Service Lines and Activity Based Costing Improve Outcomes

Session 230, February 23, 2017

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Robert Edwards MD, Professor & Chair, OB/GYN/RS, Magee-Womens Hospital of UPMC
Speaker Introduction

Robert A. DeMichiei, CPA
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Professor & Chair, OB/GYN/RS
Magee-Womens Hospital of UPMC
Conflict of Interest

Relationship Between UPMC and Health Catalyst

In January 2016, UPMC and Health Catalyst announced an agreement in which Health Catalyst licensed for commercial use an activity-based cost management system developed by UPMC as part of its effort to advance patient care while lowering costs. On February 29, 2016, Health Catalyst announced the close of a Series E capital raise that was co-led by UPMC, which is also a Health Catalyst customer.
Agenda
• Case For Activity-Based Costing
• How Does The Cost Management System Work at UPMC?
• Cost Productivity Reporting
• Service Line Reporting and Results
• Service Line Use Case – Women’s Health
• Takeaways and Questions
Learning Objectives

• Recognize the steps for implementing an activity-based costing methodology that enables the service line approach to care delivery

• Identify best practices for adopting a service line approach to care delivery that spans the care continuum

• Evaluate a costing methodology that allocates every dollar of revenue and cost in the general ledger to patients

• Analyze ways in which insights from systematic costing at the patient-activity level can be applied to clinical and operational practices
Value Of Health IT - Service Line Objectives

Increase patient satisfaction and service line market presence through improvement of cost and quality performance. “...the only thing that matters is cost and quality…” Robert A. DeMichiei

Identify opportunities to reduce unnecessary clinical variation through data assessment, opportunity identification and pathway development

Develop and provide patient-specific cost and quality data to enable the process

Develop protocols to provide the most appropriate service “in the right place” and “at the right time” and also provide optimal transparency to the patient

Monitor results as a means of measuring performance
<table>
<thead>
<tr>
<th>Description</th>
<th>Count/Details</th>
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</thead>
<tbody>
<tr>
<td>$13 billion integrated global health enterprise</td>
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<tr>
<td>3,500 employed physicians</td>
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<td>22 non-profit, academic, community, and regional hospitals</td>
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<td>4,500+ licensed beds</td>
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<tr>
<td>208,000 inpatient admissions, 174,000 surgeries performed annually</td>
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<td>4.5 million+ outpatient visits, 600,000 emergency visits</td>
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<tr>
<td>40+ UPMC Cancer Centers, 180 affiliated oncologists</td>
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<tr>
<td>UPMC Health Plan: 2 million total members, 125+ hospitals, 11,500+ physicians</td>
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</tbody>
</table>
Audience Poll - Question 1

My organization’s current cost accounting capability:
1. Excellent
2. Good
3. Fair
4. Poor or Non-Existent
My organization's current cost accounting capability:

- Excellent
- Good
- Fair
- Poor or Non-Existent

Start the presentation to activate live content.
If you see this message in presentation mode, install the add-in or get help at PollEv.com/app
Audience Poll - Question 2

My organization’s current use of Activity Based Costing:
1. Fully Operational
2. Currently Implementing
3. Under Evaluation
4. Minimal or No Interest
My organization's current use of Activity Based Costing:

- Fully Operational
- Currently Implementing
- Under Evaluation
- Minimal or No Interest

Start the presentation to activate live content
If you see this message in presentation mode, install the add-in or get help at PollEv.com/app
## Cost Challenge in Healthcare

<table>
<thead>
<tr>
<th>The Challenge</th>
<th>2.2%</th>
<th>$700B</th>
<th>Transparency</th>
<th>50%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitals are Struggling</td>
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<tr>
<td>Average Operating Margin is 2.2%*, down from the year before</td>
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<tr>
<td>Significant Waste</td>
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<tr>
<td>Over $700B of healthcare spending is considered waste</td>
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<tr>
<td>Industry Focus</td>
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<tr>
<td>Transparency is critical in the new world</td>
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<tr>
<td>Shift in Reimbursement</td>
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<tr>
<td>By 2018 50% of traditional Medicare payments from alternative models</td>
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</tbody>
</table>

### The Need

- Accurate
- Actionable
- Defensible
- Change

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*Source: 2014, April 25. Moody's: Not-for-profit hospital margins fall to 2.2%. The Advisory Board*
Changing Environment Transition From Fee-For-Service

Payment System Reforms Will Require Providers to Bear Greater Population-Based Financial Risk

Degree of Population Risk Transferred to Provider by Payment System

- Fee for Service
  - Paid for each unit of service without constraint on spending
  - Reform: Value-Based Purchasing/HAC - Readmit Policy

- Pay for Coordination
  - Additional per capita payment based on ability to manage care

- Pay for Performance
  - Payments tied to objective measures of performance
  - Reform: Bundled Payment (ACE Demonstration)

- Episodic Payments
  - Payment based on delivery of services within a given timeframe

- Shared Savings
  - Shared savings from better care coordination and disease management
  - Reform: ACOs

- Capitation
  - Providers share savings from better care coordination and disease management

67% All Other Payors

Health Services Net Patient Service Revenue: $7.2B

33% Health Plan
Structural Issues

• Revenue-Based Industry
• Silo’s within Silo’s
• Conflicting Incentives
• Managing Margin vs. Managing Cost
• Disconnected Decision-Making
Variation...Hiding in Plain Sight

