Clinical Supply Chain Integration in a Data-Driven Health Care Environment

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Conflict of Interest

The speakers have no real or apparent conflicts of interest to report.
Agenda

• How data drives decision making for success under health care reform

• How AHRMM’s Cost, Quality, and Outcomes movement aligns with the Triple Aim

• Using data for clinical integration and physician engagement
Learning Objectives

• Describe how connected data helps in decision making in a Value Based Purchasing environment
• Identify how data is used for physician engagement and clinical integration
• Discuss how AHRMM’s focus on Cost, Quality, and Outcomes aligns with the Triple Aim and Clinical Integration
• Describe how new payment models can impact decisions about clinical integration
Since the beginning, hospitals get paid for volume. Healthcare spending 6.9% of GDP

1983 DRGs introduced, Hospitals get paid fixed amount for volume. Healthcare spending 8.9% of GDP

Products efficacy becomes more important

2010, PPACA goes into law. Two arms, insurance reform and payment reform (VBSP). Healthcare spending 17.3% of GDP

Post discharge episode of care becomes a greater consideration

2013, AHRMM launches the CQO Movement

2013, CMS launches initial BPCI programs, limited adoption. Allows for sharing of savings with providers. Healthcare spending at 17.2% of GDP (recession)

Alignment with physicians creates opportunity for collaboration

2014, HAC penalties introduced, penalizes hospitals for poor outcomes. Healthcare spending at 17.4% of GDP

Non-Acute providers are now rewarded/penalized for Quality, Improvement, and Advancing Care

2013 CMS launches initial BPCI programs, limited adoption. Allows for sharing of savings with providers. Healthcare spending at 17.9% of GDP

2015-2016, CMS launches MACRA. Moves from Process to Outcomes focus for non-acute providers. Healthcare spending at 17.9% of GDP

2016, CMS launches CJR and BPCI. Sets target spending levels and allows for gainsharing with providers

Clinical integration with Supply Chain becomes essential for collective success and patient outcomes

2013, AHRMM launches the CQO Movement

2018, CMS expands BPCI-A to include 32 clinical episodes. BPCI-A also counts as an advanced APM under MACRA

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Why ‘Sudden’ Activity on Reform?

• Healthcare cost per capita
  – UK-$4,003
  – Japan-$4,150
  – France-$4,407
  – Sweden-$5,228
  – Germany-$5,267
  – US-$9,990

• Value instead of Volume has shown to be effective in reducing cost and increasing quality
Acronyms and Alphabet Soup
CQO: The Concept

• A new way of approaching Supply Chain.

• Focus is not just on price but rather the combination of product cost, the quality of care delivered, and good outcomes with favorable reimbursement to support healthcare’s new value-based models.

• CQO is not a Supply Chain issue, it is a Health Care Issue
Accurate and Complete Data Including UDI/GTIN and Classification

Comparative Effectiveness

Evidence Based Decisions

Decision Support

Research and Development

Improved Quality

Increased Satisfaction

Financial Performance

Effective Supply Chain

Efficient Transactions

Appropriate Utilization

Effective Supply Chain

Competitive Contracting

Utilization Benchmarking

Price Benchmarking

Billing and Claims Data

Clinical Documentation

Clinical Outcomes

Product Selection

Accurate and Complete Data Including UDI/GTIN and Classification

How Connected Data Optimizes CQO
CQO Tie to the Triple Aim

CQO: The Future of Healthcare Supply Chain

The IHI Triple Aim

Population Health

Experience of Care

Per Capita Cost
CQO: The Principles

• Stakeholder education
• Contribution to patient care.
• Supply Chain is strategic
• Supply Chain’s position
Why is Clinical Integration So Important?

• Encompasses Cost, Quality, and Outcomes in decisions
• Evidence based decision processes
• Inclusion of all stakeholders
• Focus on the continuum of care
• Impacts all providers reimbursement
Supply Chain’s Alignment:

- Analytics in guiding healthcare procurement decisions.
- Focus from product costs to product quality and patient outcomes.
- Identifying relationships that bring value
Supply Chain’s Alignment:

• Supply Chain involvement in non-acute settings.
• Alternative payment models like CJR.
• Linking data to identify clinical variation.
Supply Chain’s Alignment:

• Collaborative internal and external relationships.
• Coordination of existing and needed health promotion resources.
• Collaboration with clinical, social service, and trading partners.
Supply Chain’s Alignment:

- Focus on Cost, Quality, and Outcomes.
- Understanding Medicare Spending Per Beneficiary.
- Work with departments to identify care and cost trends.
Supply Chain’s Alignment:

- Technology utilization to improve analytics models.
- Data standards to enhance data quality and clarity.
- Allows clinical staff to spend more time on direct patient care.
Clinical Integration at RWJBarnabas Health

• Collaboratives and Councils
  – Twenty two centralized committees, both ad hoc and permanent
  – Both functional and specialty focused
  – Supply Chain represented on each team
  – Review contracts and standardize products/processes based on evidence

• Integrated Leadership Groups
  – Physician collaboratives by clinical specialty
  – Representation from each hospital and Supply Chain
  – Vehicle to discuss PPI and contract opportunities
Clinical Integration Successes

• Blood
  – Improved pricing for Blood/Blood Products, savings of over $3m
  – Identified utilization opportunity of $3m-$5m
  – Partnered with CMO to frame opportunity and create business plan

• CRM
  – Developed contracting plan with physicians
  – Collaboratively evaluated responses and technologies
  – ILG makes ongoing decisions regarding addition of new technology
  – Savings realized over $9m

• Stents
  – Developed contracting plan with physicians
  – Collaboratively evaluated responses and technologies
  – Agreed upon strategy resulted in savings over $3m
Using Data for Clinical Integration and Physician Engagement
### Exhibit ES-1. Overall Ranking

<table>
<thead>
<tr>
<th>Country Rankings</th>
<th>1.00-2.33</th>
<th>2.34-4.66</th>
<th>4.67-7.00</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overall Ranking (2010)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Quality Care</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effective Care</td>
<td>2</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Safe Care</td>
<td>6</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Coordinated Care</td>
<td>4</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Patient-Centered Care</td>
<td>2</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td><strong>Access</strong></td>
<td>6.5</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td><strong>Cost-Related Problem</strong></td>
<td>6</td>
<td>3.5</td>
<td>3.5</td>
</tr>
<tr>
<td><strong>Timeliness of Care</strong></td>
<td>6</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td><strong>Efficiency</strong></td>
<td>2</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td><strong>Equity</strong></td>
<td>4</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td><strong>Long, Healthy, Productive Lives</strong></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>Health Expenditures/Capita, 2007</strong></td>
<td>$3,357</td>
<td>$3,895</td>
<td>$3,588</td>
</tr>
</tbody>
</table>

* Estimate. Expenditures shown in $US PPP (purchasing power parity).

Source: Calculated by The Commonwealth Fund based on 2007 International Health Policy Survey; 2008 International Health Policy Survey of Sicker Adults; 2009 International Health Policy Survey of Primary Care Physicians; Commonwealth Fund Commission on a High Performance Health System National Scorecard; and Organization for Economic Cooperation and Development, OECD Health Data, 2009 (Paris: OECD, Nov. 2009).
Life expectancy vs. health expenditure over time (1970-2014)

Health spending measures the consumption of health care goods and services, including personal health care (curative care, rehabilitative care, long-term care, ancillary services and medical goods) and collective services (prevention and public health services as well as health administration), but excluding spending on investments. Shown is total health expenditure (financed by public and private sources).

Data source: Health expenditure from the OECD; Life expectancy from the World Bank. Licensed under CC-BY-SA by the author Max Roser. The interactive data visualization is available at OurWorldinData.org. There you find the raw data and more visualizations on this topic.
Total Medicare Reimbursements per Enrollee, 2014

Percent of Diabetic Medicare Enrollees Receiving Appropriate Management, 2014
Patient-centered health system transformation

Traditional model: hospital as hub

New model: centered around patient experience

Traditional model:
- Hospital
  - Doctors
  - Clinics
  - Surgery Center
  - Insurance

New model:
- Patients
  - Digitally enabled environment
  - Hospitals
  - Doctors
  - Insurance
  - Clinics
  - Surgery Center
The Future of Health Care Supply Chain

The Evolution of Health Care

- Acute/Non-Acute Care Organization
- Clinical Quality Organization
- Population Health Management Organization
- Personalized Health Management
- Supply Chain Management
- Value Chain Network
- Value-Creating Network
- Clinically Integrated Value Network
Clinical Integration:

Clinical integration with respect to healthcare supply chain is an interdisciplinary partnership to deliver patient care with the highest value (high quality, best outcomes, and minimal waste resulting in the lowest total cost of care); this is achieved through assimilation and coordination of clinical and supply chain knowledge, data, and leadership across the care continuum to deliver care that is safe, timely, evidence-based, efficient, equitable and patient-focused.

