HEALTHCARE PROVIDER IMPLEMENTATION GUIDE

GS1 Global Trade Item Number® (GTIN®)
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## FOR MORE INFORMATION ON GTIN IMPLEMENTATION, VISIT WWW.GS1CA.ORG/E/HCSUNRISE OR CONTACT GS1 CANADA AT 1.800.567.7084 EXT. 3 OR INFO@GS1CA.ORG.ANALYZING GTIN ROI FOR YOUR ORGANIZATION ................................................................. 19

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Executive Summary

The Canadian and U.S. healthcare sectors are transitioning to the use of GS1 Global Trade Item Numbers (GTINs) by the sunrise date of December 31, 2012. The current use of non-standardized product information in the healthcare supply chain results in costly errors, wasteful inefficiencies, and has implications for patient safety. The healthcare industry has therefore committed to implementing a common business language for product identification: the GS1 GTIN standard, part of the GS1 System of standards.

The purpose of this document is to provide guidance to Canadian healthcare providers about the need for standardized product identification in order to meet the Canada/US 2012 GTIN sunrise date. This document introduces and explains the GS1 GTIN and describes how his globally-unique identification code facilitates reliable and efficient management of precise product information. In addition, the benefits of supply chain management, operational efficiency and competitive advantage are discussed. Finally, this document provides detailed steps for implementing GTINs in your company.

In alignment with activities in the U.S and globally to move toward standardization of the healthcare supply chain, the GS1 Canada Carenet Healthcare Sector Board has indicated its support for the adoption of the GTIN as the national standard for product identification across the sector.

Using this document, you will better understand how the:

- Healthcare sector’s current use of multiple proprietary product identification numbers is error-prone and inefficient; and
- Use of GTINs for product identification will best fulfill the sector-wide need for a comprehensive approach to product identification that accommodates all of your organization’s supply chain roles and activities.
About GS1®

About GS1®
GS1 is a neutral, not-for-profit organization dedicated to the design and implementation of global standards and solutions to improve the efficiency and visibility in supply chains. GS1 is driven by more than 1.3 million companies, who execute more than 6 billion transaction as a day with the GS1 System of standards. GS1 is truly global, with local Member Organizations in over 100 countries, with the Global Office in Brussels, Belgium. Learn more at www.gs1.org.

About GS1 Canada™
GS1 Canada is a member of GS1, the world’s leading supply chain standards organization. As a neutral, not-for-profit organization, GS1 Canada enables its more than 20,000 members – organizations of all sizes from 23 sectors across Canada – to enhance their efficiency and cost effectiveness by adopting electronic supply chain best practices. Learn more at www.gs1ca.org.

About Carenet
Carenet is GS1 Canada’s healthcare sector strategy to standardize the healthcare supply chain. Based on an amalgamation between CareNET Services Inc. and GS1 Canada in 2008, GS1 Canada now represents over 470 Canadian healthcare providers and 95 suppliers, supporting the use of standards-based electronic commerce practices in healthcare to enhance patient safety and business process efficiency. The main goal of GS1 Canada’s healthcare strategy is to build an interoperable framework that will ensure pan-Canadian system integration of e-supply chain standards. Learn more at www.carenet.ca.

About GS1 Healthcare
GS1 Healthcare is a global, voluntary healthcare user group developing global standards for the healthcare supply chain and advancing global harmonization. GS1 Healthcare consists of participants from all stakeholders of the healthcare supply chain: manufacturers, wholesalers & distributors, as well as hospitals and pharmacy retailers. GS1 Healthcare also maintains close contacts with regulatory agencies and trade organizations worldwide. GS1 Healthcare drives the development of GS1 standards and solutions to meet the needs of the global healthcare industry, and promotes the effective utilization and implementation of global standards in the healthcare industry through local support initiatives, including GS1 Canada’s healthcare strategy. Learn more at www.gs1.org/healthcare.
Introduction to Standards

Trading partners in the healthcare supply chain need to share many and complex pieces of data in order to transact business and support their work. For example, manufacturers and distributors need to communicate product information and company location, and hospitals need to share location information. In order to be efficient and effective in that effort, a common language and globally-accepted standards are essential. Without such standards, supply chain partners face high, unnecessary costs due to inaccurate data and supply chain information inefficiencies.

In the US, the *Efficient Healthcare Consumer Response* (EHCR) study of 1996, analyzing the use of standards in the U.S. healthcare system, found that $11 billion ($15.5 billion US in 2010 dollars) is wasted each year in the healthcare supply chain primarily because data standards are either entirely lacking or not as widely used or well-developed as in other industries.\(^1\) Second, a groundbreaking report on patient safety issues by the Institute of Medicine in 1999 (and a follow-up report five years later) cited staggering statistics about medical error\(^2\) and widespread systemic problems. In Canada, the healthcare system, excluding long-term care environments, could save approximately $430 million per year based on an extrapolation of a 2007 Institute of Medicine U.S. estimate on using product identification standards to prevent adverse drug events in hospitals.\(^3\) The problems highlighted in those studies have risen to the forefront of Canadian and international attention today, and the momentum behind the movement to adopt and implement data standards in the healthcare supply chain is directly related to the fact that standards are essential for solving these problems.

In response, a movement has been building in the healthcare supply chain to adopt and implement data standards to support patient safety and improve supply chain management. A growing number of companies, hospitals and healthcare organizations have chosen the GS1 System to help them improve collaboration with their supply chain partners. For over 35 years, the GS1 System has provided globally accepted identifiers and a common language for the communication of supply chain information about products, services and locations.

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How Standards Help to Solve Supply Chain problems

Without standards, supply chain partners are left to develop their own identifiers and data formats, resulting in numerous proprietary “standards” for healthcare suppliers and providers to manage. The existence of proprietary “standards” causes supply chain inefficiencies and inaccurate data that introduce unnecessary cost and confusion into business processes and prevent interoperability within and between healthcare facilities. Healthcare providers need to communicate product and location information with their supply chain partners, and with the various sites and departments within their own enterprise.

Without a common language and globally accepted standards, healthcare providers, companies and/or industry associations are left to develop their own identifiers and data formats, resulting in numerous proprietary “standards” for healthcare providers and companies to manage. However, as discussed in the Efficient Healthcare Consumer Response study, this is the cause of billions of dollars of waste in the healthcare industry. Moreover, the existence of numerous “standards” causes supply chain inefficiencies and inaccurate data that inserts cost and confusion into healthcare business processes, threatening quality of care and patient safety.

Global standards promote simplicity, consistency and accuracy in supply chain communications. In today’s complex markets, supply chain lines are blurring and channels of distribution for various sectors are overlapping. This is especially true of the healthcare industry where manufacturers of healthcare products often supply both hospitals and consumer goods retailers in Canada and across the globe. Pharmacies and hospitals purchase consumer goods as well as healthcare products. The pharmaceutical supply chain has expanded to include supermarkets and consumer goods retailers in addition to traditional pharmacies. Global standards are essential in this environment. In Canada, the emergence of Shared Service Organizations, Regional Health Authorities and provincial consolidation strategies drives the need for system integration and interoperability. Never before in Canada’s healthcare system has the need for standards been more prevalent.

