If The Road Narrows: A Closer Look at Hospital Operating Margins

2018 Strategic Viewpoint
Hospitals increasingly reliant on operating margin

Hospital operating margin as a percentage of total margin

- **Annual average 1994-2000**: 58.7%
- **Annual average 2001-2007**: 67.4%
- **Annual average 2008-2014**: 77.5%

Source: Analysis of the AHA Trendwatch Chartbook (2016).
2017 marks largest drop in hospital profitability in last decade

Hospital operating cash flow margin

Median operating cash flow margin down 11.4% in 2017… lowest levels in last 10 years

Macroeconomic factors pumping brakes on future revenue growth

• Site of service trade-offs reduce unit revenues

• Aging boomers mean shift toward Medicare…more work for less money

• Significant slowdown in commercial rate hikes versus 10 years ago…working families can’t afford a return to bigger increases

• New entrants threaten to poach commercial volume – increasing transparency will compress prices for elective services

• Earliest signs of rebounding uninsured population
Site of service trade-offs reduce unit revenue… competitors poised for poaching
Shift to outpatient setting reduces unit price, muffles revenue growth

U.S. commercial volume forecast, cervical spinal fusion

<table>
<thead>
<tr>
<th>Year</th>
<th>Total (in thousands)</th>
<th>Inpatient</th>
<th>Outpatient</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>69.0</td>
<td>59.1</td>
<td>9.9</td>
</tr>
<tr>
<td>2023</td>
<td>103.6</td>
<td>43.3</td>
<td>60.3</td>
</tr>
</tbody>
</table>

U.S. hospital commercial revenue, cervical spinal fusion (in U.S. dollars, 2016)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total (in billions)</th>
<th>Inpatient</th>
<th>Outpatient</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>$2.8</td>
<td>$2.1</td>
<td>$0.7</td>
</tr>
<tr>
<td>2023</td>
<td>$2.0</td>
<td>$2.1</td>
<td>$0.9</td>
</tr>
</tbody>
</table>

Sources: Sg2 Impact of Change demand forecast model (2018)*; analysis of Medicare claims (2016); Milliman analysis of commercial claims (2015).

*Data sources for model include National Inpatient Sample (NIS), Healthcare Cost and Utilization Project (HCUP) 2015, Agency for Healthcare Research and Quality; OptumInsight, 2016 (unpublished data); Centers for Medicare & Medicaid Services 2016 Limited Data Sets for carrier, denominator, home health agency, hospice, outpatient, and skilled nursing facility; Claritas Pop-Facts, 2018; Sg2 analysis, 2018 (unpublished data).
**Boomers shift portfolio toward Medicare…more work for no more money**

Absent price increases, little organic growth expected in hospital revenues over next five years

<table>
<thead>
<tr>
<th></th>
<th>Inpatient hospital volume</th>
<th>Outpatient hospital volume</th>
<th>Projected annual impact on typical hospital revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Commercial</strong></td>
<td>-3.5%</td>
<td>-0.3%</td>
<td>+0.1%</td>
</tr>
<tr>
<td><strong>Medicare</strong></td>
<td>+3.8%</td>
<td>+11.3%</td>
<td>+1.8%</td>
</tr>
<tr>
<td><strong>Medicaid</strong></td>
<td>-2.8%</td>
<td>-0.9%</td>
<td>-0.4%</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>-2.6%</td>
<td>-0.6%</td>
<td>-0.3%</td>
</tr>
<tr>
<td><strong>All payers</strong></td>
<td>+0.2%</td>
<td>+5.3%</td>
<td>+0.6%</td>
</tr>
</tbody>
</table>

Sources: Sg2 Impact of Change demand forecast model (2018)*; analysis of Medicare claims (2016); Milliman analysis of commercial claims (2015); MACPAC (April 2017). Medicaid Hospital Payment: A Comparison across States and to Medicare

