



Healthcare providers

Tokai University Hospital achieves traceability and increased efficiencies in operating theatres

Tokai University Hospital implemented a new management system by using GS1 standards in its operating theatres. The system records detailed information about medical products used for surgical operations—the product’s Global Trade Item Number® (GTIN®), lot number and other valuable data—all by scanning source-provided GS1-128 barcodes. By capturing information about which medical products are used on what patients, the system has helped the hospital significantly improve medical safety and increase responsiveness for recalls. In addition, the hospital has reduced costs associated with data recording and enhanced the accuracy of reimbursement claims.

By Dr. Makoto Sawada and Mie Narusawa



Ensuring traceability

Located near Tokyo, Tokai University Hospital has 804 beds and 21 operating rooms in which approximately 12,000 operations are performed each year.

In 2015, the hospital installed a new management system for the surgical department, in conjunction with replacing the electronic medical record (EMR) system. Until then, medical products used for surgical operations had been manually recorded with “pen and paper” by doctors or nurses. As a result, the records were sometimes ambiguous or even incomplete. Furthermore, if a product was ever recalled, it took a significant amount of time to identify which medical products were used on what patients.

“For patient safety, the sterilisation and quality management of medical products are crucial, so we decided to implement a new system to record the use history of medical products,” says Mie Narusawa, Head Nurse of the Surgical Department, Tokai University Hospital.

“It is extremely important for us to keep accurate information of the name, serial or lot number of individual medical products. We found that the GS1-128 barcode could capture all the data we needed. In Japan, most medical products already have GS1-128 barcodes on their packages. By using GS1-128 barcodes, we do not need to use our hospital’s in-house, proprietary barcodes on the products.”



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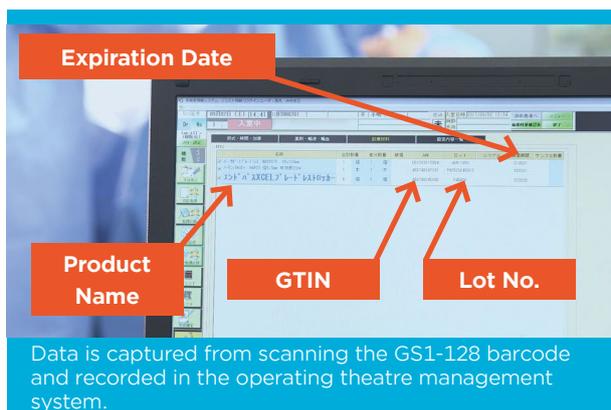
Mie Narusawa, Head Nurse of the Surgical Department, Tokai University Hospital

Adoption of GS1-128 barcodes for accurate use history

The operating theatre management system didn't originally support GS1 barcodes. Thus, before the implementation, the hospital needed to expand the data processing capabilities of both the management system and the EMR system to be able to import data from GS1-128 barcode.

The process to record the use history of medical products is as follows:

- During a surgical operation, nurses store empty packages of medical products used for the operation in a plastic bag.
- Then, nurses scan GS1-128 barcodes on those packages when they are available during an operation.
- By scanning barcodes, the management system imports data from GS1-128 barcode and automatically saves the GTIN, the lot or serial number and the expiration date.
- The management system automatically sends the data to the EMR system.



“There are some medical products that don't have a barcode on their primary packages. However, we did not think that less than 100 percent barcode availability should prevent us from implementing the system. We were sure that the system using GS1-128 barcodes would provide benefits in terms of safety and efficiency,” says Dr. Makoto Sawada, Research Associate of the Department of Anesthesiology, who led the implementation of the new system.

Ensuring a smooth transition

Dr. Sawada points out that it is important to find suitable ways to manage a new system smoothly.

“For medical products without a barcode on their primary packages or for extremely small products such as brain surgery clips, we created a barcode sheet by copying barcodes on their secondary packages,” continues Dr. Sawada. “For a while after the implementation of the management system, scanning errors sometimes occurred due to products being not registered in the master data. To resolve this, we set a collection box in each operating room to temporarily store packages that caused scanning errors and registered those products data after surgeries.”

“At first, there were dozens of medical products each day not registered in the master data. However, one month later, the number of non-registered items decreased to only several per week, and today we only have a few per month.”