How Standards Benefit the Healthcare Supply Chain

Global standards support healthcare business processes and can bring about many benefits for patient safety and supply chain management, such as:

- Reduction in medication errors through efficient automatic identification: *the right product for the right patient at the right time through the right route and in the right dose*
- Efficient traceability
- Efficient product authentication
- Less time spent on manual documentation, leaving more time to consult directly with patients
- Cost reduction through increased supply chain efficiency
- Improved order and invoice process
- Optimized receiving
- Reduced inventory
- Increased productivity
- Improved product recall
• Improved shelf management
• Improved service levels/fill rate
• Improved benchmarking and management of supply cost
• Elimination of the need for re-labeling and proprietary codes
• Regulatory compliance (where applicable)
About the Standards

The GS1 System is an integrated suite of global standards that provides for accurate identification and communication of information regarding products, assets, services and locations. Using GS1 Identification Numbers, companies and organizations around the world are able to globally and uniquely identify physical things like trade items, assets, logistic units and physical locations, as well as logical things like corporations or a service relationship between provider and recipient. When this powerful identification system is combined with the Global Data Synchronization Network (GDSN), the connection is made between these physical or logical things and the information the supply chain needs about them.

Global Location Number (GLN)

The Global Location Number (GLN) is the globally unique GS1 Identification Number for locations and supply chain partners. The GLN can be used to identify a legal entity (like a health system facility), a function within a legal entity (like a hospital pharmacy or accounting department) or a physical entity (like a warehouse or hospital wing or even a nursing station). The attributes defined for each GLN (e.g., name, address, class of trade, etc.) help users to ensure that each GLN is specific to one, very precise location within the world.

Global Trade Item Number® (GTIN®)

The Global Trade Item Number® (GTIN) is the globally unique GS1 Identification Number used to identify “trade items” (i.e., products and services that may be priced, ordered or invoiced at any point in the supply chain). GTINs are assigned by the brand owner of the product, and are used to identify products as they move through the global supply chain to the hospital or ultimate end user. The attributes defined for each GTIN (e.g., size, weight, packaging, etc.) help users to ensure that each GTIN is specific to one, very precise trading unit configuration (e.g., a blister of two aspirin tablets; a bottle of 100 aspirin tablets; etc.).

Data Synchronization

GS1 Canada enables organizations to exchange standardized product and location information by publishing and retrieving such information through a process known as data synchronization. Through data synchronization, any changes that an organization makes to its product or location information in the central registry are automatically and immediately provided to all of this organization’s trading partners. This automated approach to data management ensures that supply chain information is identical among trading partners, increasing data accuracy and driving costs out of the supply chain.

In Canada, an organization’s GLNs are stored in ECCnet Locations, the TrueSource® Registry for Party & Location Information by GS1 Canada. It is a central, online, searchable database of accurate location information – including Global Location Numbers (GLNs) and GLN-related details (e.g. street address, city/town, province, postal code, etc.) – for Ship To and Bill To locations to support trading partner transactions. ECCnet Locations helps ensure products arrive at the right place.

Similarly, GS1 Canada offers two options for product information management.

GS1 Canada GDSN

GS1 Canada GDSN is a GS1 GDSN-certified data pool service, serving organizations requiring synchronization of product data within the GS1 Global Data Synchronization Network (GDSN). The GDSN connects suppliers and retailers, operators, providers, distributors, and other recipients to the GS1 Global Registry via GDSN data pools, enabling the electronic exchange of product and location information between trading partners and thereby eliminating manual processes.
ECCnet Registry Product Information Catalogue Service

ECCnet Registry is Canada’s national product registry, which operates outside of the GDSN network. This product information catalogue service offers a single point of access between trading partners for exchanging accurate, perpetually-cleansed product information based on global standards. It streamlines business processes by enabling suppliers to maintain all of their product information in one central location and share this with multiple trading partners.

With the new category of medical device product data launched in Fall 2011, ECCnet Registry is the most comprehensive, perpetually-updated and continually validated registry of healthcare product data of its kind in Canada. It offers a single point of access for healthcare trading partners to exchange vital product data used in every-day operations, from medical devices to pharmaceutical and food product data.

The Case for the Global Trade Item Number® (GTIN®)

The Problem: Numerous Approaches to Product Identification Across the Organization

There is currently no universally adopted product identification standard for all healthcare-related products. The absence of universal, standards-based product identification has led to serious problems in healthcare supply chains. For example:

- 60% of all invoices generated in the healthcare supply chain have errors – and each invoice error costs $40 to $400 to reconcile.²
- The lack of standards for unit of measure combined with the lack of distinct identifiers for different product packaging levels causes confusion and ordering errors. For example, providers may receive 20 boxes of sterile pads when they actually meant to order 20 cases, or they may order 50 arm splints and receive 500 because splints are sold in units of 10.

These issues are highly problematic for healthcare providers. With intense competitive forces, regulatory changes and increasingly sophisticated customers, one theme common to all healthcare providers is the ever-growing pressure to improve efficiency and enhance competitive advantage.³ However, as the above examples illustrate, the absence of universal, standards-based product identification directly undermines that effort by driving up transaction costs and creating data errors that have implications for patient safety.

In response, many healthcare participants (e.g., hospitals, manufacturers, distributors, etc.) began assigning their own proprietary numbers to products. Although that would have been complicated enough, the use of different identification numbers for the same product extends much further than healthcare manufacturers, distributors and providers. American healthcare suppliers often sell their products to countries around the world, each of whom may have their own product identification requirements. Moreover, in today’s complex markets, supply chain lines are blurring and channels of distribution for various sectors are overlapping. For example,

Improving Patient Safety and Supply Chain Efficiency

suppliers of healthcare products often supply both hospitals and consumer goods retailers, and manufacturers of healthcare products often manufacture non-healthcare related products as well. As a result, healthcare suppliers selling their own products in other sectors face product identification requirements associated with those other sectors as well.

The existence of numerous product identifiers for the same product has created its own problems. Maintaining all of the various numbers has become a nightmare, requiring providers to create and manage maps among all territorial demarcations across product lines, geographical markets and/or channel of distribution (i.e., IT systems using different product identifiers and thereby inhibiting corporate-wide visibility and analytics). As all of this shows, the absence of globally-accepted, standardized product identifiers has resulted in an error-prone, inefficient approach to product identification that undermines supply chain management and efficiency.

The Solution: Standardized Trade Item Identifiers

The solution to these problems is GS1 GTINs – global standards-based product identifiers. The use of a globally-accepted, standardized approach to product identifiers enables a healthcare organization to efficiently and effectively manage information about all of the various products used in their healthcare facilities. Moreover, the use of a globally accepted, standardized approach to identifiers provides a common language to facilitate the communication of product information among supply chain partners. This promotes the efficient exchange of accurate product information with supply chain partners to support orders, returns and recalls. It facilitates the flow of accurate product information within the healthcare organization itself. This enhances patient safety [e.g., by supporting Barcode Point of Care (BPOC) Systems] and facilitates supply chain management (e.g., inventory replenishment and distribution).

The GS1 System provides globally accepted identifiers, standards and a common language for the communication of supply chain information. The GS1 Identifier for products is the GTIN. For decades, the GTIN has facilitated the sharing and communication of product information among supply chain partners in 23 industry sectors in over 150 countries across the globe. The GTIN has provided the foundation for innovative improvements in supply chain management for many Canadian and American industries. The most notable is the well-documented advances in the retail and grocery industries directly attributable to their adoption and implementation of GTINs in particular and the GS1 System in general.
What is a GTIN?

