Inventory management systems guidance

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About the Healthcare User Group (HUG)

The HUG is made up of invited senior representatives from healthcare trade associations, providers, suppliers, solution and service companies, and other related organisations. Its purpose is to promote the adoption of GS1 standards throughout UK health systems, its suppliers and partners, in line with necessary regulatory requirements.

The objectives of the group are to:

- Drive adoption of standards across the NHS, starting with acute trusts in England, and extending to health systems in Northern Ireland, Wales and Scotland
- Support implementation of standards to identify every person, product and place
- Create a sharing and learning environment
- Offer support and advice to regional groups implementing our standards
- Be responsive to the evolving healthcare environment
- Provide feedback and advice on GS1 UK's healthcare plans and activity
- Work with regulatory and other bodies, to support national and international standards activity
- Act as the UK point of contact for the GS1 Global Healthcare Group and to provide healthcare related feedback into the Global Standards Management Process (GSMP)

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1. Introduction

1.1 Foreword

GS1 is a not-for-profit, member-owned association, operating in more than 150 countries. The GS1 vision is to enable organisations to speak the same language when it comes to identifying things, including people, products and places, capturing information at the point of interaction, sharing data throughout a trust's systems and processes from supplier to point of care/point of use.

GS1 defines standards for healthcare in concert with the global healthcare industry. This includes globally unique numbers, which are used in the identification of patients and caregivers, products, locations, and assets, anywhere within the global healthcare supply chain.

These standards enable, among other things, the accurate scanning of medicines at the pharmacy, the recording of medical instruments used in a surgical procedure, and the location of equipment in a hospital that supports patient safety.

GS1 understands the importance of having efficient and smooth-running supply chains for healthcare. Barcodes and identification technologies in hospitals are very important with huge patient-safety benefits drawn from positively identifying patients, their interaction with caregivers, and the items used in their treatment.

Standards have been deployed successfully within healthcare around the globe to drive improvements in patient care and safety, while at the same time reducing costs through improved efficiencies.

The main benefit of implementing GS1 standards is improved patient safety, achieved through:

- Recording of information scanned at the point of use
- Improved traceability
- Enabling checks on usage
- Fewer Never Events and critical errors
- Reduced administration errors
- More efficient processes
- Better medicines management
- Simplification and enhanced accuracy of order processing and receipting

GS1 standards are endorsed by the Department of Health and Social Care (DHSC), NHS Digital, NHS England, and the Medicines and Healthcare products Regulatory Agency (MHRA).

1.2 Purpose

The purpose of this document is to provide healthcare organisations with the information required to include in a tender specification to enable the use of GS1 standards and not to specify the capability, or scope requirements of, an inventory management system (IMS).

This document is produced and approved by the GS1 UK National Healthcare User Group. It is the knowledge of experts brought together in a working group to support the adoption of GS1 standards in healthcare.

1.3 Target audience

This document is a reference guide to implementing GS1 standards as part of inventory management system implementation in hospitals. It is intended for any hospital who wants to implement GS1 standards to improve the traceability of products within the organisation and facilitate interoperability across different parties and systems.

It is important to recognise that the GS1 standards detailed in this document will enable traceability across the associated healthcare landscape. As such, any function involved in the procurement, storing, clinical use, and recall of products, can benefit from their accurate identification using GS1 standards.

This document is also intended for solution providers. In line with current drives to improve the consistency, flexibility, and interoperability of technology across health and social care, all systems developed in house, commissioned, procured, or adopted, should be GS1 compliant (as applicable). The GS1 UK Compliance Specification for the NHS provides guidance for buyers and commissioners on what that really means, and how to ensure that new systems are GS1 compliant.

New and existing systems will need to utilise the appropriate GS1 Identification Keys as either a primary or secondary identifier for the required data elements, based on the functionality and purpose of the system being considered.

If providers are unable to provide GS1-compliant systems in line with the recommendations in this document, then full interoperability and traceability will be unfeasible.

2. Approach

2.1 Principles of the GS1 System

GS1 Identification Keys give organisations efficient ways to access information about items across their systems and through their supply chains, enabling this information to be shared with trading partners.

The Identification Keys allow organisations to assign standard identifiers to products, documents, physical locations and more. As GS1 Identification Keys are globally unique, they can be shared between organisations, enabling interoperability, and increasing supply chain visibility for trading partners.

