Bedside scanning and patient safety

Derby Teaching Hospitals use GS1 standards to make a real difference for patient safety

Derby Teaching Hospitals NHS Foundation Trust wanted to better manage product recalls as well as streamline its theatre processes. By using GS1 standards, Derby now captures and uses complete, accurate information to automate its operations and reduce the need for manual intervention and the risk of human error. These changes have resulted in a minimum of £300,000 savings per year, just in consumables used in general surgery. Even better, the clinical staff can now spend more time taking care of patients, clinicians use trusted data to collaborate for improvements in practices, and with a faster and more precise recall process, patient safety has increased.

by Kevin Downs

Derby Teaching Hospitals NHS
NHS Foundation Trust

Background

Derby Teaching Hospitals NHS Foundation Trust (Derby) provides acute hospital-based health services, serving a population of over 600,000 people in and around southern Derbyshire. The Trust runs two hospitals. The Royal Derby Hospital, which incorporates the Derbyshire Children's Hospital, is a busy acute teaching hospital, and London Road is the Trust's community hospital. The Trust also operates some satellite services at other hospitals.

The information that GS1 barcodes gives makes for an accurate, automated process that reduces the need for manual intervention and the risk of human error.

The challenge of getting access to complete, accurate data

As with many Trusts, Derby was faced with the problem of managing product safety recalls quickly and efficiently, while minimising risk to the patient. The Trust was also concerned that they didn't have the accurate and comprehensive information required for the efficient clinical and business management of theatre operations. Traceability was a manual paper-based process, creating a drain on clinical time. Inventory levels of theatre stocks were high to ensure that stock was always available, but this led to wastage due to obsolescence and poor product life management.

Management information also suffered as a result. Procedure costing was implemented based on averages and estimates from finance, so they were not trusted by clinicians and had little or no impact on clinical management decisions. It was also difficult to know whether reimbursement was covering the actual cost of procedures.

It wasn't possible to improve surgical practice by comparing the performance of different surgical approaches based on accurate information about inputs and outputs, because that level of information just wasn't available.

It was recognised that existing processes for tracking implants and other products to patients were inadequate, as had been clearly illustrated by the Poly Implant Prostheses (PIP) silicone breast implant scandal. In addition, it was widely recognised that patient safety would be improved by being able to easily check that out-of-date products were not used on patients.

From the start, the intention was to find a solution that could be implemented across all theatres, and even beyond, into wards and clinics. And it was clear that barcodes were essential to collect the accurate, timely and comprehensive information needed to address these issues.

Streamlining operations with standards

The initial goal was to electronically capture all equipment usage and implant information within the theatre, so it would be easy to trace all instruments and implants to patients. To do this, the Trust ensured that all products, staff, patients, surgical instruments and medical equipment were identified and scanned in the theatre at the time of the surgical procedure.

Since 2013, the Trust has been rolling out scanning at points of use, enabled by wristbands on every inpatient, backed up by a catalogue and scanning system that uses GS1 standards to enable:

- Scan and check inpatients. Each member of staff also has his or her own barcode.
- Track scopes/instruments to patients.
- Track theatre and stockroom consumption.
- Produce complete and accurate procedure costs, including staff time and decontamination charges.
- Generate replenishment orders automatically.

The information that GS1 barcodes gives makes for an accurate, automated process that reduces the need for manual intervention and the risk of human error. Derby started by scanning Global Trade Item Numbers (GTINs) on products, but quickly moved to scanning patients, staff and surgical instruments and their respective locations, using Global Service Relation Numbers (GSRNs), Global Individual Asset Identifiers (GIAIs) and Global Location Numbers (GLNs), respectively.

Implementation consisted of integrating a cloud-based inventory management system, product catalogue and the barcode scanning solution. This was then all linked to a financial system for automatically creating orders—via EDI or email—to suppliers, based on the usage of products and supplies in the theatre. The system is delivered as a rental service and had minimal impact on theatre management and other internal hospital systems.

The products, staff, patient, surgical instruments and medical equipment are all scanned at the time of the surgical procedure to give a full record of the operation, including accurate timings for knife-to-skin actions and more. Information about the products used automatically updates stock levels and triggers orders, when necessary.

