State of the Union—The Next Wave of Health Care Reform

Repeal, Replace, or Repair? Adapting Provider Strategy Beyond the ACA
1. The Next Wave of Health Reform
2. The Inevitable Margin Challenge
3. Protecting Future Margins
What a Year

2017 a Busy Year in Health Care

Key Milestones in 2017 Health Care Agenda

January 20th
President Trump sworn in; signs, health care executive order

May 4th
After multiple false starts, House passes AHCA¹

July 25th-28th
Senate votes down BCRA², ORRA³, HCFA⁴

September 26th
Senate cancels vote on Cassidy-Graham

¹ American Health Care Act.
² Better Care Reconciliation Act.
³ Obamacare Repeal Reconciliation Act.
⁴ Health Care Freedom Act.

Source: Health Care Advisory Board interviews and analysis.
What’s Next for Repeal-and-Replace Efforts?

Future of Health Care Legislation Unclear

Legislative Agenda Shifting…For Now

“We haven’t given up on changing the American health care system. We are not going to be able to do that this week, but…we haven’t given up on that.”

Senate Majority Leader Mitch McConnell (R-KY), Senate Briefing, September 26th

“We’re on the path to pass Graham-Cassidy-Heller-Johnson. It’s not ‘if’ it’s only a matter of ‘when.’”

Senator Lindsey Graham (R-SC), Senate Briefing, September 26th

Three Potential Legislative Paths Forward

1. Refocus on Bipartisan Health Reform
2. Incorporate Health Care into Tax Reform
3. Renew Effort for FY2019

## Long-Term Repeal Prospects May Hinge on Mid-Terms

### Senate Map Favors GOP

<table>
<thead>
<tr>
<th>Seats</th>
<th>(34/100)</th>
<th>Seats up for election held by Democrats</th>
<th>25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seats up for election</td>
<td>34</td>
<td>Seats up for election</td>
<td>10</td>
</tr>
<tr>
<td>Democratic seats up for election in states that voted for Trump</td>
<td>10</td>
<td>Seats held by Democrats</td>
<td>1</td>
</tr>
<tr>
<td>Republican seat up for election in a state that voted for Clinton</td>
<td>1</td>
<td>Republican seats up for election in districts that voted for Clinton</td>
<td>23</td>
</tr>
<tr>
<td>Seats held by Republicans</td>
<td>1</td>
<td>Democratic seats up for election in districts that voted for Trump</td>
<td>12</td>
</tr>
</tbody>
</table>

### Future of House Control Less Certain

<table>
<thead>
<tr>
<th>Seats</th>
<th>(435/435)</th>
<th>Seats held by Republicans</th>
<th>240</th>
</tr>
</thead>
<tbody>
<tr>
<td>House seats up for election</td>
<td>435</td>
<td>Seats held by Republicans</td>
<td>240</td>
</tr>
<tr>
<td>Republican seats up for election in districts that voted for Clinton</td>
<td>23</td>
<td>Seats held by Republicans</td>
<td>240</td>
</tr>
<tr>
<td>Democratic seats up for election in districts that voted for Trump</td>
<td>12</td>
<td>Democratic seats up for election in districts that voted for Trump</td>
<td>12</td>
</tr>
</tbody>
</table>

### Races to Watch

- **Senate Map Favors GOP**
  - Nelson (D-FL)
  - Brown (D-OH)
  - Heitkamp (D-ND)
  - Donnelly (D-IN)
  - McCaskill (D-MO)
  - King (I-ME)
  - Manchin (D-WV)
  - Heller (R-NV)
  - Flake (R-AZ)

- **Future of House Control Less Certain**
  - MN – 1
  - NH – 1
  - NV – 3
  - CA – 25
  - CA – 49
  - CO – 6
  - MI – 11
  - MN – 2
  - NE – 2
  - NY – 19
  - VA – 10
  - WA – 8

In the Meantime, Several Pressing Issues Loom

Absent Congressional Action, CHIP, Health Center Funding Will Run Dry

Congress Weighing Two Key Health Care Funding Renewals

**CHIP Funding**

**Community Health Center Funding**

**What’s At Stake:**
- $15B in annual funding covering 9M low- and middle-income children
- $3.6B in annual funding for approximately 1,400 community health centers

**Current Status:**
- Missed September 30th deadline to renew funding
- Both Senate and House debating how to pay for funding extension
- 11 states will exhaust funding by December
- Missed September 30th deadline to renew funding
- Bills introduced in both the House and Senate, but neither chamber has held a floor vote

**What to Watch:**
- What Congress will target to pay for extension
- How quickly Congress acts; whether CHC rides with CHIP

One Piece of a Broader Health Care Agenda

GOP Laid Out Three Phases to Health Care Reform

A Three-Staged Approach to Repeal and Replace the ACA

<table>
<thead>
<tr>
<th>Phase</th>
<th>Process</th>
<th>Proposed Target Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Budget Reconciliation</td>
<td>Requires simple majority in House and Senate</td>
<td>Repeal ACA taxes, employer and individual mandates, Replace insurance subsidies with refundable tax credits, Transform Medicaid into block grant system, Increase contribution limit of HSAs, Allocate funds for state innovations, Require continuous coverage insurance incentive</td>
</tr>
<tr>
<td>2 Administrative Action</td>
<td>Federal agencies issue regulation through rulemaking</td>
<td>Shorten individual market enrollment period and limit special enrollment, Loosen restrictions on actuarial value of individual market plans, Enable state flexibility through waiver process, Approve state Medicaid eligibility changes (e.g., work requirements, premiums)</td>
</tr>
<tr>
<td>3 Additional Legislation</td>
<td>Requires simple majority in House, super-majority in Senate</td>
<td>Allow insurance to be sold across state lines, Expand use of HSAs, Allow formation of Association Health Plans, Reform malpractice regulation, Streamline FDA processes, Expand flexibility of state use of federal dollars</td>
</tr>
</tbody>
</table>

### Administrative Action Taking Center Stage

President, Federal Agencies Using Power of the Pen to Drive Reform

#### Executive Orders and Rules Deliver on Core GOP Promises

<table>
<thead>
<tr>
<th>Date</th>
<th>Order/Rule Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 6&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Interim Final Rules: Contraception Mandate</td>
</tr>
<tr>
<td>October 12&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Executive Order: Insurance Market Regulations</td>
</tr>
<tr>
<td>October 27&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Proposed Rule: ACA Marketplace Regulations</td>
</tr>
</tbody>
</table>

Religious Exemptions and Accommodations for Coverage of Certain Preventive Services Under the Affordable Care Act

- Allows employers to claim religious or moral exemptions from providing contraceptive coverage to employees

Moral Exemptions and Accommodations for Coverage of Certain Preventive Services Under the Affordable Care Act

- Directs agencies to draft rules easing regulations on association health plans, short-term health plans, and HRAs<sup>1</sup>

Patient Protection and Affordable Care Act; HHS Notice of Benefit and Payment Parameters for 2019

- Would increase state flexibility in regulating federally-facilitated exchanges and SHOP (e.g. altering essential health benefits)

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<sup>1</sup> Health Reimbursement Account.

Ending CSRs: The Administration’s Biggest Move Yet

Trump Administration Ending Monthly Cost-Sharing Reduction Payments as of October

“Based on guidance from the Department of Justice, the Department of Health and Human Services has concluded that there is no appropriation for cost-sharing reduction payments to insurance companies under Obamacare. In light of this analysis, the Government cannot lawfully make the cost-sharing reduction payments.”

White House Press Office, Oct. 12th

Cost-Sharing Reductions (CSR)

ACA requirement that insurers reduce OOP\(^1\) costs for silver plan enrollees with household incomes <250% FPL\(^2\)

**Impact**

- **6.4M** people enrolled in plans with reduced cost-sharing in 2016
- **~$7B** in annual insurer CSR payments
- In 2016, CSRs reduced the average deductible for those with incomes below 150% of poverty from **$3,609** to **$255**


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1) Out-of-pocket costs.  
2) Federal poverty level.
Unpacking the Potential Implications

Consumer and Market Reactions Biggest Unknowns

State Response

- California Attorney General filed lawsuit on behalf of 18 states and D.C.
- Federal judge rejected preliminary injunction
- Still seeking permanent resumption of payments

Plan Response

- Some plans likely to leave market due to uncertainty
- Some states allowed plans to add a surcharge to silver plan premiums to minimize consumer cost exposure

Consumer Response

- Some individuals likely to leave market due to real or perceived cost increases
- Those who did not qualify for subsidies particularly likely to see premium increases

Administration Taking Other Actions that Impact Exchanges

- Cutting open enrollment period in half
- Scaling back advertising
- Reducing navigator funding
- Closing website on Sundays for maintenance

## Congress Stepping In?

### CBO Positive, But President Unsure as Senate Proposes Bipartisan Deal

**Two Major Components of Alexander-Murray Bipartisan Proposal**

<table>
<thead>
<tr>
<th><strong>Market Stabilization</strong></th>
<th><strong>State Flexibility</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Provides funding for CSR payments for 2017-2019</td>
<td><strong>New 1332 waiver flexibility:</strong></td>
</tr>
<tr>
<td>• Restores 2/3 of outreach and enrollment funding for 2018-2019</td>
<td>• Process: shortens review process, extends length of waiver, allows governor certification in some states⁴</td>
</tr>
<tr>
<td>• Eliminates age limit on purchase of catastrophic plans¹</td>
<td>• Substance: Tweaks requirements for affordability, budget neutrality</td>
</tr>
</tbody>
</table>

### CBO’s Projected Impact

- **$3.8B decrease** in federal deficit
- **No significant change** in number of uninsured

### Trump Hesitant to Endorse Deal

“\[I am supportive of Lamar as a person \ldots but I can never support bailing out insurance companies who have made a fortune [with Obamacare].\]”

*President Trump*

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¹ Currently limited to those under the age of 30.
² Currently must be approved by state legislatures.

For Providers, a Relatively Limited Impact

Despite Political Significance, Exchanges Only a Small Segment of Market

Approximate Coverage of US Population by Payer Sector

As of March 2016

- ~11.5M Individuals with insurance through public exchanges
- ~153M Individuals with employer-sponsored insurance

- Employer-Sponsored Insurance (47%)
- Medicare (17%)
- Medicaid and CHIP (19%)
- Public Exchanges (4%)
- Off-Exchange Plans (2%)
- Other (1%)^1
- Uninsured (9%)


^1) Student, IHS, CH+.
Key Players in Advancing the GOP Agenda

Administration Has Considerable Leeway to Alter ACA Trajectory

Meet the Key Players

Nominee for HHS Secretary: Alex Azar

- Lawyer; clerked for Supreme Court Justice Scalia
- Former General Counsel and Deputy Secretary of HHS during Bush Administration
- Spent past decade as an executive at Eli Lilly
- Nominated on November 13

CMS Administrator: Seema Verma

- National health policy consultant from Indiana
- Helped shape Medicaid expansion in IN, OH, KY, TN
- Confirmed by 55-43 vote

Potential Administrative Actions

- End cost-sharing reduction payments
- Delay Cadillac Tax
- Eliminate, delay, or modify Innovation Center programs (e.g., CJR¹)
- Reduce enforcement of insurance mandates
- Narrow scope of essential health benefits
- Allow Medicaid eligibility, cost-sharing reform through 1115 waivers

ACA Leaves Enormous Amount to the Secretary’s Discretion

1,442

Times the ACA says “the secretary shall” or “the secretary may”

¹) Comprehensive Joint Replacement.