GS1 standards in healthcare

GS1 standards for identification

GTIN – Global Trade Item Number | **GLN** – Global Location Number | **GSRN** – Global Service Relation Number
SSCC – Serial Shipping Container Code | **GIAI** – Global Individual Asset Identifier

| Manufacturer **GLN** | Item **GTIN** | Case **GTIN** | Logistics unit **SSCC** | Transport **GIAI** | Distributor **GLN** | Logistics unit **SSCC** | Hospital **GLN** | Building **GLN** | Storeroom **GLN** | Fridge **GLN** | Patient **GSRN** | Ward **GLN** | Theatres **GLN** | Patient and registries **GSRN/GTIN/GLN** |

3. GS1 standards and inventory management
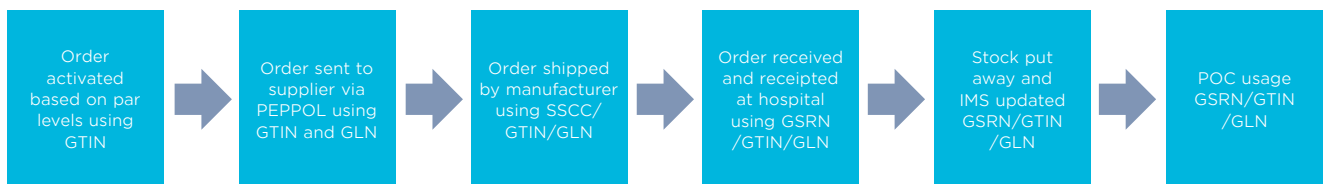
The informatic below presents the internal supply chain pathway from product order to point-of-care (POC) scanning with the patient.

Orders	Receipting	Recall	New items	Consumption
		Quarantine	Catalogue	Point of care scanning (POC)
		Identification		
		Tracking		
		Expiry management		
		Stock takes		
		Internal transfers or transfers to another site		
Standards GTIN GLN	**Standards** GTIN GLN SSCC		**Standards** GTIN GLN	**Standards** GTIN GLN GSRN

3.1 Purchase orders

The purchase order must include:

- Organisation's GLN
- Supplier GLN
- Product GTIN per line item must be the purchasing unit GTIN
- Ship-to and Bill-to GLNs

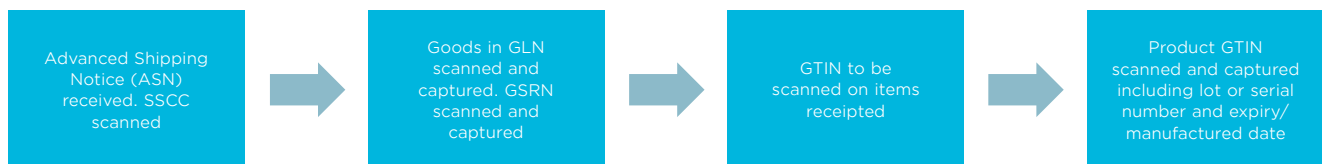| Order activated based on par levels using GTIN	→	Order sent to supplier via PEPPOL using GTIN and GLN	→	Order shipped by manufacturer using SSCC/ GTIN/GLN	→	Order received and receipted at hospital using GSRN /GTIN/GLN	→	Stock put away and IMS updated GSRN/GTIN /GLN	→	POC usage GSRN/GTIN /GLN

3.2 Receipting

When the product arrives at the organisation, the organisation needs to know which product has been receipted where and by whom.

The system:

- Must be able to scan and/or hold a physical location GLN to confirm the receipting location
- Must be able to retrieve the product information from its GTIN when scanning the barcode
- Must be able to capture the batch/lot, serial number and any dates from appropriate items' barcodes
- Must have the ability for the GTIN to be scanned at different packaging levels

If the IMS has the functionality to receive ASNs then the SSCC should be captured. If individual staff are identified in the IMS, then the GSRN should be captured.