A Global Trade Item Number (GTIN) is a GS1 standards-based globally-unique identification number used to identify “trade items” (i.e., products and services that may be priced, ordered or invoiced at any point in the supply chain).

GTINs are used to identify individual trade item units (like a box of 15 Brand X tissues), as well as all of their different packaging configurations (like a carton of six boxes of Brand X tissues). GTINs are assigned by the brand owner or manufacturer of the product, and are used to identify products as they move through the global supply chain to the hospital or ultimate end user. In fact, GTINs are already being used across the healthcare sector today, from prescription drugs, to medical devices, to healthcare supplies.

GTIN is a standard that can be used by all supply chain partners, independent of industry sector or location. As a result, healthcare suppliers can use GTINs for all aspects of their business: they can use GTINs virtually anywhere in the world to identify their healthcare and non-healthcare related products to all of their healthcare and non-healthcare customers.
How is a GTIN Used?

GTINs are assigned by the manufacturer of a product. Once assigned, GTINs are used by supply chain partners to:

1. Identify products as they move through the supply chain; and
2. Provide a link to the information pertaining to a product.

Identification of Products

Manufacturers mark their products with the applicable GTIN to support supply chain partners in accurately identifying products. Using a globally-accepted, standardized product identifier supports supply chain partners in accurately identifying products as they move through the supply chain to the healthcare provider or ultimate end user. Supply chain partners can enter GTINs into their computer systems either by manual data entry (i.e., typing) or automatically via the data carrier [i.e., bar code scanners or radio frequency identification (RFID) readers]. The option of entering a GTIN into an IT system automatically using data carriers (as opposed to typing it in) enables users to record a GTIN with minimal manual intervention, increasing both speed and accuracy. This promotes a safer and more secure supply chain, and can be especially useful for prescription drugs and recalls.

Link to Product Information

The GTIN not only identifies a specific trade item, but also provides the link to related product information. This enables supply chain partners to simply reference a GTIN in supply chain communications, as opposed to manually entering all of the necessary product information. Using a GTIN to reference trade item information promotes efficiency, precision and accuracy in communicating and sharing product information. For this reason, a GTIN is required in many types of e-commerce transactions, and is commonly used on purchase orders, as well as delivery and payment documents.
Advantages of Using GTINs in the Healthcare Supply Chain

Standards-based numbering systems are essential for efficient and effective communication of product information in supply chains. The GTIN is a global standard that delivers trade item data in a consistent format and structure based on the globally-accepted GS1 System. As such, GTINs provide suppliers with a method for product identification that is simple and can be used by all of their customers.

With GTINs, suppliers are able to implement one, comprehensive approach to product identification in all of their systems and for all of their supply chain needs. This is because the GTIN is a global standard used in 23 industry sectors. Suppliers can use GTINs to identify all of their products in their customer-facing communications and systems, regardless of whether that customer is a provider, pharmacy or retail outlet. Advantages of using GTINs include:

- **International**: GTINs are a global standard that can be assigned and used anywhere across the globe.
- **Unique**: GTINs can be used to uniquely identify healthcare trade items, including every packaging configuration of a product.
- **Multi-sector**: GTINs can be used by all business sectors, enabling a healthcare product, a grocery product, a retail product, and 99% of the items used in the healthcare sector to be identified with the same standardized identification number. This enables healthcare manufacturers to use GTINs in supply chain communications with all of their customers regardless of sector, making inventory systems, ordering systems and accounting systems compatible across different operational units.
- **Automatic Data Capture**: One of the key benefits of the GTIN is that it can be encoded in many automatic data capture technologies, such as bar codes or RFID tags. This supports automatic data capture using both current and emerging technologies. Automatic data capture enables users to enter a GTIN into an IT system with as minimal manual intervention as possible, increasing both speed and accuracy.
- **Data Integrity**: Use of the GTIN for product identification enables users to leverage ECCnet Registry for product information. ECCnet Registry offers a continuous, automated approach to data management that ensures that product information is identical among supply chain partners, increasing data accuracy and driving costs out of the supply chain.

GS1 provides a registry service (i.e., a search tool) that enables subscribers to look up the owner of a bar code. That service, available on the GS1 website, is known as GS1 GEPIR. With GS1 GEPIR, users simply enter the GTIN displayed with a bar code, and GEPIR will identify the owner of that bar code/GTIN.

(A link to GS1 GEPIR is provided in the References of this document.)
Benefits to Healthcare Providers

Healthcare is about much more than supply and demand. There is perhaps no other industry where accuracy and speed are more important. In healthcare, caregivers need the right products, in the right location, at the right time to ensure the proper patient treatment. GTINs provide the foundation for that effort.

GTINs enable healthcare providers to efficiently and effectively manage information about all of the various products used in their facilities using a unique, global standard for product identification. This facilitates communication of accurate product information among supply chain partners and within the provider as well, translating to significant benefits for supply chain management and patient safety.

Patient Safety

Caregivers need the right products, in the right location, at the right time to ensure the proper patient treatment. GTINs provide the foundation for that effort by facilitating accurate product information among supply chain partners and within the organization as well. Correct product identification and accurate product information about all of the various products used in healthcare facilities has many benefits for public health and patient safety.

Patient safety benefits of using GTINs

- **Right product**: Using GTINs in healthcare facilities provides accurate identification of products, facilitating caregivers’ efforts to ensure that the right product is delivered and used for patient care.
- **BPOC systems**: Many hospitals have leveraged automated bar code identification and technologies in their processes supporting patient care, such as Bar Code Point of Care (BPOC) systems. Use of GTINs in such systems facilitates identification of the products used/administered at bedside to ensure that they are correct.
- **Pharmaceutical and biological products**: GTINs are already used by the pharmaceutical sector to identify pharmaceutical and biological products at both the individual unit and orderable case level. Use of those GTINs in BPOC Systems for prescription drug administration can help enhance those systems and reduce medical errors.
- **Medical devices**: Many medical devices are already identified using GTINs, providing an opportunity for providers to leverage those identifiers to improve medical device reporting.
- **Product recalls**: Using GTINs facilitates a streamlined product recall process.
- **Supply chain integrity**: GTINs support accurate identification of products from point of origin to point of care. This promotes a safe and secure supply chain by providing greater visibility, accuracy and efficiency.
Supply Chain Management

Use of the GTIN facilitates communication of accurate product information among supply chain partners. In addition, it enables healthcare providers to efficiently and effectively manage information about all of the various products used in their healthcare facilities. This promotes more efficient business practices and helps to drive down supply chain costs for both healthcare providers and suppliers.

Supply chain benefits of using GTINs:

- **Reduced labour costs**: Use of GTINs frees staff time by eliminating the need to build and maintain cross reference tables in order to keep track of multiple proprietary identification numbers.

- **Improved information quality**: Using the GTIN as the link to product information improves information quality by ensuring that data is identical among supply chain partners. This benefits both internal and external business processes.

- **Simplified supply chain management**: GTINs strengthen business communications among supply chain partners by accurately identifying specific products with specific numbers. This facilitates the global flow of healthcare trade items and associated information.

- **More efficient payment and reporting processes**: With the use of GTINs, sales can be reported to providers automatically and with fewer errors, improving Electronic Data Interchange (EDI) and eBusiness transactions.

