

United Arab Emirates

Cleveland Clinic Abu Dhabi pioneers GS1 standards to transform supply chain, strengthen patient safety, and enable full traceability across pharmaceuticals and medical devices

Challenge

Cleveland Clinic Abu Dhabi faced fragmented product data, inconsistent supplier labelling, and limited traceability across pharmaceuticals, medical devices, and operating room (OR) consumables. These gaps led to scanning failures, operational inefficiencies, revenue leakage, and compliance risks, highlighting the need for a fully standardised, system-wide transformation.

Approach

The hospital executed a phased rollout of GS1 standards, onboarding suppliers and migrating to GTIN-based data while integrating GS1 barcodes across ERP, pharmacy, inventory, and operating room (OR) workflows. Cross-functional training, real-time scanning adoption, and ongoing performance monitoring enabled rapid improvements in accuracy, compliance, charge capture and patient safety.



95% scanning compliance achieved

Historic scanning rates rose from <50% to 95% across clinical departments



Standardised product identification

GS1 GTINs enabled consistent, accurate labelling across pharmaceuticals and medical consumables



Enhanced patient safety and medication accuracy

GS1 DataMatrix ensured verification at dispensing and administration points



Significant OR charge capture improvements

Automated scanning eliminated manual errors and minimised revenue leakage

Introduction

Cleveland Clinic Abu Dhabi is one of the world's leading healthcare systems, with 82,608 caregivers and a global network of 23 hospitals and 280 outpatient facilities. The hospital, located in the United Arab Emirates, is a world-class, multi-specialty hospital dedicated to providing cutting-edge healthcare services while continuously striving for innovation and excellence.

As part of this commitment, the hospital identified significant opportunities to modernise its supply chain operations. Inventory discrepancies, inefficient procurement workflows, and limited traceability of medical supplies and devices created operational inefficiencies and presented risks to patient safety and regulatory compliance. Disparate product data and non-standard identification practices also contributed to scan-

ning errors and challenges in accurately capturing operating room (OR) charges.

Recognising the critical role of global standards in addressing these challenges, Cleveland Clinic Abu Dhabi became the first healthcare institution in the UAE to adopt GS1 standards for product identification and data management in 2017. This strategic initiative aimed to strengthen patient safety, reduce medication errors, improve inventory accuracy, optimise operating room (OR) charge capture, and ensure full compliance with pharmaceutical tracking regulations. By implementing GS1 standards, the hospital set a new benchmark in healthcare excellence, aligning its supply chain transformation with its broader vision of digital innovation and operational efficiency.

Aims and objectives

The implementation of GS1 standards at Cleveland Clinic Abu Dhabi was guided by clearly defined objectives aligned with the hospital's mission to deliver safe, reliable, high-quality care. Enhancing patient safety was the foremost priority, with full end-to-end traceability of pharmaceuticals and medical supplies designed to reduce the risks associated with expired, counterfeit, or misidentified products. Barcode verification at the point of administration was introduced to strengthen medication safety and ensure accuracy.

A second primary objective was to improve the precision of operating room charge capture. Manual data entry for surgical implants and consumables has historically led to errors, administrative burdens and revenue leakage. Automating this process through barcode scanning and GS1-compliant identifiers was essential to improving financial accuracy and reducing workflow inefficiencies.



Additionally, the hospital aimed to strengthen pharmaceutical tracking and compliance. By aligning with UAE and international serialisation requirements using GS1 DataMatrix barcodes, the hospital ensured that every medication could be uniquely identified, tracked, and verified throughout its lifecycle, from receiving and dispensing to administration. This initiative was designed to prevent medication dispensing errors, while also ensuring compliance with local and global regulations.

Improving overall supply chain efficiency was also an additional focus. By adopting GS1 Global Trade Item Numbers (GTINs) to standardise product identification across medical devices, implants, and pharmaceuticals, the hospital established a foundation for greater consistency and inventory accuracy.

Beyond the operational improvements, the initiative also aimed to strengthen supplier collaboration. Transparent digital communication with vendors supported accurate data sharing and a more resilient supply chain. Finally, as the first hospital in the UAE to implement GS1 standards

at scale, the hospital also aimed to set a precedent for the region by demonstrating how global standards can transform healthcare operations, strengthen safety, and improve clinical and financial performance..