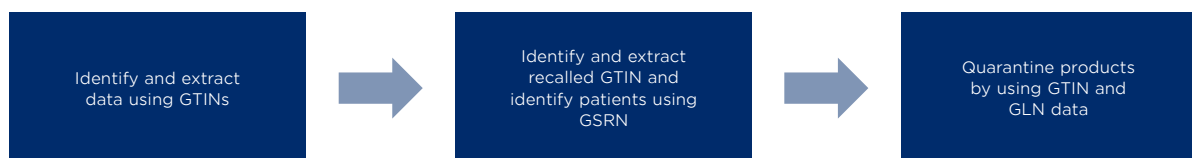| Advanced Shipping Notice (ASN) received. SSCC scanned | → | Goods in GLN scanned and captured. GSRN scanned and captured | → | GTIN to be scanned on items receipted | → | Product GTIN scanned and captured including lot or serial number and expiry/ manufactured date |

3.3 Product recall

The system:

- Must have the ability to identify any recalled products from the GTIN and any lot/batch, serial number and date provided by the MHRA
- Must have the ability to quarantine an item via its GTINs in the event of a product recall, in order to stop it being transacted through the system, issued or consumed
- Must have the ability to provide the information to the organisations' supply chain team or nominated staff, to identify the physical areas where the products are stocked to allow for the physical removal and isolation
- Must have the ability to provide stock location information via a GLN, so that the supply chain team or nominated staff can remove and isolate the recalled products

If patients are identified in the IMS then the system should have the ability to capture the GSRN.

| Identify and extract data using GTINs | → | Identify and extract recalled GTIN and identify patients using GSRN | → | Quarantine products by using GTIN and GLN data |

3.4 Identification and tracking

Organisations need to have visibility of inventory across the supply chain and across the patient pathway. Each time the product is moved, the GTIN must be used to capture the transaction within the IMS.

- Must be able to use the GTIN and corresponding barcode to track an item through the supply chain and identify its location
- Must be able to hold physical location GLNs and scan barcode GLNs where appropriate
- May also be able to use GLN Extension Components for sub-locations such as bins and shelves
- Must be able include GTINs and GLNs in transaction reports

Track the product information and location using GTIN and GLN	→	Capture GLN when GTIN moved at shelf or room level	→	Provide reports on GTINs and GLNs for tracking stock/audit purposes

3.5 Expiry

As well as the GTIN, a product's batch/lot, serial number and date information may be encoded in a GS1-128 or GS1 DataMatrix barcode. Having a barcoded expiry date enables the system to identify items with a short expiry, enables easier stock rotation, and facilitates the removal of expired products from stock.

The system:

- Must be able to capture the expiry date by scanning the barcode and extracting the expiry data from the Application Identifier (AI) – 17 and adding it to the expiry date field in the IMS
- Must be able to extract appropriate date information from a product's barcode, parsing it against the applicable field in the database
- Must be able to report or alert expiry dates against relevant product's GTINs to ensure waste can be kept to a minimum

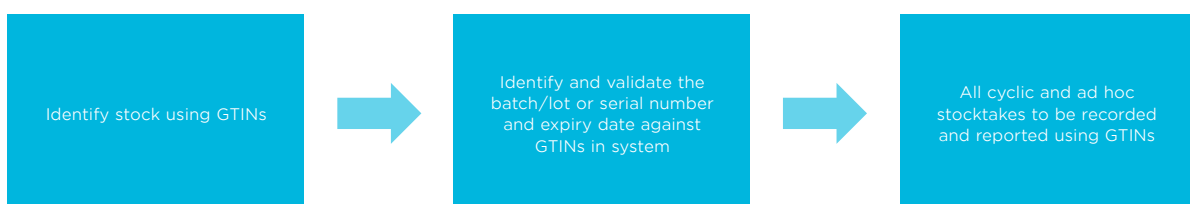| Capture the expiry date associated to the GTIN	→	Alert and report on products with specified short expiration dates using GTINs	→	Use GTIN data to move products and capture locations using GLNs

3.6 Stocktaking

Organisations will probably implement a number of types of stock takes in line with best practice, including planned cyclic stock taking and ad hoc stocktakes. All types must be recorded in the IMS.

