Advancing Personalized Health Systems by Leveraging Supply Chain Innovation

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Dr. Anne Snowdon, Academic Chair
World Health Innovation Network (WIN)

WIN partners with health system stakeholders to source innovation, create the evidence for value, and develops models for scalability to embed innovative technologies, products and models of care into health systems to achieve value for Canadians, and drive economic growth for innovators.
Rising Global Healthcare Costs: 

5.3% per year (2014-2017)

Highest global spending as a percentage of GDP is in North America

HEALTH SYSTEM CONTEXT: THE CHALLENGE OF SUSTAINABILITY
Drive towards **Precision Medicine vs. the cost of these therapies** for health systems

- the 10 highest grossing drugs in the USA, number of people that improve (blue) vs. number that fail to improve (red)

Significant Pressure to find Value at the system level to achieve sustainability

Personalized medicine: Time for one-person trials
Clinical trials will no longer be “enough” evidence to adopt new medicines and therapies.

System level tracking and traceability will be foundational to quality and safety for the future of health systems.
In the case of the metal-on-metal joint implants it took 4-5 years before evidence was accumulated and reported. We are left with more than 500,000 patients with metal-on-metal prostheses in the USA and more than 40,000 in the UK who are at elevated risk of device failure, which will inevitably result in the burden of further surgical treatment as well as billions of dollars in costs to taxpayers (Lancet, 2015)
Case study research examined supply chain transformation as a strategy to strengthen health system performance in three global health systems:

- Canada – Alberta Health Services
- U.K. – National Health Service
- U.S. - Mercy Health System

Case studies released February 15, 2018
Framing the Research

• **System Level Measurement** of patient outcomes linked to product use and care procedures does not exist; system infrastructure to support safety is under developed in the health sector.

• **Empirical Evidence of the Impact** of Supply Chain Implementation in Health Systems is very limited.

• **Goal:** To Create Empirical Evidence of the Health System Level Impact of Implementing Supply Chain Infrastructure in Health Settings.
Supply Chain Strategy Implementation

**Alberta**
- Province wide integration of supply chain processes into clinical programs and teams – optimized inventory, tracked relative to use creates and safety outcomes, reduced high cost of inventory due to waste
- Online adverse event reporting province wide.

**NHS – Scan4Safety**
- Digital Tracking of every patient, product, care process, clinician, and location of care in six hospital Trusts, using point of care scanning
- Creates transparency to reduce variation and waste, enables accurate case costing, releases provider time to care for patients

**Mercy**
- Scaling supply chain infrastructure across 45 hospitals, traceability of every product linked to patient outcomes – Cardiology, Perioperative
- Revenues $1 billion since 2002 from supply chain
- 29% decrease in labour costs/case, 33% reduction in supplies costs in Perioperative program
Emerging Findings Globally

Patient Safety is the Key Driver
• Enables automated product recall and traceability, expired or recalled products removed from clinical setting automatically; 70% reduction in Never Events (Mercy)

Inventory Optimization: significant savings
• Ranges from 4:1 to 7:1 ROI on inventory savings alone, savings occur within first 18 months; potentially able to self fund

Integration of Supply Chain in Clinical Programs Creates System Transparency
• Transparency of what care patients receive, by who, using what products linked to outcomes – cost, safety, quality in “real time”; reduces variation, accurate case costing
<table>
<thead>
<tr>
<th>Country</th>
<th>Health System</th>
<th>ROI</th>
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</thead>
<tbody>
<tr>
<td>Canada</td>
<td>Alberta Health System</td>
<td>7:1 to date from inventory savings only $301,438,786 in savings over 7 years. Savings are from inventory only to date.</td>
</tr>
<tr>
<td>England</td>
<td>National Health Service</td>
<td>4:1 expected by year 3 from inventory savings, £1,034,000,000 savings projected by year 7 (£30M/mon. all Trusts) 16 FTE’s in labour savings/Trust.</td>
</tr>
<tr>
<td>United States</td>
<td>Mercy Health System</td>
<td>$1 billion savings as a direct outcome of optimizing and transforming supply chain processes across Mercy. 29.5% decline in labour costs and 33% decline in supply costs.</td>
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THE SUPPLY CHAIN PATHWAY TO QUALITY AND SAFETY

Personalization of Care to Population Need

Traceability across the patient’s Journey of Care – what works, for who and under what conditions for accurate measure of value

Future = System Value
Predictive Analytics, Proactive risk management Innovation of Products and Care Processes

Product Traceability enables automated recall, accurate case costing, safety surveillance

Integration of supply chain tools into patient care to inform clinical decisions - Quality and Safety (reduced Never Events, med. errors)

Inventory Optimization: (4:1---- 8:1)
Cost savings = self funding potential

Global Standards Adoption: products, patients, location

Supply Chain Infrastructure as a Strategic Asset for Health Systems: Maturity Tool
Development of a Supply Chain Maturity Model

• Critical Analysis of the Literature: what is known, not known
  • Very limited empirical study of health system supply chain

• Conceptual Mapping of Key features of supply chain in healthcare

• Qualitative Interviews of system stakeholders

• Conceptual Analysis of Existing Supply Chain Maturity Tools published for all sectors (n=26)
  • Examined levels, major concepts across maturity levels
  • Relevance to Health sector

• Early Draft of H-SIMM
  • Expert Advisory review
  • Heath system case studies for validation (NHS England, Mercy, Alberta Health Services)
Next Steps

- Validation and Testing with Global Health Systems
- Launch with Beta site health systems
- Predictive (AI) Tool Development for point of care predictive analytics to inform decisions and best outcomes
- Link Innovation Procurement to Real World Evidence
Questions & Discussion
Thank You

Dr. Anne Snowdon, Academic Chair, WIN
Anne.Snowdon@uwindsor.ca

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