventory management and product recalls; as well as identify areas of clinical variation. A key focus of the projects underway is to understand how the technology can be used to deliver financial and patient safety benefits for the NHS. There are now six 'Demonstrator Sites' selected for Department of Health funding, as well as other sites operating under their own initiative. The technology has a wide variety of applications throughout the hospital setting – from reducing medication errors in pharmacy, to improving the safety and efficiency of surgery.

Derby Teaching Hospitals NHS Foundation Trust has been selected as one of the sites and has been among the first in the country to use barcodes, linked to a patient's wristband, to accurately track the medical equipment used in its operating theatres. Speaking at the GS1 UK annual healthcare conference, Kevin Downs, director of finance and performance, and Keith Jones, the clinical director of surgery, provided an insight into the financial and patient safety benefits of implementing GS1 standards in theatres, sharing their experiences of securing clinical engagement from the Trust's theatre teams.

Royal Derby Hospital is the newest hospital in the East Midlands and was officially opened in April 2010 by Her Majesty the Queen and His Royal Highness the Duke of Edinburgh. The hospital cares for more than 180,000 people as inpatients, outpatients, emergency patients and day cases – which equates to around 625,000 visits from patients each year. As well as 1,159 beds across 50 wards, the site also has 35 operating theatres.

"When these 35 theatres were first built, it was anticipated that they would be operating at 50% surplus, but we are now at full capacity," commented Kevin Downs.

"Unless we are able to improve efficiency in our theatres we will need another five to cope with the demand."

Faced with deepening financial pressures across the healthcare sector, securing funding to build additional theatres will not be an option; however, the GS1 standard will play "an important part in helping to deliver the efficiencies required," according to Kevin Downs.

The Trust had a number of different stock management systems for wards and theatres, which were time-consuming to manage. Like most other Trusts, Derby Teaching Hospitals needed to control spend, make savings and maximise the amount of revenue brought in through recharging of procedures. However, the reconciliation process was complex, and existing systems did not allow the Trust to develop accurate patient-level costing and financial control for stock and stock usage. At the same time, it was difficult to trace items used on patients for recall purposes, as this also involved a slow, manual, paper-based process. To protect patient safety without taking up excessive staff time, a faster and more efficient system was needed.

The solution

The Trust was already using Healthlogistics' catalogue and contract management service, eCat, which provides Derby Teaching Hospitals with standardised product data based on an extensive database which matches items with supplier descriptions, codes and contract prices, avoiding duplication and overpaying. Working with the Trust, Healthlogistics developed an automated general theatre supply chain process based on the hTrak stock and



procedure costing system, which is underpinned by a database of over one million barcoded items.

The initial planning stages commenced in November 2013, followed by the introduction to theatres across various specialties between April 2014 and 2016. The solution implemented is built around the patient and information is captured at the point of care. Using a handheld hTrak scanner, staff record details of the patient by scanning their wristband.

By scanning the relevant barcodes, theatre staff then capture every single detail of

the exact consumables and instruments used, prosthesis expenses, the cost of the staff involved and the actual (rather than planned) operating procedure (OPCS) codes.

"The data captured can span the length of a six page document for one procedure – the time saving achieved through this system, compared to manually recording this information, is significant...It takes just seconds, through barcode scanning," commented Kevin Downs.

"We put low value items in packs and scan surgical trays, as well as scopes. This ensures full availability and traceability. Using our own GS1 license, we have also developed GS1 barcodes for standard kits – for gowns, drapes and gloves. In addition, working with our anaesthetists, we have developed a standard pack for a general anaesthetic, so each item doesn't have to be scanned; it requires just one 'swipe'. We have also worked with surgeons to provide standard kits for standard operations," he continued.

The theatre products are pre-packed the night before and are ready to be used as

soon as the patient is transported into the anaesthetic room.

“We are trying to standardise and speed up the process, while still ensuring stock control recording. Pre-packed kits allow staff to concentrate on what they should be doing – caring for the patient, rather than rushing around trying to find equipment which should already be there for the start of the procedure. It is one less worry for staff as they can be confident the equipment and consumables they need will be there, while allowing us to streamline the stock replacement process,” Kevin Downs explained.

