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Perfect Order and Beyond

BD and Mercy/ROi Achieve Far-Reaching GS1 Standards Integration

For the first time in the U.S., GS1 global standards are used in every step – from manufacturing plant to patient bedside – illustrating ways the supply chain can impact patient safety and optimize healthcare operations with fully automated order processes and transactions.

Through a collaborative effort, BD (Becton, Dickinson and Company), Mercy and its supply chain company, ROi, implemented GS1® Standards at each step from manufacturing to patient bedside, realizing significant benefits, including those associated with patient safety and an optimized supply chain. This end-to-end global data standard integration represents the first known instance in the United States that a healthcare provider and manufacturer used the Global Location Number (GLN) and Global Trade Item Number® (GTIN®) in both supply chain and clinical processes, achieving fully automated, accurate electronic processing of order transactions known as Perfect Order.

Perfect Order is an ideal in healthcare that represents true electronic order processing, from order placement to delivery and payment, without human intervention.

BD and Mercy/ROi leveraged the usage of GTIN identification from product conception to patient use and utilized GLNs to synchronize account and location information.

The collaboration between BD and Mercy/ROi came about because both organizations view GS1 Standards as tools they can leverage to improve the present state of the healthcare supply chain.

BD and ROi are redesigning business processes, modifying business rules and using their investments in information technology and the supply chain to better serve patients and enhance supply chain operations. The organizations entered the collaboration with a goal of integrating GTIN and GLN in every transactional step, from the manufacturing plant to use at the patient bedside.

BD and ROi reached this milestone prior to the industry-established 2010 GLN and 2012 GTIN sunrise adoption dates. Complete end-to-end integration of GLN and GTIN was achieved in February 2011 and continues today.

This case study summarizes the steps the organizations took to integrate GTIN and GLN from end-to-end, and the lessons learned as a result. The project took place in two phases:

1. Establish the technology infrastructure and processes to enable true system-to-system transactional processing, eliminating 100 percent of all human interaction throughout the entire procurement and replenishment process across the entire spectrum, from the manufacturing plant to the patient, to achieve Perfect Order and beyond.
2. Implement GS1 data standards to make the process even more efficient and sustainable. The use of GS1 Standards allows for easier scalability of future Perfect Order initiatives and for improved recognition of product usage at the patient level through the use of package barcodes and supported scanning technology.

The implementation of GS1 data standards was integrated into an overall Perfect Order engagement that leveraged both organizations' supply chain capabilities. The achievement of Perfect Order and effective use of GS1 data standards are part of a comprehensive supply chain strategy. In addition to the accuracy and cleanliness of data driven by GS1 data standards, Perfect Order also requires performance in the physical delivery of the product and in accurate timely financial transactions. Supply chain components necessary to achieve Perfect Order include adequate IT infrastructure, integrated distribution centers, organizational alignment and effective use of master data.

State of the Healthcare Industry

The healthcare supply chain is functioning in a sub-optimal state. Healthcare providers, distributors and manufacturers all struggle with a large error rate related to the procurement process of medical devices. Inefficiencies or errors in the procurement process extend all the way to the patient, manifesting in ordering errors, not having enough product on hand to treat the patient, clinicians receiving the incorrect product, expired inventory and other scenarios.

There are many causes for the industry's inefficiencies. The industry has been challenged by disparate proprietary data for medical devices and for location information. The continuous translating of data and manual processes causes a multitude of errors and creates an insidious obstacle to achieving the desired future state of efficiency or implementing specific clinical systems and programs. The lack of common supply chain performance metrics creates further obstacles. Common shared metrics provide benchmarks which illuminate both good and bad supply chain performance. Something as basic as the true cost per transaction is largely a mystery to many manufacturers and healthcare providers.

New industry participants are often surprised to learn that many other industries have already implemented processes that are decades ahead of the healthcare industry. Although many healthcare manufacturers, including BD, already include GTINs and production data in barcodes on product labels and carefully track product from production to the point of delivery, the overall industry lags behind other industries in terms of product scanning, electronic ordering, order accuracy and other key processes. The industry's slower pace in collaborating and implementing best practices is helping to perpetuate wasteful practices and sub-optimal processes. Despite significant investments in technology, product labeling and attempts to automate processes, the healthcare industry is still burdened by manual processes and a tremendous amount of re-work.

