Building a Business Case for Quality Improvement

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Sessions Objectives

• Review the principles of a business case study
• Determine the opportunity costs of waste within the health care system
• Items to consider/readiness to develop a business case (picking the right project)
A Case Study: University of Pennsylvania

- Richard Shannon MD; IHI
- CA-BSI
Principles of a Business Case
Start with 1 Patient: Human Costs of CA-BSI

- 37 year old video game programmer, father of 4, admitted with acute pancreatitis secondary to hypertriglyceridemia
- Day 3: developed hypotension, and respiratory failure
- Day 6: fever and blood cultures positive for MRSA secondary to femoral vein catheter in place for 4 days
- Multiple infectious complications requiring exploratory laparotomy and eventually tracheostomy
- Day 86: Discharged to nursing home
## The Impact of CLABs on Gross Margin

<table>
<thead>
<tr>
<th></th>
<th>DRG 204/2721 (n=3)</th>
<th>DRG 191 (n=3)</th>
<th>DRG 483 (n=2)</th>
<th>Case 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acute pancreatitis</strong></td>
<td>$5,907</td>
<td>$99,214</td>
<td>$125,576</td>
<td>$200,031</td>
</tr>
<tr>
<td><strong>Pancreatitis w cc</strong></td>
<td>$5,788</td>
<td>58,905</td>
<td>$98,094</td>
<td>$241,844</td>
</tr>
<tr>
<td><strong>Gross Margin</strong></td>
<td>$119</td>
<td>$40,309</td>
<td>$27,482</td>
<td>-$41,813</td>
</tr>
<tr>
<td><strong>Costs attributable to CLAB</strong></td>
<td></td>
<td></td>
<td></td>
<td>$170,565</td>
</tr>
<tr>
<td><strong>LOS (days)</strong></td>
<td>4</td>
<td>38</td>
<td>41</td>
<td>86</td>
</tr>
</tbody>
</table>

*American J. Med Quality 2006*
Conspiracy of Error and Waste

- Average Payments: $64,894
- Average Expense: $91,733
- Average Loss from Operations: -$26,839
- Total Loss from Operations: -$1,449,306
- In only 4 cases did the hospital make money!
- The cost of the additional care averaged 43% of the total costs of care
- Average LOS: 28 days (7-137)
- Only three patients were discharged to home.
<table>
<thead>
<tr>
<th></th>
<th>Traditional Approach FY 03</th>
<th>New Protocol FY 04 Year 1</th>
<th>New Protocol FY 05 Year 2</th>
<th>New Protocol FY 06 Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICU Admissions (n)</td>
<td>1753</td>
<td>1798 (+45)</td>
<td>1829 (+76)</td>
<td>2,141 (+388)</td>
</tr>
<tr>
<td>Atlas Severity Grade</td>
<td>1.9</td>
<td>2.0</td>
<td>2.1</td>
<td>2.2</td>
</tr>
<tr>
<td>Age (years)</td>
<td>62 (24-80)</td>
<td>62 (50-74)</td>
<td>65 (39-71)</td>
<td>64 (56-76)</td>
</tr>
<tr>
<td>Gender (M/F)</td>
<td>22/15</td>
<td>3/3</td>
<td>4/7</td>
<td>2/2</td>
</tr>
<tr>
<td>Central lines employed (n)</td>
<td>1110</td>
<td>1321* (211)</td>
<td>1487* (377)</td>
<td>1998*</td>
</tr>
<tr>
<td>Line-days</td>
<td>4687</td>
<td>5052*</td>
<td>6705*</td>
<td>9006*</td>
</tr>
<tr>
<td>Infections</td>
<td>49</td>
<td>6*</td>
<td>11*</td>
<td>4*</td>
</tr>
<tr>
<td>Patients Infected</td>
<td>37</td>
<td>6*</td>
<td>11*</td>
<td>4*</td>
</tr>
<tr>
<td>Rates (infections/ 1000 line-days)</td>
<td>10.5</td>
<td>1.2*</td>
<td>1.6*</td>
<td>0.44*</td>
</tr>
<tr>
<td>Deaths</td>
<td>19</td>
<td>1*</td>
<td>2*</td>
<td>2*</td>
</tr>
<tr>
<td>Reliability (# of lines placed to get 1 infection)</td>
<td>22</td>
<td>185*</td>
<td>135*</td>
<td>500*</td>
</tr>
</tbody>
</table>
How to Develop the Business Case