The hTrak stock management software within the theatre stock rooms also detects expiring stock, avoiding wastage. Auto-replenishment software within hTrak raises stock requests to both the Derby Hospitals procurement system and direct to NHS Supply Chain. Kevin Downs also revealed that the Trust is currently working with around 10 suppliers to enable orders to be sent directly into their ledger.

Benefits

Post-solution, the Trust has seen a saving of approximately £25k per month after costs (or £300k annually), made up from a combination of factors around stock management. With a more efficient and streamlined inventory system, it has been possible to significantly reduce the amount of stock held, freeing up storage space. Reductions in the amount of non-stock spend of least 5-7% have been achieved – and with flagged expiry dates, wastage is also prevented.

The automated replenishment system has significantly reduced last-minute ordering, allowing orders to be grouped into as few deliveries as possible to cut down on delivery costs.

Saving staff time: With hTrak, significant clinical staff time has been saved, with around 20 minutes per week spent on ordering compared to three hours previously, allowing for more time for patient care. Fewer stock-takes are required, and they now take just half a day, compared to an average of 1.5 days before the new system. The accuracy of coding procedures has also been transformed, as coders do not need to spend as long interpreting and querying results with clinicians. Automated transmission of purchase orders (POs) and invoices with the Pan-European Public Procurement Online (PEPPOL) transaction exchange also simplifies the payment process, providing confidence that orders are correct and reducing the overall cost of procurement.

Greater collaborative working: The solution provides an accurate foundation for engagement between clinicians, finance and procurement to compare costs and identify opportunities for greater efficiency. For example, significant savings were made by introducing individual packs of pre-sterilised



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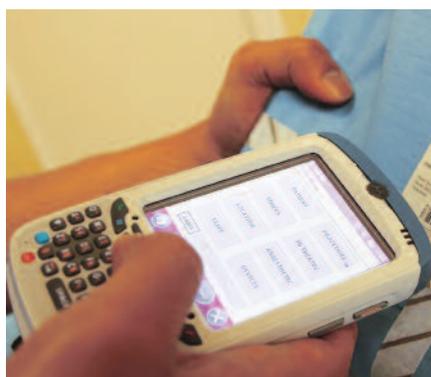
maxillofacial screws, removing the high cost of screw tray sterilisation.

Improving revenue: Using its GS1 license, the Trust has developed barcodes for procedures and for comorbidities, which are scanned to enable quick and efficient data capture. Keith Jones explained that the data captured on comorbidities allows mortality data to be fully understood within the context of the number of cases that were deemed to be complicated. The data captured also enables the Trust to identify how much income is actually being generated by individual surgeons for the Trust.

“We are able to see that the average orthopaedic surgeon earns around £720,000 for the Trust, but we have one or two that stand out as earning around £1.3 million for the Trust. Previously, we were unable to capture this information... When it comes to joint registers, we can now update external records quickly and we can also record comorbidities, so that we can get the correct tariffs for the work we are performing, while ensuring people such as the medical director are able to understand our Dr Foster data,” commented Keith Jones.

In the past, a high number of missed coding opportunities impacted the Trust’s ability to recharge CCGs but with real-time costing data, invoices are raised quickly and far more accurately. The Trust was also facing a coding backlog of around three months. This has been slashed, dramatically improving revenue retrieval times.

In the nine months prior to the end of



December 2013, invalid coding resulted in lost revenue of £840k. Clinical teams are now more aware of the need to capture all procedure details and, as a result of the transformation, the Trust has now seen a sizeable uplift in improved coding – which in turn has led to an increase in recharged revenue. The OPCS codes are preloaded on to the handheld device so nurses do not need to waste valuable time looking for them.

“We have learnt a lot from drilling down into the data,” commented Keith Jones. “Prior to the barcoding project, a suction catheter would be purchased; cut into four pieces; then sent off-site to be autoclaved. This cost five times greater than ordering the catheter pre-cut and pre-sterilised.”

