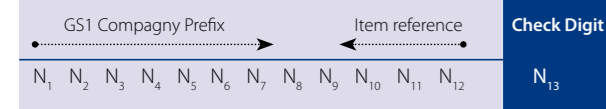→ A **GTIN** (Global Trade Item Number) is an identification number for products and services. It is normally constructed from a GS1 company prefix assigned to a company, an item reference designated by the company, and Check Digit.

GS1 Company Prefix							Item reference					Check Digit
N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}	N_{13}

When a GTIN is assigned, the producer must transmit the information linked to this number as well as the packaging hierarchies. All units (base and logistic) carry a GTIN. Further details can be found on www.gs1.org/id_keys
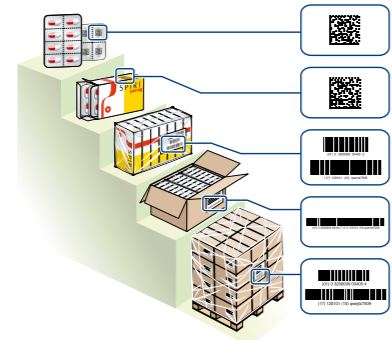
→ A **GLN** (Global Location Number) is a 13-digit number that identifies any physical or legal locations involved in a given transaction. For example; the order originator, the product shipping location, the unloading location and the final delivery destination (medical care unit, etc.). Further details can be found on www.gs1.org/id_keys

→ An **SSCC** (Serial Shipping Container Code) is an 18-digit number that uniquely identifies a logistic unit. Like all GS1 Identification Keys, it standardised structure guarantee its uniqueness. Any logistic unit that is stored, shipped, transported, or received, is thus readily identifiable using an SSCC. Upon emerging from the manufacturing or preparation process, the logistic unit is created and it is given an SSCC. Two identical trade units will have the same GTIN but two different SSCCs. The SSCC is used to manage storage and shipping of the units that are routed and traced independently.

The SSCC, which must be marked on every logistic unit, is the key to accessing information from the electronic shipping notice (Advance Shipment Notice (ASN) or Despatch Advice) that includes dynamic information such lot/batch number, expiry date, etc. This enables internal traceability within a facility. Such information can also provided in bar codes on the GS1 logistic label.

→ **GS1-128** is a linear bar code symbology. **Data Matrix** is a 2D symbology. They are both able to carry information using GS1 Application Identifiers, which are defined by GS1 and enable the bar coding of information such as product identification (GTIN), expiry date, shipping information, etc. The bar code used is according to data required for the business application, as well as the size of the packaging.
In the case of 'serialised' products, and as part of the fight against counterfeiting, radio frequency tags (RFID) might be used. Further details can be found on www.gs1.org/barcodes

→ The development of electronic exchange (Internet or value added networks) enables companies to connect the flow of commodities with relevant information flows, facilitating the smooth operation of supply chains. Every stage in the life of a product within a supply chain generates a standardised message, readily understandable by the information systems of all supply chain partners. The manufacturer transmits the product's characteristics and logistical hierarchy using a product information message. When he has received and processed an order, he informs his partner of the delivery date and of the content of the logistic unit, using an electronic shipping notice. These messages are electronically exchanged using standard formats. Messages relating to transport will be transmitted to the carriers, also electronically. The carriers then provide notification of successful delivery.
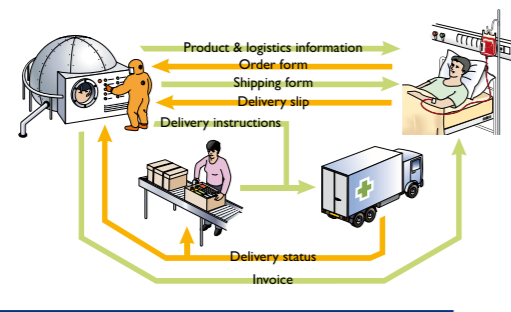
→ Healthcare facilities use other **GS1 Identification Keys** to mark and trace equipment (containers, tanks, cabinets, etc.), especially when they might be reused, cleaned and exchanged among facilities. The **GRAI** (Global Returnable Asset Identifier) enables such unequivocal identification by combining an Asset Type Identifier and a serial number. This code is also used to manage inventories. To identify the link between a patient and a healthcare service, the **GSRN** (Global Service Relation Number) is a unique code assigned by the healthcare facility at the time of patient registration. The **GDTI** (Global Document Type Identifier) is a code that enables the identification of documents such as medical prescriptions, hospital discharge notices, etc. It is used primarily to link these documents to the patient's medical chart/records.
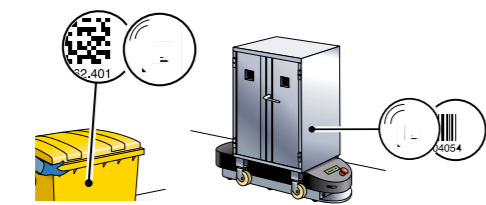
→ For more information see www.gs1.org

