Rethinking supply chain management:
How better practices impact the bottom line

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VP, Supply Chain Innovation
Lean Six Sigma Master Black Belt

Cardinal Health

Recognized leader in healthcare supply chain transformation
• Ranked #1 by Gartner 2011, 2012, 2013, in transforming the healthcare value chain to meet new challenges around costs, revenue and outcomes.
• Ranked #1 again in 2014

Unparalleled understanding of healthcare value chain
• Supplier and leading manufacturer of med/surg products
• Leader in providing supply chain services
• Built on a solid base of +40 years experience

Building for the future of healthcare
• Investments in innovative technology and data solutions
• RFID footprint in 41 countries
• Tracking medical devices in over 4,000 hospitals
A changing landscape

- Affordable Care Act (ACA)
- Unique Device Identification (UDI)
  - FDA
- Census & demographics
  - 10,000 people turning 65 every day
  - 10M Americans over 80
  - 20% Population >80 by 2030

Source: The State of Aging & Health in America 2013

The silver tsunami

The average spending on someone age 80 and older is nearly \(9x\) what it is for someone between the ages of 1 and 64.
A changing landscape

- Affordable Care Act (ACA)
- Unique Device Identification (UDI)
  - FDA
- Census demographics
  - 10,000 people turning 65 every day
  - 10M Americans over 80
  - 20% Population >80 by 2030
- CMS is growing
  - Over 50% of patients are CMS
  - Increasing bundled reimbursement by DRG
- Supply chain becoming more important

Expenses

- 35% Materials
- 55% Labor

10% Other

5

Source: American Hospital Association, Underpayment by MediCare and MediMedicaid Fact Sheet, November 2008

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Immensely waste in the supply chain

Does not include indirect costs of:
- Excess time spent by nurses searching for inventory
- Time spent (or patient risk) during product recalls
- Risk of non-compliance with FDA/UDI regulations

10%-30%
Waste in PPI supply chain

$5,000,000,000*
Estimated loss per year

*PNC Healthcare; GHX quantitative research study (August 2011)

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Ever changing environment

Must be **agile and adaptable** to control costs

Sources of variation
Fluctuating patient census

Ramp up clinical staff          Seasonal staff

Demographics

Age    Gender    Geography

80    24    59    44
Clinical practice

Lack of standardization

Diseases treated differently

Seasonal impact

Summer

Flu

Winter
Multiple variables effect

Interactions magnify demand variation

Demographics
- Census
- Disease states
- Seasonality
- Clinical practice

Adapting to change

- Grocery stores adapted to a lean model
- Point-of-use data collection/analytics
- Just-in-time inventory (logical unit-of-measure)
Ensuring financial success

Freight management

• Freight has become a profit center for manufacturers
  – Included in price of product
• For example, consider the Operating Room
  – Next-day delivery
  – Transportation budget managed elsewhere
• Unit cost vs total delivered cost
Number of suppliers

- More invoices
- More time spent ordering
- More time unloading trucks
- More cost

Manual cycle counting

- No value add in counting
  - 50% materials management time
- Too many mistakes
  - UOM issues
  - Fat finger
- Correct cycle count frequency?
  - Weekly, monthly, quarterly
  - NEVER?
Reviewing consignment

- Built in costs
- Expired/obsolete products – charged?
- Inefficient delivery method
- Ineffective controls and tracking
- Impact due to the FDA Unique Device Identification law (UDI)

How do you replenish?
Traditional forecast-based purchasing

- A retail model of purchasing
- Established based on some criteria
- A “stocking strategy”

<table>
<thead>
<tr>
<th>Positive</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low effort</td>
<td>Inaccurate</td>
</tr>
<tr>
<td></td>
<td>Creates storage solution mentality</td>
</tr>
<tr>
<td></td>
<td>Lack of visibility</td>
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</table>

Traditional demand-based purchasing

- An industry model (automotive, aerospace, etc.)
- Based on utilization

<table>
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<tr>
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<tbody>
<tr>
<td>Based on actual demand</td>
<td>Inability to react quickly to unexpected demand variation</td>
</tr>
<tr>
<td>Replenish only what you need</td>
<td>Requires supply chain visibility</td>
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</table>
The art of finding the right balance

