Digital Transformation and Readiness for GS1 Standards
A Conversation with Mackenzie Health Canada

Presentation by:
- Altaf Stationwala, President & CEO
- Susan Simao, Director, Pharmacy & Medication Management
- Pamela Richards, Program Manager, Surgery
An Introduction to Mackenzie Health (MH)

Cortellucci Vaughan Hospital

Specialized Services:
- Inpatient Integrated Stroke Care
- Inpatient Mental Health Care
- Obstetrics
- Pediatrics

Core Services:
- Critical Care
- Emergency Care
- Medicine
- Surgery

Community-Based Services:
- Autism, Behaviour Management, Brain Injury, Cardiovascular Rehabilitation, Complex Continuing Care, Diabetes Education, Dialysis, Domestic Abuse and Sexual Assault

Mackenzie Richmond Hill Hospital

Specialized Services:
- Chronic Kidney Disease Program
- Complex Continuing Care
- Outpatient Clinics
- Rehabilitation

Core Services:
- Critical Care
- Emergency Care
- Medicine
- Surgery
Mackenzie Health’s journey from one to two hospitals

2011

One hospital

- Emergency
- Inpatient Beds
- Clinical Supports
- Surgery
- Obstetrics
- Pediatrics
- Mental Health
- Rehabilitation

448 beds

500 Physicians
2,000 Staff
500 Volunteers

85,853 Emergency Visits

2022

Two hospitals, including new Vaughan hospital

- Rehabilitation & Complex Continuing Care
- Seniors & Chronic Diseases
- Chronic Kidney Disease

785 beds

650+ Physicians
4,700+ Staff
700 Volunteers

207K Emergency Visits for 2022

We more than doubled population served based on drive time.
Think Big
Be Bold
Our future is Epic

Epic implementation enabled every strategic driver of quality & patient safety
Throughout our EMR journey, we have been adding functionalities to better serve our patients.
Healthcare industry needs universal barcode infrastructure

- Healthcare industry is behind on universal barcoding system
- Infrastructure needs to be in place to ensure universal barcoding to support patient care
- Requires organization to grow data content, build infrastructure, data governance and analytical competency
- Most Canadian hospitals are at a Stage 4 which focuses on documentation and CPOE
Mackenzie Health is leveraging the Healthcare Deployment Roadmap

Global Standards
✓ Statement of Direction Approved
✓ Gap Analysis
✓ GS1 Digital Readiness Scorecard

National Product and Location Registries
✓ Pilot Stage Statement of Direction for National Healthcare Product Registry Approved
❑ Early Adopter Pilot
❑ Requirements of a healthcare product registry including a medical device category

Common Platform to Communicate Recall & Withdrawal Notifications
❑ Discussions on the advancement of a common platform
❑ Continue work commenced by GS1 Canada Product Recall for Medical Device Working Group (2018)
Barcodes promote product identification, traceability and visibility

Product identification

Inventory control and traceability

Product visibility across the product cycle
Barcoding in Pharmacy
Our Pharmacy’s Pathway to Barcoding Success

- Foundational elements
- Constructing the source of truth
- Implementation
- Monitoring impact and uptake
We had to build the infrastructure to support our vision
We built workarounds to accommodate for lack of barcoding infrastructure

Made in House Medications Will Always Require Barcoding

Repackaged Products – unit dose oral solids, unit dose oral liquids

Compounded Products – sterile and non-sterile compounds

Lack of Universal Barcoding means we have to do more

No GS1 compliant barcode on product

Limited lot number and expiry detail
Automation to generate barcodes is preferred
Due to lack of legislation, there is still a long way to go to support full traceability.

Nearly 40% of products do not have a barcode with lot and expiry.

Embedded within the 44.5% of products that are fully traceable are products with no valid GTIN.
We use many systems to optimize processes

**Pharmacy Product Flow**

1. At receiving, identify if product has a 14 digit GTIN barcode at unit of use (UOU)
2. If no usable GTIN, follow MH generated barcode workflow to label UOU
3. Restock into pharmacy automation using barcode scanning process
4. Barcode scan on removal from pharmacy automation to restock ADUs and Anesthesia Carts
5. Barcode scan to restock into correct pocket of ADU and Anesthesia Cart
6. Administer to patient using barcode scanning in Epic
7. Removal from patient care unit and pharmacy automation updates inventory tracking in Epic for full visibility