GS1-The global language of business

GS1 is a leading global organisation dedicated to the design and implementation of global standards and solutions to improve the efficiency and visibility of the supply and demand chains globally and across sectors. The GS1 system of standards is the most widely used supply chain standards system in the world. For more information on GS1, please visit: **www.GS1.org**

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**GS1 Standards
in the Healthcare Supply Chain**
- improving patient safety

Logistics for the Healthcare Industry

In all supply chains, correct logistics management optimises the circulation of products and materials, and ensures the link between the flow of physical items and the flow of information. It takes a holistic approach to a company's activities, as well as to the lifecycle of a given product, from its conception to its disposal. As a result, logistics management is positioned at the intersection of a company's many different activities and environment.

In the healthcare industry, logistics manage the flow of materials, products and patient data, and oversees the flow of information linked to these physical flows, in order to ensure quality and safety at a high level of performance and efficiency, from the manufacturer to the patient.

Supply Chain Participants

Logistics management takes a global approach to supply chain processes. At one time or another, all supply chain participants find themselves involved in all (or some) of the following logistics operations:

→ **Industry**
Receiving and inventory management of raw materials, packaging materials, manufacturing, finished product inventory management, plant localisation, order picking, shipping, transportation.

→ **Logistics**
Warehousing / Dealer / Carrier
Receiving and product inventory management, consolidation/deconsolidation, recycling, constituting lots and kits, order picking, tracking, tracing, shipping.

Shipper
Transport and delivery of raw materials, packaging and finished products.

→ **Healthcare facilities / Dispensaries**
Receiving, inventory management, order picking, unitary management, distribution, administration and traceability of products, as well as, in certain cases, providing logistics services.

Benefits of Traceability for Healthcare

The most significant benefits of traceability for products and information in the healthcare sector are:
• ensuring the safety of patients and healthcare professionals
• controlling the costs of production and procurement
• controlling logistics costs
• facilitating itemized billing
• maintaining regulatory compliance