CMMI Reshuffling the Priority List

Payment Reform No Longer the Sole Focus

"Setting A “New Direction” For CMMI"

“This administration plans to lead the Innovation Center in a new direction…We will move away from the assumption that Washington can engineer a more efficient health-care system from afar—that we should specify the processes health-care providers are required to follow.”

Seema Verma,
CMS Administrator
The Wall Street Journal
September 19th

Potential Models Included in September CMMI RFI¹

Primary focus of Obama Administration

- Expanded Opportunities for Participation in Advanced APMs

Other Models Included in RFI

- Consumer-Directed Care & Market-Based Innovation Models
- Physician Specialty Models
- Prescription Drug Models
- MA² Innovation Models
- State-Based and Local Innovation, including Medicaid-focused Models
- Mental & Behavioral Health Models
- Program Integrity

¹) Request for Information.
2) Medicare Advantage.

## Waivers Extend Reform Flexibility to States

### Enabling States to Waive Key ACA Provisions

<table>
<thead>
<tr>
<th>1332 Waivers</th>
<th>1115 Waivers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Established by ACA to allow states to experiment with alternative ways to meet ACA’s coverage goals</td>
<td>Established by Social Security Act to enable demonstrations furthering goals of Medicaid, CHIP</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Potential Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Eliminate the individual/employer mandate</td>
</tr>
<tr>
<td>• Amend the ACA’s standard for a QHP¹</td>
</tr>
<tr>
<td>• Alter cost sharing subsidies</td>
</tr>
<tr>
<td>• Implement Medicaid payment reforms</td>
</tr>
<tr>
<td>• Expand Medicaid eligibility</td>
</tr>
<tr>
<td>• Change Medicaid benefits, cost-sharing</td>
</tr>
</tbody>
</table>

### Prevalence

<table>
<thead>
<tr>
<th>4 States with current waivers</th>
<th>33 States with current waivers</th>
</tr>
</thead>
<tbody>
<tr>
<td>• <strong>Hawaii</strong>: State will retain its “Prepaid Health Care Act,” forgo setting up SHOP Exchange</td>
<td>• <strong>New York</strong>: Five-year, $6.42 billion agreement enabling providers to implement Medicaid redesign projects</td>
</tr>
<tr>
<td>• <strong>Alaska</strong>: allows state to establish reinsurance program which covers part of the cost for high-cost patients</td>
<td>• <strong>Indiana</strong>: expanded Medicaid by modifying enrollment requirements</td>
</tr>
</tbody>
</table>

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¹ Qualified Health Plan.

GOP Dominates State-Level Politics

Conservative Principles Likely to Drive State-Level Reforms As Well

2017 Legislative Partisan Composition

34/50 Republican Governors

32/50 Republican-Led Legislatures

Source: National Conference of State Legislatures, accessed October 19, 2017; Health Care Advisory Board interviews and analysis.
Majority of Americans Believe Opioids are National Health Issue

45%
Of surveyed Americans view misuse of prescription opioids as a “crisis”

41%
Of surveyed Americans view misuse of prescription opioids as a “serious problem”

Federal Government Taking Initial Steps

Predominantly Focused on Supporting State Efforts

Federal Agencies Offer Funding and Create General Guidelines

Primary Federal Funding Directed at Opioid Crisis, 2017-2021¹
As of Sep. 2017

<table>
<thead>
<tr>
<th>Agency</th>
<th>Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDC</td>
<td>$70M</td>
</tr>
<tr>
<td>HHS</td>
<td>$144M</td>
</tr>
<tr>
<td>21st Century Cures Act</td>
<td>$485M</td>
</tr>
<tr>
<td>Total</td>
<td>$699M</td>
</tr>
</tbody>
</table>

March 2016: CDC Issues Formal Prescription Guidance

Oct. 2017: FDA Streamlines MAT² Drug Development

1. No longer need to prove drugs lead to complete abstinence
2. Can now address a wider range of symptoms (e.g. cravings)

Administration Declares a Public Health Emergency

Reallocating existing resources
Cutting bureaucratic delays in hiring personnel
Expanding use of telemedicine and remote prescribing


¹ Grants awarded over 3-5 years depending on program and availability.
² Medication assisted treatment.
States Leading the Tactical Response on Opioids

Taking Policy Action, Putting Pressure on Private Payers

**States Using Variety of Strategies**

6 States have declared public health emergencies to allocate additional funding, resources

41 States plan to investigate opioid manufacturers

37 States have pressed AHIP on pain management insurance coverage

**Private Payers Respond to Pressure**

Goal to reduce inappropriate opioid prescriptions by 50% by 2022

Goal to reduce opioid prescriptions by 25% by 2019

**States See Reduced Repeat Offenders**

After requiring clinicians to use state opioid registries

75% Decline in New York

36% Decline in Tennessee

**Acknowledging the Opportunity**

“Opioid abuse and addiction are an urgent public health crisis... AHIP member plans are committed to alleviating the root causes that contribute to [this crisis]”

AHIP Letter to National Association of Attorneys General, September 22, 2017

Plenty of Open Policy Questions

What to Watch: 2017 and Beyond

1. Will President Trump use additional **executive actions and regulations** to advance the GOP’s health reform agenda?

   **Leading Indicators:**
   - Issued 49 executive orders to-date; very first executive order was focused on health care
   - Has issued several health-care related actions since FY2017 legislative effort stalled

2. Will the administration use **waivers** to enable broad flexibility or to double-down on core conservative principles?

   **Leading Indicators:**
   - Inconsistent in speed, criteria for approving 1332 waivers
   - Pending 1115 waivers could enact broad Medicaid changes

3. Will Congress hold off on **legislation** until 2019 or revisit it in 2018 (e.g., either through tax reform or bipartisan effort)?

   **Leading Indicators:**
   - 2018 budget resolution focused on tax reform
   - Sens. Lamar Alexander (R-Tenn.) and Patty Murray (D-Wash.) leading bipartisan stabilization efforts

Source: Health Care Advisory Board interviews and analysis.
Beyond the Headlines, a Larger Problem

Last Era of Health Reform Expanded Coverage and Increased Spending

Coverage Expansion to Millions…

22M

HHS estimate of adults who gained coverage as a result of the ACA

…Drove Spike in Health Care Spending

$44.6B

Estimate of increase in hospitals’ net income due to new coverage under the ACA, 2014-2016

US Adult Uninsured Rate

Q3 2013: 18.0%
Q3 2017: 12.3%


National Health Expenditures

Actual Spend FY2010-2015, Projected FY2016-2025, in billions
The Next Wave of Health Care Reform

Focus Shifting From Coverage Expansion to Health Spending

Evolution of Health Reform Goals

Last Era of Health Reform: Expanding Coverage

Next Era of Health Reform: Reducing the Price of Care

Payers pulling pricing levers to decrease health spending and drive providers to reduce cost of care

Source: Health Care Advisory Board interviews and analysis.
Not the Best Time for Spending Cuts

Margin Deterioration Already Occurring Across the Board

Excess Margin$^1$ Medians of Freestanding Hospitals, Single-State & Multi-State Healthcare Systems, by Broad Rating Category

<table>
<thead>
<tr>
<th></th>
<th>Aa 2013</th>
<th>Baa 2013</th>
<th>Median 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excess Margin</td>
<td>7.2%</td>
<td>3.3%</td>
<td>5.1%</td>
</tr>
<tr>
<td>Operating margin$^2$</td>
<td>3.5%</td>
<td>2.0%</td>
<td>0.8%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Aa 2014</th>
<th>Baa 2014</th>
<th>Median 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excess Margin</td>
<td>7.6%</td>
<td>2.8%</td>
<td>5.3%</td>
</tr>
<tr>
<td>Operating margin$^2$</td>
<td>4.0%</td>
<td>2.2%</td>
<td>0.6%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Aa 2015</th>
<th>Baa 2015</th>
<th>Median 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excess Margin</td>
<td>8.4%</td>
<td>5.0%</td>
<td>6.1%</td>
</tr>
<tr>
<td>Operating margin$^2$</td>
<td>5.0%</td>
<td>2.0%</td>
<td>3.4%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Aa 2016</th>
<th>Baa 2016</th>
<th>Median 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excess Margin</td>
<td>7.2%</td>
<td>4.4%</td>
<td>5.7%</td>
</tr>
<tr>
<td>Operating margin$^2$</td>
<td>4.4%</td>
<td>2.7%</td>
<td>1.6%</td>
</tr>
</tbody>
</table>

1) Excess margin= (total operating revenue-total operating expense + non operating revenue)/(total operating revenue + non-operating revenue)*100.
2) Operating margin= (total operating revenue-total operating expense)/total operating revenue*100.

The Inevitable Margin Challenge

Price and Cost Pressures Squeezing Provider Margins

Nine Structural Forces Compressing Provider Margins

1. Direct reimbursement pressure
2. Federalism and state-based coverage reform
3. Dilution of commercial coverage
4. Deregulation and the new era of competition
5. Shifting demographics and payer mix evolution

Provider Margins

1. Rising pharmaceutical costs
2. Uncontrolled labor spending growth
3. Increasing reliance on IT enablement
4. Growth in purchased services

Source: Health Care Advisory Board interviews and analysis.
1. The Next Era of Health Reform

2. The Inevitable Margin Challenge

3. Protecting Future Margins
Guess What’s Not Getting Repealed

Even Under Repeal, Majority of Obama-Era Cuts Would Have Remained

“Productivity” Adjustments and Other Cuts

<table>
<thead>
<tr>
<th>Year</th>
<th>ACA IPPS Update Adjustments</th>
<th>ACA DSH Payment Cuts</th>
<th>MACRA IPPS Update Adjustments</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>($32B)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>($48B)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td>($60B)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2020</td>
<td>($71B)</td>
<td></td>
<td></td>
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<tr>
<td>2021</td>
<td>($82B)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2022</td>
<td>($94B)</td>
<td></td>
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<tr>
<td>2023</td>
<td>($103B)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2024</td>
<td>($116B)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2025</td>
<td>($143B)</td>
<td></td>
<td></td>
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</tbody>
</table>

No Relief Ahead

Administration Finalizing Substantive Cuts to Hospital 340B Program

2018 HOPPS\(^1\) Final Rule Cuts 340B Payments, Redistributes Savings Across Providers

<table>
<thead>
<tr>
<th>Current Reimbursement:</th>
<th>New Reimbursement(^2):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Sales Price</td>
<td>Average Sales Price – 22.5%</td>
</tr>
<tr>
<td>+ 6%</td>
<td>– 22.5%</td>
</tr>
</tbody>
</table>

\$1.6B Total cut to 340B reimbursement in CY 2018

Redistributed as higher rates for non-drug services at all HOPPS reimbursed facilities, including non-340B-covered entities

Significant Portion of Hospitals Affected\(^3\)

- 45% Of hospitals participated in 340B in 2014
- 1,018 Hospitals participating in the 340B program will see payment cuts
- 320 Rural sole community hospitals, children’s hospitals, PPS-exempt cancer hospitals exempt from payment change

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1) Hospital Outpatient Prospective Payment System.
2) Excludes drugs on pass-through and vaccines.
3) Excludes critical access hospitals, which are reimbursed under 340B for “reasonable cost,” not “average sales price.”