- **Enhanced inventory management**: GTINs provide positive product identification, ensuring that receivers can easily identify items for distribution and use, and supporting replenishment operations.
December 2012 GTIN Sunrise in Canada & the U.S.

To improve patient safety and supply chain efficiency, organizations and companies throughout the Canadian and U.S. healthcare supply chain have announced their support to adopt GS1 standards by the industry-accepted sunrise dates of December 31, 2010 for the GS1 Global Location Number (GLN) to standardize location identification and December 31, 2012 for the GS1 Global Trade Item Number (GTIN) to standardize product identification. The “2012 GTIN Sunrise” date established by the healthcare industry calls for the adoption of GTINs in lieu of custom product numbers. The benefits of such an adoption have been delineated throughout this guide. Healthcare supply chain participants are working to meet the following GTIN criteria by December 2012:

- GTINs are assigned to healthcare products.
- GTINs are used in business transactions.
- GTINs are marked on appropriate packaging levels.
- GTINs are scanned at points-of-delivery to enhance clinical process.
- GTINs are used in product returns and recalls.
- GTINs are published in ECCnet Registry.

In alignment with supply chain standardization activities in the U.S. and global healthcare industries, the GS1 Canada Carenet Healthcare Sector Board has indicated its support for the adoption of the GTIN as the national standard for product identification.

More information on the 2010 GLN and 2012 GTIN Sunrise Dates for Healthcare can be found at www.gs1ca.org/e/hcsunrise.

Implementing GTINs in Your Organization

So, what exactly does it take to implement GTINs in a healthcare organization? What are the steps and who is involved? The following step-by-step instructions will help you implement GTINs.

Implementation Steps
Note: Since each organization varies, begin by reviewing all of the implementation steps in their entirety, and then decide where to start based on your organization’s current GTIN implementation status as well as your organizational requirements and priorities. The benefit an organization realizes initially varies depending on the requirements of their suppliers and their internal system readiness. The following steps are provided as a general guideline.

- **Step One: Establish Executive Support**
  The goals are to inform and educate executive management on standards adoption and the need for industry-wide implementation, and to obtain executive approval to proceed with GTIN implementation. As with any project that will impact the business processes of the organization, the support of senior management is critical. Many managers may already be familiar with the term GTIN through dialogues with your suppliers.

- **Step Two: Form a GTIN Advisory Group**
  The goal is to establish an Advisory Group. Formation of a cross-functional group including individuals outside of supply chain functions promotes buy-in, supports communication efforts, and ensures proper input
from the areas most impacted by implementation.

- **Step Three: Establish a Primary Point of Contact**
  Establish a primary point of contact within the organization who has the primary responsibility to ensure the integrity of the GTINs.

- **Step Four: Develop & Initiate Project Communication**
  The goal is to inform your community of your commitment to GTIN implementation. Utilize internal communication tools such as newsletters and intranet to introduce the concept of the GTIN to your organization, and external communication tools like websites and corporate letters for your suppliers. The Advisory Group member from Public Relations should be enlisted in this effort. This effort should announce that your organization is readying to use GTINs in both its external and internal communications.

- **Step Five: Initiate Education for the Advisory Group & Operational Team**
  The goal is to educate organizational personnel that will be impacted by implementation of GTINs. A base level of knowledge about GTINs, GS1 Canada’s healthcare strategy and GS1 standards is necessary for all active participants.

- **Step Six: Engage Supplier Involvement**
  The goals are to prepare suppliers and to identify partner(s) for testing. This is the most important step in this process. *What do your suppliers want and need to conduct their business?* Collaboration and communication with your supplier community is critical to implementation success. Review recent use cases (e.g., Seton Family of Hospitals / BD Success Story, available at www.carenet.ca) and engage strategic suppliers in a process of communication about your organizational plans. It is recommended that a trusted partner be selected first to align the initial implementation. GS1 Canada is here to support your organization’s implementation process: contact us at 1.800.567.7084 ext. 3 or info@gs1ca.org.

- **Step Seven: Establish Implementation Strategy**
  The goal is to establish data storage referencing GTIN. At this point, you are ready to establish a GTIN utilization strategy and corresponding data packaging level chart. The establishment of your organization’s GTIN packaging level is a critical step in the implementation process. It is necessary to consider not only how business is currently conducted, but also future business processes and supply system possibilities. In order to do that, current and possible distribution and billing systems must be clearly understood.

  The group must decide which tables/databases in the organization’s information technology (IT) systems must contain GTINs. The question that must be asked is: which proprietary numbers used today can be replaced with GTINs? At a minimum, the group should consider the tables/databases in the following IT systems: purchasing, replenishment, recall, eBusiness, classification [i.e., United Nations Standard Products and Services Code (UNSPSC)], inventory management, transportation, etc.

- **Step Eight: Assess Information System Issues & Make Necessary Changes**
  The goal is to evaluate the readiness of your information systems, and make the appropriate system changes required to accommodate the use of GTIN. The capability of your information system to contain and utilize GTINs and other Application Identifiers (AI) must be assessed, and the necessary changes budgeted and programmed, keeping in mind the 2012 GTIN Sunrise date.

- **Step Nine: Identify/Allocate GTINs**
  The goal in this step is to compile the GTINs used to uniquely identify each of the products used/purchased at your facility. Hospital databases already contain many GTINs assigned to products by their manufacturers. Therefore, this effort will encompass assessing the GTINs you already have, and then requesting that suppliers forward any GTINs you do not have for all of the packaging levels they supply to your facility. Sharing the same, accurate product information with your suppliers helps ensure data integrity.
Step Ten: Conduct Transactional Testing With Suppliers
The goal is to successfully exchange transactions with suppliers. At this point, you are ready to conduct transactional tests with your suppliers. The testing process will provide validation of information system capabilities and operational impact, and may include your Materials Management Information Systems (MMIS), Electronic Data Interchange (EDI) transactions, contracts, etc. It is recommended that providers first perform this step with their top/key suppliers and refer to the Healthcare EDI Implementation Guidelines, which are available at www.carenet.ca.

Step Eleven: Make Adjustments to Initial GTIN Implementation Plan
The goal is to review the initial plan and make corrections based on work group experiences and lessons learned. As a result of the review process, potential adjustments may need to be made to all aspects of the program, from internal processes through communications.

Step Twelve: Create Standard Operating Procedures
The goals are to document standard operating procedures that establish the necessary control, maintenance and support of GTIN and auto-identification and data capture (AIDC) of products using such means as product bar codes, and obtain sign off and funding, both internally and externally. Following the review process and the implementation of the necessary adjustments, it is necessary to prepare standard operating procedures for internal and external staff. The Advisory Group and Operational Team should be heavily involved in this process.

For more information on GTIN implementation, visit www.gs1ca.org/e/hcsunrise or contact GS1 Canada at 1.800.567.7084 ext. 3 or info@gs1ca.org.
Analyzing GTIN ROI for Your Organization

In today’s dynamic healthcare environment of growing operational costs, strained budgets and a reduced labour pool, healthcare organizations expressed a need to establish a return on investment (ROI) for the use of GTIN. Indeed, demonstration of positive ROI for GTIN supports organizations challenged daily by the allocation of scarce resources. This section provides guidance and a model to help each organization determine their own return on investment based on their individual needs and circumstances. The model is provided as a starting point for any organization wishing to pursue ROI analysis.

