

Case Study: Utilization of GS1 DataBar at HAGA RED CROSS HOSPITAL



HAGA RED CROSS HOSPITAL is one of the first hospitals that recognized the effectiveness of GS1 DataBar and has utilized GS1 DataBar for patient safety. In Japan, the pharmaceutical industry has promoted barcode labelling on prescription drugs for many years. For prescription drugs, GS1 DataBar is marked not only on sales packages but also on primary packages. In Japan, oral medicines are provided to outpatients in not sales

packages but primary packages, so barcoding on primary packages is needed to prevent medical errors and improve patient safety. According to research data released by the Ministry of Health, Labour and Welfare in September 2016, the barcoding ratio of Global Trade Item Number (GTIN) on primary packages and sales packages is already approaching a level close to 100%.

Fig. 1 Examples of GS1 DataBar

<p>GS1 DataBar Limited</p>  <p>(01) 14512345000018</p> <p>Product Code (GTIN)</p>	<p>GS1 DataBar Limited Composite Symbol</p> <p>Expiration Date</p> <p>Lot/Batch Number</p> <p>(17) 180110 (10) ABC123</p>  <p>(01) 14512345000018</p> <p>Product Code (GTIN)</p>
<p>GS1 DataBar Stacked</p>  <p>(01) 14512345000018</p>	<p>GS1 DataBar Stacked Composite Symbol</p> <p>(17) 180110 (10) ABC123</p>  <p>(01) 14512345000018</p>



Summary of HAGA RED CROSS HOSPITAL

HAGA RED CROSS HOSPITAL, located in Moka City about 100km North from Tokyo, is playing a central role in local healthcare services.

Summary of the system of the Pharmaceutical Department

The pharmaceutical department of the hospital is operating multiple systems that utilize the GS1 standards for the management of medicines and to ensure patient safety. This article focuses on the following two systems: 1) oral medicine preparation checking system and 2) injection set preparation checking system.

1. Oral medicine preparation checking system

1) For Outpatients

For the preparation of oral medicines for outpatients, checking is done by scanning GS1 DataBar marked on each package.

<Picking oral medicines from shelves>

Step 1: Print out a prescription.

Step 2: Start the checking system, scan the barcode on the name tag of the pharmacist to record the pharmacist's data.

Step 3: Scan the barcode on the prescription to retrieve the prescription data.

Step 4: Scan the GS1 DataBar on a blister package, pick up the medicines while verifying the data, and place them on a medicine tray (Fig 2).

Step 5: After entering the prescription data into

Fig. 2 Reading blister package



an inspection machine, put the medicine tray into the machine. The machine will take a photograph of the medicines and verify if the medicines are correct by cross-checking the barcodes or the shape of the medicines on the captured image with prescription data. More accurate medicine confirmation is done by checking twice; at the time of picking using GS1 DataBar and at the end with the inspection machine.

<Process for putting medicines into a medicine envelope for patients>

Step 1: Start the checking system, and scan the barcode on the pharmacist's name tag.

Step 2: When the prescription data is retrieved by scanning the barcode on the medicine envelope, the list of medicines will be displayed on the screen.

Step 3: Scan the GS1 DataBar on a blister package while putting medicine into the medicine envelope. If the pharmacist scans the correct barcode, the name of the medicine and its

