

United Kingdom

EPC/RFID: An effective method for real-time asset management

Challenge

East Kent Hospitals University NHS Foundation Trust (EKHUFT) had thousands of assets and medical devices to manage across the trust's three acute sites. But with no digital or automated solution in place, efficiently tracking its extensive asset inventory of 1,470 beds and 37,000 medical devices became a near-impossible task.

Approach

Given the benefits of RFID (radio frequency identification) in retail to provide accurate stock visibility, the trust opted to introduce passive UHF EPC/RFID tagging as a means to track and trace the high-value equipment in the trust's medical equipment library.

5,000

medical devices and 1,470 beds tagged as a starting point



RFID Discovery platform was directly integrated into the single, trust-wide medical engineering system



Real-time access to asset information, which included details of location and service due dates

98%

of very high-risk device compliance achieved for planned preventative maintenance



Following an inspection by the Care Quality Commission (CQC), the UK's care regulatory body, East Kent University Hospitals NHS Foundation Trust noted that a change was needed when monitoring its high-value pieces of equipment.

The asset management process in place at that time made tracking and tracing high-value items a challenge. Much of the equipment was managed manually and, as a result, pieces were frequently misplaced or registered as "missing."

By introducing RFID technology, the trust was able to mostly automate its asset management processes, to improve efficiencies and traceability across the organisation.

Andy Barrow

Limited visibility impacting patient safety

Similar to many NHS trusts in England, EKHUFT found it challenging to track its valuable assets across each of the trust's three individual hospital sites.

Following an inspection by the CQC in 2014, the trust realised it needed to make a change. The CQC had submitted a recommendation to improve the trust's asset management processes, particularly for high-value items.

One of the most prominent problems was the limited availability of clean infusion pumps. Since there was no visibility of where equipment

was located throughout the hospitals, it meant that wards had to regularly borrow vital equipment from others—a situation that posed a risk to patient safety.

Taking its cue from the retail industry, EKHUFT decided to introduce RFID technology into healthcare. For years, retail stakeholders have benefitted from using RFID, enabling the industry to gauge visibility of stock in real time. Applying similar principles to its equipment stock, the trust implemented RFID in order to track and trace individual assets across each site.

Delays in patient care

EKHUFT had thousands of assets to manage and keep track of across the trust: 1,470 beds and 37,000 medical devices.

Monitoring where each individual piece of equipment was, whether the service date was due or whether it was even still in date and fit for purpose were all labour-intensive tasks.

When conducting audit trails of equipment due for service and maintenance, EKHUFT found there was no way of monitoring any of its assets in a quick and effective manner.

Often, staff were left using equipment with no indication of whether it was safe to use on patients. Equipment frequently went missing, leaving staff wasting valuable time in search of the machinery they needed to do their jobs. The inherent inefficiencies of this process resulted in delays to patient care.

Without complete visibility of what assets were available and where they were located, staff resorted to purchasing additional equipment to compensate that, in turn, increased the trust's procurement costs.

Access to real-time asset information

The medical engineering team decided to implement RFID technology to resolve the trust's equipment management challenge, supported by track and trace solution, RFiD Discovery. Using EPC/RFID tags would allow them to quickly identify equipment while receiving real-time traceability information.

To enable them to do this, the medical engineering team used the GS1 Global Individual Asset Identifier (GIAI) to uniquely identify each item separately. Each of the tags is encoded with a GIAI-96 EPC, in compliance with the GS1 EPC Tag Data Standard (TDS), and read in the 865-868 MHz band by means of the GS1 UHF EPC/RFID air interface protocol.

Initially, active RFID tags were used to individually label the assets, starting with approximately 5,000 medical devices and 1,470 beds in the medical equipment library. However, following the successful use of active RFID tags, the trust then decided to expand the process to use passive EPC/RFID tags, also incorporating two-dimensional (2D) GS1 DataMatrix barcodes to efficiently track and trace all necessary devices.

To synchronise records, the RFiD Discovery system was integrated into the single, trust-wide medical engineering system. By integrating these two individual systems, the medical engineering team was able to gain access to real-time asset information, including location information and planned preventative maintenance (PPM) due dates of each of the products.

Now with passive RFID tagging in place, a larger, portable reader machine is wheeled around each of the hospital locations. The reader interacts with each of the GS1-

compliant passive EPC/RFID tags on the equipment and automatically registers the transmissions from each asset to update the medical engineering system in real time. This enables staff to quickly scan the ward and determine what equipment they have, and which pieces have an overdue service date. A notification is sent directly to the ward manager and the medical engineering team for action and reporting.