GS1's global, multi-sector identification standards provide all of these benefits and contribute to:
• increasing the reliability of the physical tracking of products and materials
• reducing the number of supply chain partner disputes and optimizing the coordination of orders, receipts, and invoices
• eliminating duplicate inputs
• saving time in product preparation, shipping and receiving
• improving traceability and thereby contributing to patient safety
• enabling targeted and efficient management of product recalls
• increasing reliability and optimizing inventories
• improving the quality of service in medical care units
• enabling the automatic recording of data, to ensure the quality of information and traceability
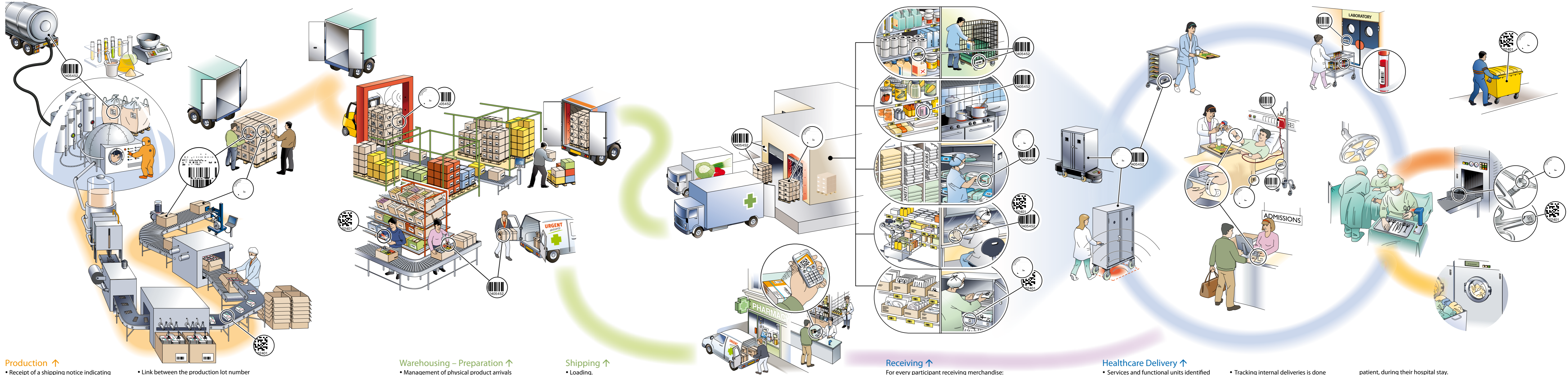
Description of the Major Supply Chain Processes
Each of these processes might be performed by different organisations or by a single entity

Industry →→→

Logistics provider →→→

Healthcare facility →→→

Production ↑
- Receipt of a shipping notice indicating traceability information linked to the raw material and packaging being used.
- Quantity control of merchandise using SSCC.
- Validation of receipt and delivery slip signature.
- Registration of lot/batch numbers and dates.
- Acceptance of primary materials.
- Recording of lot numbers used.
- GTIN assignment and marking for base units and creation of their lot numbers.

- Link between the production lot number and the raw materials used.
- GTIN and SSCC assignment for logistic units.
- Recording the links between SSCC and the content of logistic units: GTIN + lot/batch number + expiration date.

Warehousing – Preparation ↑
- Management of physical product arrivals and shipments using SSCC.
- Management of the separation and release of lots.
- Assignment of locations.
- Registering the movement of merchandise.
- Physical inventory.
- Order picking.
- Creation of logistic units, assignment and remarking of SSCC.
- Tracking inventory movements, linking SSCC, product, lot/batch number, and delivery destination.

Shipping ↑
- Loading.
- Reading and registering SSCC.
- Sending shipping notices to recipients with delivery itemisation.
- Sending shipping orders to the carriers.
- After delivery, the carrier sends a transport status report.
- Integrating information in order to efficiently coordinate orders, deliveries, and invoices.

Receiving ↑
For every participant receiving merchandise:
- Planning for receipt of goods based on shipping notices.
- Unloading and SSCC reading.
- Control of receiving through efficient coordination with shipping notices.
- Coordinating orders and deliveries, sending acknowledgements of receipt.
- Entering product data into inventory records.
- Transmitting information to efficiently manage orders and invoices.

Healthcare Delivery ↑
- Services and functional units identified by their GLN send out internal requests using the product's GTIN.
- Preparation processes, assignment and registration of SSCC, delivery and receiving, all based on the same information as all other logistics processes.
- Sterilization, bleaching and restoring, are all production processes using the full range of GS1 identifiers; GTIN, SSCC, GRAI.

- Tracking internal deliveries is done with the aid of a GRAI, which identifies the material and also allows for tracking, washing, disinfecting, maintenance, etc.
- Delivery traceability is enabled by the link between the GRAI and the delivery contents as indicated by its SSCC.
- Patients, and the services provided to them, are identified using a GSRN, read and registered in a database at each stage and movement of the

patient, during their hospital stay. The GSRN thus contributes to the safety and traceability of the patient.
- Products are identified by their GTIN + lot/batch number and are recorded in the patient's medical chart/records so as to ensure the complete safety and traceability of all events that take place during the patient's stay. This information facilitates itemized billing.