Achieving Perfect Order and Beyond

Perfect Order is more than just getting the right product to the right place at the right time. The Perfect Order process enables effective use of available resources by eliminating errors and maximizing the use of technology. Healthcare leaders are pursuing Perfect Order as a means to reduce the waste and errors that occur in the healthcare supply chain.

Collaboration Success

Patient Safety

Patients and clinicians at Mercy are benefiting from the same technology, data standards and processes utilized by other industries worldwide.

Mercy utilizes bedside scanning to ensure the right patient has received the right product at the right time. When a nurse scans the product barcode at a patient's bedside, that BD product has already been scanned and tracked at multiple points from the BD factory all the way to the patient.

Scanning also helps to manage specific lot numbers and expiration dating, and improve product tracking during product recalls, when the product has been logged into the patient's electronic health record.

Optimized Supply Chain and Perfect Order

GS1 data standards can help to remove costs from the healthcare supply chain through the achievement of Perfect Order.

GTIN and GLN standards enable trading partners to use standards to unambiguously identify locations and products and are in use across the entire supply chain and into clinical care settings. GDSN provides a single source of true synchronized healthcare information for all trading partners. Use of GLNs and GTINs can be scalable across the supply chain with all trading partners.

Perfect Order

A standard prevalent in many industries including retail, **Perfect Order** is defined by Strategic Marketplace Initiative (SMI) as "a purchase order processed electronically (from order to payment) without human intervention, delivered to the correct location, on time, undamaged, at the right price, with the desired quantity, on the first attempt." This process ensures effective use of available resources by eliminating errors and maximizing the use of technology.

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BD and ROi began their initiative by mutually reviewing past transactional history between the two organizations. By using an objective set of Perfect Order metrics to calculate transactional errors retrospectively, and then conducting extensive root cause analyses, the organizations gained insight into how to reduce transactional errors going forward. After extensive collaboration and a significant number of process changes, the two organizations are now achieving many of the desired outcomes described in the SMI Perfect Order definition. Positive outcomes include:

1. **A 30% reduction in days payable outstanding** resulted in additional early pay discounts from faster payments that require less manual intervention.
2. **73% reduction in discrepancies,** including a complete elimination of vendor part number and unit of measure (UOM) discrepancies by supplanting part number and UOMs with GTINs on purchase orders.
3. **Improved sourcing of products** by use of a single scan of a barcode to determine the right product and product UOM to reorder.
4. **Less calls to customer service** in the sourcing process.
5. **Fewer stock outs** due to the inherent simplicity offered to nursing staff for scanning barcodes at the bedside.
6. **Better charge compliance** resulting from scanning as a surrogate to traditional practices.

Data errors in the healthcare supply chain are a systemic problem in the industry. To address data problems, BD and ROi began to implement GS1 data standards, and now include them as part of their ongoing business rules. In fact, in 2008, ROi modified its supplier contracts to include GS1 GTIN implementation requirements (in both machine-readable and human-readable format) by the industry-established December 31, 2012, GTIN Sunrise date.

End-to-End Integration: GS1 Global Standards Go Where the Product Goes

The GTIN is helpful in unambiguously identifying products and communicating product data throughout the supply chain and through to the clinical setting and beyond; while the GLN is used as a consistent standard to identify delivery locations and to replace custom account numbers. BD and ROi took a holistic approach to implementing these standards as part of their normal ongoing business processes, and in pursuit of Perfect Order discovered many other benefits that extend beyond the supply chain.

> "In addition to improving the efficiency of the healthcare supply chain, data standards play a significant role in ensuring patient safety through improved product recall management. With data standards in place, hospitals can rely upon the uniqueness of the packaged barcode and use it to drive critical processes."
>
> *Gene Kirtser, President/CEO, ROi*

GTIN

BD and ROi are transacting by using the GTIN as the primary product identifier on purchase orders, invoices and other EDI transactions. The organizations are also able to follow the actual product through the supply chain by scanning the package barcode containing the GTIN that BD prints on product labels through ROi's distribution management system at the point of receipt. The native package barcode that BD prints containing the GTIN is again scanned during product consumption (i.e. in the patient's room at the point of use). Once the product is scanned at the patient bedside the transaction is interfaced to the electronic health record (EHR) for documentation and patient billing purposes. The GTIN is being successfully transmitted through all the steps of the supply chain process (product definition, master item file synchronization, order management, distribution, replenishment, etc.) as well as through to the clinical care setting (barcode scanning at patient bedside and operating room, entry into the EHR, transmitting to billing, etc.).