• Manufacturing vs. Healthcare
• Cost as a Proxy for Clinical Practice
• ATB vs. Targeted Productivity
• Evergreen Opportunity
Service Line Variability Analytics

UPMC Spine Surgery Shared Savings Supply Cost Distribution
Posterolateral Fusion, Level 1 Presby, Shadyside, St. Margaret Only (excludes private physician volume)
Service Line Variability Analytics

UPMC Service Line Analytics
Craniotomy - Shunts
FY 2014 Supply Analysis

Initial Shunts: Supply Cost Analysis

<table>
<thead>
<tr>
<th>PHYSICIAN</th>
<th>Volume %</th>
<th>Avg Acuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1.9</td>
<td>64%</td>
</tr>
<tr>
<td>B</td>
<td>1.7</td>
<td>90%</td>
</tr>
<tr>
<td>C</td>
<td>1.7</td>
<td>77%</td>
</tr>
<tr>
<td>D</td>
<td>2.7</td>
<td>58%</td>
</tr>
<tr>
<td>E</td>
<td>1.8</td>
<td>79%</td>
</tr>
<tr>
<td>F</td>
<td>1.7</td>
<td>38%</td>
</tr>
<tr>
<td>G</td>
<td>1.7</td>
<td>50%</td>
</tr>
<tr>
<td>H</td>
<td>1.7</td>
<td>69%</td>
</tr>
<tr>
<td>I</td>
<td>1.7</td>
<td>70%</td>
</tr>
<tr>
<td>J</td>
<td>1.7</td>
<td>12%</td>
</tr>
<tr>
<td>K</td>
<td>1.7</td>
<td>54%</td>
</tr>
<tr>
<td>L</td>
<td>1.7</td>
<td>91%</td>
</tr>
<tr>
<td>M</td>
<td>1.7</td>
<td>79%</td>
</tr>
<tr>
<td>N</td>
<td>1.7</td>
<td>86%</td>
</tr>
<tr>
<td>O</td>
<td>1.7</td>
<td>47%</td>
</tr>
<tr>
<td>P</td>
<td>1.7</td>
<td>71%</td>
</tr>
<tr>
<td>Q</td>
<td>1.7</td>
<td>14%</td>
</tr>
<tr>
<td>R</td>
<td>1.7</td>
<td>17%</td>
</tr>
<tr>
<td>S</td>
<td>1.7</td>
<td>21%</td>
</tr>
<tr>
<td>T</td>
<td>1.7</td>
<td>15%</td>
</tr>
<tr>
<td>U</td>
<td>1.7</td>
<td>7%</td>
</tr>
<tr>
<td>V</td>
<td>1.7</td>
<td>5%</td>
</tr>
<tr>
<td>W</td>
<td>1.7</td>
<td>4%</td>
</tr>
</tbody>
</table>

Initial Shunts: Supply Cost Analysis

- VALVES
- VP SHUNTS
- OTHER
- GENERAL SUPPLIES
- IMPLANTS
- MEDICATIONS/PHARMACY
- COVER BURR
- SCREW BNE
- PLATE BNE
- BUR TOOLS
- TOTAL AVERAGE OR SUPPLY COST

$4,020
$4,950
$4,840
$3,350
$3,760
$3,110
$5,800
$4,580
$4,760
$3,865
$3,630
$3,610
$3,005
$5,290
$1,050
$0
$1,000
$2,000
$3,000
$4,000
$5,000
$6,000
$7,000
New Management Paradigm – Connecting Decisions With Implications

✓ Cost Productivity (vs. FTE Productivity)
  □ Do you know your true cost on a patient basis?
  □ Do you know whether your major operational areas (e.g. OR’s, Patient Units) are becoming more or less productive?
  □ Do you know whether your physicians are becoming more or less productive?

✓ Service Line Management
  □ Do you know the major service lines key to your organization’s success?
  □ Do you know the margin impact of your major service lines?
  □ Do you engage physician leaders in management of service lines?
  □ Do you analyze variation of cost and quality within like clinical services?
Activity Based Costing (ABC) – Facilitates The Solutions

✓ **Cost Productivity (vs. FTE Productivity)**
  - ABC attributes all General Ledger costs to individual patients based on clinical service center activity drivers (sourced from clinical systems)
  - Service centers can measure cost per activity drivers as a means of managing hospital cost productivity
  - Physician cost per activity driver can be measured

✓ **Service Line Management**
  - Patient costs can be linked across the provider continuum; further linked to revenue; further attributed to physicians --- Service Line Margin Results
  - Physician leaders embrace the methodology and are more fully engaged
  - Patient specific results allow for clinical analytics such as clinical cost and quality variation analysis
### How Does ABC Work? – Logical and Easy to Maintain