It is good to note that beyond the analysis provided in this section for the ROI of GTIN alone, additional benefits and ROI can be found in the implementation of GTIN as part of the implementation of the full GS1 System of standards, including Global Location Numbers (GLNs). Moreover, most “early adopter” organizations have realized additional value in unanticipated areas like process improvement and infrastructure development. And, many have noted the value of a new “business philosophy” or way of doing business which places the organization in an advantageous position to address some of the upcoming challenges anticipated in healthcare over the next few years.

Background Information re: ROI from GTIN Use in Other Industries

The implementation of standards-based product identification in other industries has been found tremendously valuable, as discussed and analyzed at length in the article 17 Billion Reasons to Say Thanks. The following excerpt is provided to support your efforts to discuss the benefits of GTIN implementation and ROI:

In October, 2001 AT Kearney was engaged by the Grocery Marketing Association (GMA) and the Food Marketing Institute (FMI) to evaluate and provide recommendations for e-commerce collaboration. Recommendations of this study included the adoption of an industry-wide, standardized numbering system, providing benefits and savings across the supply chain such as out of stocks, cost of reconciling invoice errors, receiving times, and speed to market. More significant, but more difficult to capture, were the benefits from supply chain visibility and collaboration that can drive significant inventory reductions across the whole supply chain.

In the book industry, the move to computerize book information led to the realization that a descriptive/alpha system was too cumbersome. In the grocery industry, the idea had been around, but the evolution of commercially viable scanning equipment signified an opportune moment. It is significant to note that both industries adopted an all-numeric schema.

Only in the grocery industry have significant attempts been made to quantify the benefits of using GTINs. Net benefits (after implementation costs) were initially estimated at approximately 1% of sales, but more recently revised to 2.8% of sales, or US$8 billion. These benefits were primarily due to increased process efficiencies and productivity gains. The same studies also estimate that an additional US$15 billion of benefits could potentially be realized through improved collaboration. In the case of the book industry, the benefits and savings of using a standard product identification numbering system were considered so obvious that a cost/benefit analysis was not even done to quantify anticipated results.

In conclusion, the agreement to adopt a standardized product identification numbering system provides the foundation to reap extensive benefits throughout the supply chain, not only for all the individual members but also in growing the whole industry.3

Hot Spots for ROI

There are various functions and business processes which will be directly impacted and improved through the use of GTINs. These functions and business processes serve as “hot spots” for capturing return on investment of GTIN implementation. To support your ROI analysis, a list of ROI hot spots is provided below. Begin your ROI analysis by determining the amount of staff time and resources currently allocated to each of these functions. In addition, determine the amount of manual error corrections being done in each function as well.

Supply Chain Management

Consider each of the following scenarios both before and after GTIN implementation:

- Wrong product shipped due to product number error in purchase order.
- Wrong quantity shipped due to product packaging level error in purchase order.
- Right product, but:
  - No bar code
  - Incorrect bar code (i.e. bar code not scannable)
  - Not a GS1 bar code
  - Not in database
- Off catalogue purchases from non-preferred vendors (e.g., staff goes to a local outlet or store to purchase supplies they have run out of).
- Error due to the wrong product being returned.
- Distribution of the wrong product in the facility.

Operational Efficiency

In terms of operational efficiency, consider the following before and after GTIN implementation:

- Hours devoted to tracking product identification numbers.
- Hours devoted to dealing with product problems and errors.

Purchasing Management

Track the number of times before and after GTIN implementation:

- Product information from suppliers is not correct (e.g., unit of measure issues).
- Product information in purchase reports received from suppliers is incomplete.
- There is confusion about what the product is.
- There is incomplete and inaccurate supplier information.
Lessons Learned & Best Practices

The following case studies illustrate lessons learned and best practices for GTIN implementation. Documents can be found in the GS1 Healthcare US Online Document Library. (Visit www.gs1us.org/healthcare to download.)

**Document Library Folder: General**

- The Case for Global Data Standards in the Healthcare Supply Chain
- Seton Family of Hospitals / BD Success Story

**Document Library Folder: AutoID in Healthcare**

- RSS Study - Pharmacia and Dept. of Veterans Affairs
- RSS Study - Abbott Laboratories and St. Alexius Medical Center
- RSS Study - Alcon Laboratories
Frequently Asked Questions (FAQs)

What is a Global Trade Item Number (GTIN)?

The GTIN is the GS1 System standard term for product and process identification. The GTIN is a number shown below a product’s bar code, used for the unique identification of trade items worldwide. A trade item is any product or service upon which there is a need to retrieve predefined information and that may be priced, ordered, or invoiced at any point in the supply chain. A Global Trade Item Number may be 8, 12, 13, or 14 digits in length, represented as GTIN-8, GTIN-12, GTIN-13, and GTIN-14 respectively.

Is a unique GTIN required for every level of packaging?

Yes. There should be a unique GTIN identifying the consumer unit, an inner pack, multi-pack, case, or pallet where applicable.

What is GTIN Compliance?

Because of history and technical changes, bar codes can be 8, 12, 13 or 14 digits. An organization that is able to process, store, and communicate information about their products with trading partners using all GTINs, whether 8, 12, 13, or 14 digits, is considered to be GTIN compliant. To be current, a GTIN should be stored in a data base as 14 digits. Organizations can become GTIN compliant by expanding the appropriate systems and applications to 14-digits. This will support the GTIN on products at all levels of packaging (consumer, inner packs, multi-packs, cases, and pallets, etc.) It is necessary to become GTIN compliant to take advantage of the benefits of data synchronization and use of ECCnet Registry.

If a change is made to the product does the GTIN need to change?

A separate unique GTIN is required whenever any of the predefined characteristics of an item are different in any way that is relevant to the trading process. The guiding principle is if the customer is expected to distinguish a new item from an old item and purchase accordingly, a new GTIN should be assigned to the new. For complete information, refer to the GTIN Allocation Rules for Healthcare.

What can be identified using GS1 Identification Numbers?

**Trade items:** Products and services upon which there is a need to retrieve pre-defined information at any point in the supply chain: Global Trade Item Number (GTIN).

**Logistic units:** Physical units established for transport and storage of products of any kind that need to be tracked and traced individually in a supply chain: Serial Shipping Container Code (SSCC).

**Assets:** Fixed or returnable assets: Global Individual Asset Identifier (GIAI), Global Returnable Asset Identifier (GRAI).

**Locations:** Legal entities, functions within legal entities or physical entities requiring a permanent identification, such as a healthcare provider, accounting department, or warehouse: Global Location Number (GLN).

**Service Relations:** Public or private service provider to track any entity’s service requirements and needs over a continuing relationship: Global Service Relation Number (GSRN).

Note: All GS1 identifiers use the same GS1 Company Prefix assigned to the organization.
What are Application Identifiers?

The GS1 System uses a bar code that can carry special prefixes to identify and separate multiple identification (ID) numbers. These two-, three- or four-digit numbers are called Application Identifiers (AIs). When a scanner sees this special bar code, it automatically knows to look for AIs in order to separate and interpret ID numbers properly. The information that comes after the AIs can contain numeric (n) or alphanumeric (an) data characters.

What is a U.P.C.?