Payment Reform Marches On

2018 MACRA\(^1\) Final Rule Expands Exemptions, Increases Requirements

Bipartisan Support Guarantees Continued Implementation

92-8 Senate vote on MACRA

392-37 House vote on MACRA

Expanded Low-Volume Threshold Increases Clinicians Exempt from MIPS

2017 Requirements:
$30K$ or 100 patients in Medicare Part B

2018 Requirements:
$90K$ or 200 patients in Medicare Part B

540K Clinicians exempt from MIPS in 2018 due to low-volumes

Requirements Ramp Up for 2018 MIPS\(^2\) Reporting

1. Clinicians must now report IA\(^3\) and ACI\(^4\) measures for at least 90-days; must report a full calendar year for quality measures

2. Clinicians must now report with 60% data completeness for quality measures; must report all CEHRT data for ACI

3. The quality reporting category is now worth 50% of the final MIPS score; down from 60% in 2017

4. The cost category is now worth 10% of the final MIPS score; up from 0% in 2017

Source: CMS, Medicare Access and CHIP Reauthorization Act; Dickson, V., “CMS will give providers flexibility on MACRA requirements,” Modern Healthcare, September 2016; CMS, Medicare Program; CY 2018 Updates to the Quality Payment Program; and Quality Payment Program: Extreme and Uncontrollable Circumstance Policy for the Transition Year, November 2017; Health Care Advisory Board interviews and analysis.

1) Medicare Access and CHIP Reauthorization Act.
2) The Merit-Based Incentive Payment System.
3) Improvement Activities.
4) Advancing Care information.

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MACRA Dealing Physicians in on Risk

Greater Payment Updates, Bonuses Depend on Payment Migration

Annual Provider Payment Adjustments

<table>
<thead>
<tr>
<th>Year</th>
<th>MIPS Bonuses/Penalties</th>
<th>APM Bonuses/Penalties</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015–2019</td>
<td>+/-4%</td>
<td>Maximum annual adjustment, 2019</td>
</tr>
<tr>
<td>2016–2024</td>
<td>+/-9%</td>
<td>Maximum annual adjustment, 2022</td>
</tr>
<tr>
<td>2025–2026</td>
<td>$500M</td>
<td>Additional bonus pool for high performers</td>
</tr>
<tr>
<td>2020–2025</td>
<td></td>
<td>Annual lump-sum bonus from 2019-2024 (plus any bonuses/penalties from Advanced Payment Models themselves)</td>
</tr>
<tr>
<td>2026 onward</td>
<td></td>
<td>0.25% annual update (MIPS track)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.75% annual update (Advanced APM track)</td>
</tr>
</tbody>
</table>

Source: The Medicare Access and CHIP Reauthorization Act of 2015; CMS, Merit-Based Incentive Payment System (MIPS) and Alternative Payment Model (APM) Incentive under the Physician Fee Schedule, and Criteria for Physician-Focused Payment Models, April 25, 2016; Health Care Advisory Board interviews and analysis.

1) Relative to 2015 payment.
## Changing the Calculus Around ACO Participation

### MACRA Already Moving the Dial on Participation in Downside Models

### Model Selection Determines MACRA Track Qualification

<table>
<thead>
<tr>
<th>MIPS</th>
<th>MSSP Track 1</th>
<th>MSSP Track 1+</th>
<th>MSSP Track 2</th>
<th>MSSP Track 3</th>
<th>NGACO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not in an ACO or other APM; will receive MIPS payment adjustment</td>
<td>Maximum share rate of 50%</td>
<td>Fixed loss rate of 30%; maximum share rate of 50%</td>
<td>Maximum share/loss rate of 60%</td>
<td>Maximum share/loss rate of 75%</td>
<td>Choice of 80% or 100% share/loss rate</td>
</tr>
<tr>
<td>- 438 Participants&lt;sup&gt;1&lt;/sup&gt;</td>
<td>- Begins in 2018</td>
<td>- 6 Participants</td>
<td>- 36 Participants</td>
<td>- 45 Participants</td>
<td></td>
</tr>
</tbody>
</table>

### Model Selection Determined by Eligibility for APM Track

- **MIPS**
- **MIPS-APM**
- **Eligible for APM Track**

<table>
<thead>
<tr>
<th>MIPS</th>
<th>MIPS-APM</th>
<th>Eligible for APM Track</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Risk</td>
<td>Upside Risk</td>
<td>Upside &amp; Downside Risk</td>
</tr>
</tbody>
</table>

### Participants in Downside ACO Models

- 40 Participants in downside ACO models, 2016
- 87 Participants in downside ACO models, 2017

### Percent Increase in Downside ACO Model Participation

- 117%


<sup>1</sup> As of January 2017.

<sup>2</sup> Next Generation ACO.
Future of Bundled Payments in Question

CMS Poised to Iterate on Voluntary Programs, Scale Back Mandatory Ones

Cardiac EPMs\(^1\) Cancelled

- **Mandatory** bundling for CABG\(^2\) and AMI\(^2\), originally slated to go into effect July 2017
- Final rule released on November 30\(^{th}\) cancels both programs

CJR\(^3\) Scaled Back

- **Mandatory** bundling for hip and knee replacements, originally in 67 markets
- Final rule makes participation in 33 markets voluntary, cancels planned expansion to SHFFT\(^4\)

What’s Next for BPCI\(^5\)?

- **Optional** bundling program; providers may opt into any of 48 different conditions across four risk models
- Current Models 2, 3, and 4 extended through September 30\(^{th}\), 2018

---

CMS Committed to Exploring New Bundled Payment Programs

“We [at CMS] believe the best way to drive health system change while [reducing] burden & maintaining access to care is through developing different bundled payment models & engaging more providers”

*Seema Verma, CMS Administrator, November 30\(^{th}\)*

---

The Oldest Payment Reform in the Book

2018’s Outpatient Payment Rule Promotes Outmigration

Total Knee Arthroplasty (TKA) to be Reimbursed in HOPD\(^1\) Setting

\begin{align*}
\text{Inpatient Reimbursement}^2 & \quad \text{\$12,384.78} \\
\downarrow & \\
\text{Outpatient Reimbursement}^3 & \quad \text{\$10,122.22}
\end{align*}

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>18%</td>
<td>Reduction in TKA reimbursement</td>
</tr>
<tr>
<td>48%</td>
<td>Average percentage of Medicare TKA cases per organization that are potentially eligible to be performed in outpatient setting(^4)</td>
</tr>
</tbody>
</table>

Non-Excepted Hospital Outpatient Clinic Reimbursement Rate to be Cut by 20%

Final CY 2018 Rates

Percentage of HOPPS\(^5\) Reimbursed by Setting\(^6\)

\begin{align*}
\text{Excepted HOPDs}^1 & \quad 100\% \\
\text{ASCs}^7 & \quad 55\% \\
\text{Non-Excepted HOPDs}^1 & \quad 40\% \\
\text{Physician Offices} & \quad 35\%
\end{align*}

1) Hospital Outpatient Department.
2) Final rate for FY2018.
3) Final rate for CY 2018.
4) Analysis of MEDPAR inpatient Medicare claims from FY 2016 per six-digit Medicare CCN. Analysis reviewed cases assigned MS-DRG 469 or 470 with a TKA primary procedure code for distinct Medicare CCN. Cases with MS-DRG 470 were considered eligible to shift outpatient if the patient did not fulfill any of the exclusion criteria listed above. Please note that this is a generous analysis of eligibility, as other patient criteria not present in claims data (e.g., preference for no hospital stay; post-operative presence of a caregiver in patient’s home) also impact whether a case should be performed outpatient.
5) Hospital Outpatient Prospective Payment System.
6) Ambulatory Surgery Center.
7) According to analysis in CMS’s CY 2018 MPFS Final Rule.

## Impact of Price Cuts and Payment Reform Adds Up

### Medicare Payment Cuts Threatening Future Margins

*CBO Analysis of Impact of Medicare Payment Cuts*¹

<table>
<thead>
<tr>
<th>Share of impacted hospitals² that would have negative profit margins by 2025 without productivity improvements</th>
<th>Projected average aggregate hospital profit margin in 2025 without productivity improvements²</th>
</tr>
</thead>
<tbody>
<tr>
<td>60%</td>
<td>(0.2%)</td>
</tr>
</tbody>
</table>

### MACRA Poised to Further Exacerbate Financial Pressures

*RAND Analysis of Change in Utilization and Spending Under MACRA*³

<table>
<thead>
<tr>
<th>Spending decrease in “medium-prospectiveness⁴” scenario</th>
<th>Spending decrease in “high-prospectiveness⁴” scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>($22B)</td>
<td>($250B)</td>
</tr>
</tbody>
</table>

---

¹ Focusing on 3,000 acute care hospitals subject to ACA’s Medicare payment cuts.
² Assuming hospitals continue at 2016 levels of productivity.
³ RAND Corp. Projections, April 7, 2017.
⁴ Model factors in changes in physician behavior and potential financial gains/losses for providers if they increase/decrease their level of financial risk.

31 States and DC Have Approved Expansion
As of October 2017

31 States and DC Have Approved Expansion

Impending Federal Cuts to Safety Net Spending Threaten Stability

Federal Matching Rate for Expansion Population

$43B
Cut to federal Medicaid DSH payments, 2018-2026

31
States face revenue shortfalls, Jan. 2017

"Medicaid could make up close to half of Louisiana's state budget"
"We can't control our costs. We're growing out of control," said state Rep. John Schroder, R-Covington.

$68B
Federal spending on Medicaid expansion population, FY2015

$4.3B
State spending on Medicaid expansion population, FY2015

## Waivers Offer Opportunity for Funding and Innovation

### States Using Waivers to Drive Three Major Types of Medicaid Reform

<table>
<thead>
<tr>
<th>1</th>
<th>Payer-Led Managed Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Section 1932 and 1915 waivers, some 1115</td>
<td></td>
</tr>
<tr>
<td>• Implemented in 39 states</td>
<td></td>
</tr>
<tr>
<td>• Controls state spending by shifting beneficiaries to managed care with per-capita spending limits and/or home-based care alternatives</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2</th>
<th>Consumer-Driven Insurance Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Section 1115 waivers</td>
<td></td>
</tr>
<tr>
<td>• Implemented in 7 states</td>
<td></td>
</tr>
<tr>
<td>• Allows states to change Medicaid coverage and eligibility options, often implementing more conservative features (e.g. beneficiary cost-sharing requirements)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3</th>
<th>Provider-Focused Delivery Reform</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Section 1115 waivers, notably DSRIP(^1) waivers</td>
<td></td>
</tr>
<tr>
<td>• Implemented in 16 states</td>
<td></td>
</tr>
<tr>
<td>• States receive federal dollars upfront; commit to delivery and/or payment reform that will save federal government money in long-term</td>
<td></td>
</tr>
</tbody>
</table>

\(^1\) Delivery System Reform Incentive Payment.