<table>
<thead>
<tr>
<th>Traditional General Ledger Cost Center and Natural Classification</th>
<th>ABC Classification</th>
<th>Costing Allocation Method</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patient Facing (Patients Units, OR, Imaging, etc.)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supplies/Drugs</td>
<td>Direct</td>
<td>Actual Patient Utilization</td>
</tr>
<tr>
<td>Salaries/Other</td>
<td>Unit Operating</td>
<td>Actual Patient Driver (e.g. Time)</td>
</tr>
<tr>
<td><strong>Supporting Services</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nurse Administration</td>
<td>Unit Supporting</td>
<td>Actual Department Driver (e.g. Square Ft.)</td>
</tr>
<tr>
<td>Environmental Services</td>
<td></td>
<td></td>
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<tr>
<td>Depreciation</td>
<td></td>
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<tr>
<td><strong>Indirect Services</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finance, HR, Administration</td>
<td>Indirect</td>
<td>Actual Department Driver</td>
</tr>
</tbody>
</table>

ABC Costing Methodology Provides Truer Costing Than RCC and RVU Models

- Fully Absorbed Patient Facing Costs Allocated To Patient
- Supporting Costs Allocated To Patient Facing Services
- Indirect Costs Allocated To Supporting Services
ABC Advantage vs. RCC Costing Flaws -- Example: Nursing Unit

<table>
<thead>
<tr>
<th>Patient A</th>
<th>Patient B</th>
<th>Patient C</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCC</td>
<td>RCC</td>
<td>RCC</td>
</tr>
<tr>
<td>0.263</td>
<td>0.263</td>
<td>0.263</td>
</tr>
<tr>
<td>RCC Cost</td>
<td>RCC Cost</td>
<td>RCC Cost</td>
</tr>
<tr>
<td>$816</td>
<td>$816</td>
<td>$816</td>
</tr>
<tr>
<td>Minutes</td>
<td>Minutes</td>
<td>Minutes</td>
</tr>
<tr>
<td>1,467</td>
<td>1,308</td>
<td>1,232</td>
</tr>
<tr>
<td>ABC Cost</td>
<td>ABC Cost</td>
<td>ABC Cost</td>
</tr>
<tr>
<td>$934</td>
<td>$833</td>
<td>$785</td>
</tr>
<tr>
<td>Difference</td>
<td>Difference</td>
<td>Difference</td>
</tr>
<tr>
<td>$118</td>
<td>$17</td>
<td>($32)</td>
</tr>
</tbody>
</table>

RCC Method – All Patients Are Attributed Same Cost

ABC Method – Patients Are Attributed Cost Based On Time Spent In Unit

Better Result
### ABC Advantage vs. RVU Costing Flaws -- Example: MRI Department

<table>
<thead>
<tr>
<th>MRI Upper Extremity</th>
<th>MRI Pelvis</th>
<th>MRI Brain</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RVU</strong></td>
<td>1.62</td>
<td>1.46</td>
</tr>
<tr>
<td><strong>RVU Cost Per Charge</strong></td>
<td>$34</td>
<td>$34</td>
</tr>
<tr>
<td><strong>RVU Cost</strong></td>
<td>$55</td>
<td>$50</td>
</tr>
<tr>
<td><strong>Minutes</strong></td>
<td>40</td>
<td>87</td>
</tr>
<tr>
<td><strong>ABC Cost</strong></td>
<td>$116</td>
<td>$250</td>
</tr>
<tr>
<td><strong>Difference</strong></td>
<td>$61</td>
<td>$200</td>
</tr>
</tbody>
</table>

**RVU Method** – Patients Are Attributed Cost Based On Charges And RVU Value Assignment

**Better Result**

**ABC Method** – Patients Are Attributed Cost Based On Time Spent On Machine
ABC Work Requires Use Of A Data Warehouse Infrastructure

Source Systems
- Medical Records
- Clinical Operational
  - Bed Management
  - Operating Room
  - Cardiology
  - Imaging
- Revenue Cycle
- General Ledger

Cost Management
- Processing/Allocation/Storage/Reporting

Cost Management Data Warehouse
- Reporting Tables
  - BI Tool
- History Tables
  - User Reporting
## UPMC ABC Implementation Timeline

<table>
<thead>
<tr>
<th>Phase</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
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<tbody>
<tr>
<td>Phase 1</td>
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<tr>
<td>UPMC Mercy (Pilot)</td>
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<td>2013</td>
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<tr>
<td>Phase 2</td>
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<tr>
<td>UPMC Presbyterian Shadyside</td>
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<tr>
<td>Phase 3</td>
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<tr>
<td>Physician Model</td>
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<td>Phase 4</td>
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<tr>
<td>Remaining Allegheny County Hospitals</td>
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<tr>
<td>Phase 5</td>
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<tr>
<td>Non-Allegheny County Hospitals</td>
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<tr>
<td>Phase 6</td>
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<tr>
<td>Conversion To New Platform</td>
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<tr>
<td>Next Phases</td>
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<tr>
<td>Continuum Of Care</td>
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<tr>
<td>UPMC Expansion</td>
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<tr>
<td>Advanced Analytics</td>
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</table>

The Future

In Progress
Benefits of the Cost Management System

• **Measure Everything…Volume-Adjusted**
  • Service Lines/Centers
  • Hospitals/Departments
  • Physicians

• **Understand Variation & Trend**
  • Identify Best Practice/Opportunity for Improvement
  • Performance Based on Current vs. Past Period(s)
  • Improving or Declining Trend?