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96%



To date, in Tokai University Hospital, the number of medical products registered to the master data is about 55,000 items inclusive of non-reimbursable. This number covers about 96% of reimbursable materials used in the operating theatres.

JAN	品名・規格	バーコード	数量
4946329137996	杉田チタンクランプⅡ 17-001-68 No.68(BB)弱弯		1
4946329137392	杉田チタンクランプⅡ 17-001-02 No.2直		1
4946329137972	杉田チタンクランプⅡ 17-001-65 No.65弱弯		1
4946329137866	杉田チタンクランプⅡ 17-001-53 No.53ハイバネット		1
4946329137477	杉田チタンクランプⅡ 17-001-10 No.10直		1
4946329137392	杉田チタンクランプⅡ 17-001-02 No.2直		1
4946329137859	杉田チタンクランプⅡ 17-001-52 No.52直		1
4946329137842	杉田チタンクランプⅡ 17-001-51 No.51直		1
4946329137866	杉田チタンクランプⅡ 17-001-53 No.53ハイバネット		1

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Benefits of the new system

The new system has enabled the Tokai University Hospital to record which medical materials are used with which patient during an operation as well as check the expiration date of materials—making it highly beneficial in terms of patient safety.

Before the implementation of the new traceability system, the use history of medical materials needed to be handwritten and manually input into a system. Thanks to the new system, the hospital has been able to optimise the work process and can precisely calculate costs spent for an operation by accessing accurate data imported from GS1-128 barcode. In fact, the hospital advises that, based on the ease of scanning barcodes, the new system has opened up job opportunities for workers with disabilities—an unexpected and positive benefit.

“An accurate reimbursement claim requires the accurate identification of medical products actually used,” explains Dr. Sawada. “Before the implementation of the system, we had often received inquiries about the used materials from the division that is in charge of reimbursement claims. Since running the system, we have received significantly fewer inquiries.”

Comparison of work flow before and after the implementation of the system

Before the implementation of the system

During or after an operation, nurses count the number of medical products used for the operation and fill out a cost bill form. In addition, they peel off product labels, which include information such as product name, lot number, and expiration date, from their packages, and put them onto a recording form.

Workers of operational theatre scan the two forms using a image scanner to record into EMR system as medical history.

The cost bill form is sent to the division which is in charge of reimbursement claims. Workers there enter the information on the form into the reimbursement system manually to calculate the cost of the operation.

