Poland

Improving efficiency and safety through the automatic identification of medical devices at the University Clinical Centre, Gdańsk

Challenge

Medications and medical devices are the second highest cost in the day to day running of the hospital. Taking into account the requirement to ensure the appropriate level of patient care, and most importantly their safety, the management of the flow of healthcare products is a very important aspect of the functioning of the University Clinical Centre (UCC).

Approach

There were attempts to reduce costs across many areas and one of these was to improve the flow of medical devices. For this, a concept of deposit warehouses enabled by barcode scanning was created, with 24/7 access to medical devices and the hospital only paying for what they actually use.

In the Cardiosurgery Clinic, as soon as the barcode is scanned this information is added to the patient's Electronic Health Record

In the case of a recall finding the affected patients proved to be no problem at all since the medical devices data were scanned into the IT system including their individual serial numbers

Stock taking of the deposit warehouses showed that automatic identification is completely error-free

Once scanned the product cost is assigned to a specific patient giving information about the cost of treatment

UCK Uniwersyteckie Centrum Kliniczne

The University Clinical Centre (UCC) was founded by the Medical University of Gdańsk and is one of the largest hospitals in Poland. Its connection with the university gives the hospital access to the latest technologies, global-tier medical knowledge and clinical research. UCC covers a full range of medical services, advanced diagnostics, various surgical procedures, transplantation procedures, rehabilitation and palliative care. The hospital has most specialties available within the area of medical service, meaning that it can offer comprehensive treatment to patients, including those suffering from numerous concurrent diseases.

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Around 120,000 patients are treated in the hospital annually. The hospital has 33 highly specialised clinics and over 60 outpatient clinics. The constantly growing facility has a state-of-the-art infrastructure and is considered to be one of the most modern hospitals in Poland and Europe. UCC has undergone major extension and modernisation works in the last few years. A modern complex spanning 32,000 m^2 was commissioned in 2012 and another complex of buildings, this time covering 72,000 m^2, will be commissioned by 2020. Apart from its usual medical activity, the hospital also runs educational programmes with a focus on disease prevention.

To keep functioning, a unit that large requires a steady stream of medications, medical devices and other equipment needed to treat patients. Right after salaries, medications and medical devices are the second highest cost in the day to day running of the hospital. Taking into account the requirement to ensure the appropriate level of patient care, and most importantly their safety, the management of the flow of healthcare products is a very important aspect of the functioning of the UCC.

Reducing costs, improving efficiencies

To improve the hospital's efficiency, there were attempts to reduce costs across many areas. One of these was to improve the flow of medical devices while at the same time ensuring uninterrupted access to relevant products in a wide range of types and sizes. From this, a concept for creating deposit warehouses was created. The idea behind a deposit warehouse is that the hospital's staff has prompt,

24/7 access to medical devices and the hospital only pays for what they actually use. This way, costs are reduced while product availability is increased.

The Cardiosurgery Clinic, with the highest value of stock in the entire hospital, was one of the first places to receive this solution. Their warehouse contained heart valves and specialised, expensive medical devices used in cardiosurgery procedures. A tender was announced, agreements were concluded and deliveries began. It turned out that this solution requires very quick and effective acceptance of products into the central warehouse, moving them to the warehouse in the operating block, allocating them to specific patients, informing the supplier about the use and receiving the invoice and then processing it. At that time, the data was introduced to the hospital's IT system manually, which proved inefficient, mainly due to the time needed to do this and the high risk of making mistakes.

When looking into solutions to improve this process, barcodes were seen to have great potential. The changes were introduced as a result of observing other business sectors, receiving education from GS1 Poland via their publications and webinars, and using the team's passion and support of the management. Ultimately, the hospital began the process of handling deposits using the automated identification of products through GS1 standards. Each medical device accepted into the deposit was scanned when being directly introduced to the computerised warehouse and accounting system (provided the device had this kind of marking) and then transferred for deposit in the operating block. After some time, certain improvements were introduced to the IT system for handling the medical part, where patients' data was stored. Both IT systems were joined in a way to allow for the transfer of data between them and with the use of barcodes scanned from these devices. Barcode readers were purchased for the Cardiosurgery Clinic warehouse and a new era of facilitated data flow started in the hospital.

Thanks to this solution the data related to the product's name, GTIN number, expiry date, serial, lot and batch numbers are automatically assigned by medical personnel to the patient's record, right after the surgery. As soon as the barcode is scanned, this information is added to the patient's Electronic Health Record.

The implementation proved to be of great use to the hospital's finances and gave a good return on investment.

The stock, and with that costs, were greatly reduced. Currently, the stock in the deposit warehouses is twice the value of the non-deposited stock of products purchased daily by the hospital. Stock taking of the deposit warehouses showed that automatic identification is completely error-free and there have been no data entry errors whatsoever. Additionally, once scanned, the product cost is assigned to a specific patient, giving information about the cost of treatment.

Most importantly, however, a new value was obtained - in the form of identification of the products.

The hospital's staff know where specific products, identified by their serial numbers and expiry dates, are - but most importantly they know exactly who received them. This information is vital if defects in implanted devices occur.

The hospital can identify the patients who received these products, promptly and accurately. Recently, around 250 patients had to be identified, who were implanted with products with hidden defects identified by the producer several years after the application. Finding these patients proved to be no problem at all, since the medical devices data were scanned into the IT system, including their individual serial numbers. Consequently, the patients were informed about the situation and corrective activities were taken up as per the producer's recommendations.

The implemented solution turned out to be a great tool and other clinics expressed their interest in applying it. By March 2019, there were 17 deposit warehouses in the hospital and their total value is rising year by year.