**Framework for Transformation**
Hospital Cost Productivity Results – Operating Room

Operating Room Cost Productivity
(Cost/Surgical Hour)

Sample data for illustrative purposes.
Physician Cost Productivity Results

Sample data for illustrative purposes.

- wRVUs/cFTE/EWD
- Clinical + Admin Salary/wRVUs
- Linear (wRVUs/cFTE/EWD)
- Linear (Clinical + Admin Salary/wRVUs)

% Change:
- 5.1%
- 1.1%
Service Line Management

Key Challenges

- Developing Service Line “Mindset” vs. Traditional Paradigms
- Engaging Physicians To Improve Cost and Quality

Approach

- Formed Initial Major Service Line Structure – Orthopaedics, Neurological Institute, Cardiovascular, Women’s Health
- Designated Clinical and Financial Leaders
- Utilized ABC Technology To Provide:
  - Patient – level data to facilitate variation analysis at a service level
  - Aggregated patient data to measure service line performance - - connecting decisions with implications
## Traditional View of Reporting – Natural Class By Hospital

<table>
<thead>
<tr>
<th>Hospital Component</th>
<th>Natural Classification of Expenses</th>
<th>Hospital 1</th>
<th>Hospital 2</th>
<th>Hospital 3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenue</strong> (Net of Bad Debt)</td>
<td>$1,400</td>
<td>$300</td>
<td>$350</td>
<td>$2,050</td>
<td></td>
</tr>
<tr>
<td><strong>Operating Expenses</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salaries, Supplies &amp; Purchased Services</td>
<td>750</td>
<td>150</td>
<td>200</td>
<td>1,100</td>
<td></td>
</tr>
<tr>
<td>Physician Investment</td>
<td>250</td>
<td>40</td>
<td>60</td>
<td>350</td>
<td></td>
</tr>
<tr>
<td>Admin &amp; Other Expenses</td>
<td>110</td>
<td>40</td>
<td>40</td>
<td>190</td>
<td></td>
</tr>
<tr>
<td><strong>Total Operating Expenses</strong></td>
<td>1,110</td>
<td>230</td>
<td>300</td>
<td>1,640</td>
<td></td>
</tr>
<tr>
<td><strong>Operating Income before Centrally Managed Expenses</strong></td>
<td>$290</td>
<td>$70</td>
<td>$50</td>
<td>$410</td>
<td></td>
</tr>
<tr>
<td><strong>Centrally Managed Expenses</strong></td>
<td></td>
<td></td>
<td></td>
<td>380</td>
<td></td>
</tr>
<tr>
<td><strong>Operating Income</strong></td>
<td></td>
<td></td>
<td></td>
<td>$30</td>
<td></td>
</tr>
</tbody>
</table>

Sample data for illustrative purposes.
## Service Line Reporting – Links Service Line With Service Center

### Patient Service Line Components

<table>
<thead>
<tr>
<th>Revenues</th>
<th>Women’s Health</th>
<th>Ortho</th>
<th>Cardio</th>
<th>Cancer</th>
<th>Neuro</th>
<th>Sub-Total</th>
<th>Other Medical</th>
<th>Other Surgical</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues</td>
<td>$100</td>
<td>$150</td>
<td>$200</td>
<td>$250</td>
<td>$150</td>
<td>$850</td>
<td>$900</td>
<td>$300</td>
<td>$2,050</td>
</tr>
</tbody>
</table>

### Service Center Costs

<table>
<thead>
<tr>
<th>Operating Expenses</th>
<th>Direct (a)</th>
<th>10</th>
<th>40</th>
<th>40</th>
<th>100</th>
<th>30</th>
<th>220</th>
<th>90</th>
<th>40</th>
<th>350</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Center (b)</td>
<td>50</td>
<td>40</td>
<td>50</td>
<td>80</td>
<td>40</td>
<td>260</td>
<td>300</td>
<td>80</td>
<td>640</td>
<td></td>
</tr>
</tbody>
</table>

### Variable Costing at Service Line Basis

<table>
<thead>
<tr>
<th>Total Variable Expenses</th>
<th>60</th>
<th>80</th>
<th>90</th>
<th>180</th>
<th>70</th>
<th>480</th>
<th>390</th>
<th>120</th>
<th>990</th>
</tr>
</thead>
</table>

### Full Costing at Service Line Basis

<table>
<thead>
<tr>
<th>Operating Income before Support and Indirect Expenses</th>
<th>$40</th>
<th>$70</th>
<th>$110</th>
<th>$70</th>
<th>$80</th>
<th>$370</th>
<th>$510</th>
<th>$180</th>
<th>$1,060</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support Expenses (c)</td>
<td>30</td>
<td>40</td>
<td>70</td>
<td>50</td>
<td>40</td>
<td>230</td>
<td>400</td>
<td>100</td>
<td>730</td>
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</table>

<table>
<thead>
<tr>
<th>Operating Income before Indirect Expenses</th>
<th>$10</th>
<th>$30</th>
<th>$40</th>
<th>$20</th>
<th>$40</th>
<th>$140</th>
<th>$110</th>
<th>$80</th>
<th>$330</th>
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<tbody>
<tr>
<td>Indirect Expenses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td>300</td>
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<tr>
<td>Operating Income</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$30</td>
</tr>
</tbody>
</table>

(a) Direct expenses include clinical supplies, drugs and blood.
(b) Service centers represent functional clinical areas including nursing, surgical, interventional and diagnostic services.
(c) Support expenses represent clinical support areas including physician costs, facility costs, depreciation, administration.