The U.P.C. on a product is both a bar code and an identification number. The bar code is the bars and spaces, properly termed an EAN/UPC bar code. The product’s globally-unique identification number is the 12-digit number shown below the bar code, properly termed a GTIN-12. Scanning the bar code enters the 12-digit GTIN into business applications – the most common use is at the checkout counter.
## Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Glossary Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>AI</td>
<td>Acronym for Application Identifier (defined below).</td>
</tr>
<tr>
<td>Application Identifier (AI)</td>
<td>The field of two or more digits at the beginning of an element string that uniquely identifies its format and meaning within the GS1 System.</td>
</tr>
<tr>
<td>Attribute</td>
<td>A piece of information reflecting a characteristic of the object to which an identification number (i.e., GLN, GTIN, etc.) relates.</td>
</tr>
<tr>
<td>Bar Code</td>
<td>A precise arrangement of parallel lines (bars) and spaces that vary in width to represent data.</td>
</tr>
<tr>
<td>Company Number</td>
<td>A number allocated by the GS1 Numbering Organization. It is combined with the GS1 Prefix (for the GS1 Member Organization) to create the GS1 Company Prefix. The GS1 Company Prefix (i.e., the GS1 Prefix + the Company Number) uniquely identifies a provider.</td>
</tr>
<tr>
<td>Data Carrier</td>
<td>A physical or electronic mechanism that carries data (e.g., a bar code or RFID tag).</td>
</tr>
<tr>
<td>Data Format</td>
<td>Required structure for the numerical string of a GS1 Identifier (e.g., text, length, spacing, punctuation, etc.)</td>
</tr>
<tr>
<td>Data Standard</td>
<td>The entirety of all GS1 System data standardized in meaning and structure.</td>
</tr>
<tr>
<td>Data Structure</td>
<td>The GS1 System data structures defined in the various lengths required for the different identification purposes, which all share a hierarchical composition. Their composition blends the needs of international control with the needs of the user.</td>
</tr>
<tr>
<td>EDI</td>
<td>Acronym for Electronic Data Interchange (defined below).</td>
</tr>
<tr>
<td>Electronic Commerce</td>
<td>A method of business communications and management using electronic methods, such as electronic data interchange and automated data collection systems.</td>
</tr>
<tr>
<td>Electronic Data Interchange (EDI)</td>
<td>The computer-to-computer exchange of structured information, by agreed message standards, from one computer application to another by electronic means and with a minimum of human intervention.</td>
</tr>
<tr>
<td>GLN</td>
<td>Acronym for the GS1 Global Location Number (defined below).</td>
</tr>
<tr>
<td>Global Location Number</td>
<td>The globally unique GS1 System identification number for legal entities, functional entities, and physical locations. The GLN is 13 digits, comprised of a GS1 Company Prefix, Location Reference, and Check Digit. Supply side trading partner locations generally include corporate headquarters, regional offices, warehouses, plants, and distribution centers. Demand side trading partner locations generally include healthcare provider facilities, divisional offices, stores, and distribution centres.</td>
</tr>
<tr>
<td>Global Trade Item Number</td>
<td>The globally unique GS1 System identification number for products and services. A GTIN may be 8, 12, 13, or 14 digits in length, represented as GTIN-8, GTIN-12, GTIN-13, and GTIN-14 respectively.</td>
</tr>
<tr>
<td>GS1 Company Prefix</td>
<td>A globally unique number assigned to companies/organization by GS1 Member Organizations, including GS1 Canada, to create the identification numbers of the GS1 System. It is comprised of a GS1 Company Prefix and a Company Number.</td>
</tr>
<tr>
<td>GS1 System</td>
<td>The specifications, standards, and guidelines administered by GS1. GS1, through the Global Standards Management Process, manages the GS1 System to maintain the most implemented standards in the world.</td>
</tr>
<tr>
<td><strong>Term</strong></td>
<td><strong>Glossary Definition</strong></td>
</tr>
<tr>
<td>------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>GS1-128 Bar Code Symbol</strong></td>
<td>A subset of the Code 128 Bar Code Symbol that is utilized exclusively for GS1 defined data structures. UCC/EAN-128 Symbols can be printed as stand-alone linear symbols or as a composite symbol with an accompanying 2D Composite Component printed directly above the GS1-128 linear component.</td>
</tr>
<tr>
<td><strong>GTIN</strong></td>
<td>Acronym for the GS1 Global Trade Item Number (defined above).</td>
</tr>
<tr>
<td><strong>Identification Number (ID)</strong></td>
<td>A numerical designation that uniquely identifies an object in the supply chain. Identification numbers are used to retrieve information previously exchanged between trading partners and stored in their computer database files.</td>
</tr>
<tr>
<td><strong>Location Number</strong></td>
<td>See GLN (defined above).</td>
</tr>
<tr>
<td><strong>Location Reference</strong></td>
<td>A number within a GLN assigned by various parties to identify a different entity.</td>
</tr>
<tr>
<td><strong>Supply Chain Partner</strong></td>
<td>A party to transactions in the supply chain, such as a supplier (seller) or a customer (buyer).</td>
</tr>
<tr>
<td><strong>Trade item</strong></td>
<td>Any item (product or service) upon which there is a need to retrieve pre-defined information and that may be priced or ordered or invoiced at any point in any supply chain.</td>
</tr>
<tr>
<td><strong>U.P.C. symbol</strong></td>
<td>A bar code symbol that encodes the GTIN-12, Coupon-12, RCN-12, and VMN-12.</td>
</tr>
</tbody>
</table>
Improving Patient Safety and Supply Chain Efficiency

References

- Online Healthcare Supplier Implementation Guide
  http://www.gs1ca.org/e/hcsunrise
- Online Healthcare Provider Implementation Guide
  http://www.gs1ca.org/e/hcsunrise
- 2010 GLN Sunrise / 2012 GTIN Sunrise Dates
  http://www.gs1us.org/hcsunrise
- The Case for Global Data Standards in the Healthcare Supply Chain
- Standardization …Stat! Industry Awareness Video
  http://www.gs1us.org/stat
- 17 Billion Reasons to Say Thanks: The 25th Anniversary of the U.P.C. and Its Impact on the Grocery Industry
- Seton Family of Hospitals / BD Success Story
- RSS Study - Pharmacia and Dept. of Veterans Affairs
- RSS Study - Abbott Laboratories and St. Alexius Medical Center
- RSS Study - Alcon Laboratories
● **GTIN Allocation Rules for the Healthcare Sector**

www.carenet.ca/resources.php

● **GS1 Company Prefix**

To obtain a GS1 Company Prefix, visit [www.gs1ca.org/e/membership](http://www.gs1ca.org/e/membership) or call GS1 Canada at 1.800.567.7084 ext. 3.

● **GS1 GEPIR**

http://www.gepir.org

● **GS1 Canada Websites**

Main website: [http://www.gs1ca.org](http://www.gs1ca.org)
Healthcare webpage: [http://www.gs1ca.org/e/healthcare](http://www.gs1ca.org/e/healthcare)
Appendix A: GTIN Data Formats

Data carriers may or may not restrict the data format of GTINs that can be encoded (e.g., GTIN-12 in UPC-A symbols; GTIN-13 in EAN-13 symbols; all GTIN data structures in GS1-128; GS1 DataBar; GS1 DataMatrix). Since some GTIN fields in databases, IT systems and bar codes require storage as a 14 digit number, it is important to understand how to encode and/or store all GTIN data structures.