*Data sources for model include National Inpatient Sample (NIS), Healthcare Cost and Utilization Project (HCUP) 2015, Agency for Healthcare Research and Quality; OptumInsight, 2016 (unpublished data); Centers for Medicare & Medicaid Services 2016 Limited Data Sets for carrier, denominator, home health agency, hospice, outpatient, and skilled nursing facility; Claritas Pop-Facts, 2018; Sg2 analysis, 2018 (unpublished data).
Commercial price increases less than half of what they were

Average commercial price increase (intensity-adjusted)

<table>
<thead>
<tr>
<th>Service</th>
<th>2010-2011</th>
<th>2015-2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outpatient surgery</td>
<td>8.3%</td>
<td>3.9%</td>
</tr>
<tr>
<td>ER visits</td>
<td>7.4%</td>
<td>4.6%</td>
</tr>
<tr>
<td>Inpatient surgery</td>
<td></td>
<td>2.1%</td>
</tr>
<tr>
<td>Inpatient medical</td>
<td>5.2%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Outpatient radiology</td>
<td></td>
<td>2.7%</td>
</tr>
</tbody>
</table>

Survey: Vizient members with strong bargaining clout reported annual contract increases 6% to 8% 10 years ago, 4% to 5% today; project 2% to 4% over next 5 years

Reality check: return to steeper price hikes threatens middle class bankruptcy

Average annual health care spending per working household
(Insurance premiums and out-of-pocket expenditures)

<table>
<thead>
<tr>
<th>Year</th>
<th>Median Compensation</th>
<th>Health Spending as Percentage of Compensation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>$68,600</td>
<td>13.4%</td>
</tr>
<tr>
<td>2016</td>
<td>$105,800</td>
<td>24.4%</td>
</tr>
<tr>
<td>2030 (proj.)</td>
<td>$149,000</td>
<td>33.9%</td>
</tr>
<tr>
<td>2030 (if commercial price increases = 6%)</td>
<td>$149,000</td>
<td>39.2%</td>
</tr>
</tbody>
</table>

Competition heating up for low acuity, elective services

- 1,900 retail clinics currently, up from 260 in 2007…with roughly 18 million annual visits provided by the largest chain alone

- Disrupters (e.g., virtual visits, insurer/provider partnerships, etc.) threaten to undercut traditional clinic/office-based E&M pricing, and may siphon market share from hospitals

- Outpatient hospital prices three times free-standing reference labs for routine panel

Source: http://www.twofour.com/work/power-to-the-patient
Margins vulnerable if competition compresses prices

Impact on operating margin if elective CT/MRI prices meet competitors (excludes ED, OB, head/brain, and all studies related to complex illness)

![Bar chart showing impact on operating margin for different types of hospitals and percentile ranks of commercial prices today.]

Source: Analysis of Milliman commercial claims (2015), Vizient Clinical Data Base (2017), and Definitive Healthcare Hospital Database (2016).
Uninsured rate showing preliminary signs of potential rebound

Percentage of U.S. working age adults without health insurance (2013 – 2018)

Hospital revenue could grow at rate closer to rest of economy

<table>
<thead>
<tr>
<th>Payer Type</th>
<th>Inpatient Volumes</th>
<th>Outpatient Volumes</th>
<th>Costs/Prices</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Commercial revenue</strong></td>
<td>-0.7%/year</td>
<td>0.1%/year</td>
<td>Commodity prices down 50% due to competition, Other prices up 4%/year</td>
</tr>
<tr>
<td><strong>Medicare revenue</strong></td>
<td>0.7%/year</td>
<td>2.2%/year</td>
<td>Prices up 2%/year</td>
</tr>
<tr>
<td><strong>Medicaid revenue</strong></td>
<td>-0.6%/year</td>
<td>-0.2%/year</td>
<td>Prices up 1%/year</td>
</tr>
<tr>
<td><strong>Other payer revenue</strong></td>
<td>-0.5%/year</td>
<td>0.1%/year</td>
<td>Prices flat as uninsured rate rises</td>
</tr>
</tbody>
</table>

Average change in annual hospital revenue:
- Commercial: +3.7%
- Medicare: +3.7%
- Medicaid: +0.5%
- Other payer: -0.5%

All payers combined: +3.4%

Sources:
- Data sources for model include National Inpatient Sample (NIS), Healthcare Cost and Utilization Project (HCUP) 2015, Agency for Healthcare Research and Quality, OptumInsight, 2016 (unpublished data); Centers for Medicare & Medicaid Services 2016 Limited Data Sets for carrier, denominator, home health agency, hospice, outpatient, and skilled nursing facility; Claritas Pop-Facts, 2018; Sg2 analysis, 2018 (unpublished data).