Source: Kaiser Family Foundation, “Medicaid Enrollment in Managed Care by Plan Type,” 2014; Medicaid.gov, “State Waiver List,” Health Care Advisory Board interviews and analysis.
Payer-Led Managed Care

Medicaid Managed Care Reaching Its Limits

39 States and DC Have At Least One Medicaid Managed Care Organization

As of September 2016

Implications of Medicaid Managed Care for Providers

- Continued payment rate cuts
- Increased opportunity for provider-sponsored health plans

“The number of Medicaid beneficiaries covered by insurers] is staggering. It’s nearly a quarter of the population, [but] the easy growth is over.”

Ari Gottlieb,
Director Health Industries Payer Strategy, PwC Advisory


1) Capitated Medicaid managed care organizations.

Indiana Tests Medicaid Coverage Reform

Injecting Consumer-Driven Principles Into Medicaid Market

Case in Brief: Healthy Indiana Plan

- Section 1115 Medicaid expansion-enabled model modifying traditional program elements implemented in 2015
- Includes enrollee premiums, co-pays, incentives for preventive services, two plan tiers, and penalties for non-payment
- Providers reimbursed at Medicare rates to encourage provider acceptance of Medicaid
- 73% of eligible Medicaid beneficiaries participated in 2015, the first year

HIP\(^1\) Attempts to Encourage Three Behaviors:

1. Taking Personal Responsibility
   - Requires monthly contributions to “POWER” health savings account; failure to pay results in reduced benefits
   - No retroactive coverage

2. Using Preventive Services
   - Free preventive services
   - POWER account balances roll over if beneficiaries access these services
   - Higher copays for use of ED in a non-emergency situation

3. Staying on Employer-Sponsored Coverage
   - HIP Link program offers Medicaid-eligible individuals with employer-sponsored insurance a state-funded POWER account with $4,000 to cover out-of-pocket expenses


1) Healthy Indiana Plan.
Mixed Results in First Year of Healthy Indiana Plan

Challenges with Cost, Complexity Somewhat Offset by Coverage Expansion

First-Year Results

60% Of enrollees **were previously uninsured** or became eligible due to a change in income

75% Members that remained in the program for a year who **accessed preventive care**

46K Applicants earning above the FPL\(^1\) **were never enrolled** because they didn’t make their first payment\(^2\), Feb. 2015-Nov. 2016

13K Beneficiaries were **disenrolled after failing to pay**, Feb. 2015-Nov. 2016

Key Takeaways

**Program Impact**

- Significantly expanded number of individuals with coverage
- Not yet clear if POWER accounts truly encourage enrollees to shop for the highest value providers and services

**Provider Response**

- Employed navigators to assist eligible individuals with enrollment

**Future Plans**

- In February 2017, officials filed to extend the waiver through 2021, with the addition of voluntary job-related services

---

1) Federal poverty level.
2) Either because they had not heard of a POWER account or because they could not afford the payment.

## Following in Indiana’s Footsteps

New Proposals Even More Expansive than HIP¹

### Key Components of Select State Medicaid Waiver Requests Further Embrace Conservative Aims

<table>
<thead>
<tr>
<th>Eligibility and Enrollment</th>
<th>Amending current Medicaid expansion</th>
<th>Not expanding Medicaid</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Indiana²</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coverage conditional on first premium payment</td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>Waives retroactive eligibility</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>Work requirements</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Substance abuse screening and testing</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Time limit on coverage</td>
<td>✗</td>
<td>✓</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cost Sharing</th>
<th>Amending current Medicaid expansion</th>
<th>Not expanding Medicaid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coverage or select benefits conditional on continued premium payments</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Healthy behavior incentives</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Amending current Medicaid expansion</th>
<th>Not expanding Medicaid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waive non-emergency medical transportation</td>
<td>✓</td>
<td>✗</td>
</tr>
</tbody>
</table>

1) Healthy Indiana Plan.
2) Original waiver approved by CMS without work requirements, planning to apply to add them as of May 24, 2017.
3) Already has approval for premiums, healthy behavior incentives.

## Payment Reform an Increasingly Popular Strategy

### State Demonstrations Span Value-Based Payment Spectrum

<table>
<thead>
<tr>
<th>Pay-for-Reporting</th>
<th>PCMHs(^1)</th>
<th>Bundled Payments</th>
<th>Population-Based, ACOs</th>
<th>Total Cost of Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>• New Jersey</td>
<td>• Arkansas</td>
<td>• Arkansas and</td>
<td>• Alabama</td>
<td>• Maryland</td>
</tr>
<tr>
<td>Funds private</td>
<td>Offers PMPM(^2)</td>
<td>Tennessee</td>
<td>Regional Care</td>
<td>Global budget</td>
</tr>
<tr>
<td>hospital projects</td>
<td>payments and</td>
<td>Accountable</td>
<td>Organizations</td>
<td>caps for hospital</td>
</tr>
<tr>
<td>focused on one</td>
<td>shared savings</td>
<td>physicians</td>
<td></td>
<td>services</td>
</tr>
<tr>
<td>of eight conditions</td>
<td>potential if</td>
<td>rewarded or</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>cost and</td>
<td>penalized based</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>quality</td>
<td>on quality and</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>thresholds</td>
<td>cost performance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• New York</td>
<td>• Arkansas</td>
<td>• Colorado</td>
<td>• Oregon</td>
<td></td>
</tr>
<tr>
<td>Offers provider</td>
<td>and Tennessee</td>
<td>Distributes PMPM</td>
<td>Coordinated Care</td>
<td></td>
</tr>
<tr>
<td>coalitions</td>
<td></td>
<td>payments to cover</td>
<td>Organizations</td>
<td></td>
</tr>
<tr>
<td>incentive</td>
<td></td>
<td>enhanced services (e.g. care coordination)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>payments for</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>delivery reform</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Upside Risk Only**

**Potential for Downside Risk**

---

1) Patient Centered Medical Homes.
2) Per-member per-month.

Source: Health Care Advisory Board interviews and analysis.
Delivery Waivers Offer Most Opportunity for Providers

An Alternative to Cuts to Coverage and Reimbursement

Items to Watch For

- Will more comprehensive data on cost, savings, and quality from existing demonstrations be forthcoming?
- How will the Trump administration assess new and renewal waiver proposals?
- Will more commercial payers get involved in these demonstrations?
- Will CMMI create a third round of State Innovation Model (SIM) grants?

Provider Considerations

- Take advantage of money available from current demonstrations to fund new initiatives or ongoing projects
- Leverage model parameters to enhance value-based care capabilities; align incentives across distinct Medicaid, uninsured enrollment groups; and prepare for population health under MACRA
- Proactively engage with state officials to participate in shaping and improving program structure

Source: Health Care Advisory Board interviews and analysis.
Force #3: Dilution of commercial coverage

Employer Spending Continues to Grow

Cost-Shifting Remains Dominant Response

Average Annual Growth Rate Among Private Business’s Health Expenditures
FY 2014-2017

Percentage of Workers by Annual Deductible of $2,000 or More
By Firm Size, 2009-2016


1) September 2018 Mercer Employer Survey.

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Four Structural Threats to Providers

Evaluating the Near-Term and Long-Term Impact of Employer Cost-Shifting

**Near-Term Volume Impact**

1. **Decreased Demand**
   - Large out-of-pocket obligation leading to deferral of care across all services

2. **Extreme Seasonality**
   - Delaying high-acuity elective care until out-of-maximum achieved, accentuating volume shifts to the end of the year

**Near-Term Pricing Impact**

3. **Reduced Collections**
   - Inability to pay out-of-pocket obligation leading to decline in patient collections

**Long-Term Market Share Impact**

4. **Increased Shopping**
   - Growth of transparency apps facilitating price comparisons, shifting preference to lower-priced providers

Source: Health Care Advisory Board interviews and analysis.
Bad Debt on the Rise

Bad Debt via HDHPs Creates Additional Margin Pressure

Modeled Impact on Hospital Finances
350 Bed Hospital

<table>
<thead>
<tr>
<th>Year</th>
<th>Yearly Savings$1</th>
<th>Yearly Losses$2</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>$1.9M</td>
<td>($1.2 M)</td>
</tr>
<tr>
<td>2015</td>
<td>$2.6M</td>
<td>($2.1M)</td>
</tr>
<tr>
<td>2016</td>
<td>$3.2M</td>
<td>(2.8M)</td>
</tr>
<tr>
<td>2017</td>
<td>$3.2M</td>
<td>(3.6M)</td>
</tr>
<tr>
<td>2018</td>
<td>$3.2M</td>
<td>($4.1M)</td>
</tr>
</tbody>
</table>

1) Compares charity care levels if they had stayed constant from pre-ACA to charity care decreasing with a 21% CAGR (based on Cost Reports data from 2013 to 2016).

2) Compares bad debt levels if they had stayed constant from pre-ACA to bad debt increasing with a 5% CAGR since 2011 (based on Advisory Board proprietary data from 2011 to 2015), plus Medicare DSH reductions.


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New Tools Aim to Facilitate Consumer Shopping

Helping Employees Make High-Value Choices

Employers Entering a New Era of Health Benefits Strategy

First Phase: Cost Shifting

- Shifted costs to employees by transitioning to high-deductible health plans

Current Phase: Facilitating Decision Making

1. **Leveraging scale** to demand greater value from delivery system
2. **Offering enhanced tools** to simplify value-based shopping
3. **Curating networks** to incentivize use of higher-value providers

Source: Health Care Advisory Board interviews and analysis.
Using Scale to Incentivize Transformation

Employer Coalition Demanding Greater Value

**Select Founding Members**

- American Express
- American Water
- BNSF
- Coca-Cola
- DuPont
- HCA
- IBM
- Ingersoll Rand
- International Paper
- Lincoln Financial
- Macy’s
- Marriott
- NextEra Energy
- Pitney Bowes

**$14B** Annual health spending

**4M** Covered lives

**HTA’s First Priority Areas**

**Prescription Drug Purchasing**

- Three-year contract with CVS and OptumRX
- Members receive full transparency on rebates/discounts, ability to audit fees, and participation in formulary decision-making

**Data and Analytics**

- Contract with IBM Watson Health
- Will aggregate and analyze claims data to better-understand impact of medical interventions and wellness initiatives

**Narrow Network Curation**

- Partnering with Cigna and UnitedHealthcare
- Payers will build high-value networks for Type II Diabetes, joint replacements, and back pain in Dallas, Phoenix, and Chicago

Engagement Tools Simplify Shopping Process

Personalized Support Helps Facilitate Decision-Making

Technologies Span a Variety of Engagement Mediums

**Aggregator Platforms**
Integrated interfaces that aggregate all health benefits related tools and resources

*Example: Jiff*
Increased use rates of price transparency tool by 62% within two months for Activision Blizzard

**Customized Messaging**
Communication platforms that use predictive analytics to tailor messaging

*Example: Evive Health*
Increased flu vaccination rates by 4% among high-risk employees at a large, Midwest utility company