*Note: GS1 compliant barcodes include the GTIN, expiry date and lot number*

**Anesthesia Removal at CVH**

1. At removal from Anesthesia Cart, scan medication barcode using Codonics Printer
2. Codonics will verbalize the name and strength of the scanned medication as a second check
3. Codonics printer generates medication label with a barcode
4. Label is applied to prepared medication to scan at administration
5. MD scans barcode on Codonics label to document administration in Epic

Administration in Epic generates traceability of product to the patient level (including lot and expiry if that info is included in the GS1 compliant barcode)
We built workarounds to accommodate for poor system infrastructure

Resources, processes, and workflows are needed in order to compensate for the deficiencies in the existing barcode standards and legislation.

- Maintain formularies
- Verify barcodes
- Create and verify standardized barcodes
- Troubleshoot when barcodes are not working
The process for technicians to apply a barcode on a single product is very complicated and high-risk.
Since implementation, we have had high adherence to the barcoding process

<table>
<thead>
<tr>
<th></th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec (MTD)</th>
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<tbody>
<tr>
<td>Patients attempted to scan at the bedside (≥95%)</td>
<td>98.2</td>
<td>98.2</td>
<td>97.7</td>
<td>97.7</td>
<td>97.6</td>
<td>97.8</td>
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<tr>
<td>Medications attempted to scan at the bedside (≥95%)</td>
<td>96.8</td>
<td>96.8</td>
<td>96.8</td>
<td>96.4</td>
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<tr>
<td>Blood Products attempted to scan at the bedside (≥95%)</td>
<td>98.9</td>
<td>97.5</td>
<td>99.3</td>
<td>99.4</td>
<td>99.8</td>
<td>99.6</td>
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<tr>
<td>Human Milk attempted to scan at the bedside (≥95%)</td>
<td>99</td>
<td>99.7</td>
<td>99.6</td>
<td>99.5</td>
<td>98.4</td>
<td>100</td>
</tr>
<tr>
<td>Bedside Specimen/Sample Collection (≥95%)</td>
<td>98.6</td>
<td>98.5</td>
<td>98.5</td>
<td>98.4</td>
<td>98.5</td>
<td>98.5</td>
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<tr>
<td>Computer Provider Order Entry (≥90%)</td>
<td>97.4</td>
<td>97.3</td>
<td>97.1</td>
<td>97.2</td>
<td>97.2</td>
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## Pharmacy’s Challenges and Ideal State

<table>
<thead>
<tr>
<th>Benefits Observed</th>
<th>Challenges Faced</th>
<th>Lessons Learned</th>
<th>Next Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Improved provider experience by automating workflows</td>
<td>• Maintaining several databases</td>
<td>• Build the GTIN as the identifier of choice</td>
<td>• Need advocacy for legislation</td>
</tr>
<tr>
<td>• Decrease patient safety events by utilizing barcode scanning at different stages</td>
<td>• Manual checks</td>
<td>• Invest in an EMR that has capability to read and store lot and expiry from the barcode</td>
<td>• Need single global registry</td>
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<td>• Quality assurance</td>
<td>• Investing in resources to re-barcode vendor GTINs</td>
<td>• Invest in automation at the medication management level</td>
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<tr>
<td>• Line of sight to inventory</td>
<td>• Barcodes generated by Pharmacy have the potential to create a downstream error</td>
<td>• Ensure all systems use the same barcode</td>
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<td>• Drug recall management</td>
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<td>• Scan compliance</td>
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Barcoding in Operating Room
Our Operating Room Pathway to Barcoding Success

- Foundational elements
- Constructing the source of truth
- Implementation
- Monitoring impact and uptake
Before barcoding we relied on manual data entry

Key patient information was formerly tracked through the “Implant Book”

Included:

- Patient stickers
- Implant stickers
- Surgery information
Perioperative scanning requires partnerships to manage, maintain and capture barcodes accurately & effectively.