In fact, savings have been identified for a variety of other products – for example, the cost of jaw plates varies depending on whether the plate is purchased bent or straight. “You don’t have to bend the plate in the theatre. We scan the patients and bend the plates in the laboratory, before theatre, to save time. However, what we have discovered is that, if we use a pre-bent plate from a manufacturer, it adds another £240 to the cost – which we then have to bend again.”

The Trust also has the data ready to start benchmarking on pricing with like-minded organisations.

Improving clinical effectiveness and patient safety:

The key to the GS1 barcoding project is securing clinical engagement, and to ensure the support of clinical staff, the focus of the message at the Trust has been on patient safety and traceability. The ‘Track and Trace’ system automatically captures implant lot or consumable serial numbers, and logs the instrumentation set so that patients can easily be recalled in the event of an issue. The handheld scanner also flags up if any equipment is out of date.

Explaining the benefits, Kevin Downs said: “We track everything that touches the patient and, at the same time, the system will monitor if the product is out of date. If it is found to be out of date, it will be flagged ▶

before it is actually used. Not only are we able to attribute costs to scopes and instruments, but we can also track equipment to patients, in cases of CJD or AIDS.”

So much is barcoded in our everyday lives, “so why not the patient?” asked Keith Jones. “When the horse meat scandal emerged, the speed at which the product was traced was amazing. However, 30,000 women still do not know if they have a product in their body that is defective, following the PiP breast implant scandal. This is completely unacceptable.”

The value of the barcoding project has the potential to extend much further in terms of improving clinical effectiveness, however. Clinical effectiveness, Keith Jones explained, is defined as: ‘the degree to which a particular healthcare intervention does more good than harm’ and ‘the application of best knowledge derived from research, clinical experience and patient preference to achieve optimum processes and outcomes of care for patients’.



The process involves a framework of informing, changing and monitoring practice.

As a result of implementing the system, the Trust is now able to discuss clinical variation with theatre staff, supported by accurate data.

“It is possible to obtain a print-out of consultants’ consumables costs and the

average theatre time. One consultant may take 90 minutes on average for a procedure, have a consumables cost of £188, and may be the most experienced surgeon in the Trust doing this procedure. Another case performed out of hours, by a registrar, under the supervision of a consultant, may have taken 181 minutes with a cost of consumables of £285... This data tells me a great deal about how we do things and who needs to be doing them. I think it is important that a patient is on and off the table as quickly as possible – experience counts,” commented Keith Jones.

The Trust can also look at individual procedure codes and compare costs between consultants. This data can then be analysed further to assist decisions around the support consultants may require. Although the procedure may have been longer in duration for one consultant, they may have had less staff in theatre when compared to a colleague with a shorter procedure time. This could identify the need for additional HCAs in theatre, so that another case can be added to their list. This data can now be obtained through the barcoding technology.

“This is about much more than procurement. This is about really understanding what we do and the data informing us on what we are doing,” said Keith Jones.

He highlighted a serious untoward incident that occurred. The patient suffered a nerve injury during the procedure and, during an investigation by the Trust, the surgeon and the anaesthetist gave differing accounts of how this arose. The surgeon should have checked what he was doing by using a nerve stimulator. However, Keith Jones was able to examine the complete data for the patient and discovered that the instrument did not appear anywhere in the report – confirming the surgeon had not used the device to prevent the risk of injury.

“What started as a stock control process has now grown and is informing, enlightening and embracing many of our staff – including clinicians... My surgeons want to see what they are spending. They are competitive and want to see where they are in terms of the team. We have an enthusiastic group at Derby who believe in what we are doing.”

In conclusion, Kevin Downs commented that Trusts should expect the same detailed information that retailers have about their customers, for patients undergoing their care: “It is my ultimate aim that each patient, in the future, will have the equivalent of the ‘Derby advantage card’; when they walk into the outpatients department, the card will be swiped and this will be the opening of their record,” he commented. He added that the health service needs to move faster on the GS1 standard: “It could be your mother we are trying to trace in terms of the implant or consumable we are trying to recover.”

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