**Concierge Navigation**
Phone- or web-based service that provides access to a dedicated health navigator

*Example: Accolade*
Improves health care outcomes and engagement (e.g. 98% consumer satisfaction, 3% reduction in ED visits) across clients

Others Curating Through Network Design

High-Performing Networks Most Prevalent Among Large Employers

Percentage of Firms With Health Plans Offering a Narrow Network, High-Performance Network, or Tiered Network

By Firm Size, 2016

8% 11% 11% 9% 18% 38%

50-199 Workers 200-999 Workers 1,000-4,999 Workers 5,000 or More Workers

Even More Companies Poised to Join the Trend

46%

Of employers surveyed¹ in Q1 2016 are considering implementing value-based plan designs or high-performance networks in 2017


¹ PwC’s 2016 Health and Well-being Touchstone Survey; includes 1,100 employers from 37 industries across the US.
Regulatory Reform a Centerpiece of the GOP Agenda

White House, HHS, Congress Looking to Scale Back Regulations

Executive Orders to-date include:

- January 20th order to “[minimize] the economic burden” of the ACA
- January 30th order requiring at least two regulations be identified for elimination for each new regulation issued
- February 24th “Enforcing the Regulatory Reform Agenda” order requiring every federal agency to create Regulatory Reform Task Force

RFIs on reducing regulatory burden included in:

- 2018 inpatient prospective payment system (IPPS) rule
- Standalone RFI on reducing the regulatory burdens of the ACA; comments were due on July 12
- The proposed outpatient prospective payment system (OPPS) rule for 2018; comments due on September 11
- The proposed physician fee schedule (PFS) rule for 2018; comments due on September 11

Medicare Red Tape Relief Project seeks to:

- Deliver relief from regulations that “impede innovation, drive up costs, and ultimately stand in the way of delivering better care for Medicare beneficiaries”
- Request feedback from stakeholders to identify opportunities
- Host stakeholder roundtables
- Drive Congressional action based on the stakeholder input efforts

### Not an Altogether Unfamiliar Story

Market Forces, Regulatory Changes Have Driven Rapid Transformation in Other Sectors

<table>
<thead>
<tr>
<th>Industry</th>
<th>Transformative Forces</th>
<th>Industry Evolution</th>
</tr>
</thead>
</table>
| **AIRLINES** | • 1978 Airline Deregulation Act  
   • Influx of low-cost carriers drives price competition | **Market Share Among Four Largest Domestic Carriers** |
|          |                       | 1977  | 2000 | Present |
|          |                       | 56%   | 61%  | 87%     |
| **BANKS** | • Deregulation in 80s decreases barriers to geographic expansion, expands scope of allowable services  
   • Development of ATM technology | **Number of Commercial Banks in the US** |
|          |                       | 1984  | 2000 | Present |
|          |                       | 14,400| 8,458| 5,031   |
| **TELECOM** | • Rapid advancement of technology (e.g. smartphone) in 2000s rewards those with massive capital resources  
   • Demand for national infrastructure, coverage rewards geographic scale | **Market Share Among Four Largest US Wireless Carriers** |
|          |                       | 2003  | 2009 | Present |
|          |                       | 63%   | 90%  | 98%     |

Source: FRED Economic Research, “Commercial Banks in the United States,” April 2017; Metzler, J., “6 years after the iPhone launched, just 4 big carriers are left standing,” Venture Beat, July 8, 2013; Health Care Advisory Board interviews and analysis.
Value to Consumers Paramount

Consolidation and Scale Deliver End-User Value in Other Industries

- **Lower prices**: After adjusting for inflation, airline prices have declined by 50% since 1978
- **Superior delivery model**: Increase in number of routes, fare classes has made flying more accessible
- **Upgraded infrastructure**: Number of branches grew from 53,000 in 1980 to 71,000 by the end of 1998; digital banking now on the rise
- **Superior delivery model**: Wider range of products and services (e.g. types of accounts, personal finance)
- **Lower prices**: Cost of wireless voice service per minute has declined by more than 30% since 1993
- **Upgraded infrastructure**: National networks now ubiquitous, enabling affordable long-distance calls

Imperatives for Health Systems

- **Reduce Prices**: Bring down both unit cost and total cost of care
- **Improve Delivery Model**: Make care more convenient and consumer-focused
- **Upgrade Infrastructure**: Use scale to improve and expand asset base

Source: Health Care Advisory Board interviews and analysis.
Meeting Demands of Market Requires New Forms of Partnership

Access

Partnered with:
- Legacy Health (18 clinics)
- Dignity Health (8 clinics)
- Northwell Health (35 clinics)
- Hartford Healthcare (1 clinic)

Diagnostics

Partnered with:
- ThedaCare ($3M investment)
- Edward-Elmhurst Health ($7M investment)

Procedures

Partners include:
- Tenet Healthcare ($425M investment for 50.1% stake)
- Baylor Scott & White Health (25 ASCs and 7 short-stay hospitals)
- Over 50 other health systems

“Smart Choice MRI shares our vision to put patients and consumers at the center of the health care experience. We sometimes collaborate with competitors in the best interests of consumers.”

Keith Livingston, SVP of Systems of Care Support, ThedaCare

The “Checking in on Granny” Economy

Health Care Forced to Confront a Larger Societal Issue

Force #5: Shifting demographics and payer mix evolution

From the Factory Floor…

…To the Rocking Chair

Image: © 1942, Howard R. Hollem

Image: © 2012, Lisay

Source: Health Care Advisory Board interviews and analysis.
Demanding an Entirely Different Set of Services

Retirees, Millennials Have Vastly Different Demands From Middle-Aged

30s-40s  
Happy and Unhappy Accidents

Health Care Needs:
• Low-to-mid acuity urgent care
• Women’s health, maternity care
• Pediatrics

40s-60s  
Repair and Replace

Health Care Needs:
• Imaging
• Surgeries

60s-90s  
Maintain and Decline

Health Care Needs:
• Chronic disease management
• Cancer care
• Post-acute care, palliative care

Millennials: ~79.4M  
Gen X: ~65.7M  
Baby Boomers: ~75.5M

Provider Customer Base

Source: Health Care Advisory Board interviews and analysis.
Economic Model at a Crossroads

Reimbursement Model and Customer Needs Shifting Simultaneously

Yesterday’s Model:
Privately Reimbursed Procedural Care

Today’s Model:
Publicly Reimbursed Medical Care

Largest patient base comprised of commercially-insured, middle-aged patients in need of imaging services and surgeries

Patients covered by Medicare or HDHPs, in need of medical management, low-acuity preventive care

“If you have a commercial cost structure and you’re getting public reimbursement, there’s no silver bullet that will save you. You could pull every utilization and care management lever under the sun, and you’d still be underwater.”

VP Of Strategy, Integrated Delivery System in the Northeast

Source: Health Care Advisory Board interviews and analysis.
Expense Growth Now Outpacing Revenue Gains

Revenue and Expense Growth Rates for Non-Profit Hospitals
2009-2016 Medians, n=444

<table>
<thead>
<tr>
<th>Year</th>
<th>Revenue Growth</th>
<th>Expense Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>6.5%</td>
<td>5.7%</td>
</tr>
<tr>
<td>2010</td>
<td>4.0%</td>
<td>4.0%</td>
</tr>
<tr>
<td>2011</td>
<td>5.4%</td>
<td>5.0%</td>
</tr>
<tr>
<td>2012</td>
<td>5.5%</td>
<td>5.1%</td>
</tr>
<tr>
<td>2013</td>
<td>4.3%</td>
<td>3.9%</td>
</tr>
<tr>
<td>2014</td>
<td>4.7%</td>
<td>4.6%</td>
</tr>
<tr>
<td>2015</td>
<td>6.2%</td>
<td>6.6%</td>
</tr>
<tr>
<td>2016</td>
<td>7.4%</td>
<td>7.5%</td>
</tr>
</tbody>
</table>

1) Preliminary median.

The Quest for Scale

Size Driving Price Advantage, Not Cost Advantage

**Hospital M&A Activity**
*Total Deal Volume*

<table>
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<tbody>
<tr>
<td>Deal Volume</td>
<td>66</td>
<td>88</td>
<td>95</td>
<td>98</td>
<td>95</td>
<td>112</td>
<td>102</td>
</tr>
</tbody>
</table>

**Hospitals Part of a Health System**

- **In 2005**: 2,176
- **In 2015**: 3,198

**Hospital, Physician Integration Correlated with Increased Price**

*Hospital Prices Increase with Reduced Competition*

- **$2,000**
  - Per-admission price differential between markets with one hospital and markets with four or more hospitals

**Physicians Practice Prices Increase After Health System Acquisition**

- **12%**
  - Average price increase by primary care physicians
- **34%**
  - Average price increase by specialists (e.g. cardiologists)

In Search of Our Cost Advantage

Understanding the Drivers of Our Cost Growth

Major Cost Drivers Evolving

PAST

Medical device costs

Facility construction

PRESENT

1. Low-hanging fruit (devices, back-office) increasingly tapped out

2. Shifting demographics driving demand for different-in-kind services

3. Increasing administrative, compliance burden driving workforce demand

Over the next year, rising labor and pharmaceutical costs will continue to pressure the expense growth rate.”

Beth Wexler, VP, Moody’s Investors Service

Pharma Costs Dominating the News

Force #6: Rising pharmaceutical costs

I think it will be huge...Almost all of it is profit and I think we will get three years of that or more. Should be a very handsome investment for all of us.”

Martin Shkreli, Former CEO
Turing Pharmaceuticals

“Over the last several years, Mylan Pharmaceuticals has increased the price of EpiPens by more than 400%. That's outrageous.”

Sen. Amy Klobuchar
D-Minnesota

“I am a very pro-business Republican, yet I am really sickened by what I’ve heard about [the EpiPen] situation. Nobody can really earn or deserve that much money.”

Rep. John Duncan
R-Tennessee

Drug Spending Growth Outpacing Broader Health Care Spending and Overall Economy

Annual Change

The U.S. healthcare system spent $373.9 billion on drugs in 2014 — 13.1% more than it did the previous year and the highest rate of spending growth since 2001.

Forbes

An Emerging Challenge for Providers

Rising Cost Weakens Cost Control Ambitions

Reduces Inpatient Profitability

- Physicians refuse to use low-cost alternatives or none exist
- DRG reimbursement does not go up at the same rate as pharma costs

Raises Employee Benefit Costs

- Benefit design insulates employees from medication costs
- Outsourced retail pharmacy and specialty pharmacy limit cost control efforts

Undermines Population Health Focus

- Providers responsible for pharmaceutical spend in most commercial total cost of care contracts
- Economically exposed consumers exhibit poor medication adherence

Health Systems Already on the Hook

39% Rise in drug spending per inpatient admission (2013 – 2015)

77% Of ACOs with commercial contracts are responsible for prescription spending

>200 Total provider sponsored health plans in the US

1) As of 2014.