- People
- Processes
- Infrastructure
- Database
- Tracking
- Automation
Most of MH’s implant vendors have worked to meet a barcode standard that can be accessible to scanning into an EMR.
We have achieved success in scanning the orthopaedic implanted devices

**Implant Scanning:** Barcodes are available directly from manufacturer to scan
Many key items are not scanned into the patient’s chart

No barcode scanning for the following

- Instruments
- Supplies procured in bulk
- Equipment
We are diligent in scanning into the patient’s chart where it is possible

**Implant Barcode Scanning**

- The supply database within Epic is updated with information on supplies and implants from Plexxus.
- For implants, Plexxus sends a GTIN which is a generic barcode unique to that implant.
- In the operating room, the nurse uses a handheld barcode scanner and scans the implant barcode on the product.
- Because the barcode on the implant matches the GTIN in the Epic supply database, the implant is automatically documented in the patient’s chart.
Barcodes improve safety, efficiency, patient outcomes, and staff satisfaction

Clinical and Supply Chain Benefits

Case Costing
- Barcode scanning captures cost of care
- Individual patient as well as individual surgeon costs can be tracked in detail
- Benchmarking with our provincial peers
- Provides real time data to address areas of concern

Supply Chain Replenishment
- Multiple supply replenishment processes exist with or without the availability of barcoding
- JIT combines manual processes with scanning
- Direct orders also vary in applicability supplies
- Plexxus supports the procurement of both direct orders and Just in time supplies

Data Capture in the Patient’s Chart
- Easy process to scan data into the patient chart including lot and expiry when included in the barcode
- Easy retrieval process through report writing from within EPIC

Product Recalls
- Reports available to search EMR for recalled product
- Data then readily available to inform patient, vendor or other registries as necessary

Provider scans supplies
Optional for the vendor to send GTIN to the procurement partner so supplies do not scan
Items not scanned are assumed to exist on a pick ticket and already recorded in the chart or manually recorded in the chart
The healthcare system has a long way to go to catch up to retail and improve our systems for patients.

### Supply Chain Clinical Use

- Clinician scans supplies
- Optional for the vendor to send GTIN to the procurement partner so supplies do not scan
- Items not scanned are assumed to exist on a pick ticket and already recorded in the chart or manually recorded in the chart

### Impact on Implementation

- Vendor submission of GTIN is not mandatory making it impossible to scan into the EMR
- Some vendors use an alternate identifiers to the GTIN standards making it difficult to convert to a GTIN
- Not all items are in the database for scanning even if a GTIN does exist
We have achieved success in the face of challenges, but more could be accomplished with effective collaboration of state, industry and healthcare.

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<td>• accurate implant data in the EPIC chart</td>
<td>• Not all supplies scannable</td>
<td>• Scanning ensures timely and accurate documentation</td>
<td>• Creation of partnership agreements between GS1, Industry Suppliers, EMR vendors, Healthcare provider organizations and Health Canada</td>
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<td>• Decreased documentation errors related to supplies</td>
<td>• Risk of Inaccurate documentation when entered manually</td>
<td>• Removes assumptions from the process; this consistency creates reliability in the data</td>
<td>• Regulating and monitoring compliance to Healthcare GTIN data definitions</td>
</tr>
<tr>
<td>• Patient focus during care</td>
<td>• Supplies traced via scanning in EPIC chart, still requires manual entry into the procurement system</td>
<td>• Scanning increased provider time at the patient level</td>
<td>• Single national data registry for medical supplies</td>
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<tr>
<td>• Easier inventory replenishment</td>
<td>• Maintenance of current system/processes requires 3 FTE to support</td>
<td>• Facilitates access to information</td>
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</tr>
<tr>
<td>• Retrievable information on all scanned implants</td>
<td></td>
<td>• Enables evaluation of patient outcomes as associated with the products used</td>
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<tr>
<td>• High staff compliance with scanning process</td>
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Opportunities: Healthcare Excellence Through Application of GS1 Barcodes

**Patient Care Excellence**
- Correct medication administration
- Accurate implant device information in the EMR
- Simple recall notification process

**Inventory, Procurement and Recall Processes**
- Integrated inventory and procurement systems
- Recall notification at vendor, hospital, provider and patient levels

**Quality Assurance and Quality Improvement**
- Pristine National Registry
- Easy access to vendor quality issues and improvement initiatives
- Regular industry compliance evaluation with scorecard release

**Industry Quality Standards**
- GTIN Compliance with GS1 standards
- Barcode Compliance at the unit of use level
Future Opportunities: Inputs For Ideal State

Commitment to put patients first in the initiative

Engagement of surgical supplies vendors, health care providers, GS1 to create the knowledge base, urgency for action and evidence of success

Partnerships to implement GS1 standards compliance and implementation within each partner’s sector

Monitoring and follow up

Regulatory oversight

Understanding of the implications to patient care

Universal Standards and Registry
Thank you