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Downward pressure on revenue increases importance of throughput, documentation, and revenue cycle performance

<table>
<thead>
<tr>
<th>Revenue capture opportunity</th>
<th>Potential impact on net revenue</th>
<th>Potential impact on operating margin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved throughput and reduced LOS</td>
<td>0.1% to 0.25%</td>
<td>3% to 5%</td>
</tr>
<tr>
<td>Clinical documentation improvement</td>
<td>0.5% to 1%</td>
<td>15% to 25%</td>
</tr>
<tr>
<td>Revenue cycle enhancement</td>
<td>2% to 5%</td>
<td>50% to 100%</td>
</tr>
</tbody>
</table>

*Incremental revenue capture is based on commonly observed performance improving to benchmarks*

Source: Vizient Advisory Solutions
Expense growth throttles liquidity as absolute cash rises

In health care, we spend our revenue” - Western U.S. health system CFO

Sources: Moody’s Investors Services (April 23, 2018), Not-for-profit and public healthcare – US: Preliminary medians underscore negative sector outlook.
“Unparalleled patient experience” comes at a price

Depreciation and interest per adjusted patient day (2016)

Older hospitals (>15 years) - $122
Average age hospitals (10-15 years) - $162
Newer hospitals (<10 years) - $191

Source: Analysis of AHA Data Viewer (2016).
Moody’s concerned over capital needs

“Despite two years of growth in the median capital spending ratio to 1.3 times in 2017, median age of plant has ticked up to 11.6 years.”

“Many hospitals have recently foregone large spending on facility replacements to make significant investments in information technology.”

“We expect capital spending needs, coupled with lower cash flow will likely continue to restrict liquidity growth.”
U.S. hospital administrative costs are highest in the world and growing rapidly

Total hospital expenditures per capita (in U.S. dollars, 2010)*

<table>
<thead>
<tr>
<th>Country</th>
<th>Administrative Costs</th>
<th>Clinical Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.</td>
<td>$2,634</td>
<td>$1,631</td>
</tr>
<tr>
<td>Netherlands</td>
<td>$1,458</td>
<td>$1,271</td>
</tr>
<tr>
<td>England</td>
<td>$1,458</td>
<td>$1,271</td>
</tr>
<tr>
<td>Canada</td>
<td>$1,458</td>
<td>$1,271</td>
</tr>
</tbody>
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*U.S. dollars adjusted based on purchasing power parity (PPP)

CAGR of U.S. hospital costs and GDP (2000 – 2011)

- Administrative costs: 7.4%
- Clinical costs: 6.5%
- GDP: 3.8%

Byzantine payment system contributes to but does not explain administrative cost differential

Revenue cycle expenses as a percentage of net revenue

- High-performing hospitals: 2.6%
- Typical hospitals: 3.0%
- Low-performing hospitals: 4.2%
- MD practices: 6.0%

Hospital administrative cost per capita (in U.S. dollars, 2010)*

- U.S.: $667
- Netherlands: $323
- England: $225
- Canada: $158

*U.S. dollars adjusted based on purchasing power parity (PPP)

Drug costs like moving water beneath the foundation… eroding structural stability

Year-over-year increase in hospital expenses per adjusted day (2013 – 2017)

Slowdown in non-drug expense per adjusted day reflects improved labor productivity as outpatient volume grew

Still untapped opportunity to reduce non-labor variable costs

$1 billion health system

Typical operating margin = 4%

Current operating margin = $40 million

Typical supply savings opportunity = 5-10%

$200 million supply spend

$10-20 million savings opportunity

Incremental supply savings could increase or restore current operating margin by 25% - 50%