Source: Colla, C et al. “Role of Pharmacy Services in Accountable Care Organizations,” JMCP, Apr. 2015; Deloitte, “Provider-sponsored health plans: Positioned to win the health insurance market shift,” 2015; Health Care Advisory Board interviews and analysis.
Focusing in on Actionable Opportunities

Pharma Costs Require C-Suite Attention

1. Reining in Employee Health Spend
   - How actively do we manage our outpatient formulary?
   - Are we collecting and utilizing data on prescriber variation patterns?

2. Commercializing Pharmacy Management Expertise
   - Have we expanded our health plan to outside entities?
   - Have we initiated conversations with retail pharmacies?

3. Managing Prescription Costs for At-Risk Contracts
   - Are pharmacists integrated in our clinical care teams?
   - Is medication reconciliation being performed at all transitions of care?

4. Evaluating the Opportunity for Specialty Pharmacy
   - Have we evaluated our eligible patient population and their drug coverage?
   - Have we created a strategy to manage limited distribution drugs?

To explore these topics in more depth, members can watch our on-demand webinars: “5 Things CEOs Need to Know About Pharmacy” and “What CEOs Don’t Know About Pharmacy”
Labor Force Reaches Unprecedented Heights

Job Growth Rises to Meet Demands of Reform, Coverage Expansion

Hospital Jobs in Millions, By Year

More people—15.5 million—now work in health care than live in the state of Ohio…
Based on job numbers, no sector is healthier than health care.”

“Politico

Source: Diamond, D., “Obamacare, the secret jobs program,” Politico, July 13, 2016; Health Care Advisory Board interviews and analysis.
Competition for Physician Assets Heating Up

Physicians Have Growing Number of Alternatives to Hospital Employment

Four Main Alternatives to Health System Employment

1. Large Independent Groups
   - 25%
   - Growth in median medical group size, 2013-2015

2. National Practice Companies
   - 35%
   - Physicians currently part of a group of 100 or more

3. Private Equity Firms
   - $400M
   - Venture investment in Privia for care delivery innovation, primary care expansion, 2016
   - 3-5 years
   - Common investment duration for private equity firm
   - $250M
   - Invested by equity firm Summit Partners in DuPage Medical Group, a 459 physician multi-specialty group in Illinois

4. Health Plans
   - 75%
   - Markets for which United subsidiary Optum aims to provide primary care and ambulatory services
   - 40%
   - Surveyed independent groups who reported interest in acquisition by health plans

Administrator, Cure Thyself

Clinical Workforce Only a Small Piece of the Puzzle

Growth of Physicians and Administrators¹, 1970-2013

1) Spans three occupational categories: management, non-financial administrative support, and financial administrative support.

Evolving the Labor Model No Small Challenge

Leaders Across the Organization Must Grapple with Difficult Questions

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Responsibility</th>
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</thead>
</table>
| How do we improve productivity given our industry’s reliance on human capital? What role will technology play in driving productivity gains? | • CEO, CSO  
• CIO  
• President, Medical Group |
| How should we evolve our physician alignment strategies as the cost of physician employment continues to rise? How do our recruitment and compensation strategies need to evolve? | • CEO, CSO  
• VP, Physician Enterprise  
• President, Medical Group |
| How do we unlock economies of scale in our administrative workforce, especially amid consolidation? How do we attract and retain the right talent to our organizations? | • VP, Planning  
• VP, HR |

Source: Health Care Advisory Board interviews and analysis.
### Spent a Billion Dollars Lately?

Cost of EHR Implementation Surges Past Expectations

#### Behind the Price Tag

*Cost of EHR Software Only the Tip of the Iceberg*

<table>
<thead>
<tr>
<th>Common EHR Install-Related Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EHR software and licensing</strong></td>
</tr>
<tr>
<td><strong>Consulting services</strong></td>
</tr>
<tr>
<td><strong>Hardware upgrades</strong></td>
</tr>
<tr>
<td><strong>Reduced availability</strong></td>
</tr>
<tr>
<td><strong>Increased ED staffing</strong></td>
</tr>
<tr>
<td><strong>Training resources</strong></td>
</tr>
<tr>
<td><strong>Staff time</strong></td>
</tr>
</tbody>
</table>

---

“Partners launches $1.2 billion electronic health records system”

“Price tag for Mayo's big electronic medical records project: $1B”

“UMass Memorial Health Care to spend $700 million on big patient record upgrade”

---

Source: Becker's Hospital Review; Health Care Advisory Board interviews and analysis.
But IT Crucial to Business, Clinical Transformation

From Cost Minimization to Value Extraction

Digital health systems take full advantage of digital technologies and IT-related capabilities to redefine business models; rethink processes, quality, and their cost structure; and identify and address customer or patient needs.

Source: Health Care Advisory Board interviews and analysis.
A Hidden, But Growing, Line Item in the Budget

Purchased Services Emerging as New Opportunity for Savings

**Purchased Services**
A service that is outsourced and performed by a third party rather than employees of the health system

*Includes:*

- **Support services** (ambulance, food services, laundry, etc.)
- **Clinical services** (dialysis, DME, pathology, etc.)
- **Administrative services** (claims, rev cycle, etc.)
- **Operations** (telecom, utilities, waste management, etc.)

**A Significant, but Challenging Opportunity**

*Substantial Portion of Provider Expenses*

15-20%
Provider expenses that are attributed to purchased services

**Difficult to Track**

5-10%
Purchased services that are formally sourced through the supply chain

**Growing Quickly**

6/9
Largest not-for-profit hospitals for whom purchased services were the fastest growing expense category from 2011-2016

Source: Vizient, Health Care Advisory Board interviews and analysis.
Approaching the Outsourced Enterprise?

Purchased Services Present Challenges and Opportunities Alike

Outsourcing is Exploding in Healthcare — Will the Trend Last?

The REIT way to finance growth for not-for-profit hospitals

The outsourcing explosion: Hospitals turn to outside firms to provide more clinical services

Opportunities

- Potential to free up capital for other investments (e.g. selling real estate to finance other objectives)
- Allows providers to harness scale and expertise for capabilities they are unable to build effectively in-house

Challenges

- Challenging to both track and manage total spending on purchased services due to fragmentation, number of contracts
- Requires expertise to identify right partners and ensure value from external vendors and contracts

Source: Becker’s Hospital Review; Modern Healthcare; FierceHealthcare; Health Care Advisory Board interviews and analysis.
1. The Next Wave of Health Reform

2. The Inevitable Margin Challenge

3. Protecting Future Margins
The Inevitable Margin Challenge

Price and Cost Pressures Squeezing Provider Margins

Nine Structural Forces Compressing Provider Margins

<table>
<thead>
<tr>
<th>Downward Pricing Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Direct reimbursement pressure</td>
</tr>
<tr>
<td>2. Federalism and state-based coverage reform</td>
</tr>
<tr>
<td>3. Dilution of commercial coverage</td>
</tr>
<tr>
<td>4. Deregulation and the new era of competition</td>
</tr>
<tr>
<td>5. Shifting demographics and payer mix evolution</td>
</tr>
</tbody>
</table>

Provider Margins

<table>
<thead>
<tr>
<th>Upward Cost Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Rising pharmaceutical costs</td>
</tr>
<tr>
<td>7. Uncontrolled labor spending growth</td>
</tr>
<tr>
<td>8. Increasing reliance on IT enablement</td>
</tr>
<tr>
<td>9. Growth in purchased services</td>
</tr>
</tbody>
</table>

Source: Health Care Advisory Board interviews and analysis.
Our Leadership Challenge

Delivery System Transformation Central to Future Success

**Strategic Challenges**

- **High**
  - Rebuild Health System
  - Transform Care Delivery Model
  - Reduce Cost of Operations

- **Low**
  - Value Potential

**Near-Term Priorities**

1. Design a sustainable Medicaid strategy
2. Contain cost growth to sustain future margins
3. Realize full value from enterprise IT investments
4. Harness innovation to fuel future growth

Source: Health Care Advisory Board interviews and analysis.
Design a Sustainable Medicaid Strategy

Preserving the Community Safety Net

Three Steps to Establishing a Sustainable Medicaid Strategy

1. Addressing Avoidable Low-Margin Utilization Flashpoints
2. Extending Risk Strategy into Medicaid
3. Succeeding Under Medicaid Risk

Source: Health Care Advisory Board interviews and analysis.
Contain Cost Growth to Sustain Future Margins

The New Cost Mandate

1. Rebasin External Spending
   Elevate decision-making to reduce purchased services and supply spending

2. Cultivating the Cost-Effective Workforce
   Increase productivity and rationalize service lines to slow labor cost growth

Position for the Long Term

Transforming Fixed Costs
   Right-size fixed cost structure to support variable expense goals

Meet the Mandate

Marginal-sustaining cost growth
Marginal-diluting cost growth

Source: Health Care Advisory Board interviews and analysis.
Realize Full Value from Enterprise IT Investments

Beyond Meaningful Use

Five Foundational Lessons

1. You may have to invest more to realize value from IT-related activities.

2. IT governance is the most highly correlated predictor of value generation.

3. System optimization requires more than just surface-level technical upgrades.

4. Some IT initiatives may require a faster, more “agile” implementation process.

5. Cybersecurity is not just an IT issue.

Source: Health Care IT Advisor research and analysis.
Harness Innovation to Fuel Future Growth

The New Innovation Agenda

1. Detecting New Indicators of Disease
   - Gather data to accurately detect conditions earlier and with less invasiveness

2. Powering Evidence-Based Decisions
   - Accelerate data processing to support more accurate and specific treatment decisions

3. Delivering Precise Clinical Care
   - Improve clinical outcomes with targeted and customized treatments

Source: Health Care Advisory Board interviews and analysis.
Questions Guiding Future Strategy

1. With margin pressures building, how do we ensure our ability to care for our most vulnerable patients? How must our safety net strategy evolve in the face of reduced funding?

2. As the major drivers of cost change, what are our top cost control opportunities? Which costs are actually inflectable and which are outside of our immediate control?

3. How do we improve efficiency and productivity given our industry’s reliance on human capital? What role should the physician network play in our cost control efforts?

4. As we continue to outsource functions, particularly in IT, how do we ensure we maximize value from outsourcing?

5. How do we balance the dual mandate of cost control and growth? As we grow the size of our delivery systems, how do we ensure that scale does not add additional cost to the delivery system? What new sources of innovation will unlock future avenues of growth?