1. Identify patients and adjust for age, gender, and severity
2. Establish clinical outcomes
3. Acquire cost data and stratify according to attributable and non-attributable costs
4. Acquire reimbursement data
5. Calculate profit and loss per case
6. Calculate cost of intervention
7. Determine return on investment (ROI)
Bootstrap Success

Pull Here
VAP: Financial Losses Are Sizable

VAP vs. Non-VAP patient average

<table>
<thead>
<tr>
<th></th>
<th>Intubated Patient Total (N=2006)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>VAP case (N= 99, 5.1%)</td>
</tr>
<tr>
<td>Total Cost*</td>
<td>$87,318</td>
</tr>
<tr>
<td>Reimbursement*</td>
<td>$62,883</td>
</tr>
<tr>
<td><strong>Profit/Loss</strong></td>
<td><strong>-$24,435</strong></td>
</tr>
<tr>
<td>VAP/Non-VAP Difference</td>
<td></td>
</tr>
<tr>
<td>LOS</td>
<td>34.3</td>
</tr>
<tr>
<td>Days on Vent</td>
<td>27.8</td>
</tr>
<tr>
<td>ASG**</td>
<td>2.6</td>
</tr>
</tbody>
</table>
The Costs of VAP

- Average Payments: $62,883
- The average payments were twice that for a similar care without VAP ($62,883 vs $33,569)
- Average Expense: $87,318
- Average Loss from Operations: -$24,435
- Total Loss from Operations: -$2,419,065
- Average LOS: 34 days versus 17 days
- 32% of patients died and 43% underwent tracheotomy
The Cost of the Intervention

• Variable Costs of the Components (ie. Treatment Intervention)

  $0.40/day/pt Chlorohexidine mouthwash
  + $1.00/day Clear and blue ventilator tubes
  = $1.40/day

  * 11.17 Average days on ventilator
  = $15.64/patient

  + $0.58/patient Yankauer suction
  + $0.75/patient Resuscitation bag hook
  = $17 (per patient)

• No Other Costs Associated With Implementation
  ▫ No special training for nurses
  ▫ Little additional time for nurses to perform
## Savings Far Exceed the Costs of Intervention

<table>
<thead>
<tr>
<th>Cost of the Intervention</th>
<th>$10,897 (for all patients)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Savings</td>
<td>$16,010 (per one case)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No. of prevented VAP cases</th>
<th>Nominal Savings</th>
<th>Cost of the Intervention</th>
<th>Actual Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$16,010</td>
<td>$10,897</td>
<td>$5,113</td>
</tr>
<tr>
<td>2</td>
<td>$32,020</td>
<td>$10,897</td>
<td>$21,123</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>$160,098</td>
<td>$10,897</td>
<td>$148,201</td>
</tr>
</tbody>
</table>
Reductions in Hospital Acquired Infections

Journal of Quality and Patient Safety 2006;32:479
The Incentives Are Not Aligned with Outcomes

126 more admissions

Net Profit/Loss per case

Intubated

Intubated+VAP

- $24,435

- $8,426

$6,938

$3,292
Other Case Studies
Case Study: VA Hospital System

- **Cost of Poor Quality**

<table>
<thead>
<tr>
<th>Safety Event</th>
<th>Avg Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Falls</td>
<td>$25,000 to $35,000 per fracture**</td>
</tr>
<tr>
<td>Nosocomial infection</td>
<td>minimum of $5,000 per episode</td>
</tr>
<tr>
<td>Adverse drug events</td>
<td>$5,000 per event</td>
</tr>
</tbody>
</table>

**1 in 3 patients over age 65 with a fall-related fracture dies**

- **Programs to Date:**
  - For every $100 spent on VA operations, 10 cents is spent on implementing patient safety programs, equating to $130,000 per facility per year.
  - An investment of $1,000 in hand hygiene yielded $60,000 in avoided care costs.
  - An investment of $25,000 in a fall prevention program yielded $115,000 in savings in fracture care.
“Pay for Value” Programs Means… Revenue at Risk
Suboptimal Care will Get More Expensive: “Pay for Value” Programs in the Marketplace