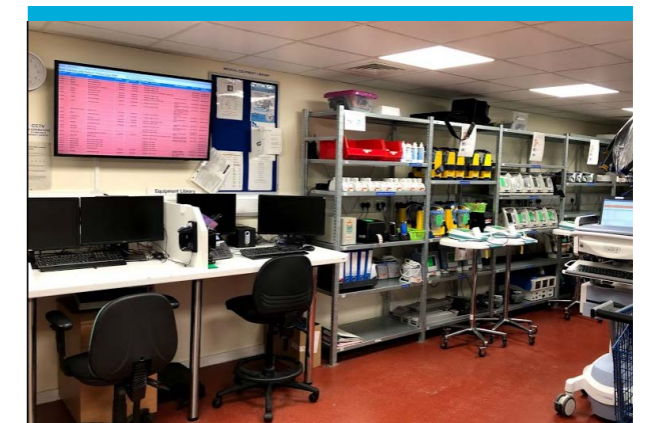


Figure 1: EKHUFT's medical equipment office

"GS1 standards and EPC/RFID-based tracking have taken medical engineering to another level, enabling higher compliance of preventative maintenance and spend on medical devices."

Andy Barrow
Head of Medical Engineering and Radiology Maintenance
East Kent University Hospitals NHS Foundation Trust

Improved productivity and patient safety

The asset management process that is supported by GS1 standards-based EPC/RFID has had a direct, positive impact on both the medical engineering and clinical teams, as well as on patients.

Time is no longer wasted looking for medical devices, allowing medical engineers to quickly identify and locate devices within minutes. And clinical staff now has access to the right equipment, in the right place and at the right time, thus preventing unwarranted delays to patient care.

The trust has realised a consistent increase in overall PPM compliance, achieving 98% of very high-risk device compliance.

Fewer medical devices have been purchased since all standard devices are managed through the medical equipment library. With locations tracked alongside them, the trust can ensure

that just the right amount of equipment is available and in operation, with nothing sitting in cabinets or hidden and unused in wards.

Now, critical PPM activities can be performed on time and even ahead of schedule, so that clinical teams can rest assured that any equipment they use has been assessed and validated as safe for patient use.

From a financial perspective, the new asset management process has reduced the amount of money spent on procuring surplus equipment to replace missing items—driving operational efficiencies throughout the hospitals. The real-time reporting alerts the team of any discrepancies so that swift action can be taken.

The trust is now in a better place to monitor the 37,000 medical devices in operation across the three acute trust sites. In recognition of its great work, EKHUFT received the Lord Carter Innovation Award in 2017, and continues to adopt GS1 standards as part of its aim to drive efficiencies across the trust.



Figure 2: RFID tagged medical equipment assets

Looking ahead

EKHUFT is currently exploring the needed scope to introduce GS1 Global Location Numbers (GLNs), to uniquely identify sub-locations within each of the hospitals across the trust. This will allow them to make their location identification more specific, improving the accuracy of asset traceability.



Figure 3: UHF passive tags used on infusion pumps for tracking

About the author



Andy Barrow, Head of Electronics, Medical Engineering and Radiology Maintenance, East Kent Hospitals University NHS Foundation Trust

Andy Barrow is Head of Medical Engineering and Radiology Maintenance for 2gether Support Solutions, a wholly owned subsidiary of East Kent Hospitals University NHS Foundation Trust.

Mr. Barrow has worked for the trust in medical device management for 30 years and across all modalities, both as a technician and as a manager. He leads a team of more than 40 technical and administrative staff who look after approximately 37,000 assets over three acute hospital sites and two smaller hospitals.

Common standard devices are managed through one of their three medical equipment libraries, using passive or active RFID tracking. Mr. Barrow's teams also look after 16,000 other devices across the community trust of East Kent, ranging from the simplest handheld devices, up to large, fixed-modality X-ray rooms, CT scanners and MRI scanners.

About the organisations



East Kent Hospitals University NHS Foundation Trust (EKHUFT) is one of the largest hospital trusts in England, with five hospitals and community clinics serving a local population of around 750,000 people. In October 2017, a wholly-owned subsidiary, 2gether Support Solutions, was formed to provide managed equipment services to the trust.

EKHUFT provides some specialist services for a wider population, including renal services in Medway and Maidstone, and a cardiac service for all of Kent, based at William Harvey Hospital, Ashford. The trust also has a national and international reputation for delivering high-quality specialist care, particularly in urology, kidney disease and vascular services.

EKHUFT has also been ranked first in Kent for clinical research studies. As a teaching trust, it plays a vital role in the education and training of doctors, nurses and other healthcare professionals, working closely with local universities and King's College University in London.

www.ekhuft.nhs.uk

2gether Support Solutions was formed in April 2018 as a new, wholly owned subsidiary company of one of the largest NHS Foundation Trusts in the UK, East Kent Hospitals University NHS Foundation Trust. 2gether Support Solutions provides facilities, property, procurement and professional services in the South East. The company, a wholly owned subsidiary of one of the largest NHS Foundation Trust's has social values at its core.

www.2gethersupportsolutions.org