



China

Chinese pharmaceutical manufacturer uses GS1 standards to help automate the hospital pharmacy process

Manual processes in the hospital setting are prone to errors, many of which could lead to patient safety concerns. With greater focus on automation to reduce errors, improve patient safety and meet regulatory requirements around the world, manufacturers and hospitals alike are looking for ways to evolve their processes to improve product data accuracy and process efficiencies, reduce costs and improve the patient experience. A pharmaceutical manufacturer in China, Hangzhou Huadong Pharmaceutical Group, is adopting GS1 standards to improve the accurate exchange of medicine information within the pharmaceutical supply chain, and is seeing positive results, from the time the medicine is packaged all the way through to its dispensing to the patient. Accuracy of medicine information and process automation through standardisation are leading to reduced costs, greater efficiencies and improved patient safety and satisfaction.



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Background

Hangzhou Huadong Pharmaceutical Group Co., Ltd. is a large pharmaceutical manufacturer based in Hangzhou, China and is the head office of Huadong Medicine, which is collaborating with the Hangzhou Binjiang Hospital. The company primarily focuses on developing products and services that benefit large and medium-sized hospitals and drugstores across the country.

With current medicine reform and market demand changes in China and around the world, pharmaceutical supply chain management is evolving day by day. Huadong Medicine, with

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the support of GS1 China, provides management consulting services for the hospital pharmacy management industry to incorporate best practices in the pharmaceutical and hospital supply chains.

Challenge

In the traditional model, the hospital or retail pharmacist would conduct a series of manual operations when dispensing medications. Because these manual operations are complex, the pharmacist cannot complete the process rapidly and effectively. This affects the patient who may not receive his medicine in a timely manner, which affects the quality of care and service levels.

In addition, the pharmacist is responsible for researching and procuring the medication, verifying its authenticity, planning its proper storage and inventory, and ultimately its safe

disposal when it expires. The pharmacist also dispenses the medical information to patients to ensure proper dosing and adherence to prescribing protocols, reducing the occurrence of the drug-related adverse events, and providing related drug consultation and pharmaceutical service. With the pressures on the pharmacist under the current model, the pharmacist cannot always effectively perform his or her role, and also cannot consistently deliver good service to the patients.

How to improve the working efficiency of the pharmacy and the service experience of patients has become one of the transformational goals in current hospital management.

Solution

Using the GS1 Global Trade Item Number (GTIN) and the additional product information (application identifiers or AIs), enables identification of all the drug packs in a standardised way. Furthermore, the item identification information encoded can be automatically collected and exchanged throughout the whole supply chain. Additionally, GS1 barcodes can be marked on multiple levels of the packaging (primary, secondary and even on the shipper/container lever). The two-dimensional GS1 DataMatrix barcode, for example is ideal for encoding large amounts of information in a relatively small space compared to a linear barcode, such as an expiration date or lot/batch number.



Picture 1
Medicine package and GS1 DataMatrix barcode

Benefits

Currently, about 60 % of the medicines used in the hospital are already marked with a GS1 barcode. This enables the hospital pharmacy to track and trace the drug from the moment it leaves the warehouse up to the point of dispense.

To enable full traceability with GS1 standards, for all of the medicines these are the steps followed:

1. Mark the medicine

The medicine distribution centre marks a GS1-128 on the case level (which includes medicine batch number, expiration date, and quantity of the trade items). The medicine warehouse uses a PDA barcode scanner to scan the specific information of the medicine required by the customers (hospital), to verify that the order matches the shipment.

When receiving the goods, the hospital can use a wireless handheld barcode scanner to scan the barcodes of the outer cartons one by one, to identify the related information, and check the storage information of the medicine.

2. Print two-dimensional barcode according to GS1 standards (GS1 DataMatrix) on secondary package

When there is no medicine batch number, expiration date and other information included in the barcode on the box of the medicine, the hospital decided to create a GS1 DataMatrix which includes the medicine product code, product batch number.



Picture 2
Automatic integrated closed medicine cabinet scans the barcode



Picture 3
Internal structure of automatic integrated closed medicine cabinet

The DataMatrix is then printed on an adhesive sticker through the online barcode printer, which then automatically sticks them to the corresponding medicine (box-packed) as shown on Picture 1.

3. Automate warehouse management

The automatic integrated closed medicine cabinet (automatic dispensing cabinet) reads the GS1 DataMatrix on the product package, obtains specific information of the medicine, and scans the size of the package by using a Infrared-3D scanner, shown in Picture 2.

The automatic integrated closed medicine cabinet automatically records the three-dimensional size of the medicine package and checks the medicine, and gets rid of the incorrect medicine through the detection system, so as to ensure the correct medicine is put on the conveyor belt. The cabinet is made of high-density taper slots (saving space to store medicine), and uses the manipulator to send the single-packed medicine to the position specified by the cabinet for storage, shown in Picture 3. Inside the cabinet, the system is constantly temperature controlled, and a transparent observation window allows to monitor the operation of the internal manipulator inside the cabinet.

4. Apply of the barcode technology at the hospital outpatient pharmacy

When the physician issues a prescription, the pharmacy staff scans the code related to the specific patient. The Hospital Information System automatically analyses the barcode and sends the prescription information to the dispensing system control platform. Then, the rapid dispensing system of the automatic medicine cabinet binds the code and the prescription together for the specific patient, and fetches the right medicine with the manipulator inside the medicine cabinet. This medicine is automatically transported to the corresponding medicine-dispensing window,



Picture 4
Internal structure of automatic integrated closed medicine cabinet

shown in Picture 4. The pharmacist uses a bar code scanner to read the GS1 DataMatrix on the outer package of the medicine. After confirming that the medicine information is in line with the prescription information of the patient, the pharmacist then provides the right medicine to right patient, and adds information such as the dosage, usage and side-effects of the medicine.

Conclusion

With the professional advice and technical support from GS1 China, Huadong Medicine developed a barcode solution based on GS1 standards. And thanks to the application of Automatic Identification and Data Capture barcode technology, hospital pharmacies can successfully automate their information management and medicine distribution processes using accurate product data that is recognised across multiple information systems.

Through using “only” barcode identification on the single medicine package, the hospital can accurately and clearly record the medicine information (medicine, patient, prescription, etc.), and establish an effective traceability system to simplify and streamline operational processes. Automation improves working efficiencies, shortening by approximately 40 % the time that it takes to verify, accept and store the medicine, ensuring the accuracy of the medicine information. By allowing full visibility on the medicine’s stock, automation reduces the error rate related to medicine distribution by over 95%.

Other benefits include a reduction in hospital management costs, and improvements in the patient experience, with enhanced safety and better quality of care. Accuracy of medicine information and process automation through standardisation are leading to reduced costs, greater efficiencies and improved patient safety and satisfaction.

About the authors



Wang Xuehua is Manager of Hangzhou Huadong Pharmaceutical Group Co., Ltd. has experience in GS1 standards application and the hospital information construction for more than ten years.



Shi Jin and Feng Qianqian are conducting research on the application of automatic identification technology in information systems in hospitals, logistics and other industries.

About the organisations

Hangzhou Huadong Pharmaceutical Group Co., Ltd., is mainly engaged in antibiotics, medicine, chemical synthetic drugs, genetically engineered drug production and wholesale and retail distribution business. The largest integrated pharmaceutical commercial enterprises in Zhejiang Province also heading Huadong Medicine.

Hangzhou Binjiang Hospital of Zhejiang University School of Medicine is a nonprofit medical institution. They have 410,000 outpatient visits and about 16,000 emergency people since 2013.