The BD/Mercy/ROi collaboration resulted in the first known instance where GS1 Standards were integrated across the medical device supply chain through to the clinical setting, driving supply chain optimization (including the achievement of Perfect Order) and enhancements to patient safety initiatives.

The following describes how BD and Mercy/ROi integrated and leveraged the GTIN at each step in the supply chain and beyond to clinical care:

See illustration inside gatefold spread >>

1 BD

For BD, the use of GTINs begins during the product definition stage. BD enumerates products with catalog numbers and GTINs, and captures the codes in applicable systems before the company releases the products to market. GTINs are created for each packaging level (i.e., Each, Shelf Pack, Case, etc.). Catalog numbers are directly associated to the GTINs in a configuration that allows healthcare providers and distributors to interpret packaging hierarchies. Although a proprietary barcode standard could have been used for internal processes, BD has invested in GS1 Standards to enhance customer supply chain processes and to support healthcare provider programs.

BD has collaborated with healthcare providers to understand specific use cases for various categories of products. For example, it is important to note that not all Each or Unit level packages can be physically marked with barcodes. Due to small package sizes and materials, it is not always feasible to mark the Each or Unit level package with a barcode. In these instances, a GTIN should still be assigned to the Unit package, communicated to healthcare providers and utilized in various IT systems. These low-risk products can still be tracked by healthcare providers using the Shelf Pack which stores/dispenses the product and inference through scanning higher levels of packaging. In vitro diagnostics (IVDs) and equipment present additional use cases and have different marking requirements.

BD also creates and manages many forms of product data that are ultimately associated with GTINs and catalog numbers. This product data includes information such as unit of measure, shelf life, dimensions, allergens, etc. Product data must meet the needs of many stakeholders, including patients, regulatory agencies, customers and supply chain participants. BD defines and records data requirements early in the product life cycle, and updates and maintains relevant product data the entire time a product is marketed.

As part of the Perfect Order effort, BD shared an initial set of product data with ROi via the GS1 Global Data Synchronization Network™ (GDSN®). Lessons learned from using the GDSN led to BD and ROi developing a custom GTIN sharing/reconciliation process – a process that may be leveraged and modified for future GTIN implementation initiatives with other supply chain partners and to advance the industry's GDSN initiative. Both organizations plan to continue efforts with GDSN in the future.

2 BD Factories

BD has enumerated its medical devices sold in the U.S. with GTINs and prints the GTIN in a GS1-128 barcode at the shippable packaging level. Additional GTINs and production data are applied in barcodes at other levels of packaging, depending on the product. BD scans the GTINs at multiple points in its internal supply chain. This information is stored in BD systems and used for a multitude of internal processes.

GTINs and production data (e.g., Lot Number, Expiration Date, Manufacturing Data, etc.) are printed on products during the manufacturing process. While the GTIN is standard, production data varies by product. BD follows the GS1 Standard and uses the applicable Application Identifiers (AIs) to help provide consistency throughout the supply chain. In addition to sharing the GTINs and production data in a barcode carrier, BD also provides the same information in a human readable format and uses ISO symbols for the identification of some written information. Where applicable, GTINs may be used to track products during the manufacturing process to aid in production processes.

Besides GTINs, BD uses additional GS1 Standards, such as the Serial Shipping Container Code (SSCC), to identify a single shipping unit, and is beginning to use the Global Shipment Identification Number (GSIN), to identify groupings of shipping units to track shipments from BD Distribution Centers to customers. This shipment data is stored in BD's enterprise resource planning (ERP) system, SAP, and made available on shipping documentation.

3 BD Distribution Centers

BD Distribution Centers use the SSCC, GTINs and production data when receiving products from manufacturing plants to verify receipt and track inventory. Having this information at the moment it is needed speeds up supply chain processes and helps ensure overall process accuracy. This same product identification data is used to pick products and create shipments to distributors and healthcare providers. GTINs, specific quantity data and production data are captured and associated with a pallet license plate barcode (SSCC). That information is stored in internal systems and is used for each material movement through the use of the scanning system. The data can then be shared with distributors and healthcare providers in EDI transactions, such as order acknowledgements (855), automated shipping notices (856) and invoices (810).

