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# Modernising the pharmaceutical product supply chain in Hong Kong public hospitals

## Abstract

The Hong Kong Hospital Authority is a statutory body that manages all the public hospitals and affiliated institutions in Hong Kong, totalling 42 public hospitals, over 27,000 beds, 48 specialist out-patient clinics and 73 general out-patient clinics. In 2010, the Hospital Authority began its Supply Chain Modernisation project with the aim to achieve two main goals: firstly, to enable the track and trace capability in its handling of the large volume of pharmaceutical products through the adoption of industry standards including unique item identification as well as electronic data messaging protocols; secondly to achieve operational efficiency in the supply chain management process.

These goals, with the full collaborative support from the major pharmaceutical distributors, were successfully achieved in 2013. The entire implementation process of the Supply Chain Modernisation project had benefited from the professional technical advice from GS1 e.g. in the use of GS1 Standards and their support providing the appropriate training. The project has provided significant improvement in the workflow efficiency with much enhanced pharmaceutical product traceability and has paved the way to benefit medication and patient safety in the clinical care process.



## Manual processes created a challenge

In 2012, the Hospital Authority Hong Kong's drug expenditure amounted to near HK\$4 billion in pharmaceutical products. However, the entire supply management process was based on traditional manual workflow procedures, e.g. majority of the procurement and goods receipt processes were paper based. There was a lack of efficient and accurate means of recording the movement of different batches and expiration dates of the goods into and out of the pharmacy warehouse with high degree of questionable traceability.

To address these fundamental issues of concern, the Hospital Authority began an initiative in 2010 called the Supply Chain Modernisation (SCM) project, to revamp these related processes in order to:

- automatically check products received against ordered ones to improve accuracy and efficiencies; and
- automatically track and trace pharmaceutical products from the point they are received to the point of distribution to prevent expired medications from being dispensed.

## Ensuring operational efficiencies and patient safety through adoption of GS1 Standards

The Hospital Authority adopted the following GS1 Standards to help achieving the aims of the SCM project to track and trace pharmaceutical products:

- the Global Trade Item Number (GTIN) to identify every pharmaceutical product package;
- the Global Location Number (GLN) to identify every medication supplier and different delivery locations for their hospitals; and
- the Serial Shipping Container Codes (SSCC) to identify the logistic units in each goods delivery from the suppliers.

When cartons of products carrying the GS1-128 BarCode is scanned by Hospital Authority staff at the goods receipt process, vital information such as the GTIN, batch number and expiration date is provided via wifi access through the scanner. Since these products are delivered to different points-of-use throughout the Hospital Authority's operations, the Supply Chain Modernisation project provides an accurate tracking of products from one location to another through the use of the GLN.