Approach and solution

The hospital adopted a structured, multi-phase implementation supported closely by GS1 UAE. Stakeholder engagement was the foundational step: awareness workshops were delivered to clinical, supply chain, IT, procurement, and pharmacy teams to ensure cross-functional alignment and build organisational commitment. Executive leadership also endorsed the initiative, emphasising its strategic importance in advancing digital transformation.

Supplier onboarding and data standardisation formed the second phase of the initiative. The hospital collaborated with vendors to ensure GS1-compliant labelling and standardised product identification. Dedicated training helped suppliers understand requirements and accelerate adoption, addressing long-standing inconsistencies that affected inventory and procurement workflows.

A third priority was the integration of pharmaceutical compliance. The hospital introduced GS1 DataMatrix barcodes on pharmaceutical packaging in line with UAE and international regulatory standards. Barcode scanning was enabled during receiving, dispensing, and administration to ensure authenticity and verification at every step. Integration of GS1 barcodes with the hospital's electronic medication administration records (eMAR) system further reduced the risk of medication errors and improved traceability.



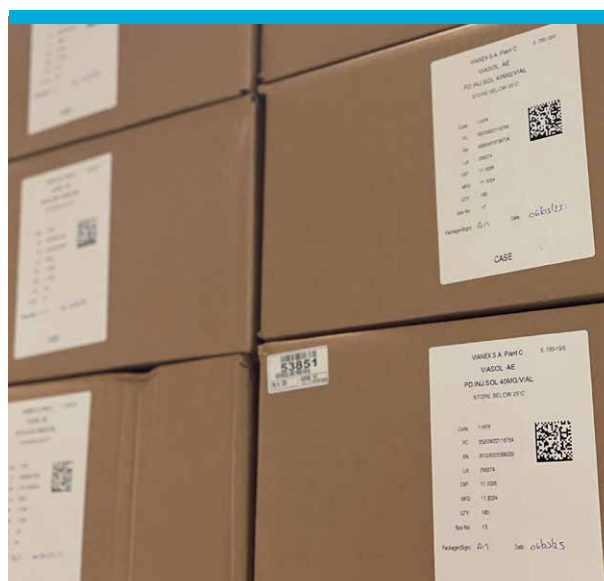
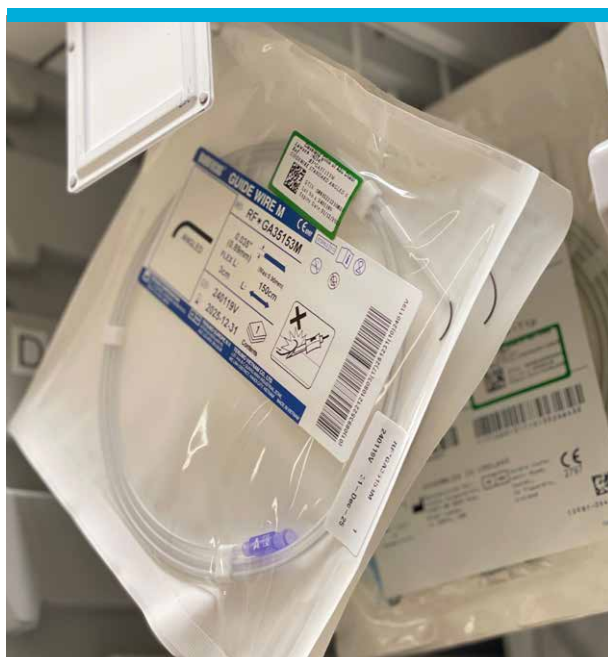
Technology enablement played a critical role. GS1 standards were embedded within Cleveland Clinic Abu Dhabi's Enterprise Resource Planning (ERP) system, automating data synchronisation and enabling real-time inventory visibility.

The final phase was pilot implementation and evaluation. The hospital began with critical medical supplies before expanding into other product categories, while closely monitoring key performance indicators, including inventory accuracy and compliance levels. User feedback was collected, enabling the hospital to refine workflows, improve compliance, and address integration challenges before full deployment across the hospital.