The system:

- Must be able to identify products by the GTIN when carrying out a stocktake
- Must be able identify and validate the specific batch/lot or serial numbers and dates of manufacture/expiry when scanned against what is already captured within the system

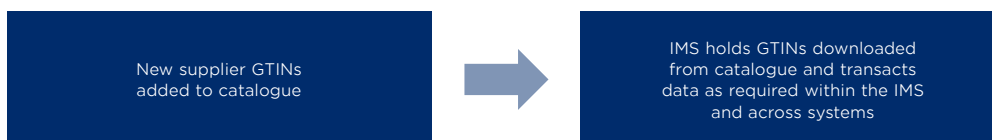| Identify stock using GTINs	→	Identify and validate the batch/lot or serial number and expiry date against GTINs in system	→	All cyclic and ad hoc stocktakes to be recorded and reported using GTINs

3.7 Transfer

The system:

- Must be able to track products that are transferred to another internal or external location e.g. another hospital
- Must scan the product GTIN when transferred and scan the GLN, where implemented
- Should capture the GSRN of the person carrying out the transfer by scanning the staff ID badge, where implemented

| Identify products transferred to other organisations using GTIN (and GLN and GSRN where implemented) | ➕ | Identify products transferred to other internal locations (ward, department) using GTIN (and GLN and GSRN where implemented) |

3.8 New products

For products to be shared accurately across different systems in the organisation it is important that the GTIN is uploaded into the product catalogue accurately and maintained along with all the product master data and any new products to the catalogue in the first instance so that they are system generated from the master data.

- All new products added into the catalogue should include the GTIN and supplier GLN
- The IMS should hold all product GTINs to enable the products to be scanned and the data captured and transacted while carrying out various activities

| New supplier GTINs added to catalogue | ➡ | IMS holds GTINs downloaded from catalogue and transacts data as required within the IMS and across systems |

3.9 Barcode management

Organisations want to validate the product information when a product is scanned. Organisations are recommended to check and cleanse their barcode data annually and remove GTINs which are no longer relevant.

The system:

- Must scan GS1 barcode symbols (EAN/UPC, GS1-128, ITF-14, GS1 DataMatrix)
- Should cross-reference all the relevant packaging levels of GTIN to the product. This will ensure that the purchasing unit of measure can be scanned at receipt through to the storage location. If broken down further and issued or consumed at each level, the GTIN on that packaging level can be scanned and recognised by the system, and the relevant data captured and allocated to the specific fields.
- Should have the ability to validate GTINs when scanned and cross reference to a product

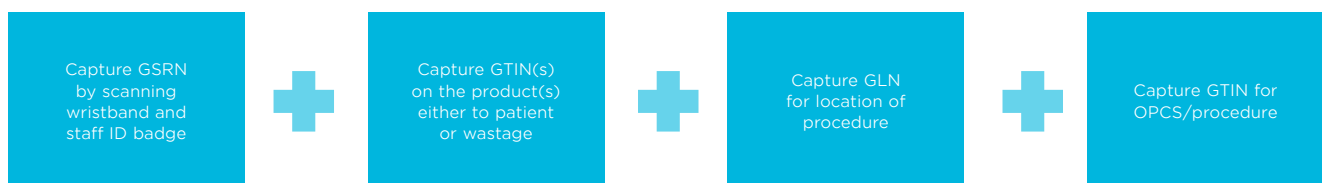| IMS receives GTIN information from regularly cleansed catalogue		IMS validates GTINs against catalogue information held within the IMS when scanned

3.10 Point of care

Point-of-care scanning takes place when product(s) are used on a patient. Organisations want the ability to capture all products used on a patient, along with the caregiver and the location, to provide full traceability.

GTINs have been allocated for OPCS codes by NHS Digital and have been released on the TRUD (Technology Reference data Update Distribution).

The system:

- Should capture the GSRN of the patient by scanning the patient wristband and allocating the patient number into an appropriate field in the IMS which can be easily extracted for reporting purposes
- Should capture the GSRN of various caregivers, as specified by the organisations, by scanning the staff ID badge and allocating the staff number into the appropriate field in the IMS which can be easily extracted for reporting purposes
- Should capture consumption of products through the scanning of their GTINs, facilitating monitoring of:

    - When a product has been issued
    - Point of care consumption to a patient
    - When a product has been written off
    - Product wastage

- Should capture the location where an activity is taking place through the scanning of a physical location GLN barcode
- The range of locations is to be determined by the organisations e.g. at point of care locations such as theatres and cardiac catheter labs
- Should capture an OPCS codes' GTIN, parsing it into the appropriate field in the database

Capture GSRN by scanning wristband and staff ID badge		Capture GTIN(s) on the product(s) either to patient or wastage		Capture GLN for location of procedure		Capture GTIN for OPCS/procedure

Further information

GS1 UK Compliance Specification for the NHS
GS1 UK | GS1 UK Compliance Specification for NHS systems

GS1 UK partner finder
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