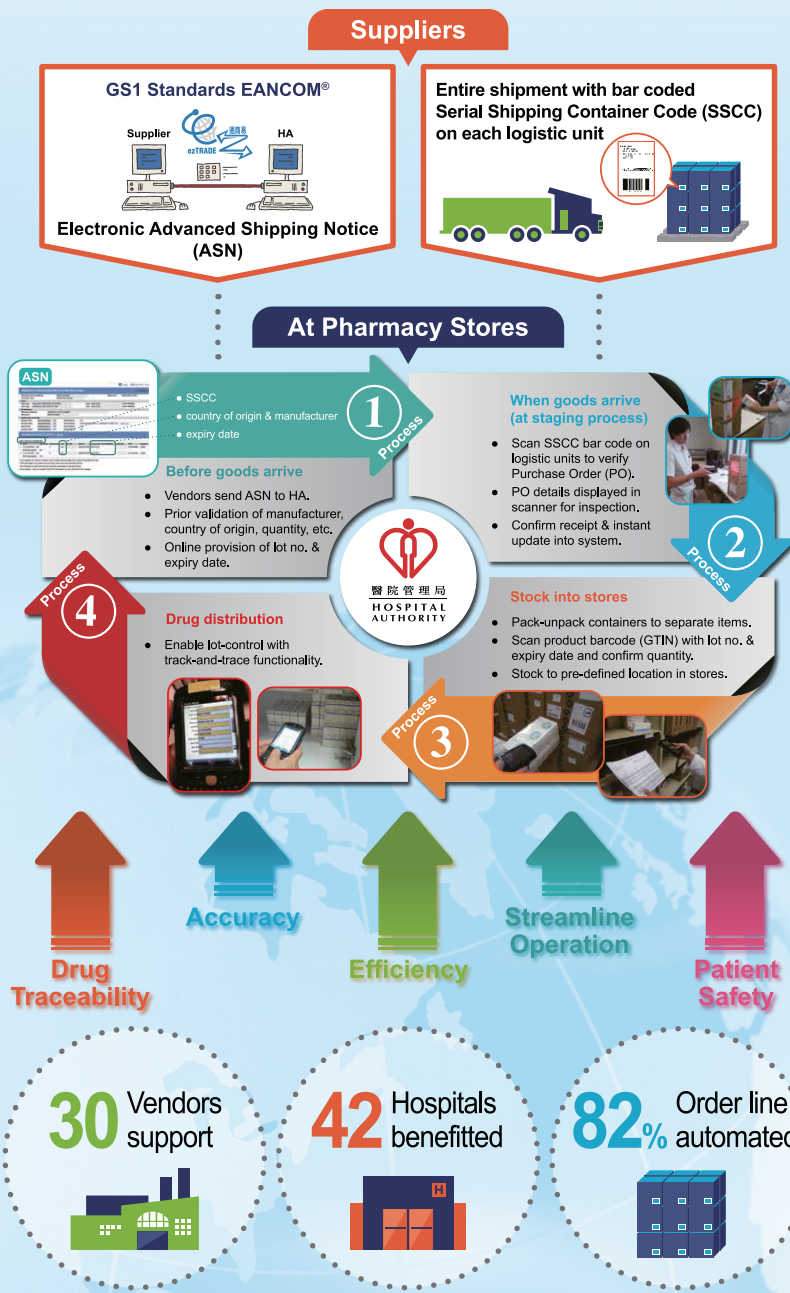
# PHARMACEUTICAL SUPPLY CHAIN MODERNISATION

## Make Traceability Possible

### DID YOU KNOW?

Starting from June 2012, Hospital Authority (HA) pharmacies are able to **track and trace** pharmaceutical products from external vendors into the pharmacy stores in a **more accurate and efficient way**.

### HOW DOES THIS WORK?



To facilitate the accurate and efficient exchange of information between the Hospital Authority and the suppliers, information such as purchase orders, purchase order responses, despatch advice and invoices, are sent and received using defined Electronic Data Interchange (EDI) protocols such as GS1 EANCOM®, the GS1 Standard for electronic business-to-business exchanges, were deployed.

The EDI processes and the improved Supply Chain process includes the following steps:

- The Hospital Authority sends the EDI purchase orders to the suppliers
- Upon receipt of these orders from the Hospital Authority, the suppliers pack up the required products and attach SSCC labels that contain GS1-128 BarCodes onto these shipments
- Suppliers then send an electronic despatch advice to the Hospital Authority for advance validation by the purchasing units.
- Upon delivery of the products at the Hospital Authority's warehouses, pharmacy staff scans the bar codes from the SSCC labels to retrieve information which was received in advance from the electronic despatch advice to make sure all the product data for the goods delivered, matches with the electronic information source.
- Pharmacy staff also checks to ensure the right products were delivered and counts the quantities delivered to ensure the delivery quantities are correct. After validation, the product data retrieved from the despatch advice through the scanners are confirmed and fed back through the wifi connection into the Hospital Authority's system.
- Suppliers then send electronic invoices to the Hospital Authority's finance department to settle the payment process.



## Successful implementation

To minimise the risks from the project implementation and to test out these solutions, an extensive pilot project was undertaken and conducted in two phases. In Phase 1, products were tracked from distributors into Hospital Authority pharmacy stores. In Phase 2, products were tracked from pharmacy stores to the dispensing stores.