Next steps

The next step the hospital is considering is to cover all medical devices purchased for patient-related needs with this solution. To this end, the hospital is planning to buy a modern warehouse management system (WMS) so that the data can be introduced to the IT system, using GTINs to identify the product, when the goods are placed in the warehouse and then, when they are delivered directly to patients, they can be scanned directly into the IT system. This will also save the medical personnel time, since scanning is quick, simple and almost completely error-free.

Several years have passed since the implementation of the first warehouse deposit. In the meantime, when preparing new tenders, the hospital encouraged other suppliers to provide medical devices marked according to GS1 standards. This is worth additional points in favour of the supplier when evaluating the bids. Initially, many suppliers reacted with curiosity to the hospital's requirements, with no understanding of the underlying purpose. As time passed, more and more suppliers began implementing GS1 standards to devices which previously didn't have them.

Building awareness and co-responsibility for the process of marking medical devices, as per GS1 standards, by their manufacturers has been of key importance. It allows both the supplier and the hospital to easily monitor the process of identifying the products and to co-create traceability. It is important that the hospital concentrates on treating patients and the supplier delivers products that can be identified with a GTIN, expiry date or lot number, and read with a barcode scanner.

Additionally, by using relevant stipulations and entries in tenders, UCC encourages suppliers to use GTINs assigned to the products. Some suppliers have already started creating lists of products in data sheets including their GTIN. This is of major importance because the hospital can assign the GTIN to the database for specific products already at the stage of uploading the tender agreement into the IT system. When picking the product up from the warehouse or when issuing them from the central warehouse the staff can refer to the data to identify the product. This gives them assurance that the product submitted in the bid is the same product that is delivered to and used in the hospital. Additionally, when sending purchase orders to the supplier, the number is specified in the hospital's order, which may facilitate logistics processes.

Working to eliminate the challenges

It must be noted, however, that product identification should not end with the collective packaging (e.g. a box including a number of individual units). Only a single or several products are administered to the patient at the hospital, not the entire package. It is this single item that should be specifically marked using the GS1 standard. Just like when you are buying a 12-pack of mineral water, you only present a single bottle to the shop assistant operating the cash register. Similarly, the hospital's personnel want to be able to scan the data from a single item, e.g. a bag of sutures, a stapler charge, an electrode, etc. Which is why there should be focus on automatic identification of individual product items. The hospital should not be marking the purchased products by applying stickers or coming up with their own line for marking products.

It is the supplier and the producer who should be supplying every single item in a way that it can be individually identified and read with a barcode scanner.

Today, hospitals wish to know exactly what the cost of treatment is and this system of marking individual products may be of help to them. By scanning the patient's data from their wristband and then scanning individual products, they are allocated to that patient in the IT system, generating a price automatically.

Unfortunately, there are still many groups of products used in hospitals for which GS1 standard marking only extends to the packaging. A good example is surgical gloves, with marking placed on a container with several dozen pairs, whereas only up to a dozen pairs of various types and sizes are used during a single procedure. That is why the hospital is promoting and encouraging suppliers to apply marking on every pair of this particular product.

Yet another problem is a large group of products that are difficult to access since their collective packaging is secured against opening and the relevant documents carry no information about the GTIN number for the unit product. Surgical suture is a great example for this. The analysis carried out in the hospital shows that manufacturers have started implementing GTIN and, optionally, the expiry date and serial number for e.g. 10, 12, 24 and 36 bags on the collective packaging secured against opening with special plastic film. During a surgery, several bags, rather than pieces of packaging, of various types of sutures are used. Once applied, data cannot be scanned from the collective packaging, but should be rather scanned from a specific bag. GS1 standard marking should be assigned to the bag at the stage of uploading data when accepting the delivery, with price included on the IT system so that can also be assigned. So, either the hospital staff have to commit to do the intensive work of unpacking the secured packaging in the warehouse, or the hospital receives the data in a different way, e.g. via an electronic file.

Yet another challenge is posed by the number of barcode types on a medical device's unit packaging and the various types of data carried by the barcodes. It happens that some products carry a GS1 DataMatrix and another linear barcodes on their unit packaging. As it turns out, these barcodes carry slightly different data, e.g. an extra application identifier assigned to one of them. The hospital staff now faces a problem of determining which barcode should be introduced into the IT system so that the same barcode is scanned and assigned to the proper patient by the medical personnel. The scanning of barcodes by the medical personnel needs to be as easy as possible, because their main job is to treat the patient, so all other actions should be simplified to the highest extent. Therefore one single barcode is the desired end goal.

In conclusion, it should be noted that the hospital's management has learned about the extensive possibilities and benefits resulting from the marking of medical devices with GS1 standard barcodes and are looking to develop this topic and introduce solutions stemming from automation in this field. A dream emerged at a certain stage of development of this hospital, for the staff to be able to scan medical devices and the hospital's management believe that soon, thanks to mobile scanners, nurses will not only be able to scan codes of all products or patients' data, but also the codes of medical procedures and staff. The possibilities are limitless...

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About the organisation

The University Clinical Centre is one of the largest hospitals in Poland, founded by the Medical University of Gdansk. The hospital provides medical, diagnostic and treatment services. Cooperation with the university gives the possibility of access to the modern technologies, world medical knowledge and clinical research. In addition to medical activities, the hospital has educational programs that put pressure on prevention of illness. The mission of the hospital is the slogan "Effectively healing, teaching well and serving science". The University Clinical Centre employs 3,500 staff, serving 120,000 patients per year.
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