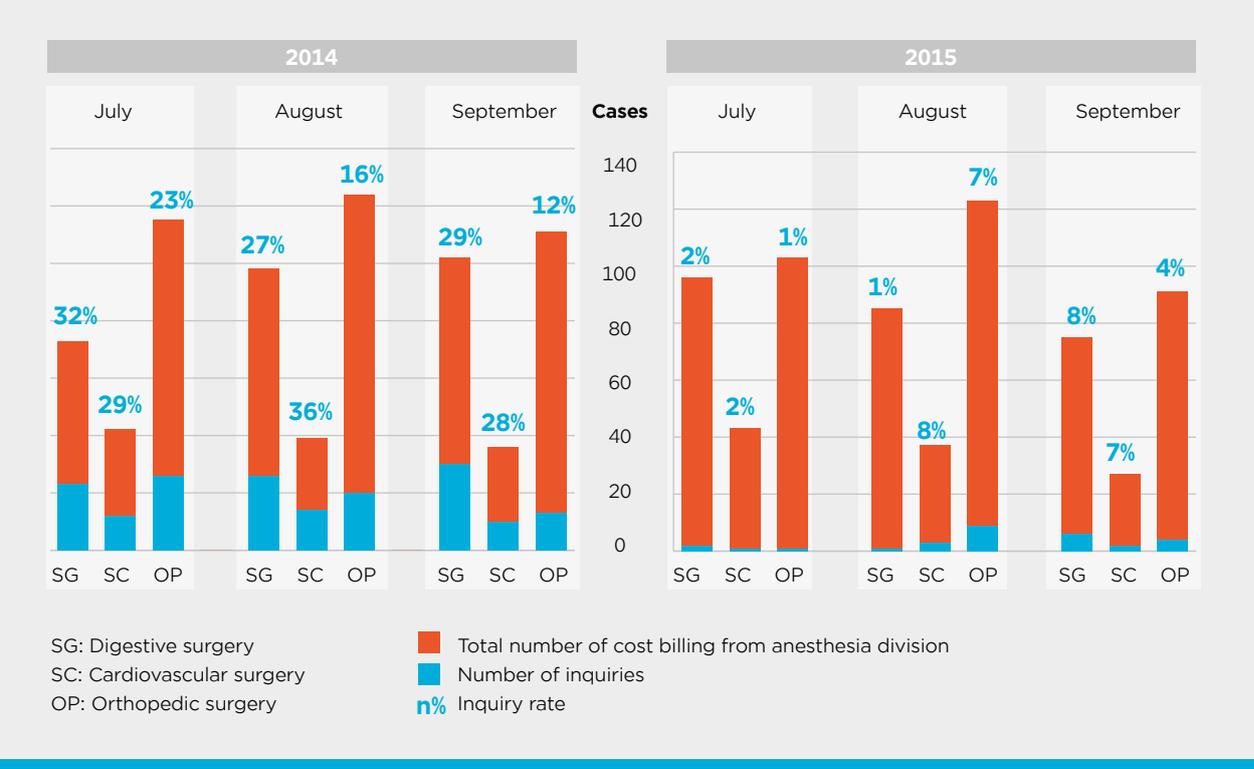
After the implementation of the system

During an operation, nurses scan GS1-128 barcodes of medical products. The product name, GTIN and lot number are automatically recorded into the system.

Data is automatically forwarded to the EMR system.

Data is automatically forwarded to the reimbursement claim system

Total number of cost billing from anesthesia division and number of inquiries from the division that is in charge of reimbursement



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By scanning GS1-128 barcodes, the hospital is able to capture the accurate medical products used in operations, thus capturing the actual and accurate cost. This has resulted in an 81.7% reduction in inquiries from the division in charge of reimbursements.

Expanding the use of GS1 standards

In order to utilise GS1-128 barcodes in its operating theatres, Tokai University Hospital needed some technological and operational support.

However, Dr. Sawada emphasises “In the field of retail, barcodes have already been utilised worldwide, and the effectiveness of barcodes has been proven. While there are still not many medical institutions using GS1-128 barcodes, many hospital systems still support non-GS1 barcode formats like patient wristband barcodes.”

“I believe that technological issues are likely to be resolved simply by supporting the GS1 standards format, and the true difficulty actually lies in the fact that the system operation methods have not been well established because there are few examples of the introduction of GS1 barcodes,” continues Dr. Sawada. “Similarly, in the area of medical information, I believe GS1 standards will provide significant benefits as a fundamental technology, though there are still few examples.”

To date, Tokai University Hospital is using GS1-128 barcodes to manage medical products only in its operating theatres—the first such implementation of GS1 standards in the hospital. However, since the traceability system has a very good reputation with multiple benefits, the hospital is considering expanding it to inpatient and outpatient wards in the future.

Also, while surgery costs (as an indicator of current hospital management) are only calculated from reimbursable medical products, large costs are also spent on medical products that cannot be reimbursed. Such non-reimbursable medical products have already been registered to the hospital’s master data. The hospital is considering calculating the complete and accurate surgery costs associated with all products used in an operation, as an indicator of hospital profitability.

About the Authors



Makoto Sawada, MD is a Research Associate in the Department of Anesthesiology, Tokai University Hospital. In addition to being an excellent anesthesiologist, Dr. Sawada is familiar with IT systems in hospitals and has led the implementation of GS1 standards in the hospital.

Collaborating with GS1 Japan, he is continuously promoting safe and efficient healthcare management with GS1 standards.



Since 2015, **Mie Narusawa** has been the Head Nurse of the Surgical department, Tokai University Hospital. In 2004, Mie graduated from the School of Health Science of Tokai University. She is leading the implementation of GS1 standards in operating rooms to ensure

traceability and efficient management.

About Tokai University Hospital

Tokai University Hospital was established in Isehara City, Kanagawa Prefecture, in 1975. The hospital provides opportunities for education and training for various medical professionals, including students and interns from the School of Medicine or the School of Health Science, as well as advanced medical care. The hospital also plays a central role in regional healthcare as the medical institution operating Kanagawa prefectural doctor helicopters, which constitute the wide-area emergency transport system.

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