Challenges encountered

Before implementing GS1 standards, the hospital faced a range of operational and technical challenges. The absence of standardised product data was one of the most pressing issues, as suppliers practiced inconsistent identification methods, resulting in procurement inefficiencies and inventory inaccuracies. Some suppliers were slow to adopt standardised identification, requiring extensive engagement and support.

Some technical challenges were also encountered. Integrating GS1 standards into the hospital's existing ERP and supply chain systems required considerable customisation and expertise. Additionally, adapting GS1's global standards to align with the UAE's specific regulatory framework introduced an additional layer of complexity. During the implementation phase, data cleansing, supplier onboarding, and workflow redesign required careful management. Continuous communication, iterative improvements, and alignment with GS1 UAE enabled the hospital to overcome these challenges and achieve a successful implementation.



Implementation of GS1 standards

The hospital conducted its implementation in structured phases. Supplier engagement began with education and onboarding to ensure GS1-compliant identifiers were consistently applied. BrandSync was introduced as a centralised portal for product data management. Data standardisation was then introduced, creating a uniform product data framework that improved visibility, accuracy and inventory control.

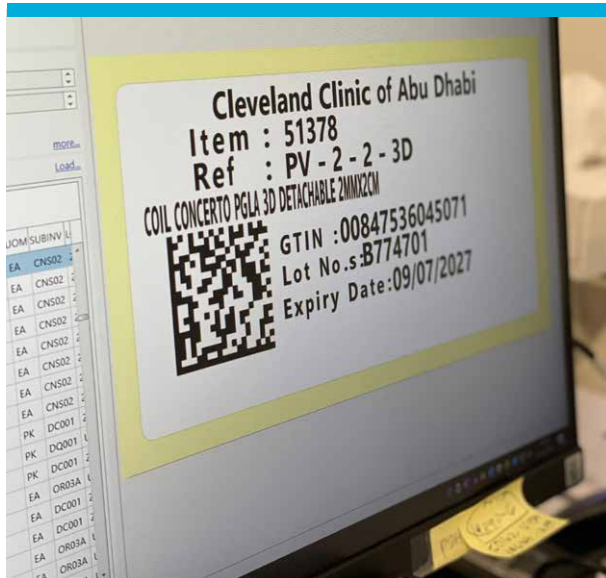
Barcode integration followed, with GS1-compliant barcodes deployed across medical products, enabling improved tracking and verification at every stage of the supply chain. These barcodes were also linked with the hospital's ERP system, ensuring seamless interoperability between procurement, inventory, and clinical workflows. Comprehensive training programs ensured that clinical and supply chain staff were well-prepared to adopt new workflows. Continuous improvement measures were also established to monitor performance, refine processes and ensure long-term sustainability.

Results and benefits

By 2025, the hospital achieved measurable, system-wide improvements as a result of GS1 standards implementation. Pharmacy compliance reached 79%, while medical consumables reached 76%, reflecting strong supplier alignment. Scanning compliance improved dramatically—from 40% in 2022, increased to 42% in 2023 and 48% in 2024, before reaching 95% in 2025, enhancing traceability and safety.

Departmental performance data further illustrates the improvements. Before GS1 adoption, scanning rates in procedures such as general surgery and plastics were as low as 42% and 0%, respectively. Following implementation, these areas achieved

100% compliance, alongside other specialties such as gastroenterology, gynaecology, ophthalmology, and interventional radiology. Cardiac procedures improved from 58% to 88%, cardiology from 79% to 96%, and urology from 50% to 90%.



Weekly monitoring in 2025 showed compliance rising from 76% in Week 1 to 95% by Week 9, indicating a consistent upward trend in compliance and reliability.

These gains translated directly into tangible benefits:

- Improved patient safety through accurate identification and reduced medication errors
- Greater regulatory readiness through full alignment with UAE and international pharmaceutical standards
- Enhanced financial integrity, with automated OR charge capture reducing revenue leakage
- Strengthened supply chain collaboration, supported by consistent data and digital communication

Collectively, these results positioned Cleveland Clinic Abu Dhabi as a regional leader in healthcare supply chain transformation and digital innovation, setting a precedent for the wider industry.

Next steps and plans

Building on this success, the hospital plans to expand GS1 standards across additional product categories, including high-value implantable devices and speciality pharmaceuticals, and to achieve 100% GTIN compliance across all categories. The hospital is also exploring the integration

of Radio Frequency Identification (RFID) technology with GS1 barcodes to further enhance the tracking and automation of critical inventory.