Sample data for illustrative purposes. ($ in millions) - Discharged Patients only.
Women’s Health Service Line Performance Reporting

Sample data for illustrative purposes.
Service Line Results To Date

✓ $42 Million Of Cost Reduction Opportunities (Approximately 2 Percent Of Targeted Service Line Cost)

✓ $5 Million In Realized Supplies Savings

✓ Transparency Toward Identification Of Practice Variation For Specific Procedures

  ☐ Women’s Health – Delivery and Hysterectomies
  ☐ Orthopedics – Supporting CMS Joint Replacement Program and Other Payer Bundles
  ☐ Neurosurgery – Spine Shared Savings Program

✓ Up to 97 Percent Improvement In Time To Access Information
Audience Poll - Question 3

My organization’s status of Service Lines/Service Line Mgmt:
1. Operational/Systemic Reporting
2. Implementing/Manual Reporting
3. Under Evaluation
4. Minimal or No Activity
Opportunities within the Women’s Health Service Line

Gynecology

• Reduce Open Hysterectomies.
• Increase Same Day Hysterectomies.
• Decrease Hysterectomy Utilization.
• Physician Variability in Supply Usage.

Obstetrics

• Reduce Length of Stay.
• Reduce Cesarean Sections.
• Reduce NICU costs.
• Physician Variability in Prenatal Care.
• Enhanced Education.

Solutions:

1. Clinical Pathways.
2. Awareness and Monitoring of Cost and Quality.
3. Engaging Physicians.
Improvement Initiative Process Flow

- Data assessment and opportunity identification
- Clinician created protocols and pathways
- Pilot design and implementation
- Pilot assessment
- Process improvements selection and launch
- Metrics & reporting, ongoing evaluation
### Service Line P&L

**Women's Health Contribution Margin**  
($ in 000's)

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Deliveries</th>
<th>Non-Cancerous</th>
<th>Other</th>
<th>Other OP</th>
<th>Other OP Services</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mother</td>
<td>Baby</td>
<td>Inpatient</td>
<td>Procedures</td>
<td>Services</td>
<td></td>
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<tr>
<td>Volume</td>
<td>12,100</td>
<td>1,730</td>
<td>2,500</td>
<td>7,500</td>
<td>285,000</td>
<td>308,830</td>
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<tr>
<td>Revenue Expenses</td>
<td>$ 62,900</td>
<td>$ 64,650</td>
<td>$ 21,000</td>
<td>$ 20,000</td>
<td>$ 77,000</td>
<td>$ 257,240</td>
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<tr>
<td>Direct</td>
<td>$ 2,760</td>
<td>$ 895</td>
<td>$ 2,540</td>
<td>$ 4,500</td>
<td>$ 6,300</td>
<td>$ 19,585</td>
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<tr>
<td>Supplies</td>
<td>590</td>
<td>20</td>
<td>1,400</td>
<td>3,900</td>
<td>170</td>
<td>8,250</td>
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<tr>
<td>Pharmacy</td>
<td>1,530</td>
<td>825</td>
<td>820</td>
<td>500</td>
<td>5,720</td>
<td>9,745</td>
</tr>
<tr>
<td>Blood Service</td>
<td>640</td>
<td>50</td>
<td>320</td>
<td>100</td>
<td>510</td>
<td>1,590</td>
</tr>
<tr>
<td>Medical/Surgical/Blood</td>
<td>$ 23,050</td>
<td>$ 25,950</td>
<td>$ 7,440</td>
<td>$ 5,950</td>
<td>$ 33,615</td>
<td>$ 91,465</td>
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<tr>
<td>ICU/CCU/NICU Labor</td>
<td>16,580</td>
<td>6,500</td>
<td>2,550</td>
<td>260</td>
<td>1,420</td>
<td>28,140</td>
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<tr>
<td>Laboratory</td>
<td>160</td>
<td>11,600</td>
<td>440</td>
<td>5</td>
<td>12,250</td>
<td></td>
</tr>
<tr>
<td>Outpatient Clinic</td>
<td>650</td>
<td>-</td>
<td>30</td>
<td>20</td>
<td>6,430</td>
<td>7,130</td>
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<tr>
<td>Imaging</td>
<td>120</td>
<td>220</td>
<td>190</td>
<td>80</td>
<td>6,210</td>
<td>6,830</td>
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<td>Premium Tax</td>
<td>1,650</td>
<td>3,200</td>
<td>700</td>
<td>-</td>
<td>5,680</td>
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<tr>
<td>Operating Room</td>
<td>20</td>
<td>-</td>
<td>1,020</td>
<td>1,750</td>
<td>10</td>
<td>4,200</td>
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<tr>
<td>Other Services</td>
<td>3,290</td>
<td>3,950</td>
<td>1,940</td>
<td>2,530</td>
<td>2,870</td>
<td>15,600</td>
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<tr>
<td>Subtotal, Variable Expenses</td>
<td>$ 25,810</td>
<td>$ 26,845</td>
<td>$ 6,220</td>
<td>$ 9,980</td>
<td>$ 9,595</td>
<td>$ 108,635</td>
</tr>
<tr>
<td>Unit Supporting</td>
<td>14,670</td>
<td>14,600</td>
<td>5,590</td>
<td>5,050</td>
<td>13,200</td>
<td>57,140</td>
</tr>
<tr>
<td>Subtotal, Total Expenses less Indirect</td>
<td>$ 40,480</td>
<td>$ 41,445</td>
<td>$ 15,570</td>
<td>$ 14,645</td>
<td>$ 43,385</td>
<td>$ 165,775</td>
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<tr>
<td>Hospital Contribution Margin</td>
<td>$ 22,420</td>
<td>$ 23,205</td>
<td>$ 7,200</td>
<td>$ 5,430</td>
<td>$ 33,615</td>
<td>$ 91,465</td>
</tr>
</tbody>
</table>