4 ROi Distribution Center

Without global data standards in place, many distributors and healthcare providers currently cover manufacturing barcodes with labels using their own internal product numbering system. Maintaining proprietary numbering systems increases non-value costs. However, through the collaboration with BD, ROi is now implementing GTINs as the global standard product identifier for BD products rather than creating custom labels. The GTINs are entered into Mercy's item master, and are being used to

Provider Lessons Learned for GTIN Implementation

1. Healthcare providers must account for GTINs for each product, including the GTINs for multiple levels of packaging.
2. GTINs must be integrated into all applicable IT systems.
3. Healthcare providers should associate all internal product numbers with a specific GTIN.
4. Before embarking on a GTIN conversion, ensure that GTINs serve a transactional purpose (e.g., item master, charge master, ordering products, receiving, EHR, bedside scanning).
5. Develop a process for sharing GTINs between trading partners.
6. Reconcile GTINs throughout your item master and make sure you account for all products. Align "Base Units" and clean up obsolete products.

track and order products. Because the GTIN is pre-loaded into the provider's item master, the process of validating receipt of product delivery is made much simpler and orders in general are more accurate.

For products that already existed in Mercy's item master, ROi and BD conducted a thorough cleansing of item numbers and package level hierarchies. This GTIN synchronization process results in the elimination of duplicate GTINs and GTINs for products that had been acquired or divested by BD. Mercy's item master now enables use of a complete GTIN packaging hierarchy. ROi and BD agree that it is essential to undertake a cross-verification process to ensure that all units of measure are captured and to properly account for net contents for specific products. Failure to properly reconcile updates and clean an item master when adding GTINs will cause errors in product ordering, scanning and accounting.

ROi now consistently uses GTINs when ordering, picking and shipping BD products. In addition, both organizations use production data assessed via the manufacturer assigned barcodes to rotate inventory and for quality control processes. Finally, ROi's Distribution Center and Mercy facilities have active GLNs, obtained through the GLN Registry for Healthcare®, which ROi is using to improve shipping and pricing accuracy. ROi is working with vendor partners to share its GLN information to replace custom account numbers to reduce errors and confusion throughout the entire supply chain.

5 Mercy Hospital Receiving

Once GTINs are stored in Mercy's systems, they become the primary reference number for transacting. The difference now is that the GTIN serves as a common identifier, enabling the tracing of supplies from the point of replenishment to the point of use.

Upon shipment, ROi sends an Advance Ship Notice (ASN) to the Mercy department receiving the shipment. The hospital does not need to undertake any additional "receipt activity" like manually receiving each PO line by line because the receipt is processed reliably and automatically every time. Reliability is due to the high pick accuracy in ROi's Distribution Center.

6 Mercy Store Room

GTINs are used to order and track medical devices for use in labs, pharmacy, storage locations and in patient care areas. The GTIN product shipped from the Store Room may be in multiple units of measure including the Case, Pack or even Each level. GTINs can also be scanned to help search for products in Mercy's materials management information system (MMIS). A Receiving and Delivery software program is used to scan-out products to various departments throughout the facility.

7 Mercy Patient Room

Caregivers scan patient wrist bands to identify the patient and the location where care is taking place. Caregivers also scan GTINs on consumed products, capturing critical information to drive:

- Product consumption
- Real-time usage
- Real-time inventory control
- Patient charging

Since the GTIN number is globally unique, ROi is able to perfect internal and external transactions using the identifier. A simple scan of the product barcode will identify the product in each system, **allowing for flawless product identification**. Barcode scanning leads to more efficient data and better replenishment processes. This information is used in EHR and can aid in comparative effectiveness research and for improved product recall management. In addition, some GTINs and associated production data may be captured in either human-readable or machine-readable form from the Shelf Pack. Manufacturers should consider important variables — such as clinician workflow, product usage patterns, efficiency considerations, product risk and label size — when assigning GTINs and managing production data.