Fig. 3 Process for filling a medicine envelope

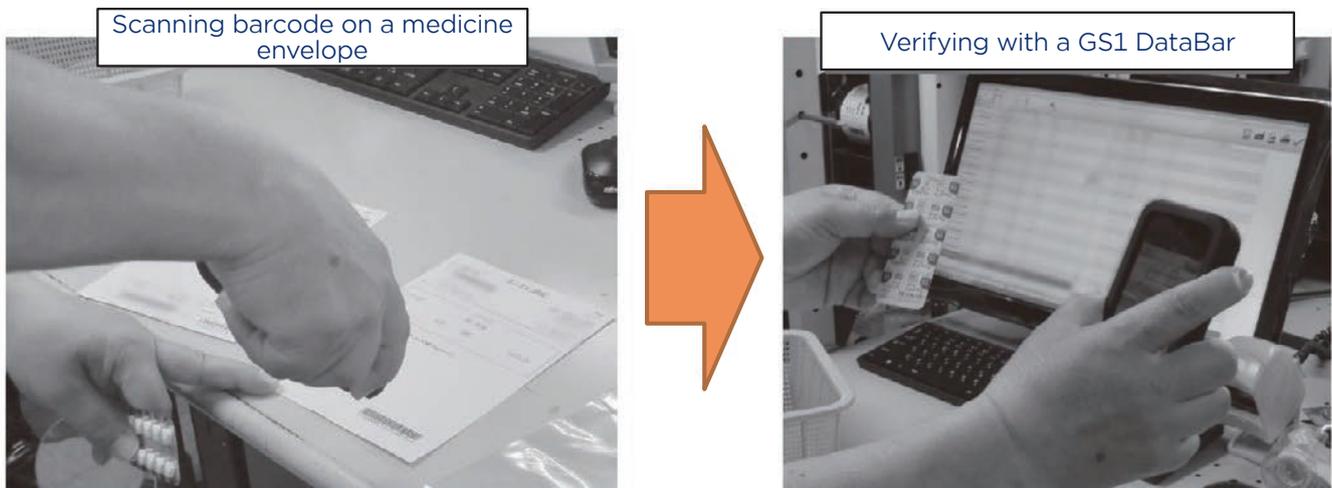


Fig. 4 Verifying screen for one-dose packages

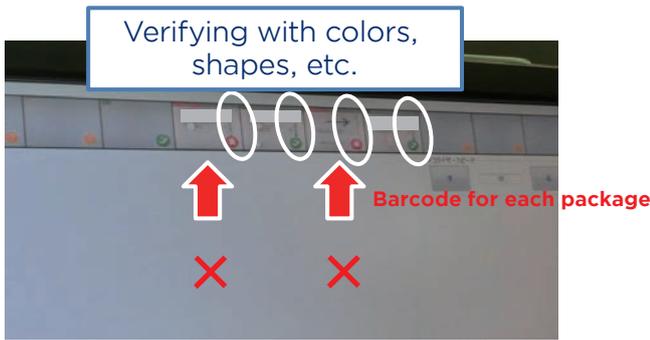
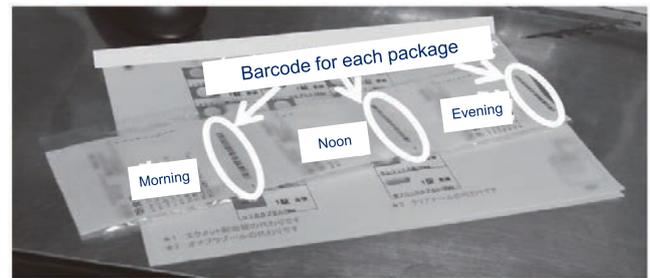


Fig. 5 Medicines in a one-dose package



quantity will be displayed. The name of the medicine will be deleted from the list once verification is completed. Repeat step 3 until all medicines are deleted from the list (Fig 3).

By using barcodes, pharmacists can ensure that they identify correct medicines and thus prevent errors in the picking process.

A new function was added to the checking system: it now not only verifies the accuracy but also informs users the necessary quantity for each medicine. The new function was more convenient for pharmacists and they have started to use the barcodes more proactively.

2) For Inpatients

Under an automated system, the hospital is focusing on one-dose packages, for which the system prepares one-time doses of medicines in one pack.

<Steps for one-dose packaging>

Step 1: Once prescription data is sent to an automated one-dose packaging machine, the one-dose packaging process begins. The machine is loaded with hundreds of different types of medicines, and each of them is verified by GS1 DataBar when loaded into the machine.

Step 2: Several medicines are packaged together for each part of the dosing schedule; such as, morning, noon, and evening. On each package, the patient's name, dosage regimen, names of medicines, and a barcode encoding serial number are printed.

Step 3: Put the prepared package into an image inspection machine. The image inspection machine takes a photograph of medicines in the

package. It then automatically verifies the accuracy of the contents by cross-checking the barcode printed on the package and the colors and shapes of tablets and capsules with pre-registered medicine data (Fig 4).

Step 4: If an error is found, a pharmacist will confirm the medicine by visual check or by enlarging the image taken by the machine (Fig 5).

2. Injection set preparation checking system

Injections used in wards are generally administered to patients after being mixed with transfusion for use in intravenous drips. The mixing process is called coinfusion. After coinfusion, it is impossible for medical staffs to confirm the name and quantity of medicines by visual check. Therefore, accurate picking of injection sets is vital.

<Picking Process>

Step 1: A pharmacist fills a picking machine with ampules and vials. When filling, the staff scans GS1 DataBar on ampule/vital label and barcodes on racks of the machine to fill in the accurate drugs into accurate racks.

Step 2: Once prescription data is sent to the picking machine, prescriptions and drip infusion labels will be printed out (prescription data and barcodes are printed on the label). Then, the machine automatically starts picking the drugs up.

Step 3: An assistant picks up the medicines that are not filled in the machine because of the size (such as transfusion and large containers) and prepares them in a basket.

Fig. 6 In the case of medicine errors



<Checking Process>

Step 1: A pharmacist starts the checking system, and scans the barcode on the name tag.

Step 2: Scan the barcode on the prescription to retrieve prescription data.

Step 3: Scan GS1 DataBar on medicines to verify, and put verified medicines in a basket to be delivered to the ward. If the wrong drugs have been selected, there will be an error display and alarm sound (Fig 6).

Before the implementation of the system, two pharmacists were engaged in this process; a pharmacist prepared and verified injection sets, and another pharmacist verified the sets again. After the introduction of the system, assistants can prepare injection sets and pharmacists are only in charge of the final verification, so pharmacists can do other work such as inpatient pharmaceutical services.

Conclusion

HAGA RED CROSS HOSPITAL has introduced AIDC technologies to its daily operations. Utilizing those technologies, the hospital reviewed the workflow and has achieved patient safety and cost efficiency at the same time.

Thanks to the high ratio of barcode display and the consistency of product identification code, Japan is one of the countries most prepared for the introduction of a traceability system utilizing GS1 standards. To leverage the benefit of this environment, GS1 Japan aims to introduce the advanced examples utilizing GS1 standards and promote to use GS1 standards at medical institutions. Through such efforts, GS1 Japan would like to contribute to the achievement of higher quality, safety, and efficiency in medical services.

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