1 Supply savings opportunity includes procurement, physician preference items, and utilization

Tough calculus unless labor costs addressed

Distribution of total hospital expenses (2016)

- Wages and benefits, 47.2%
- Supply, 14.5%
- Rx, 6.6%
- Interest and depreciation, 6.3%
- Other (e.g., purchased services), 25.5%

Source: Analysis of AHA Data Viewer (2016).
Skilled/professional labor cost up faster than unskilled labor costs

Year-on-year increase in total compensation, by hospital labor type

Wide variation in labor productivity suggests opportunity for most hospitals

Adjusted patient days per FTE of non-physician labor (2017)

Note: “Adjusted patient days” includes inpatient days and outpatient services converted to resource equivalents

Similar productivity gains across performance quartiles noteworthy

Adjusted patient days per FTE of non-physician labor (2007 – 2017)

Note: “Adjusted patient days” includes inpatient days and outpatient services converted to resource equivalents

Untested hypothesis: productivity gains may reflect increased outpatient volumes filling previously underused capacity

Productivity per dollar of labor cost a better measure – sensitive to skill mix differences

Adjusted patient days per $10K of non-physician labor (2017) (labor costs area wage index adjusted)

Note: “Adjusted patient days” includes inpatient days and outpatient services converted to resource equivalents

Gains in labor productivity – when sustained – largely arise from higher outpatient volume

Productivity vs. volume

Change in adjusted patient days per $10K of non-physician labor (2007 – 2017)*

-30% -20% -10% 0% 10% 20% 30% 40% 50% 60%

-30% -20% -10% 0% 10% 20% 30%

Change in non-acute adjusted patient days (2007 – 2017)

- CAGR of unit labor cost:
  - <2.5%
  - 2.5 – 4.0%
  - >4.0 %

Outpatient volume accounts for majority of productivity gains when unit labor cost CAGR <2.5%

Volume accounts for only 1/3 of productivity variation if unit labor cost CAGR is 2.5% to 4%

No correlation between outpatient volume and productivity when unit labor cost CAGR >4%

* Historical labor costs indexed to 2017 dollars.

Wages and skill mix = smoking gun... price, not quantity driving costs

Comparison of trend in two measures of labor productivity

- Increases in wages and/or skill mix more than offset gains in unit labor productivity
- Increases in wages and/or skill mix partially offset gains in unit labor productivity

Change in adjusted patient days per FTE of non-physician labor (2007 – 2017)

Change in adjusted patient days per $10K of non-physician labor (2007 – 2017)*

* Historical labor costs indexed to 2017 dollars.

Achievable labor productivity gains will restore margins if revenue growth flattens

<table>
<thead>
<tr>
<th>Labor productivity (adjusted days per $10K wage-adjusted labor cost)</th>
<th>15+ days</th>
<th>12 to 14 days</th>
<th>10 to 12 days</th>
<th>8 to 10 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>6% ↓ labor cost/adj day</td>
<td>7% ↓ labor cost/adj day</td>
<td>7% ↓ labor cost/adj day</td>
<td>8% ↓ labor cost/adj day</td>
<td></td>
</tr>
<tr>
<td>2% revenue → margin</td>
<td>2.5% revenue → margin</td>
<td>2% revenue → margin</td>
<td>3.5% revenue → margin</td>
<td></td>
</tr>
</tbody>
</table>

Takeaways

• 2017 was warning shot over bow…operating cash flow margins lowest in decade
• Little organic revenue growth ahead – site of service trade-offs and payer mix portend flat trajectory
• Slower top line growth intensifies pressure to capture revenue owed
• Expense growth outpacing revenue, threatens liquidity
• Price was traditional fix…softening private sector and middle-class affordability crisis limit head room
• Facility replacements and EMRs increased fixed costs but many aging plants remain…more capital stress ahead
• Administrative expenses out of sync with rest of world – complex revenue cycle not the explanation
• Rx costs threaten hospital budgets and American affordability
• Non-labor costs merit attention but will not solve the problem
• Wage hikes and skill mix eroding nominal gains in labor productivity…like bigger picture, it’s price not quantity driving costs