Inventory management

Cambridge University Hospitals implement GS1 standards to manage medical devices

Cambridge University Hospitals NHS Foundation Trust was challenged with tracking its mobile medical devices, spending unnecessary time to manually locate them while not focusing on their primary duties or, worse yet, not caring for patients. In addition, extra costly inventory was being kept on hand to serve the needs of the hospital. The Trust implemented GS1 standards to uniquely identify each device along with EPC-enabled RFID (Radio Frequency Identification) technology for tracking devices. Now, devices can be easily and quickly located, resulting in increased utilisation, availability of devices and improved patient care. Costs savings have also been realised. For example, tagging all ECG monitors has resulted in a capital cost savings of £175,000.

By Simon Dawkins

Background

Cambridge University Hospitals NHS Foundation Trust (CUH) is one of the largest and best known Trusts in England. The Trust includes Addenbrooke's Hospital, which offers general and specialist care, and the Rosie Hospital, which provides maternity and women's care. As well as delivering care through the Addenbrooke's and Rosie hospitals, the Trust is also a leading national centre for specialist treatment for rare or complex conditions and is one of only five academic health science centres in the UK with a worldwide reputation.

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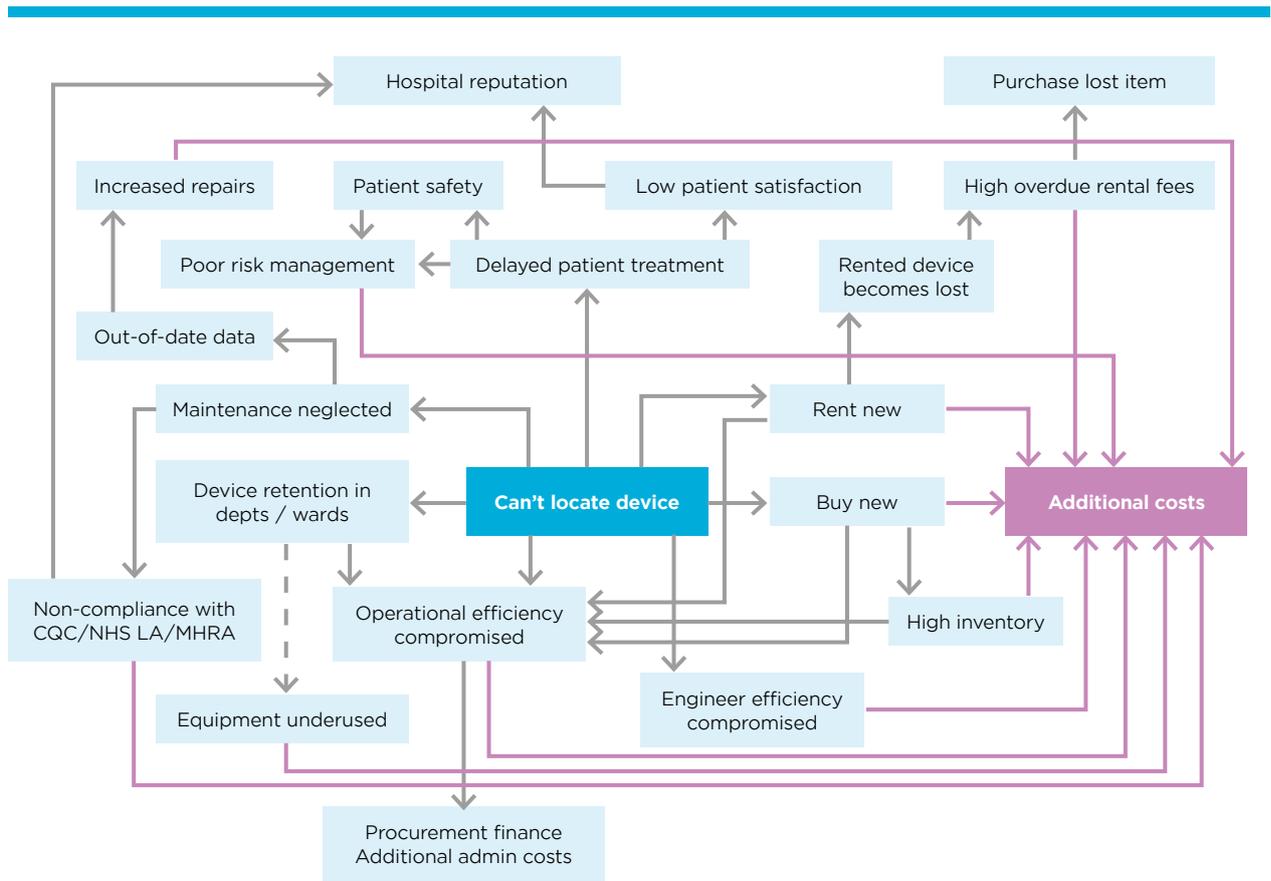
The inability of the Trust to locate devices led to a host of issues that increased costs, lowered productivity and compromised patient care and safety.

Time wasted on tracking devices

The Clinical Engineering team at CUH was challenged with tracking mobile medical devices, spending unnecessary time to manually locate and record each device—time that could have been spent on its core tasks of maintenance, repair and delivery of medical devices to the wards. The Medical Equipment Library team would also regularly spend hours (and walk miles) to locate specific devices.

This led to problems since the team was unable to confirm the number or types of devices allocated to wards or departments. Furthermore, the clinical staff would spend time looking for devices when they should have been spent time providing patient care.