8 Mercy Operating Room

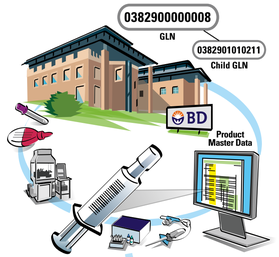
Tracking products in the operating room at Mercy is similar to the process used in patient rooms. As surgeries are performed, products used during the procedure are documented on the patient chart in the EHR. GTIN data can then be tracked from end-to-end, all the way from the point of order to the near exact time the product was applied to a specific patient. Transactions entered in the patient EHR are seamlessly used in Mercy's system for patient billing. In time, industry-supported recall notifications for specific GTINs could trigger automatic reports alerting administrators of affected patients.

1. Enumerate and store your GLNs internally and in the GS1 US GLN Registry for Healthcare.
2. Remove any duplicate or inaccurate GLN numbers from the GLN Registry.
3. Only use validated GLNs. Use of non-validated GLNs which are not being maintained by location owners can disrupt processes and cause errors.
4. Reconcile GLNs with all trading partners.
5. GLN changes must be maintained over time.
6. Integrate GLNs into processes and use for transactions.
7. GLN implementation will be a journey. Realize that GLNs used for desktop locations, storage cabinets, mail drops and other granular locations will not help at this time.
8. Leverage best practice recommendations from those that came before you. Many can be found at the GS1 Healthcare US website at *www.GS1US.org/healthcare.*

"We overcame two major obstacles – software and standards – to work toward true Perfect Order. Mercy's IT infrastructure incorporates both Global Trade Item Numbers, GTINs, and Global Location Numbers, GLNs, to lead to a fully automated synchronization of data with our suppliers."

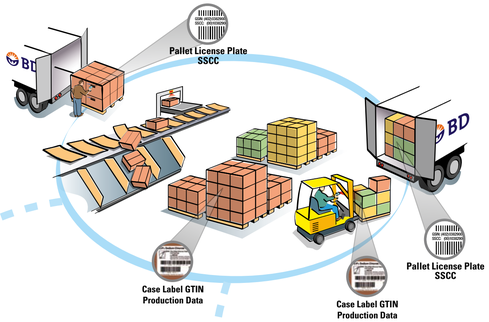
Curtis Dudley,
Vice President of Integrated Business Solutions, ROi

End-to-End Integration: GS1 Global Standards Go Where the Product Goes



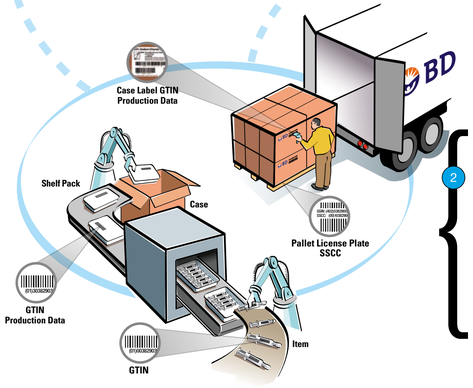
1 BD

- GTINs created for each product and package level
- Product data defined, created and managed
- BD GLNs assigned and managed
- Validated customer GLNs collected and stored
- Synchronization of EDI Processes
- Order Management
- Data stored in ERP system



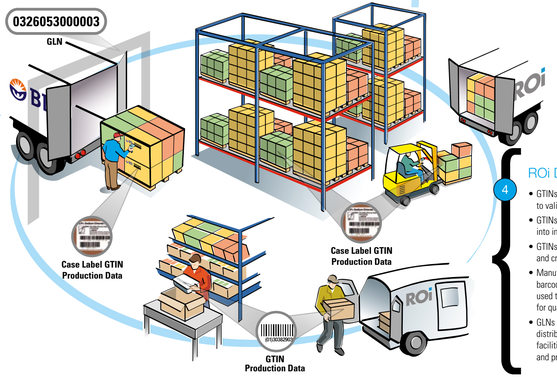
3 BD Distribution Center

- GTINs and ASNs used for receipt verification
- GTINs used to assure accuracy of picked products
- GTIN and barcoded production data used to create and track shipping unit
- Shipping unit content barcoded and tracked with pallet license plate (SSCC)
- ASNs containing GTINs, SSCC numbers and GLNs sent to customers
- Inventory and delivery information stored in ERP system