Beyond its own operations, the hospital intends to continue promoting industry-wide adoption by sharing best practices and collaborating with other healthcare providers in the UAE. Continuous optimisation remains a priority, with the hospital committed to refining its systems in response to user feedback and technological advancements.

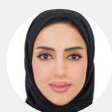


Conclusion

By becoming the first healthcare provider in the UAE to adopt GS1 standards across its supply chain management, OR workflows, and pharmaceutical tracking, Cleveland Clinic Abu Dhabi has established itself as a powerful model for healthcare institutions both regionally and globally. The integration of GS1 barcoding, automated inventory management and advanced traceability has delivered substantial improvements in patient safety, financial integrity, and operational efficiency, setting a new benchmark for healthcare logistics, innovation, and digital transformation in the region and beyond.



About the author



Fatima Alsubaihi
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Fatima Alsubaihi is a visionary and results-driven healthcare supply chain leader, recognized for transforming Cleveland Clinic Abu Dhabi's (CCAD) supply chain into a strategic, patient-centric, and globally benchmarked operation. As Senior Director of Supply Chain Operations, Fatima has redefined the role of supply chain in healthcare delivery, elevating it from a transactional support function to a strategic enabler of clinical excellence, operational efficiency, and sustainable value creation.

Under her leadership, Cleveland Clinic Abu Dhabi's supply chain has achieved measurable and unprecedented outcomes, including:

- Zero cancelled procedures due to supply unavailability, ensuring uninterrupted access to life-saving care in high-acuity services such as cardiac surgery, stroke interventions, and organ transplantation.
- 75% reduction in stockouts, 95% fill rate, and 88% inventory accuracy, reflecting robust operational control and process discipline.
- Implementation of RFID technology for OR supplies and GS1 barcode systems, enhancing real-time inventory visibility, traceability, and charge capture, and enabling clinicians to focus on patient care rather than operational tasks.
- Average inventory turns index of 4.0 and 50% reduction in average expiry value, demonstrating efficient resource utilization and financial stewardship.
- Average annual savings of 17% against budget, reinvested into patient care, innovation, and sustainability initiatives.

International recognition with the Silver Winner Award at the 2024 IHF Awards for driving Scope 3 decarbonization in healthcare supply chains, The Healthcare & Pharmaceutical Supply Chain Excellence Awards APAC 2025, and The Warehouse Initiative Awards MEA 2025, positioning the hospital as a global benchmark for sustainable healthcare operations.

Fatima's leadership is defined by strategic vision, operational rigor, and a relentless focus on patient outcomes. She has cultivated a culture of collaboration, innovation, and accountability, working closely with clinicians, nursing leaders, finance, quality, sustainability teams, and suppliers to deliver integrated solutions that improve patient safety, clinical reliability, and organizational performance.

A recognized rising leader in global healthcare supply chains, Fatima has combined deep operational expertise with digital innovation to advance supply chain maturity, including RFID-enabled OR workflows, GS1-enabled traceability, and data-driven inventory management. She is widely acknowledged for her ability to translate complex supply chain strategies into measurable, real-world impact, ensuring that clinical teams have the resources they need to deliver world-class care.

Fatima's leadership philosophy is anchored in patients first, excellence always. Her ability to align strategy with execution, integrate innovation, and drive sustainability has not only elevated the hospital's supply chain to world-class standards but also set a global benchmark for healthcare organizations aspiring to transform their supply chains into strategic enablers of care.

About the organisation



Cleveland Clinic Abu Dhabi is a world-class, multispecialty hospital in the United Arab Emirates, part of Cleveland Clinic's global network of 23 hospitals. It is renowned for delivering exceptional, patient-centred care. Designed to replicate the quality and safety standards of the Cleveland Clinic in the United States, the hospital combines advanced medical expertise with state-of-the-art technology across more than 40 medical and surgical specialties. To strengthen patient safety and operational excellence, Cleveland Clinic Abu Dhabi became the first hospital in the UAE to implement GS1 standards, thereby transforming its supply chain through improved traceability, inventory accuracy, and regulatory compliance, while supporting its broader vision for digital innovation.

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