From January 2011 onwards, with professional advice and business support from GS1 Hong Kong, the Hospital Authority successfully engaged an initial batch of 13 vendors who are the major suppliers of pharmaceutical products in its Supply Chain Modernisation project pilot accounting for more than 70% of the Hospital Authority's purchase volume. The Phase 1 of the project was successfully implemented in all the pharmacy stores and warehouses at 41 public hospitals in Hong Kong by June 2013.

The Hospital Authority then engaged a second batch of 13 vendors who constituted another 16% of their purchase volume. This second wave of implementation was completed in April 2014.

## Benefits of GS1 Standards

The Supply Chain Modernisation project was initiated in response to important quality care aspects in the healthcare industry – safety and efficiency. In implementing the project, the Hospital Authority revamped the entire processes which made use of GS1 Standards. **Along with its suppliers, the Hospital Authority is now able to harness supply chain visibility through the use of GS1 GTINs for products, SSCCs on logistical units, GLNs for delivery locations, and despatch advices for delivery notifications.**

- The adoption of GS1 Standards and implementation of the new process resulted in the realisation of a full range of benefits. Hospital Authority Hong Kong has enhanced the speed of their operations by replacing manual processes with automated ones,
- Hospital Authority Hong Kong has improved the accuracy of the information captured in their trading documents during the procurement cycle
- Hospital Authority Hong Kong has automated the validation of the goods delivery thus making the operations faster and more accurate.

With the appropriate technology and systems in place, the Hospital Authority was – and continues to be – able to improve the quality and safety of the healthcare services it provides.

## Next steps



By April 2014, the project covered 86% of the Hospital Authority's purchase volume of pharmaceutical products, with altogether 26 vendors participating. The Hospital Authority now intends to extend its Supply Chain Modernisation project further to more pharmaceutical products and suppliers.

Since many local suppliers have yet to be part of the Hospital's automated procurement process, it has worked with GS1 Hong Kong on educating them on the concept, processes and benefits of using GS1 Standards. Practical examples from the Supply Chain Modernisation project are shared with these suppliers, as well as with healthcare professionals and organisations in Hong Kong and abroad.

In the longer term, the Hospital Authority plans to develop a system with enhanced level of pharmaceutical product traceability – beyond the pharmacy and dispensary level to the point of patient care for every product and every patient. However, such a system would require the pharmaceutical products to be repackaged in such a way to facilitate the transfer of information such as the product identity, the expiration date and the batch number from the product to the tracking system at individual item levels to ensure that the right medication is administered to the right patient. The benefits are invaluable – it will help enhance pharmaceutical traceability and safety throughout the supply chain process for the patients and general population.





#### About the author

**Ms. S.C. Chiang** is the senior pharmacist with the Hong Kong Hospital Authority in charge of the development and implementation of the Supply Chain Modernisation project. Ms. Chiang began in the pharmacy industry and was one of the first pharmacists to develop a dispensing and labeling system, which was eventually used in all public sector pharmacies. She was also the first pharmacist to introduce automated dispensing technologies. Ms. Chiang obtained her Bachelor of Pharmacy from the University of Bradford, England and obtained a Master of Health Administration from the University of New South Wales, Australia.

#### About the Hong Kong Hospital Authority

The Hospital Authority is a statutory body that is responsible for managing Hong Kong's public hospitals and their services to the community. The Hospital Authority is accountable to the Hong Kong Special Administrative Region Government through the Secretary of Food and Health, who also formulates health policies and monitors the Hospital Authority's performance.

At present, the Hospital Authority has a workforce of around 64,000 people, managing 42 hospitals and institutions, 48 specialist out-patient clinics, and 73 general out-patient clinics. Between them, they provide 27,000 beds, or about 4 beds for every 1,000 members of the public.

***“The Supply Chain Modernization (SCM) project has adopted the GS1 Standards and this has turned out to be a successful healthcare system initiative that we have implemented recently to enable automation in the pharmaceutical procurement process and track-and-trace capability in the supply chain process in our hospitals, which is essential for the achievement of medication safety, supply chain efficiency, and traceability.”***

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