- AHRMM Clinical Integration Taskforce
**What it could look like...**

### Silos
- Clinician wants product
- SC finds best price

### Collaboration
- Clinicians agree on best option
- SC negotiates contract
- SC tracks contract compliance
- Clinicians track utilization (maybe)

### Integration
- Clinicians and SC agree on best option based on evidence
- SC negotiates contract leveraging outcomes
- Joint accountability for compliance AND appropriate utilization
- Outcomes drive choice

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**Clinical and Financial decisions (CQO)**

**Clinicians and Supply Chain**

**Clinical decisions**
- Clinicians

**Financial decisions**
- Supply Chain

**Clinical and Financial decisions**
# Clinical Integration: Why? (or why not?)

<table>
<thead>
<tr>
<th>Pros/drivers</th>
<th>Cons/challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aligned with value-based payment models (MACRA, APMs, BPCI, etc.)</td>
<td>Misconception that supply chain’s role is (or should be) purely transactional</td>
</tr>
<tr>
<td>Sets quality as a financial metric</td>
<td>Lack of quality and outcomes evidence</td>
</tr>
<tr>
<td>“Workaround” substitute for physician employment (antitrust)</td>
<td>Cultural barriers</td>
</tr>
<tr>
<td>Joint risk sharing for contracting</td>
<td>Stakeholders not clear on the concept</td>
</tr>
<tr>
<td>Accepts accountability for population health</td>
<td>Traditional misalignment between hospitals and physicians</td>
</tr>
<tr>
<td></td>
<td>Still relying on fee for service</td>
</tr>
</tbody>
</table>
Measuring Clinical Integration for Value

- **What** metrics do we need to measure?
- **Where** do we get the data?
- **Who** owns the data?
- **Who** are the key stakeholders?
- **How** should the data be used?
Defining the Components of Value: (Quality + Outcomes)/Cost

- **Quality:** “doing the right thing”
  - Preop antibiotics given within 1 hour of incision
  - Number of postop days before a urinary catheter was removed
  - Percentage of patients who received smoking cessation education

- **Outcomes:** “how things turned out”
  - Rate of surgical site infections
  - Urinary tract infection rate
  - Amount of pain medications used by the patient
  - Rate of unexpected readmissions
  - Financial outcomes/margin

- **Cost:** Total cost of care
  - Supplies, lab, pharmacy, R&B, OR time, etc.
  - Must consider pre- and post-acute costs
  - What is the cost of quality?
The Stages of Clinical Data Maturity

**What**
- Raw Data
- Relevant Data
- Actionable Data
- Information
- Story/strategy

**Format**
- Unsorted Spreadsheets
- Sorted Spreadsheets
- Abstracted Data
- Dashboards
- Scorecards
- Financial proforma
- Charts
- Executive reports
- Committee minutes
- Newsletters
- Articles
- Corporate/board reports
- Customer facing
- Stakeholder meetings

**Who**
- Data entry
- EHRs
- Abstractors
- Data analysts
- Clinical informaticists
- Medical directors
- CMO, CQO
- CEO, other Cs

**Example**
- Lab results
- Intraoperative Glucose
- Variations in Glucose management
- Improved outcomes in postop infections
- Better patient care using data

Variations in Glucose management improved outcomes in postop infections, better patient care using data.
## Using Data Effectively

<table>
<thead>
<tr>
<th>Good</th>
<th>Bad (or not so good)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify quality improvement opportunities</td>
<td>Point out outliers</td>
</tr>
<tr>
<td>Physician credentialing</td>
<td>Physician credentialing</td>
</tr>
<tr>
<td>Improve earnings</td>
<td>Cost shifting</td>
</tr>
<tr>
<td>Patient education</td>
<td>Selective transparency</td>
</tr>
<tr>
<td>Organize teams and set goals</td>
<td>Identify good and bad performers</td>
</tr>
<tr>
<td>Set the burning platform</td>
<td>Prove a point</td>
</tr>
</tbody>
</table>
How can physicians enhance value with supply chain?