---

- **Current efforts to improve quality & reduce costs**
- **Identification of significant variable expenses**
- **Continuum of care costs & stand-alone visits**

Sample data for illustrative purposes.
## Service Line Performance - Cost and Outcomes

### LAPAROSCOPIC VAGINAL ROBOTIC OPEN TOTAL HYSTERECTOMIES

<table>
<thead>
<tr>
<th></th>
<th>LAPAROSCOPIC</th>
<th>VAGINAL</th>
<th>ROBOTIC</th>
<th>OPEN</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>CASES</td>
<td>870</td>
<td>250</td>
<td>330</td>
<td>280</td>
<td>1,730</td>
</tr>
<tr>
<td>REVENUE</td>
<td>$6,207</td>
<td>$10,480</td>
<td>$5,152</td>
<td>$7,036</td>
<td>$6,757</td>
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<tr>
<td>VARIABLE &amp; SUPPORTING EXPENSE</td>
<td>$5,397</td>
<td>$4,400</td>
<td>$6,803</td>
<td><strong>$7,893</strong></td>
<td>$5,925</td>
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<tr>
<td>CONTRIBUTION MARGIN</td>
<td>$810</td>
<td>$6,080</td>
<td>$(1,651)</td>
<td>$(857)</td>
<td>$832</td>
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</table>

### Hysterectomy Quality Outcomes

- **Complications**
  - Laparoscopic: 2.7%
  - Open: 6.2%
  - Robotic: 8.1%
  - Vaginal: 8.1%
  - Total: 6.1%

- **Transfusions (IP Only)**
  - Laparoscopic: 10.1%
  - Open: 12.5%
  - Robotic: 20.2%
  - Vaginal: 2.3%
  - Total: 43.3%

- **Surgical Site Infections**
  - Laparoscopic: 0.3%
  - Open: 0.6%
  - Robotic: 0.6%
  - Vaginal: 0.4%
  - Total: 0.4%

- **30 Day Returns**
  - Laparoscopic: 4.0%
  - Open: 4.8%
  - Robotic: 4.8%
  - Vaginal: 4.7%
  - Total: 4.7%

### IP Average LOS

- **Laparoscopic**: 1.38
- **Open**: 3.51
- **Robotic**: 1.63
- **Vaginal**: 1.18
- **Total**: 2.10

---

Sample data for illustrative purposes.
Physician Variability

Non-Cancerous Hysterectomies

Sample data for illustrative purposes.
Solution #1: The Hysterectomy Clinical Pathway

Evidence-based clinical decision pathway

Series of clinical questions that lead to a recommendation for the type of hysterectomy to be performed.

Decision support is driven by flow sheet data and evidence-based literature published by the American Congress of Obstetricians and Gynecologists (ACOG).

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Able to palpate uterus and judge size?</td>
<td>Yes / No</td>
</tr>
<tr>
<td>What is the size of the uterus?</td>
<td>6-8cm / 8-10cm / 10-12cm / 12-14cm / &lt;14cm</td>
</tr>
<tr>
<td>Suspicion of extrauterine disease?</td>
<td>Yes / No</td>
</tr>
</tbody>
</table>
Solution #2: Monitoring Progress

- *What gets measured, gets done!*

- Physician incentives and evaluations include criteria for the following:

  80% Pathway Adherence.

  Cost and Quality
  Physician Dashboard.
## Hysterectomy Pathway Adherence by Physician

