

Introduction of Hands-Free Picking Utilizing GS1 Standards at Kyoto Second Red Cross Hospital



There are many different kinds of medical supplies used for surgery, and the necessary instruments differ according to the surgery to be performed. It is imperative that the proper instruments are prepared prior to each operation. However, this preparation is a complicated and highly responsible task. Even a single error can be a threat to patient safety. Thus, Kyoto Second Red Cross Hospital implemented a hands-free picking system utilizing wearable devices for scanning GS1 barcodes affixed to medical supplies to improve patient safety and medical efficiency.

Implementation of Hands-Free Picking System

The Kyoto Second Red Cross Hospital has been using GS1 barcodes for picking for over 10 years. Originally, medical workers cross-checked data in a medical supply barcode against the master data using an ordinary handheld scanner. After confirming, the selected instrument was placed onto a hand cart. Whilst this is a more accurate method when compared with manual checking, it

still required medical workers to do the work one-handed, while pushing the hand cart and holding the scanner.

In May 2013, the hospital implemented a hands-free picking system that utilized wearable devices with the aim of achieving even greater efficiency. This system uses three devices: a smart glass for displaying operation instructions, a headset for issuing voice commands, and a small wrist wearable barcode scanner.

The operation process is as follows:

- The worker wears the three devices and starts picking, while holding a handbasket.
- Followed by the call “start.”, the worker scans a barcode on the list of medical supplies.
- The medical supply to be picked is displayed with its storage location on the smart glass.
- The worker heads to the storage location (shelf) according to the display and reads the barcode attached to the medical supply (or shelf, case)

with the barcode scanner worn on the wrist.

- After reading the barcode, the worker places the medical supply in the handbasket. When the barcode of the medical supply is read, the smart glass automatically shows the next item to be picked.

This process is repeated until the worker finishes picking all the necessary medical supplies.

Fig. 1 A medical worker preparing medical supplies



Reviewing Flow Lines

Almost 7,000 operations are conducted annually at Kyoto Second Red Cross Hospital. The number of surgical techniques is close to 300, so it is an intricate task to arrange the medical supplies properly according to each operation method every time.

Unlike distribution centers or warehouses, work flow lines in hospitals are rarely taken into consideration because there are various medical supplies in different shapes and the storerooms are tiny.

With the introduction of the hands-free picking system, Kyoto Second Red Cross Hospital decided to review work flow lines as well. The storage place of medical supplies was reviewed according to the frequency of use, and an application that can set the optimum flow line for each picked item was incorporated into the system.

Additionally, as many of the instruments are similarly named and their shapes are indistinctive, indications of red circle were added to the pictures of medical supplies to be displayed on

the smart glass to allow for more reliable supply picking. The red circles are displayed on unique areas that make the item distinguishable from others.

With the introduction of hands-free picking system and the review of flow lines, the burden of this work has greatly reduced and accurate surgical supply picking has become possible without requiring a deep knowledge of medical products.

Aiming for Further Medical Safety and Efficiency

In addition to hands-free picking, the hospital uses GS1 barcodes to record the usage history of reimbursable medical materials and to verify medicines.

Medical Doctor Tanaka, Deputy Hospital President, has been promoting the introduction of the system utilizing GS1 standards, although he has also noted some limitations.

First, there is a problem that some products have multiple barcodes on one package. Medical workers may find it difficult to identify which barcode should be scanned.

While the hospital has prepared a manual and distributed it to each ward to help medical workers identify which barcode to read, Dr. Tanaka claims that applying two or more barcodes on the same package inconveniences users.

Dr. Tanaka also notes the fact that maintaining the master data, which is indispensable for such systems, is a demanding task. He hopes for the development of a standard database keyed by GTIN that can be used at any hospital to reduce the enormous amount of labor required to continuously update the master database.

Utilizing GTIN on medical supplies improves not only patient safety, which is the hospital's first priority, but also work efficiency. It is expected that moving forward the current status of barcoding ratio for medical supplies will continue

Fig. 2 Medical Doctor Tanaka, Deputy Hospital President of Kyoto Second Red Cross Hospital



Fig. 3 the Kyoto Second Red Cross Hospital



to improve, and GS1 barcodes will further contribute to medical safety and efficiency.

Outline of Kyoto Second Red Cross Hospital

The Kyoto Red Cross Hospital, founded in 1926, is

a regional acute hospital with 672 beds (*1). The hospital serves approximately 337,000 outpatients and 189,000 inpatients annually.

*1 As of April 2017.



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