Regardless of the specific data format, all of the GS1 Data Standards implement structured, hierarchical numbering schemes in which each identifier is actually a numerical string comprised of several distinct segments. To that end, GTINs are numerical strings that consist of four segments:

1. **GS1 Indicator Digit**: The indicator digit identifies packaging levels. The field consists of a numeric value from 1 to 9. (The number 0 is used as a fill character when GTIN-13, GTIN-12, or GTIN-8 are stored in 14 digit fields or bar codes.)

2. **GS1 Company Prefix**: The globally unique number assigned to an organization by GS1 Canada (or by another GS1 Member Organization from around the world). GS1 Company Prefixes are assigned in varying lengths depending on the organization’s needs.

3. **Item Reference**: The number assigned by the holder of the GS1 Company Prefix to uniquely identify a trade item. The Item Reference varies in length as a function of the Company Prefix length. (Refer to the GS1 General Specifications and the GTIN Allocation Rules for the Healthcare Sector for additional information.)

4. **Check Digit**: A calculated one-digit number used to ensure data integrity. Refer to the Check Digit Calculator at www.gs1ca.org/apps/Calculator/main.asp.

The various GTIN data structures are presented below in the order most frequently found in Canadian healthcare:

**GTIN-14:**

<table>
<thead>
<tr>
<th>Segments:</th>
<th>Data Carriers using the GTIN-14 data format:</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 digits in total:</td>
<td>ITF-14</td>
</tr>
<tr>
<td>- 1 digit representing the Indicator Digit to denote packaging level</td>
<td>GS1-128 (formerly UCC/EAN-128)</td>
</tr>
<tr>
<td>- 12 digits consisting of:</td>
<td>GS1 DataBar™ (formerly Reduced Space Symbology (RSS))</td>
</tr>
<tr>
<td></td>
<td>GS1 Data Matrix bar codes</td>
</tr>
<tr>
<td></td>
<td>GS1 Electronic Product Code™ (EPC) tags</td>
</tr>
<tr>
<td>- GS1 Company Prefix</td>
<td>Item Reference assigned by the manufacturer</td>
</tr>
<tr>
<td>- 14th digit representing the Check Digit</td>
<td></td>
</tr>
</tbody>
</table>

**Table 1: GTIN-14 Data Format**
GTIN-12: Required in Canadian and U.S. Retail and Grocery point-of-sale.

<table>
<thead>
<tr>
<th>Segments:</th>
<th>Data Carriers using the GTIN-12 data format:</th>
</tr>
</thead>
</table>
| 12 digits in total: | • UPC-A  
| | • UPC-E |
| • 11 digits consisting of the: | |
| | • U.P.C. Company Prefix  
| | • Item Reference assigned by the manufacturer  
| | • 12th digit represents the Check Digit |

Table 2: GTIN-12 Data Format


<table>
<thead>
<tr>
<th>Segments:</th>
<th>Data Carriers using the GTIN-13 data format:</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 digits in total:</td>
<td>• EAN-13 bar codes</td>
</tr>
<tr>
<td></td>
<td>• 12 digits consisting of the:</td>
</tr>
</tbody>
</table>
| | • GS1 Company Prefix  
| | • Item Reference assigned by the manufacturer  
| | • 13th digit represents the Check Digit |

Table 3: GTIN-13 Data Format

GTIN-8:

<table>
<thead>
<tr>
<th>Segments:</th>
<th>Data Carriers using the GTIN-8 data format:</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 digits in total:</td>
<td>• EAN-8 bar codes*</td>
</tr>
<tr>
<td></td>
<td>• 7 digits consisting of the:</td>
</tr>
</tbody>
</table>
| | • GS1-8 Company Prefix  
| | • Item Reference assigned by the manufacturer  
| | • 8th digit represents the Check Digit |

* The GTIN-8 is available for items whose packaging does not include enough available space to permit the use an EAN-13 or UPC-A Symbol. GTIN-8s are individually assigned by GS1 Canada on request.

Table 4: GTIN-8 Data Format
The following table shows examples of GTINs providing unique product identification:

- At various packaging levels; and
- Using various bar codes.

In addition, it displays the data format of the GTIN as it appears in:

- The bar code; and
- A database.

**Table 5: GTIN Examples and Data Formats**

<table>
<thead>
<tr>
<th>Description</th>
<th>Item</th>
<th>Level</th>
<th>Bar Code</th>
<th>GTIN in Bar Code</th>
<th>GTIN in Database</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product A</strong></td>
<td>1 Unit</td>
<td>Consumer</td>
<td>UPC-A</td>
<td>614141000012</td>
<td>00614141000012</td>
</tr>
<tr>
<td></td>
<td>96 Units</td>
<td>Case</td>
<td>ITF-14</td>
<td>614141000029</td>
<td>00614141000029</td>
</tr>
<tr>
<td><strong>Product B</strong></td>
<td>1 Unit</td>
<td>Consumer</td>
<td>UPC-A</td>
<td>6141410000777</td>
<td>006141410000777</td>
</tr>
<tr>
<td></td>
<td>6 Pack</td>
<td>Consumer</td>
<td>UPC-A</td>
<td>614141000883</td>
<td>00614141000883</td>
</tr>
<tr>
<td></td>
<td>12 Pack</td>
<td>Consumer</td>
<td>UPC-A</td>
<td>614141000999</td>
<td>00614141000999</td>
</tr>
<tr>
<td></td>
<td>2x12 Pack</td>
<td>Case</td>
<td>GS1-128</td>
<td>10614141000996</td>
<td>10614141000996</td>
</tr>
<tr>
<td></td>
<td>4x12 Pack</td>
<td>Case</td>
<td>GS1-128</td>
<td>30614141000990</td>
<td>30614141000990</td>
</tr>
<tr>
<td><strong>Product C</strong></td>
<td>1 Unit</td>
<td>Syringe</td>
<td>GS1 Data Matrix</td>
<td>00614141000074</td>
<td>00614141000074</td>
</tr>
<tr>
<td></td>
<td>12 Units</td>
<td>Consumer</td>
<td>GS1-128</td>
<td>10614141000071</td>
<td>10614141000071</td>
</tr>
<tr>
<td><strong>Product D</strong></td>
<td>1 Unit</td>
<td>Unit dose blister</td>
<td>GS1 DataBar</td>
<td>00614141000050</td>
<td>00614141000050</td>
</tr>
<tr>
<td></td>
<td>100 Units</td>
<td>Consumer 100 blisters</td>
<td>UPC-A</td>
<td>361414100058</td>
<td>00361414100058</td>
</tr>
</tbody>
</table>

*A product that can be separated from others on its card*
Appendix C: GS1 Application Identifiers

Beyond the product description attributes defined by the manufacturer and saved in a database, there may be certain item specific attributes that manufacturers or supply chain partners want on products themselves to provide item specific information at the point where the bar code is scanned (e.g., expiration date; lot number; batch number; etc.). To facilitate that, the GS1 System provides “Application Identifiers” (AIs) for encoding item specific attributes directly into GS1 bar codes and GS1 radio frequency tags (RFID) tags [known as GS1 Electronic Product Code (EPC) tags].