Source: Health Care Advisory Board interviews and analysis.
Preserving the Community Safety Net

10 Imperatives for Designing a Sustainable Medicaid Strategy
1. Current State of the Safety Net

2. Preserving the Community Safety Net

3. Our Mission Imperative
Medicaid Steps Back Into the Spotlight

A Tumultuous Year for Medicaid

**The New York Times**
“G.O.P Health Plan is Really a Rollback of Medicaid”
*June, 2017*

**Forbes**
“House G.O.P.’s Medicaid Plan Will Mean More Flexibility, Less Money, and Worse Care for Seniors”
*July, 2017*

**Modern Healthcare**
“Analysts Predict Drop in Provider Net Revenue Under BCRA”
*July, 2017*

**KHN**
“Repeal-Only Bills’ Estimated Impact: 32 Million More Uninsured; 25 Percent Premium Spikes”
*July, 2017*

**BECKER'S Hospital Review**
“Uncompensated Care Costs Could Rise 78% at Hospitals in Medicaid Expansion States Under AHCA”
*June, 2017*

**THE WALL STREET JOURNAL**
“G.O.P. Ramps Up Effort to Transform Medicaid Into Block Grants”
*February, 2017*

Source: Health Care Advisory Board interviews and analysis.
Medicaid Expansion (Mostly) Good for Finances

Absent Shift to Block Grants, a Seemingly Rosy Picture for Medicaid

31 States and DC Have Approved Expansion

Coverage Expansion Put More Dollars into Safety Net

- **$68B** Federal spending on Medicaid expansion population, FY2015
- **$4.3B** State spending on Medicaid expansion population, FY2015
- **$6.2B** In savings for hospitals in expansion states through reduced uncompensated care, 2013-2015

Expansion Only One Piece of a Much Bigger Picture

Focus on Uncompensated Care Reductions Obscures Other Threats

### Three Major Forces Eroding Safety Net Economics

<table>
<thead>
<tr>
<th>Shifting Population Dynamics</th>
<th>Changing Utilization Patterns</th>
<th>Increasing Reimbursement Pressures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decreasing proportion of children and pregnant women in Medicaid</td>
<td>Growing need for Long-term Services and Supports</td>
<td>Declining enhanced federal match for the expansion population</td>
</tr>
<tr>
<td>Dual-eligible beneficiaries aging</td>
<td></td>
<td>Impending cuts to and increased scrutiny of supplemental payments</td>
</tr>
<tr>
<td>Higher-spending groups outgrowing lower-spending groups</td>
<td>Opioid epidemic driving inpatient and ED volumes</td>
<td></td>
</tr>
</tbody>
</table>

**Deteriorating Economics of the Safety Net**

- Disproportionate burden of uninsured falls on safety-net providers, minimizing opportunities to cross-subsidize
- Safety-net hospitals heavily dependent on threatened supplemental payments
Meet the New Medicaid Population

Expansion, Population Aging Increasing Per-Capita Medicaid Costs

Expansion Redistributed Low- to High-Spend Categories

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children</td>
<td>8.6%</td>
<td>8.4%</td>
</tr>
<tr>
<td>Adults</td>
<td>6.6%</td>
<td>8.4%</td>
</tr>
<tr>
<td>Disabled</td>
<td>14.6%</td>
<td>12.6%</td>
</tr>
<tr>
<td>Aged</td>
<td>24.4%</td>
<td>31.1%</td>
</tr>
<tr>
<td>Unknown</td>
<td>45.8%</td>
<td>39.5%</td>
</tr>
</tbody>
</table>

Reduction in proportion of women of reproductive age between 2009 and 2014: 19%

Reduction in proportion of children enrolled between 2011 and 2014: 6%

Aging Population will Further Exacerbate Trend

Projected growth in 65+ population by 2050, making it the fastest growing age group: 50%

Times higher spending per full-year equivalent for aged beneficiary than adult: 2.79

Projected annual growth in Medicaid spending due to growing aged and disabled population: 6%


1) FY 2014 Data.
### Need for Costly Services on the Rise

**New Pressures Demanding Increased Spending in Medicaid**

#### Aging Population Grows Need for Long-term Services and Supports

<table>
<thead>
<tr>
<th>Change</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>4.8M → 5.2M</td>
<td>Increase in number of people receiving Medicaid-funded LTSS, 2011-2013</td>
</tr>
<tr>
<td>363%</td>
<td>Increase in total Medicaid LTSS expenditures, 2006-2010</td>
</tr>
</tbody>
</table>

#### Opioid Epidemic Driving Increased Medicaid Spending on Addiction Treatment

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2x</td>
<td>Greater chance a Medicaid enrollee will be prescribed opioids than those with private insurance</td>
</tr>
<tr>
<td>45%</td>
<td>Of total overdose deaths accounted for by Medicaid enrollees in 2014</td>
</tr>
<tr>
<td>$9.4B</td>
<td>Medicaid program spending on opioid-related treatment in 2013</td>
</tr>
</tbody>
</table>

Medicaid Pricing Likely at Its Peak

Multiple Forms of Downwards Pressures on Reimbursement

Enhanced Match for Expansion Phasing Down

<table>
<thead>
<tr>
<th>Year</th>
<th>Match (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>100%</td>
</tr>
<tr>
<td>2017</td>
<td>95%</td>
</tr>
<tr>
<td>2018</td>
<td>94%</td>
</tr>
<tr>
<td>2019</td>
<td>93%</td>
</tr>
<tr>
<td>2020</td>
<td>90%</td>
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</table>

Diminishing Reliability of Supplemental Payments

- $1.6B cut in 340B payments
- New limits on pass-through payments
- Increased scrutiny of provider taxes

Economy Currently at Relative High

- Change in unemployment rate 2013-2017: 7.2% → 4.2%
- Change in GDP growth 2013-2017: 1.68 → 2.6%

Impending DSH Payment Cuts

- Cut to federal Medicaid DSH payments, 2018-2026: $43B
- 20 States have projected cuts that surpass decline in uncompensated care

Potential Shift to Block Grants


1) Data for September 2013 and September 2017.
2) Q2 data.
3) Between 2013 and 2014.

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Safety Net Hospitals Particularly Vulnerable

Price Cuts, Loss of Supplemental Payments Hit Safety Net First

Breakdown of Medicaid Payments to Hospitals

- 56% Non-DSH Supplemental Payments
- 27% DSH Supplemental Payments
- 17% Base Payment

Operating Margins of a Safety Net Hospital

- 2013: -3.20%
- 2014: 0.00%
- 2015: 3.20%

DSH Status Closely Tied with 340B Benefit

74% DSH respondents reported using 340B benefit to provide more services despite low Medicaid payments in 2017

Margin Pressures Not Unique to Safety Net Providers

Hospital Pricing Challenged Across All Payer, Provider Segments

Hospital Price Growth Low Despite Rebound
Annualized Hospital Price Growth, Jan. 2010-May 2017

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</thead>
<tbody>
<tr>
<td>3.5%</td>
<td>2.7%</td>
<td>2.9%</td>
<td>1.5%</td>
<td>1.2%</td>
<td>1.6%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2016-2017 Hospital Price Growth

- Medicaid: 1.5%
- Medicare: 0.9%
- Commercial: 2.0%

Current Strategies Further Erode Safety Net Stability

As Margins Deteriorate, Reactive Strategies Compromise the Safety Net

The Status Quo Health System’s Approach to Medicaid

- Deflect Medicaid volumes to safety net hospitals
- Siphon off select few lucrative Medicaid volumes (e.g., L&D, neonatal)
- Compete for Medicare and commercial patients

Safety-Net Providers Forced to Close

- 70% Of the 195 hospital closures in the U.S. between 2003 and 2011 were in urban areas
- 138% Increase in number of rural hospitals vulnerable to closure¹ between 2013 and 2015

Direct Impact on Remaining Hospitals

- 1.6% Increase in local unemployment rate when a critical access hospital closes
- 10% Increase in uncompensated care at neighboring hospitals when an average county hospital closes


¹ At risk for unprofitability, equity decline, insolvency, and closure.
Significant Downstream Impact of Safety Net Closures

Closures Create Substantial Challenges for Those Left Standing

St. Vincent’s Closure Increases Burden on Remaining Hospitals

After years of serving Medicaid and indigent patients, permanently closed with $1B in debt  

Impact on Remaining Hospitals

- Increased demand for staffing and hours
- Increased emergent psychiatric patients
- Increased overcrowding compromised patient privacy

Increase in ED volumes across the 4 remaining hospitals in the area 10-30%

Case in Brief: St. Vincent’s Hospital

- Not-for-profit, Level 1 trauma safety net hospital in lower Manhattan, NY
- Handled 62,000 ED visits, 22,000 admissions, and 1,800 births annually
- Permanently ceased all operations after negotiations for new ownership failed in 2010
- Closure drove surge in patient volume, particularly in ED, across remaining four hospitals in the area

Seemingly Pulled in Two Directions

Mission and Margin Seem in Conflict

“On many Medicaid services, there is no longer any contribution margin. If we were in any other business, now would be the time to walk away. But we can’t.”

Executive Planning Officer
ACADEMIC MEDICAL CENTER IN MIDWEST

Boosting Margin

- Target advantageous payer mix geographies
- Terminate MCO contracts
- Benefit from tax exemption through provision of “community benefits” programs
- Charge competitive rates

Advancing Mission

- Expand direct network access to vulnerable patients
- Improve health outcomes in communities
- Deliver compassionate care and service

Source: Health Care Advisory Board interviews and analysis.
Recognizing a False Choice

Two Potential Paths Forward

Margin Deterioration Compromises Access, Fuels High-Cost Utilization

- Margin deterioration forces providers to limit access for safety net population
- Inappropriate ED and IP utilization increase, further eroding margins
- Caught in vicious cycle that deteriorates both margins and access

Margin Improvement Funds Access Expansion, Right-Sizing Utilization

- Margin improvement fuels access expansion
- Expanded network enables providers to shift patients out of unnecessary, high-cost settings
- Further improvements to margin enable additional investments in community

Source: Health Care Advisory Board interviews and analysis.
Clarifying Our Ambition

Striking a Balance Across Conflicting Priorities

**Protect Margins**
- Mitigate losses under FFS
- Evaluate potential to transform reimbursement model

**Enhance Access**
- Maintain ability to provide crucial services
- Expand access by filling network gaps

**Preserve Stability of the Community Safety Net**
- Refrain from strategies that actively harm safety-net counterparts
- Engage in partnerships to preserve, enhance market stability

Source: Health Care Advisory Board interviews and analysis.
Designing a Sustainable Medicaid Strategy

Three Steps to Establishing a Sustainable Medicaid Strategy

1. Addressing Avoidable Low-Margin Utilization Flashpoints
2. Extending Risk Strategy into Medicaid
3. Succeeding Under Medicaid Risk

Breakeven Point

Medicaid Margins

Stabilize Under Current Economics
Transform Business Model

Source: Health Care Advisory Board interviews and analysis.
Preserving the Community Safety Net

10 Imperatives for Designing a Sustainable Medicaid Strategy

Stabilize Under Current Economics

1. Addressing Avoidable Low-Margin Utilization Flashpoints
   - Deploy Targeted Strategy for Highest Utilizers
     1. Stratify super-utilizers to customize level of intervention
   - Fill Highest-Need Network Gaps
     2. Minimize high-acuity mental health needs through crisis management
     3. Establish bidirectional community clinic partnerships
     4. Address most prevalent non-clinical drivers of inappropriate utilization

Transform Business Model

2. Extending Risk Strategy into Medicaid
   5. Predicate transition to Medicaid risk on care management capabilities
   6. Target manageable entry point to establish baseline experience
   7. Capitalize on emerging opportunities to rapidly expand risk strategy

3. Succeeding Under Medicaid Risk
   8. Augment staffing model to include non-clinical roles
   9. Hone risk stratification methodology with social determinants of health
   10. Recruit patients to care management system

Special Report:
Confronting the Opioid Epidemic

Source: Health Care Advisory Board interviews and analysis.
1. Current State of the Safety Net