### Period 1

<table>
<thead>
<tr>
<th>Physician</th>
<th>Group</th>
<th>No</th>
<th>Yes</th>
<th>Total</th>
<th>Adherence %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physician 1</td>
<td>Group 1</td>
<td>6</td>
<td>6</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Physician 2</td>
<td>Group 2</td>
<td>4</td>
<td>4</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Physician 3</td>
<td>Group 2</td>
<td>2</td>
<td>2</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Physician 4</td>
<td>Group 2</td>
<td>4</td>
<td>4</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Physician 5</td>
<td>Group 2</td>
<td>1</td>
<td>1</td>
<td>12%</td>
<td></td>
</tr>
<tr>
<td>Physician 6</td>
<td>Group 3</td>
<td>1</td>
<td>1</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Physician 7</td>
<td>Group 3</td>
<td>1</td>
<td>1</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Physician 8</td>
<td>Group 3</td>
<td>2</td>
<td>2</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>Physician 9</td>
<td>Group 3</td>
<td>3</td>
<td>3</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Physician 10</td>
<td>Group 3</td>
<td>4</td>
<td>4</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Physician 11</td>
<td>Group 3</td>
<td>4</td>
<td>4</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Physician 12</td>
<td>Group 3</td>
<td>1</td>
<td>1</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Physician 13</td>
<td>Group 4</td>
<td>No Volume</td>
<td>No Volume</td>
<td>No Volume</td>
<td>No Volume</td>
</tr>
<tr>
<td>Physician 14</td>
<td>Group 5</td>
<td>1</td>
<td>6</td>
<td>7</td>
<td>86%</td>
</tr>
<tr>
<td>Physician 15</td>
<td>Group 5</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>75%</td>
</tr>
<tr>
<td>Physician 16</td>
<td>Group 5</td>
<td>7</td>
<td>9</td>
<td>16</td>
<td>26%</td>
</tr>
<tr>
<td>Physician 17</td>
<td>Group 5</td>
<td>5</td>
<td>11</td>
<td>16</td>
<td>69%</td>
</tr>
<tr>
<td>Physician 18</td>
<td>Group 5</td>
<td>6</td>
<td>9</td>
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<td>60%</td>
</tr>
<tr>
<td>Physician 19</td>
<td>Group 5</td>
<td>4</td>
<td>6</td>
<td>10</td>
<td>60%</td>
</tr>
<tr>
<td>Physician 20</td>
<td>Group 5</td>
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<td>5</td>
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<td>15%</td>
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<tr>
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<td>Group 6</td>
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<td>No Volume</td>
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<td>No Volume</td>
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<tr>
<td>Physician 22</td>
<td>Group 7</td>
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<td>3</td>
<td>8</td>
<td>38%</td>
</tr>
<tr>
<td>Physician 23</td>
<td>Group 7</td>
<td>1</td>
<td>1</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Physician 24</td>
<td>Group 7</td>
<td>7</td>
<td>7</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Physician 25</td>
<td>Group 8</td>
<td>No Volume</td>
<td>No Volume</td>
<td>No Volume</td>
<td>No Volume</td>
</tr>
</tbody>
</table>

### Total Adherence

<table>
<thead>
<tr>
<th>No</th>
<th>Yes</th>
<th>Total</th>
<th>Adherence %</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>0</td>
<td>32</td>
<td>0%</td>
</tr>
</tbody>
</table>