GS1 Application Identifiers (AIs) are a finite set of specialized identifiers encoded within a numerical string of a bar code. Each AI has a two-, three- or four-digit numeric prefix that appears in parentheses to signal a certain type of data in the bar code numerical string (i.e., identify what the data in the next string in the bar code sequence is conveying). For example, the AI for lot/batch number is (10). Thus, when “(10)” appears in the numerical string, it means a lot/batch number follows in the next segment.

There are approximately 100 AIs. The complete definitions for all of the Application Identifiers reside in the GS1 General Specifications. However, an overview is provided in the table below:

Table 6: Overview of GS1 Application Identifiers

<table>
<thead>
<tr>
<th>AI Categories</th>
<th>Total #</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>GS1 Identifiers</td>
<td>7</td>
<td>There is one AI assigned for each of the seven GS1 Identifiers (i.e., GTIN, GLN, SSCC, GRAI, GIAI, GDTI, GSRN).</td>
</tr>
<tr>
<td>Trade Item Attributes</td>
<td>45</td>
<td>Examples: count; net weight; lot number; expiration date; etc.</td>
</tr>
<tr>
<td>Logistic Unit Attributes</td>
<td>28</td>
<td>Examples: count of trade items contained, gross weight, gross volume, routing code</td>
</tr>
<tr>
<td>GLN Extensions</td>
<td>4</td>
<td>GLN physical location attributes.</td>
</tr>
<tr>
<td>Special Purpose</td>
<td>Approx. 20</td>
<td>Shipment Identification, Consignment Identification, Coupons, Refund Receipts, Electronic Serial Identification for Cellular Mobile Telephones, Internal Use, Payment Slips, and Customer Specified Articles</td>
</tr>
</tbody>
</table>

GS1 AIs commonly used in healthcare include:

- **AI (01)**  GTIN
- **AI (10)**  Lot/Batch Number
- **AI (17)**  Expiry
- **AI (21)**  Serial Number

GS1 AIs are standard throughout the world and are familiar to IT system developers. GS1-128, GS1 DataBar™, GS1 Data Matrix, and Composite Component can all carry AIs, and more than one AI can be carried in one bar code. GS1 standardized attributes and AIs enable companies to communicate product information as well as item-specific information without encoding it in the identifier itself.
Appendix D: Illustrations of Bar Coded GTINs

GS1 Symbologies encoding GTIN

Figure 7: GTIN encoded in a GS1-12 Bar Code

Figure 11: GTIN encoded in a GS1 DataBar (Limited)

Figure 8: GTIN encoded in a GS1-13 Bar Code

Figure 12: GTIN encoded in a GS1 DataBar (Stacked)

Figure 9: GTIN encoded in a GS1-128 Bar Code

Figure 13: GTIN encoded in a GS1 Data Matrix

Figure 10: GTIN encoded in an ITF-14 Bar Code
**GS1 Symbologies encoding GTIN with Serial Number**

**AI (01) GTIN and AI (21) Serial Number**

**Figure 14: GTIN with Serial Number encoded in a GS1-128 Bar Code**

![GTIN with Serial Number encoded in a GS1-128 Bar Code](image)

**Figure 15: GTIN with Serial Number encoded in a GS1 DataBar (Limited) & Composite**

![GTIN with Serial Number encoded in a GS1 DataBar (Limited) & Composite](image)

NOTE: GTIN is encoded on the GS1 DataBar Limited, and Serial Number is encoded on the Composite.

**Figure 16: GTIN with Serial Number encoded in a GS1 DataBar (Stacked) & Composite**

![GTIN with Serial Number encoded in a GS1 DataBar (Stacked) & Composite](image)

NOTE: GTIN is encoded on the GS1 DataBar Stacked, and Serial Number is encoded on the Composite.

**Figure 17: GTIN with Serial Number encoded in a GS1 Data Matrix**

![GTIN with Serial Number encoded in a GS1 Data Matrix](image)
GS1 Symbologies encoding GTIN with Lot Number

Figure 18: GTIN with Lot Number encoded in a GS1-128 Bar Code

Figure 19: GTIN with Lot Number encoded in a GS1 DataBar (Limited) & Composite

Figure 20: GTIN with Lot Number encoded in a GS1 DataBar (Stacked) & Composite

Figure 21: GTIN with Lot Number encoded in a GS1 Data Matrix

NOTE: GTIN is encoded on the GS1 DataBar Limited, and Lot Number is encoded on the Composite.

NOTE: GTIN is encoded on the GS1 DataBar Stacked, and Lot Number is encoded on the Composite.

NOTE: GTIN is encoded on the GS1 Data Matrix.
GS1 Symbologies encoding GTIN with Expiration Date

AI (01) GTIN and AI (17) Expiration Date

Figure 22: GTIN with Expiration Date encoded in a GS1-128 Bar Code

Figure 23: GTIN with Expiration Date encoded in a GS1 DataBar (Limited) & Composite

NOTE: GTIN is encoded on the GS1 DataBar Limited, and Expiration Date is encoded on the Composite.

Figure 24: GTIN with Expiration Date encoded in a GS1 DataBar (Stacked) & Composite

NOTE: GTIN is encoded on the GS1 DataBar Stacked, and Expiration Date is encoded on the Composite.

Figure 25: GTIN with Serial Number encoded in a GS1 Data Matrix
GS1 Symbologies encoding GTIN with Serial, Lot & Expiration Date

Figure 26: GTIN with Serial, Lot & Expiration Date encoded in a GS1-128 Bar Code

Figure 27: GTIN with Serial, Lot & Expiration Date encoded in a GS1 DataBar (Limited) & Composite

Figure 28: GTIN with Serial, Lot & Expiration Date encoded in a GS1 DataBar (Stacked) & Composite

Figure 29: GTIN with Serial, Lot & Expiration Date encoded in a GS1 Data Matrix

NOTE: GTIN is encoded on the GS1 DataBar Limited, and Expiration Date, Lot Number and Serial Number is encoded on the Composite.

NOTE: GTIN is encoded on the GS1 DataBar Stacked, and Expiration Date, Lot Number and Serial Number is encoded on the Composite.
Appendix E: About Your GS1 Company Prefix

The GS1 Company Prefix is a globally-unique number licensed to your organization by GS1 Canada, and the foundation to create the identification numbers of the GS1 System. The GS1 Company Prefix is what makes the identification numbers of the GS1 System unique. GS1 Canada assigns GS1 Company Prefixes in varying lengths, seven to 11 digits, depending on your needs.

When you join GS1 Canada and get your GS1 Company Prefix, a corporate legal entity GLN will also be automatically assigned to identify your organization by GS1 Canada. Your Legal Entity GLN is communicated to your trading partners to identify your company/organization in e-commerce transactions.
Appendix F:
Generic 850 Purchase Order with GTIN & GLN

ST^850^0001~
BEG^00^SA^1234500^20090815~
PER^BD^John Doe^TE^(902) 222-2222^EM^john.doe@abchospital.ca~
ITD^08^3^10^30~
DTM^002^20090818~
N1^VN^Needles Inc.^UL^0057129123448~
N1^BT^ABC Hospital^UL^0068780152135~
N1^ST^ABC Hospital^UL^0068780152142~
N3^125 Main Street~
PO1^1^200^CA^21^UK^10012345000010^IN^476653~
PID^Needles by the case~
PO1^2^100^EA^6.66^UK^10012345000034^IN^476690~
PID^Individual Needles~
CTT^2~
SE^16^0001~
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