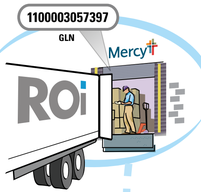
2 BD Factory

- Production order and GTINs pulled from ERP
- GTINs and production data (Lot/Expiry, etc.) printed on products (barcode and human readable)
- GTINs used to track products during manufacturing
- GTINs used to track contents of shipments
- Manufacturing data stored in ERP system



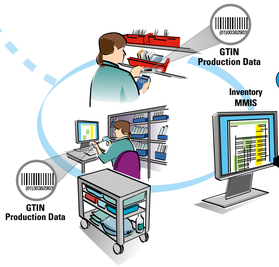
4 ROi Distribution Center

- GTINs used at the point of receipt to validate delivery accuracy
- GTINs used to put products into inventory
- GTINs used to pick products and create shipments
- Manufacturer assigned barcoded production data used to rotate inventory and for quality control processes
- GLNs assigned to ROi distribution center and Mercy facilities to improve shipping and pricing accuracy



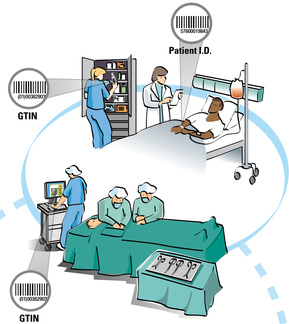
5 Mercy Hospital — Receiving

- Advance Ship Notice (ASN) received from ROi
- No additional receipt activity required due to the high quality of pick using GTIN to validate item and quantity
- Chain of custody maintained through automated processes



6 Mercy Hospital — Store Room

- GTINs scanned to help search for products in Mercy's MMIS system
- GTINs used to order and track medical devices for use in labs, pharmacy, storage locations and in patient care areas
- Receiving and Delivery program used to scan and pick products for various departments throughout the hospital system
- GTINs used to drive inventory replenishment

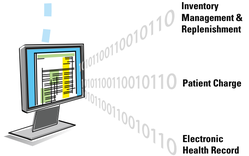


7 Mercy Hospital — Patient Room

- Patient arm band is scanned identifying location and patient in point of care system
- GTINs on product packages are scanned at the point of care capturing critical information to drive:
  - Product consumption
  - Inventory replenishment
  - Patient charging
  - Cost accounting

8 Mercy Hospital — Operating Room

- Products used during the procedure documented on the patient chart
- GTIN data tracked all the way from the point of order to the near exact time the product was applied to a specific patient
- In time, industry supported recall notifications for specific GTINs could trigger automatic reports alerting administrators of potential issues



Each Level GTIN in a GS1-128 barcode

Shelf Pack Level GTIN and Production Data in GS1-128 barcodes

Case Level GTIN and Production Data in GS1-128 barcodes

Pallet License Plate — Serial Shipping Container Code (SSCC)

The illustrations above are provided as examples and are not exact replicas of actual labels.

GLN

Challenges identifying the correct supplier or customer location can cause supply chain errors. Currently, healthcare providers need to manage and store a multitude of customer numbers assigned by their suppliers. The quantity of assigned numbers will vary depending on the number of locations a healthcare provider has and the number of transactional entities per supplier. For example, ROi has 124,000 manufacturer-assigned numbers for Mercy facilities stored in its systems today. In comparison, 30 GLNs can cover the majority of ROi transactional locations. Throughout the BD/Mercy/ROi collaboration, GLNs were utilized to unambiguously identify locations and further reduce transactional errors. ROi and BD continue to transact with the GLN today, and are each working with other partners to implement GLN going forward.

BD is migrating to the use of GLNs from a system that is currently based on proprietary customer numbers. BD, like all healthcare manufacturers, incurs expenses related to maintaining customer location data. Since each distributor and GPO maintains unique proprietary numbering systems for each location, manufacturers must utilize resources to continually manage all the different numbers representing the same customer locations. When location data slips out of manual synchronization, errors often occur. This includes pricing errors, chargeback errors, shipping errors and GPO administration fee mistakes or miscalculations. Since proprietary ERP-generated customer numbers are necessary in the current environment, GLNs must be correlated to these ERP numbers. BD is only using GLN numbers that have been validated by the location owner and are maintained by the owner in the GS1 US GLN Registry for Healthcare. BD has assigned itself GLNs to define the company as a global entity, a U.S. organization and specific transactional locations for EDI usage.