A record of the devices implanted into the patient is automatically available as well as a complete and accurate calculation of the procedure costs, by linking the products and instruments used, the number of and band of staff, and the time taken for the operation.

The OPCS and ICD-10 codes are also available to coders in real-time, which allows coders to request additional information, if required. The system has led to much closer co-operation between clinical staff and coders that, in turn, has led to further improvements. In addition, because the OPCS and ICD-10 codes from theatres are always available, they may be used to claim reimbursements, even if the full patient notes are unavailable.

OPCS, or more formally OPCS Classification of Interventions and Procedures is the procedural classification used by clinical coders within National Health Service (NHS) hospitals of NHS England, NHS Scotland, NHS Wales and Health and Social Care in Northern Ireland.

ICD-10 is the 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD), a medical classification list by the World Health Organization (WHO). It contains codes for diseases, signs and symptoms, abnormal findings, complaints, social circumstances, and external causes of injury or diseases.

Significant financial and clinical impact

The changes have had a financial and clinical impact, including direct cost savings of £10,000 per month in just the general theatre through lower inventory and reductions in the number of orders and associated delivery costs, wastage and staff costs. Other benefits include:

- More accurate and detailed management information is now available.
- Non-stock spending has been reduced by 5 percent.
- Automation of processes means that clinical staff can spend more time with patients.
- Clinical support now assesses clinical practices in terms of costs, time and patient outcomes since the data is trusted and provided directly by clinicians.
- Improved information and co-operation with clinicians has resulted in identifying significant cost savings through simple process changes. For example, the move to purchase screws in sterile packages led to around £3,000 per annum savings in decontamination costs for trays containing screws. With over 1,000 trays identified as other potential trays to target and some of these are cleaned over a thousand times a year, this represents a significant savings.
- When recalls take place, the Trust can easily identify all products that are held within the Trust, preventing their use. It can also identify all patients that may have been affected by the products, even patients with implants who are now at home, making it quicker and easier for required recall actions to take place.
- Scanning everything in the theatre also means that stock levels are automatically updated, triggering automated orders. And as equipment and implants are recorded against the patient, by also linking cost, staff and time information, a complete and accurate procedure cost is calculated.
- Since April 2014, the Trust has been saving at least £25,000 per month, just in the consumables being used in general surgery, imaging and catheter laboratories, for an annual savings of £300,000.

Tracking patients and their records

Implementing GS1 standards is ultimately about patients—and every patient needs a barcode. Clinicians can now spend more time with those in their care, data is more accurate and the automation of theatre processes reduces human error.

Derby is planning to roll out the project to all wards and outpatient areas so it can fully map the patient's pathway throughout the hospitals. The Trust is working with GS1 UK to make sure that all implementations are GS1 compliant.

Work is also underway to see how barcodes for OPCS and comorbidity codes can be implemented using GS1 standards. The use of the Global Document Type Identifier (GDTI) and EPC-enabled RFID is under consideration for tracking physical patient records.

About the Author

*In April 2015, **Kevin Downs** was appointed Director of Finance and Performance at Derby Teaching Hospitals NHS Foundation Trust, having spent the previous three years at the Trust as Deputy Director of Finance. Previously, he worked at other NHS Acute providers, including Leicester, Milton Keynes, Northamptonshire and Hull, mainly in operational roles. Prior to joining the NHS, the majority of Kevin's career was spent in the commercial sector at Finance Director level. He is a Fellow of the Chartered Association of Certified Accountants and a Fellow of the Institute of Directors and has an MBA from Nottingham Trent University.*

About Derby Teaching Hospitals NHS Foundation Trust

Derby Teaching Hospitals NHS Foundation Trust provides acute hospital based health services, serving a population of over 600,000 people in and around southern Derbyshire. The Trust runs two hospitals: Royal Derby Hospital and London Road. The Trust also operates satellite services at other hospitals. The Derby Graduate Entry Medical School, on the Royal Derby Hospital site, is run in partnership with the University of Nottingham.

www.derbyhospitals.nhs.uk