• Standardize vendor selection
• Contract compliance
• Savings within contracts
• Appropriate utilization
• Product standardization (e.g. packs, preference cards)
• New product value assessment
Setting the right targets

Outlier reduction

Total cost reduction
Typical cost outlier analysis example

Average total direct variable cost
Primary unilateral total knee replacement
for surgeons with >75 cases per yr
(size of circle reflects relative case volume)

System average direct variable cost per case
Average Cost for an Item Category: Elective TKA

Each line represents one surgeon. Size of circles represents relative case volume.
Driving sustained margin improvement over time

- Average cost per case distribution if each provider moved 25% closer to the most cost-effective practice each year

Example: Direct Variable Cost for Elective Total Knee Replacements over time

Average Total Cost: Elective TKA

Estimate of current benchmark performance for direct cost coverage
Contract Compliance (Hospital A and B conversion in April 2017)
### No Effect on Outcomes After Product Conversion

<table>
<thead>
<tr>
<th></th>
<th>Hosp A</th>
<th>Hosp B</th>
<th>System</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Index period</td>
<td>Post conv</td>
<td>Index period</td>
</tr>
<tr>
<td>Case volume</td>
<td>52</td>
<td>56</td>
<td>65</td>
</tr>
<tr>
<td>Reoperation</td>
<td>5.8%</td>
<td>0.0%</td>
<td>6.2%</td>
</tr>
<tr>
<td>Mortality</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Deep abscess</td>
<td>7.7%</td>
<td>1.8%</td>
<td>6.2%</td>
</tr>
<tr>
<td>LOS (Median days)</td>
<td>4.1</td>
<td>3.4</td>
<td>4.2</td>
</tr>
</tbody>
</table>
Anesthesia Agent Selection:
PSJH- Financial & Environmental (GHG) Impacts, 2018.1

<table>
<thead>
<tr>
<th>MAC-hours (%)</th>
<th>Cost $ (%)</th>
<th>mtCO$_2$e (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>total = ~ $1.7 million</td>
<td>total = 4610.6 mtCO$_2$e</td>
</tr>
</tbody>
</table>

~ 11.3 million passenger car miles
Agent Selection:
Individual Clinician Examples from 8 sample hospitals
(% agent use of total individual case-hr [2016])

Brian Chesebro, MD
Agent Selection: Individual Clinician Examples- Environmental (GHG) cost

- total 2016 case-hrs within ~5% of each other

<table>
<thead>
<tr>
<th>Case-Hr (%)</th>
<th>Case-Hrs</th>
<th>Passenger Car Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;50:50&quot; Phil</td>
<td>78.8 mtCO₂e / ~193,000 passenger car miles</td>
<td></td>
</tr>
<tr>
<td>&quot;sevo&quot; Sara</td>
<td>7 mtCO₂e / ~17,000 passenger car miles</td>
<td></td>
</tr>
<tr>
<td>&quot;desfl&quot; Dave</td>
<td>124.1 mtCO₂e / ~305,000 passenger car miles</td>
<td></td>
</tr>
</tbody>
</table>

Brian Chesebro, MD
Agent Selection (%)

- Isoflurane
- Sevoflurane
- Desflurane

Efficiency Index: Agent-specific

- Sevoflurane
- Desflurane

Cost ($)

- Isoflurane
- Sevoflurane
- Desflurane

GHG emissions (mtCO2e)

- Isoflurane
- Sevoflurane
- Desflurane

Cost & GHG emissions / hour

- Desflurane use: ▼ 98.7% (79% ▼ 1 %)
- Efficiency Indices: ▲ sevo., n/a des.
- Cost: ▼ 74.2% (▼ $33,410 / yr.)
- GHG emissions: ▼ 97% (▼ 251.8 mtCO2e / yr.) (▼ ~617,000 passenger car miles)
Summary for Clinical Integration Success

- Understand the forces driving the need for Clinical Integration will help you define the right metrics.
- Start with data that is reliable and accurate, AND meaningful (i.e. clinically relevant).
- NEW: Physician/clinician leadership driving clinically oriented data analytics strategy.
- Data architecture that can be drilled down to physician level and individual cost drivers.
- Unified CQO approach to prevent isolating individuals as outliers, segregating “right” from “wrong”, and missing significant opportunities for cost savings and quality improvement.
- Joint accountability for cost, quality and outcomes.
Questions

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