An analysis by BD and ROi of past transactional errors indicates problems, including the associating of BD products with incorrect shipping locations, a lack of clarity on some Mercy-owned alternate site locations and a general need to more precisely measure sales/purchases by trading partner. The process of investigating GLNs revealed confusion related to the purchasing locations for some BD products. (Because ROi provides integrated distribution and GPO services to Mercy, location-related supply chain errors were lower than the average reported within the overall industry.)

Since ROi already distributes to Mercy locations and has an enumeration process in place, GLN numbering was a fairly simple process and mirrored recommendations from industry best practices. ROi decided to use one primary Ship-to GLN per location. Data reconciliation began with BD reviewing Mercy's GLN locations. The primary focus was on the ROi Distribution Center and 23 Mercy hospitals. BD's master data related to the Mercy hospitals proved to be accurate. Since BD does not typically ship to any of the owned physician offices or other alternate site locations, this portion of the GLN effort was not included as part of the first phase. Additional reconciliation work will be required at a later date to review all of the alternate site locations.

2010 GLN Sunrise | 2012 GTIN Sunrise

In their efforts to achieve Perfect Order, BD and Mercy/ROi met the goals of the industry established 2010 GLN Sunrise and the 2012 GTIN Sunrise:

2010 GLN Sunrise goals:

- GLNs are assigned by location owners.
- GLNs are used in appropriate business transactions and processes between trading partners.
- GLN hierarchy is defined and maintained by location owners.
- GLN Registry for Healthcare is used to facilitate correct location identification.

2012 GTIN Sunrise goals:

- 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 registered in a GS1 Global Data Synchronization Network (GDSN)-certified Data Pool.

> "GS1 data standards enable healthcare trading partners to speak the same language when it comes to product or location information, saving valuable time and resources, as well as reducing costs and enhancing patient safety. As such, BD supports the widespread use of GS1 data standards in the healthcare supply chain. We look forward to collaborating with our healthcare provider partners to leverage the investments in data standards and improve the overall healthcare supply chain."
>
> *Ewald Parolari,*
> *Senior Director Supply Chain Operations, BD*

GTINs and GLNs in EDI Transactions

ROi and BD implemented both GLNs and GTINs into EDI transactions. The EDI transmission is the primary point in the supply chain when the GLNs and GTINs are exchanged between trading partners in transactions. For this initiative, the EDI transaction between BD and ROi was the last step in the implementation, occurring after all the steps involved with GLN enumeration and GTIN reconciliation and synchronization. The actual implementation of GLNs and GTINs took place as separate events. Each test iteration yielded different results requiring minor rework. At ROi, a cross-functional team was created to make the implementation possible, consisting of IT, an item master data manager, a business analyst and a team leader to oversee the project. Since a test system was not available, live orders were used. GHX was utilized for the EDI transactions and participated in the planning calls during the EDI transaction phase.

Key best practices from the BD/ROi EDI transaction process include:

1. Communicate with your trading partner at every step.
2. Be prepared: EDI transactions using GTIN and GLN may require modifications to internal systems.
3. Communicate intent to migrate to GLN and GTIN and work closely with EDI partners (i.e., GHX) and/or software vendors (i.e., Lawson) to create workable solutions.
4. Reconcile GLNs and GTINs with GPO, distributors and manufacturers in advance (follow industry best practices outlined in GS1 Healthcare US materials available at www.GS1US.org/healthcare).
5. Make sure "saleable unit" is mutually understood and communicated.
6. Use one common map and an agreed-upon format for EDI transactions.
7. Once EDI purchase order (850) is implemented, expect to use GLNs and/or GTINs in order acknowledgements (855), advanced shipping notices (856), invoices (810), etc.
8. To avoid confusion, after converting to GLNs/GTINs, do not switch back to legacy format unless agreed upon in advance.
9. Stay optimistic and focused, and believe in the value proposition. Healthcare can succeed in this transition!

Conclusion

GLNs and GTINs can be implemented now to help improve the healthcare supply chain. Before embarking on an implementation plan, clearly identify and agree to goals in advance. To prevent "scope creep" and distractions, identify and prioritize project phases. Finally, trading partners need to ensure that technology providers can support the agreed upon goals and established work plan.

