



Case study

Leeds Teaching Hospitals NHS Trust implements GS1 bar codes and RFID technology to improve patient safety and increase productivity

Leeds Teaching Hospitals NHS Trust has been a pioneer in implementing bar coding using GS1 standards. Its stock control and forecasting system known as 'CHOC Stock' has enabled the live update of stock usage through bar code scanning at point of use and also achieved ongoing revenue benefits by using quality inventory information to reduce unnecessary stock holding levels without the risk of stock outages. The Trust has also carried out a successful proof of concept RFID pilot to track and trace its orthopaedic loan kits containing vital hip and knee joints. The pilot identified benefits in early demand information for hospital staff and suppliers, reduced administration and improved efficiency.

Background

Leeds Teaching Hospitals NHS Trust is the largest in the UK and includes the largest teaching hospital in Europe. The Trust provides high quality acute hospital services for the population of Leeds and the surrounding area and acts as a regional centre for a number of specialist services such as cancer and cardiac surgery. In total it employs over 14,000 staff across eight sites, treating around a million patients a year with a budget of £790 million.

The Trust's key drivers for implementing GS1 standards include patient safety, improved productivity and compliance with NHS requirements to track and trace implanted products and ensure that the true cost of each procedure including the consumables are recorded accurately.

"Leeds Teaching Hospitals NHS Trust fully supports the Department of Health's recommendations that the GS1 coding system should be adopted throughout the healthcare system in England and we have been working closely with GS1 UK to ensure that we meet these requirements. We are also helping to drive the adoption of GS1 standards to improve patient safety and productivity through our active participation in the GS1 Healthcare User Group's Leadership Team," says Graham Medwell, Information Manager – Supplies Department at Leeds Teaching Hospitals NHS Trust.

Implementing GS1 bar codes to improve stock control

The Trust started its stock control system using GS1 bar codes in 1999 and now has 3,000 bar coded items which can be scanned at its 270 stocking points. The system is implemented throughout the hospital including cardiology, radiology, orthopaedic and trauma. In 2006, the Chapel Allerton Hospital Orthopaedic Centre (CHOC) was identified as a priority for increased stock management due to its high stock levels and system integrity problems.

The IT team worked hard to improve the Trust's product data quality to provide live and accurate updates to its stock and patient systems. Once all the product lines were identified and recorded, it worked with suppliers through, GHX, the healthcare e-commerce exchange provider, to enrich the data. Suppliers were required to provide the Trust with GS1 GTINs (Global Trade Item Numbers) as well as specific product attributes. Using GHX's web-hosted Nexus cataloguing solution, the Trust and its suppliers are now able to access, upload and maintain approved lists of centrally managed product information.

When a patient arrives for a procedure and his/her identification is entered onto the patient administration system (PAS), the consumables in the procedure will be allocated to the patient and procedure automatically by scanning their bar codes. By only scanning the stock that was





actually used during the procedure, the information on costs by procedure and implant data for the National Joint Registry (NJR) can be recorded accurately and in real time. Any unused stock is returned to the store immediately.

The stock control system has resulted in significant benefits for the Trust including:

- Live and up-to-date view of stock usage enabling better forward planning
- Accurate and up-to-date track and trace of products
- Improved stock availability due to better stock integrity system
- Reduced stock holding and obsolescence of stock through improved stock visibility and stock rotation ensuring usage within expiry date.

Improving productivity with RFID technology

Orthopaedic kits or modules, which contain hip and knee joints, are usually ordered on loan to the Trust on a consignment basis and only the elements that are utilised or not returned to the supplier are invoiced. A manually-intensive checking exercise is carried out at each point in the lifecycle of the kit by both the supplier and the Trust to ensure that all the elements are accountable at all times. The checking process at each point could take up to 2 hours depending on the complexity of the kit.

Loan kit orders are usually done over the phone and are inconsistent with orders made electronically for other stock using the Trust's automated ordering system. Staff tend to work around the system which can result in data inaccuracies. The Trust is also unable to track its loan kits accurately from purchase order to invoice due to the manual process. The ordering, checking and invoicing processes for these kits are very time consuming, labour intensive and often result in lengthy invoice reconciliations.

The Trust has identified Radio Frequency Identification (RFID) technology as a potential solution and in conjunction with GS1 UK, Depuy, Sybase and GHX, has carried out a proof of concept RFID pilot to simplify the ad-hoc checking, receipting, issuing and final return of its orthopaedic kits. During the pilot, each item in the kit was RFID tagged using EPC Gen 2 Class 1 tags and identified with a unique code allocated by the supplier to enable the accurate track and trace of all the elements in each kit. The Trust worked closely with GS1 UK to ensure that it complied with GS1 standards where possible.

The Trust's Sybase RFID Anywhere solution was also integrated with its existing stock control system, which was already linked to its purchasing and corporate ERP system. This allowed staff to create a shopping list for

each kit so that orders could be generated by simple drag-and-drop style requisitioning. The requisitions were then matched with the purchasing system where purchase orders were produced and then transmitted electronically to the supplier.

The proof of concept pilot found significant benefits from implementing RFID technology:

- Clinical staff were able to check the contents of a kit instantly, without the need for manual counts at each step in the administrative and clinical process.
- The turnaround time for suppliers from sale to receipt of payment could potentially only take approximately ten days compared to the current two months due to less administration and more accurate invoicing.
- The Trust had complete control of its data from order to invoice – improving its visibility of stock and data quality and enabling the accurate track and trace of its kits.

"Our RFID pilot has proven that the technology is scalable and the concept is possible. To be able to fully implement RFID at Leeds and reap the benefits, we would need to drive adoption within the healthcare sector. We need to get the major suppliers and healthcare providers on board to see the benefit of implementing RFID in healthcare," says Graham Medwell.

Future plans

The vision at Leeds is to integrate the patient administration system with the stock control system to update stock records and patient data automatically in order to improve accuracy and provide live data to suppliers and the Trust. The Trust has been working hard to achieve this vision through its stock control project and RFID pilot which has produced significant efficiency savings.

Leeds has identified several other applications using GS1 standards which could further improve its productivity. It is currently considering the implementation of Global Location Numbers (GLNs) to establish a standard way of coding its key locations. At present suppliers delivering stock find it difficult to accurately identify different locations in the Trust due to the varied coding systems being implemented. It is also looking at using the GS1 System to track its 30,000 fixed assets accurately and efficiently throughout the Trust.

To comply with the National Patient Safety Agency's (NPSA) requirements for the adoption of standardised wristbands throughout the NHS in England and Wales (SPN 24), the Trust is working on including GS1 bar codes on its wristbands.