- TJC “Never Events”
- Core Measures
- PQRS
- VBM
- Global Payments & Episode Groupers
- Tiered Network, Gainsharing
  – Commercial Payer
Defects in Process of Care
VALUE = \frac{Quality}{Cost} = \text{Outcomes + Patient Experience} \begin{array}{c} \text{Direct Costs + Indirect Costs} \end{array}
Take a Closer Look at Waste

**Overproduction:** Producing too much; producing too soon; batch processing

**Transportation:** Any nonessential transport or handling

**Inventory:** High supply stores; finished product stores; in-work materials

**Waiting:** Waiting on parts or documents, waiting for other workers or a machine

**Defects:** Any rework; errors

**I**ntellect: Failure to fully utilize the time and talents of people; lack of training; no avenue for suggestions

**Motion:** Any motion that does not add value; chasing parts, signatures, tools, etc

**Extra Processing:** Adding inspections; approvals; reviews
Does improving healthcare quality cost money or save money?
Answer: Depends How you look at it
Typical IHQSE Business Cases

• Efficiency
  – Decrease LOS
  – Increase volume

• Quality/Safety
  – Decrease patient harm
  – Decrease unplanned care (readmissions)
  – Decrease unnecessary utilization (testing, consultation, etc)
  – Decrease variation
Business Case

“Hard”
- Direct impact on cash flow
  - Less FTEs
  - More volume
  - New business line
- Data ($) easy to quality
  - Usually transaction based
- Impact near “real term”
  - CFO’s think in Qcycles

“Soft”
- Indirect impact on cash flow
  - Eg. Decrease practice variability
  - Increase capacity
- Data tough to quantity
  - Staff “satisfaction”
- Long term impact (years)
IHQSE B Case Challenge
Challenges

• Seems too complex
• Inability to understand and measure
  – ** Cost
• Often best ROI is not a quick win
• May (think there needs) to be a capital investment
• Lack of alignment
Improving the Patient Experience

- Patient visits from 7-9/session
- On-Time Performance
- Patient satisfaction (waiting)
- Lag days
How Do We Get Started?

Table 1 Steps in developing a business case for quality

1. Describing the intervention
2. Determining perspective
3. Identifying the effects of the intervention on quality
4. Designing the study
5. Identifying and measuring cash flows
6. Considering the effects of capacity constraints
7. Selecting a measure of return on investment
8. Determining the time horizon
9. Determining the ‘right’ discount rate
10. Adjusting costs and savings for inflation
11. Determining organizational readiness for business case development
Resources
THE BUSINESS CASE FOR QUALITY:
ENDING BUSINESS AS USUAL IN AMERICAN HEALTH CARE

David Blumenthal and Timothy Ferris
Institute for Health Policy
Massachusetts General Hospital

July 2004
The Business Case For Quality: Case Studies And An Analysis

Current payment mechanisms allow, and even reward, defective care because they are unable to reward future benefit.

by Sheila Leatherman, Donald Berwick, Debra Iles, Lawrence S. Lewin, Frank Davidoff, Thomas Nolan, and Maureen Bisognano

ABSTRACT: The financial implications of implementing quality improvements are often poorly understood. Simply put, does improving quality yield a return on investment? We examine four cases—management of high-cost pharmaceuticals, diabetes management, smoking cessation, and wellness programs in the workplace—to understand the financial and clinical implications of improving care. We explore costs and benefits, in both the short and the long term, to four stakeholders with different and sometimes conflicting interests: providers, purchasers and employers, individual patients, and society. Finally, we recommend policy changes to better align financial incentives for superior quality of care.

Does improving health care quality cost money or save money? Much controversy surrounds this seemingly straightforward question. The answer is often unknown, since the needed analyses are missing or inadequate. Even where analyses do exist, the answer varies with the stakeholder’s viewpoint and the time frame examined. An investment that improves quality for patients may have different financial consequences for providers or payers.

Important work is under way around the country to implement quality improve-
"As you can see, we have thought carefully about ways of improving staff productivity in this company."
• Review the principles of a business case
• Review details of a case study
• Determine the opportunity costs of waste within the health care system
• Items to consider/readiness to develop a business case (picking the right project)
New Perspective

- Organizations (may) balk at the costs of improvement but never stop to consider the lost financial opportunity associated with poor performance