In addition, through this collaboration, BD and Mercy/ROi were able to use and leverage GS1 Standards throughout the supply chain and beyond, realizing many benefits, including, but not limited to:

- Achievement of Perfect Order.
- More accurate purchase orders, invoicing and payment processes.
- Clean data on delivery locations and account information.
- Real-time product usage and consumption.
- Better product and lot number tracking.
- Improved infrastructure and data accuracy for future patient care initiatives and the recall process.
- Stronger business relationships with critical healthcare partners.

This project marks the first time in the U.S. that GTIN and GLN were leveraged from end-to-end across the healthcare spectrum. Through this collaborative effort, BD and ROi have achieved demonstrable improvements in the healthcare supply chain. Mercy is also able to leverage the improvements in the supply chain to enhance patient care initiatives.

Ten Key GLN/GTIN

Accomplishments

1. BD assigns GTINs to all products and relevant packaging levels (Each, Shelf Pack, Case) and stores in a centralized master data file.
2. BD prints GTINs and production data in a GS1-128 barcode for all shippable levels of product packaging.
3. BD also prints GTINs and production data on secondary and tertiary packaging in various GS1 barcode formats depending on package size, requirements and market needs.
4. BD utilizes GTINs and production data (lot numbers, expiry) in internal manufacturing and distribution processes.
5. BD uses SSCCs to identify pallet shipments and enhance supply chain identification and processes.
6. GLNs, GTINs and associated data are used in EDI orders (from Purchase Order to Invoice) to validate locations, unambiguously identify products, and share additional information.
7. BD's GTIN data were synchronized with ROi and stored in Mercy's item master.
8. Converting to GTINs in Mercy's MMIS uncovered item duplications. Since the MMIS will not allow duplicate numbers to be reused, the unique GTIN structure helped reduce unnecessary overhead and burden to the system.
9. ROi scans BD's GTINs and production data at the point of receipt and through their internal supply chain to identify products and manage production data (lot numbers, expiration dates, etc.) in their system.
10. Mercy scans individual products at the point of care to track consumption and to incorporate data into the patients' electronic health record.

BD

BD is a leading global medical technology company that develops, manufactures and sells medical devices, instrument systems and reagents. The Company is dedicated to improving people's health throughout the world. BD is focused on improving drug delivery, enhancing the quality and speed of diagnosing infectious diseases and cancers, and advancing research, discovery and production of new drugs and vaccines. BD's capabilities are instrumental in combating many of the world's most pressing diseases. Founded in 1897 and headquartered in Franklin Lakes, New Jersey, BD employs approximately 29,000 associates in more than 50 countries throughout the world. The Company serves healthcare institutions, life science researchers, clinical laboratories, the pharmaceutical industry and the general public.

For more information, please visit *www.bd.com*

ROi

ROi (Resource Optimization & Innovation) is a recognized leader in the health care supply chain management industry. Founded by Mercy in 2002, ROi provides a single-source, fully integrated supply chain solution, including group contracting, clinical and operational consulting, pharmaceutical repackaging, custom procedure tray manufacturing, print operations, purchasing and master item file management, and distribution and transportation management. ROi collaborates with like-minded health care providers and progressive suppliers to redefine the supply chain and develop solutions to drive greater efficiencies, reduce costs and produce sustainable change. ROi co-workers support health care providers from a home base in St. Louis, Mo., and a 100,000-square-foot Consolidated Services Center (CSC) in Springfield, Mo. ROi is ranked by Gartner (formerly AMR Research) as one of the top three global supply chain organizations in health care.

For more information, visit *www.roiscs.com*

Mercy

Mercy is the eighth largest Catholic health care system in the U.S. and serves more than 3 million people annually. Mercy includes 30 hospitals, more than 200 outpatient facilities, 38,000 co-workers and 1,500 integrated physicians in Arkansas, Kansas, Missouri and Oklahoma. Mercy also has outreach ministries in Louisiana, Mississippi and Texas.

For more about Mercy, visit *www.mercy.net*

"True collaboration and use of an agreed upon set of common Perfect Order metrics provide the healthcare industry a real opportunity to improve operational effectiveness and eliminate costs from the supply chain."

Steve Gundersen,
BD Vice President of
Corporate National Accounts