Because equipment couldn't always be found, additional stock was held or ad hoc equipment purchased at short notice. In fact, new devices were regularly purchased unnecessarily to replace lost, misplaced and non-usable equipment. During a test audit, when applied to the entire Trust, the location of over £1 million worth of equipment was unknown.

The audit was also found to be less than 80 percent correct, and the amount of time taken meant the audit was not completed as required. The Clinical Engineering team soon realised that all these challenges were linked and could be addressed by automating the inventory tracking process.

In short, the inability of the Trust to locate devices lead to a host of problems that increased costs, lowered productivity and compromised patient care and safety.

A web-based application allows users to perform a location search to identify the last known location of a device.

Easily locating EPC/RFID tagged devices

The Clinical Engineering team recognised that it could automate the process of tracking mobile medical devices using EPC/RFID technology.

In order to comply with GS1 standards, they decided to re-label and identify all 40,000 medical assets with a GS1 Global Individual Asset Identifier (GIAI). The labels contain the device's GIAI in both a GS1 DataMatrix barcode and also in a GS1-compliant EPC/RFID tag.

Medical engineers now travel throughout the hospital using a specially designed trolley fitted with powerful RFID readers to perform equipment searches and audit wards. With a read range of up to 11 meters, these trolleys automatically record the date, time and location of any tagged devices within range.

The team also has a small mobile handheld reader with a read range of six meters that it uses to perform specific equipment searches or to audit wards. This enables the team to capture asset location information quickly and efficiently. A web-based application then allows users such as nurses and engineers to perform a location search to identify the last known location of a device. History reports also show where an asset has been over a defined timeframe.

As of February 2016, a total of 16,000 assets had been fitted with the new GS1-compliant asset label.

Improved tracking means improved patient safety

There has been a sharp increase in the number of devices the Medical Equipment Library team has been able to supply for a variety of different types. Increased utilisation and availability of devices has ensured the number available matches the number demanded, which supports improved patient care. For example, the supply of infusion pumps increased from 1,054 in November 2011 to 3,326 in March 2013.

Improved tracking of the movement of devices also provides all stakeholders with greater intelligence about device movement and use, providing vital management information for decision-makers at the Trust.

The use of RFID tracking and bringing all devices under the control of a central system highlighted a number of potential patient safety issues. For example, the emergency department once had specific settings on syringe drivers. This sometimes caused problems when these devices were moved to a ward with staff who were unfamiliar with these settings. Now, all 475 syringe drivers have a generic setting and the staff has been trained to use them.

Using EPC/RFID has also reduced the time it takes to audit wards. The average is now down from 90 minutes to just 8 minutes, enabling more effective use of engineers' time and allowing for more frequent auditing.

Introducing EPC/RFID tracking has also highlighted some surprising figures related to contractor performance. For example, by using the system, it identified that a medical device had been cleaned for only 1.5 minutes, a process that should have taken 7 minutes.

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Location accuracy of devices has increased considerably, which means that those who need to find a particular device can conduct a search, using a web-based application on their local personal computer to save significant time.

Complaints from staff requesting devices have dropped dramatically and clinical staff now feels confident that they are going to receive a device when requested. The target for supplying a device to a ward is 30 minutes, yet the staff can now supply a device much faster in approximately 12 minutes. Increased confidence among clinical staff means that they no longer find it necessary to hoard equipment for their convenience—an issue that once exacerbated the problem of device availability.

Examples of cost savings include:

- Tagging all ECG monitors and moving their management under the Medical Equipment Library department's control has helped improve the use of existing devices, resulting in a lifetime capital cost savings of £175,000. The one-time cost of tagging all ECG monitors was just £16,000.
- The use of EPC/RFID tracking has highlighted issues with the management of hired devices, including specialised low-level beds. A first year savings of £99,441 was achieved by enabling staff to locate low-level beds for a timely return to the rental company as well as avoiding losing and having to replace rented beds.

Expanding the solution to other departments

GS1 implementation for medical devices has saved the Trust time and money, and frees up time for the staff to focus on other work. Clinical staff members are more confident that they'll receive a device when they need it and the entire team has better information about equipment movement and usage, providing vital management information for decision-makers at the Trust.

The next stage in the process for CUH is to introduce GS1 Global Location Numbers (GLNs) to uniquely identify each location within the hospital, and to implement the system in other departments/sections within the Trust as part of the wider GS1 rollout within healthcare.

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About the Author

Simon Dawkins *is the Head of Medical Equipment Library in Addenbrooke's Hospital that is part of the Cambridge University Hospitals NHS Foundation Trust. His main role is to manage medical devices to support patient care and to ensure medical devices meet the needs of clinical staff and the Care Quality Commission, Medicines and Healthcare products Regulatory Agency and the NHS Litigation Authority. In the last four years, Addenbrooke's Hospital has been a leader in promoting ways to track and audit over 40,000 medical devices using GS1 standards and EPC-enabled RFID. To date, savings total over £750,000. Prior to working in the NHS, Simon worked for 20 years in retail.*

About the Cambridge University Hospitals NHS Foundation Trust

Cambridge University Hospitals NHS Foundation Trust runs Addenbrooke's Hospital and the Rosie Hospital. Both are recognised as centres of medical excellence and innovation, and the independent Dr. Foster Hospital Guide ranks the Addenbrooke's Hospital as the safest in the region and the second-safest in the country. As an internationally known university teaching hospital, the hospital provides specialist services dealing with rare or complex conditions that need the most modern facilities, the most up-to-date treatment, and the best doctors, nurses, and clinical staff.

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