### Grand Total

| 182 | 270 | 452 | 60% |

**Total pathway adherence**
## Physician Dashboard – Cost & Quality

### Table: Physician Group and Name Analysis

<table>
<thead>
<tr>
<th>Physician Group</th>
<th>Total # of Cases</th>
<th>Avg LOS</th>
<th>Avg OR Time</th>
<th>Avg Supplies</th>
<th>Avg Direct</th>
<th>Avg Unit Operating</th>
<th>Avg Direct &amp; Unit Op</th>
<th>Complications</th>
<th>IP Blood Transfusions</th>
<th>SS Infections</th>
<th>30-Day Readmissions</th>
<th>Cases w/o Incident</th>
<th>OP Volume</th>
<th>Cases with Same-Day Discharge</th>
<th>Pathway Adherence %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group - 02</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physician 08</td>
<td>1</td>
<td>1.00</td>
<td>273</td>
<td>1,009</td>
<td>1,178</td>
<td>2,580</td>
<td>3,499</td>
<td>0.00%</td>
<td>100.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>100.00%</td>
<td>0%</td>
<td>No Pathway Data</td>
<td></td>
</tr>
<tr>
<td>Physician 09</td>
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<td>1,868</td>
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<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0%</td>
<td>No Pathway Data</td>
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</tr>
<tr>
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<td>228</td>
<td>1,077</td>
<td>1,171</td>
<td>2,027</td>
<td>2,198</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>100%</td>
<td>No Pathway Data</td>
<td></td>
</tr>
<tr>
<td><strong>Group - 04</strong></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Physician 13</td>
<td>133</td>
<td>0.88</td>
<td>164</td>
<td>1,109</td>
<td>1,296</td>
<td>1,455</td>
<td>2,750</td>
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<td>3.76%</td>
<td>3.02%</td>
<td>92%</td>
<td>36%</td>
<td>83%</td>
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<td>46</td>
<td>1.07</td>
<td>157</td>
<td>1,121</td>
<td>1,292</td>
<td>1,575</td>
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<td>2.17%</td>
<td>2.17%</td>
<td>6.52%</td>
<td>93%</td>
<td>0%</td>
<td>26%</td>
<td>57%</td>
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</tr>
<tr>
<td>Physician 15</td>
<td>57</td>
<td>1.23</td>
<td>256</td>
<td>1,129</td>
<td>1,327</td>
<td>1,995</td>
<td>3,322</td>
<td>7.07%</td>
<td>8.77%</td>
<td>1.75%</td>
<td>36%</td>
<td>33%</td>
<td>33%</td>
<td>88%</td>
<td></td>
</tr>
<tr>
<td>Physician 16</td>
<td>25</td>
<td>1.16</td>
<td>234</td>
<td>1,053</td>
<td>1,233</td>
<td>1,937</td>
<td>3,170</td>
<td>8.00%</td>
<td>8.00%</td>
<td>8.00%</td>
<td>94%</td>
<td>0%</td>
<td>14%</td>
<td>74%</td>
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<tr>
<td>Physician 17</td>
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<td>238</td>
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<td>1,227</td>
<td>1,706</td>
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<td>6.67%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0%</td>
<td>0%</td>
<td>15%</td>
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<tr>
<td><strong>Group - 06</strong></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physician 19</td>
<td>20</td>
<td>1.35</td>
<td>186</td>
<td>680</td>
<td>891</td>
<td>1,774</td>
<td>2,665</td>
<td>0.00%</td>
<td>5.00%</td>
<td>5.00%</td>
<td>3%</td>
<td>90%</td>
<td>16%</td>
<td>21%</td>
<td></td>
</tr>
<tr>
<td>Physician 20</td>
<td>25</td>
<td>1.40</td>
<td>187</td>
<td>3,062</td>
<td>3,258</td>
<td>1,757</td>
<td>5,015</td>
<td>4.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>96%</td>
<td>20%</td>
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<td>50%</td>
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<td>168</td>
<td>1,176</td>
<td>1,276</td>
<td>1,299</td>
<td>3,227</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>100%</td>
<td>1%</td>
<td>0%</td>
<td>33%</td>
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<tr>
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<td>26</td>
<td>1.04</td>
<td>176</td>
<td>532</td>
<td>756</td>
<td>1,585</td>
<td>2,341</td>
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<td>0.00%</td>
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<td>96%</td>
<td>23%</td>
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<tr>
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<td>3</td>
<td>1.00</td>
<td>295</td>
<td>1,219</td>
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<td>2,075</td>
<td>3,645</td>
<td>0.00%</td>
<td>35.33%</td>
<td>0.00%</td>
<td>67%</td>
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<td>1,101</td>
<td>1,522</td>
<td>1,180</td>
<td>2,702</td>
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<td>0.00%</td>
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<td>76</td>
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<td>0.00%</td>
<td>0.00%</td>
<td>100%</td>
<td>1%</td>
<td>0%</td>
<td>50%</td>
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<td>267</td>
<td>1,668</td>
<td>1,648</td>
<td>1,831</td>
<td>3,679</td>
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<td>0.00%</td>
<td>0.00%</td>
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<tr>
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<td>1.00</td>
<td>245</td>
<td>2,780</td>
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<td>1,885</td>
<td>4,830</td>
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<td>0.00%</td>
<td>0.00%</td>
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<td>Physician 29</td>
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<td>241</td>
<td>52</td>
<td>278</td>
<td>2,595</td>
<td>2,873</td>
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<td>0.00%</td>
<td>0.00%</td>
<td>0%</td>
<td>50%</td>
<td>0%</td>
<td>33%</td>
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</tbody>
</table>

Sample data for illustrative purposes.
Audience Poll - Question 4

My MDs know their cost for care provided/comparison to peers
1. True
2. False
3. Unsure or not applicable
My MDs know their cost for care provided/comparison to peers

TRUE

FALSE

Unsure or not applicable
Solution #3: Engaging Physicians

- Initial results $\rightarrow$ ~24%.
- Feedback from physicians.
- Resolution of concerns.
- Support by physician leadership.

- Focused efforts:
  - 200% increase in adherence!
Lessons Learned: Critical Success Factors

|-----------------------------------|-------------------|-----------------------------------------------------------------|----------------------------------------|---------------------------------------------|-------------------------|

Quality, safety, and patient satisfaction at a **reduced cost** leads to increased value.
Future Plans

- Reduce hysterectomy surgeries performed by low volume surgeons and proceduralists, using quality metrics and group incentives.
- Reduce physician variability in OR utilization and supply usage for hysterectomies.
- Expand same day hysterectomy to other providers and hospitals.
- Expand focus on the obstetric population to reduce variability in prenatal care, develop protocols for inpatient management, reduce Cesarean sections, reduce NICU costs, and enhance education.
Future Plans

With a winning combination of service line management and activity-based costing, UPMC will continue to improve patient care and set an example for other healthcare systems to follow.
Takeaways

✓ Activity Based Costing Is A Prerequisite For Effective Cost Productivity Management and Service Line Development

✓ Cost Productivity Information Is Essential To Improve Service Cost Performance In An Era Of Shifting Service Volumes and Locations

✓ Service Line Management Is Critical Toward Improving Cost And Quality Of Key Patient Services

✓ Developing A Collaborative Leadership Team Is Key To Overcoming Traditional Structures And Paradigms

✓ Physician Engagement Is Key To Improving Performance

✓ Credible Patient–Level Cost and Quality Data Is Necessary For Physician Buy-In
Benefits Realized Of Health IT - Service Line Successes

Successfully developed template for organizing service lines to assess clinical practice performance. Collaborative teams assessing key patient service areas for improvement, including hysterectomy, joint replacement, spine surgery.

Activity based costing data provided to assess for greatest areas of clinical variation and improvement opportunities.

Patient-specific cost and quality data developed and linked to allow clinicians to analyze variation circumstances.

Protocol development in process to provide the most appropriate service “in the right place” and “at the right time” and also provide optimal transparency to the patient.

$42 million in cost reduction opportunities identified.
Questions

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