Three-legged stool

Technology is the enabler

Patient outcome

Labor

Capital

Freight
## Best practice for high value items

<table>
<thead>
<tr>
<th>Best practice</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using an RFID-enabled system</td>
<td>• Real time visibility</td>
</tr>
<tr>
<td></td>
<td>• Unique Device Identification</td>
</tr>
<tr>
<td></td>
<td>• Accurate tracking</td>
</tr>
<tr>
<td></td>
<td>• Eliminate manual counting and errors</td>
</tr>
<tr>
<td>Point of care charge/data capture</td>
<td>• Compliance</td>
</tr>
<tr>
<td></td>
<td>• Accurate charge capture</td>
</tr>
<tr>
<td>Carefully choosing open vs. closed storage</td>
<td>• Time management</td>
</tr>
<tr>
<td></td>
<td>• Inventory control and compliance</td>
</tr>
<tr>
<td></td>
<td>• Cost</td>
</tr>
<tr>
<td>Interface with HIS</td>
<td>• Integrate inventory management in eco-system</td>
</tr>
<tr>
<td></td>
<td>• Eliminate double entry</td>
</tr>
<tr>
<td>Targeting the desired end state</td>
<td>• Inventory profile changing with successful implementation</td>
</tr>
</tbody>
</table>

## Best practice for commodity products

**Replace your PAR system!**

<table>
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<th>Best practice</th>
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<tbody>
<tr>
<td>Using 2-bin Kanban methodology</td>
<td>• Proven best practice in other industries</td>
</tr>
<tr>
<td></td>
<td>• Less labor</td>
</tr>
<tr>
<td></td>
<td>• Supports FIFO (first in first out)</td>
</tr>
<tr>
<td>No over investment in technology</td>
<td>• ROI not realized</td>
</tr>
<tr>
<td>Eliminate manual counting</td>
<td>• Upside down transactions</td>
</tr>
<tr>
<td>Strong analytics platform</td>
<td>• More predictable ordering patterns</td>
</tr>
<tr>
<td></td>
<td>• Use data to optimize purchasing</td>
</tr>
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Balancing the investment

Risk of under-investing  Risk of over-investing

Metrics for success in supply chain
Before you begin

Consistency is key

Ranking common metrics

<table>
<thead>
<tr>
<th>Rank</th>
<th>Tracking methods</th>
<th>Reason</th>
</tr>
</thead>
</table>
| Good | Total supply expense as a percent of net patient revenue | • Variability in Net Patient Revenue distorts month over month trends  
• Does not effectively illustrate true supply spend performance |
| Better| Total supply expense per adjusted discharge or CMI adjusted discharge | • Better aligns supply spend with patient volumes and level of acuity  
• Does not capture supply spend performance at the patient level |
| Best | Supply Intensity Score                                  | • Measures supply costs by patient and procedure type  
• Provides more precise and actionable data                       |
Are you measuring the right metrics?

- Every hospital measures similar benchmarks
  - But your waste is hiding in what you’re not measuring

<table>
<thead>
<tr>
<th>New metrics to track</th>
<th>Improvement opportunity</th>
</tr>
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<tbody>
<tr>
<td>Expired Supplies</td>
<td>• How much are you expiring out each month?</td>
</tr>
<tr>
<td></td>
<td>• These are products that could have been returned, redeployed, or even resold.</td>
</tr>
<tr>
<td></td>
<td>• 2% - 5% annually lost</td>
</tr>
<tr>
<td>Lost Products (Leakage)</td>
<td>• How much product is missing each month?</td>
</tr>
<tr>
<td></td>
<td>• Leakage can be mitigated with enhanced tracking and inventory controls.</td>
</tr>
<tr>
<td>Clinical time spent on supply chain (HCAHPS)</td>
<td>• How much clinical time is spent on finding stocked out supplies,</td>
</tr>
<tr>
<td></td>
<td>logging in/out of POU systems, or recording takes/returns?</td>
</tr>
<tr>
<td></td>
<td>• This represents time could have been spent with the patient.</td>
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Case study

Source: Emory St. Joseph case study, May 2015
Case study

Source: Bellevue Medical Center case study, September 2013

Choose the right tool for the right inventory

Cardinal Health Inventory Management Solutions
The total supply chain approach

Cardinal Health Inventory Management Solutions

Supplier/manufacturer — Distribution center — Hospital/healthcare provider — Patient and procedure

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