2. Preserving the Community Safety Net

3. Our Mission Imperative
Special Report: Confronting the Opioid Epidemic
Safety Net Bearing the Brunt of the Opioid Crisis

Medicaid Beneficiaries Disproportionately Affected

U.S. National Opioid-Related Emergency Department Visits by Expected Payer

<table>
<thead>
<tr>
<th>Year Q</th>
<th>Medicare</th>
<th>Medicaid</th>
<th>Private Insurance</th>
<th>Uninsured</th>
</tr>
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<tbody>
<tr>
<td>2010 Q1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2011 Q1</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>2012 Q1</td>
<td></td>
<td></td>
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<tr>
<td>2013 Q1</td>
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<tr>
<td>2014 Q1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015 Q1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


A Disproportionate Impact, Spending Within Medicaid

2x
Greater chance a Medicaid enrollee will be prescribed opioids than those with private insurance

45%
Of total overdose deaths accounted for by Medicaid enrollees in 2014

$9.4B
Medicaid program spending on opioid-related treatment in 2013
Prescribing Patterns a Clear Contributor

Acknowledging Health Systems’ Role

Opioid Prescriptions Undeniably Part of the Problem

17%  
Of surgical patients who were prescribed opioids were still using them three to six months later

5%  
Of opioid-naïve patients who received a prescription became addicted

10%  
Of opioid-naïve patients who filled a second prescription refill became addicted

Driven by Misconceptions of Necessity and Impact

The Joint Commission classified pain as the “fifth vital sign” indicating patient well-being

CMS used to include pain management in HCAHP² scoring, impacting provider reimbursement

$600M  
Purdue Pharma penalty for contending that OxyContin had a lower risk of addiction, misuses than other pain killers

1) In addition to temperature, pulse rate, breathing rate, and blood pressure.  
2) Hospital Consumer Assessment of Healthcare Providers and Systems.

Providers a Vital Part of the Solution

Health System Responses Must Target Two Goals

Prevent Addiction

- Standardize clinician education to prevent and mitigate unintentional harms
- Strive for addiction-free prescribing through targeted protocols that include accountability mechanisms
- Empower patients to be part of the solution with resources, education, and accountability

Treat Addiction

- Begin treatment in the hospital to capture high-impact opportunity
- Expand treatment options to offer sufficient capacity and flexibility
- Connect community caregivers to ensure post-discharge wrap-around services

Source: Health Care Advisory Board interviews and analysis.
Provide Resources, Guidelines to Prevent Addiction

Health Systems Must Support Clinicians, Patients to Change Behavior

Three Steps to Safe Opioid Prescribing Practices

1. **Standardize Clinician Education**
   - Provide physicians with **baseline education** to prevent, mitigate unintentional harms

2. **Strive for Addiction-Free Prescribing**
   - **Create specific goals** to reduce prescriptions
   - **Implement targeted protocols** to guide, support physician behavior
   - **Embed accountability mechanisms** to ensure compliance

3. **Empower Patients to Be Part of the Solution**
   - Provide patients with **resources, education, accountability** to drive safe behavior

Source: Health Care Advisory Board interviews and analysis.
## Overcoming Our Fear of Feedback

### Physician Misconceptions Encourage Unsafe Opioid Prescribing

<table>
<thead>
<tr>
<th>Misconception</th>
<th>Reality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opioids lead to better long-term pain relief than alternatives</td>
<td>No studies have confirmed opioids are most effective long-term pain treatment</td>
</tr>
<tr>
<td>Curbing opioid prescriptions will bring down HCAHP scores</td>
<td>Opioid prescriptions have not been correlated with increased HCAHPs</td>
</tr>
<tr>
<td>The patient receiving the prescription is the only individual likely to abuse it</td>
<td>54% of individuals taking illegal opioids acquire them through a relative or friend</td>
</tr>
</tbody>
</table>

### Components of Successful Physician Education

- ! Warning icon: Outlines potential pitfalls of current prescribing patterns
- ☑️ Success icon: Demonstrates efficacy and safety of alternative treatments
- ✋️ Color icon: Uses real life and patient scenarios, case examples
- 🔴 Error icon: Mandates attendance of all prescribing physicians

Set Clear, System-Wide Goals

Intermountain’s Initiative Aligns Service Line Interventions

System-Wide Opioid Reduction Pathway

- Surgical service line leadership conducted a survey of 7K patients; learned 40% of pills go unused
- Analytics team took four months to build a cross-system opioid prescription-tracking dashboard
- Service line leaders tasked with developing team-specific protocols for prescription reduction
- CEO established opioid reduction as a cross-system priority
- System leadership teams determined goal to reduce opioid prescription by 40% across acute conditions by 2019

Case in Brief: Intermountain Health Care

- 22-hospital health system based in Salt Lake City, UT
- Recognized that Utah consistently has one of the highest rates of opioid-related overdose in the country
- Pursuing a cross-system goal to reduce opioid prescriptions across acute conditions by 40% by the end of 2018

Promising Early Results

10% Reduction in tablets prescribed in primary care
32% Reduction in tablets prescribed in women’s, newborn’s care

Source: Health Care Advisory Board interviews and analysis.
Establish Protocols to Achieve Reduction Goals

Gundersen Sought Input, Offered Resources to Ensure Clinician Buy-in

Assemble Multi-Disciplinary Protocol Development Team

Opioid Safety Committee

Provide Clinicians with Clear Guidelines Across Care Continuum

1. Patient presents with pain
2. Consult PDMP\(^1\) to screen for pill shoppers
3. Screen for opioid abuse risk factors (anxiety, depression, substance abuse)
4. Explain and complete opioid use contract to hold patient accountable
5. Educate patients on opioid risks, handling, safe use, disposal
6. Follow up to address any suspected misuse or abuse

Includes medical and non-medical staff, such as:
- Nursing
- Pharmacy
- Service line leaders
- IT and analytics
- Emergency response
- Legal

---

\(^1\) Prescription Drug Monitoring Program: electronic database that tracks controlled substance prescriptions in a state.

Establish Protocols to Achieve Reduction Goals

Continued

Case in Brief: Gundersen Health System

• Five-hospital health care system based in La Crosse, WI
• Identified over-prescription of opioids as a source of rising incidence of opioid misuse
• Pain clinic established committee to spearhead opioid management efforts, but eventually included other departments, such as nursing, legal, quality, patient education
• Committee representatives from across the organization obtained executive and physician buy-in from their respective departments to develop prescription protocols and create an opioid patient registry
• System provided prescribers with standard operating procedure as well as a screening checklist for visits with opioid patients to ensure comprehensive pain management care across the system

Accountability a Key Driver of Behavior Change

Pair Broad-Based Transparency with Targeted Interventions for Outliers

Geisinger Uses Data Transparency, Provider Education to Facilitate Culture Change

Case in Brief: Geisinger Health System

- 12-hospital system based in Danville, PA
- Identified pain management prescriptions as a driver of opioid misuse and poor patient satisfaction
- Created a dashboard to track cross-system opioid prescriptions visible to all system clinicians; use targeted interventions, offer resources to address outlier physicians

1. Track provider prescription patterns in data dashboard visible to all system clinicians
2. Identify clinicians with high incidence of opioid prescriptions
3. Send Pharmacy Outcomes team to educate outlier clinicians on pain management alternatives
4. Have clinical service line leaders use data transparency, individual follow-up to ensure compliance
Engaging Patients the Final Step

Create Guidelines, Support Structures to Drive Safe Patient Behavior

Gundersen Health Instituted Opioid Use Contracts

- Established Patient Expectations
  - Patients required to sign contract before receiving opioid treatment

- Key Contract Components:
  - Treatment goals
  - Medication use, refill guidelines
  - Consequences of breaking contract

- Ensured Consequences of Non-Compliance
  - Providers empowered to change treatment if patients fail to meet expectations

Case in Brief: Gundersen Health System

- Five-hospital health care system based in La Crosse, WI
- Identified over-prescription of opioids as a source of rising incidence of opioid misuse
- System provided prescribers with patient chronic pain management contract to hold patients accountable and establish mechanism to change treatment should patients begin to show signs of opioid abuse or addiction

Ensure Patients Have Tools for Success

Provide Community Options for Safe Excess Drug Disposal

Intermountain Introduced Speak Out, Opt Out, Throw Out Initiative

Case in Brief: Intermountain Health Care

- 22-hospital health system based in Salt Lake City, UT; also owns SelectHealth insurance plan
- Recognized that Utah consistently has one of the highest rates of opioid-related overdose in the country
- Pursuing a cross-system goal to reduce opioid prescriptions, including educating community members and encouraging safe drug disposal

Funded Drop Boxes
Established 25 secure opioid drop boxes in Intermountain pharmacies; funded drop boxes for six non-profit clinical partners

Developing Disposal Bags
Bags will be distributed to patients and include instructions on how to dispose of excess opioids and a map of drop box locations

Source: Health Care Advisory Board interviews and analysis.
Providers a Vital Part of the Solution

Health System Responses Must Target Two Goals

Prevent Addiction

- Standardize clinician education to prevent and mitigate unintentional harms
- Strive for addiction-free prescribing through targeted protocols that include accountability mechanisms
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Treat Addiction

- Begin treatment in the hospital to capture high-impact opportunity
- Expand treatment options to offer sufficient capacity and flexibility
- Connect community caregivers to ensure post-discharge wrap-around services

Source: Health Care Advisory Board interviews and analysis.
From Prevention to Treatment

Medication-Assisted Treatment the Gold Standard in Treating Addiction

Medication-Assisted Treatment in Brief

• The use of medications such as methadone or buprenorphine to wean patients off of more potent painkillers

• **Benefits:**
  – Has reduced mortality among addiction patients by more than half
  – Eliminates withdrawal symptoms
  – Does not induce euphoria; less attractive for abuse
  – Does not reduce functionality

• **Considerations:**
  – Frequently highly regulated
  – Overdose and abuse still possible
  – Cautious prescription practices still necessary

Health Systems Positioned to Help

**Begin treatment in the hospital**
with enhanced system inpatient MAT$^1$ treatment options

**Expand outpatient treatment options**
by increasing community MAT$^1$
resources and capitalizing on external funding to fill market gaps

**Connect community caregivers**
across the care continuum to ensure post-discharge wrap-around services

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1) Medication-Assisted Treatment.

Source: Lopex, G., “There’s a highly successful treatment for opioid addiction. But stigma is holding it back,” Vox, July 20, 2017; Health Care Advisory Board interviews and analysis.
Leveraging a Critical Inpatient Opportunity

OHSU\textsuperscript{1} Begins Addiction Treatment in the Hospital

- OHSU Care Team Identified Rare Treatment Opportunity

1. Recognized hospitalization is a reachable moment to initiate and coordinate addiction care

2. Developed capacity to begin treatment in hospital through an inter-professional hospital addictions team in collaboration with community partners

System Implemented IMPACT\textsuperscript{2} Model

- Assembled an inter-professional team including peers with lived experience in recovery (2), socials workers (2), a nurse practitioner, and physicians (1.5 FTE)

- Treat 10-15 hospitalized adults at any time focusing on patients admitted to medical and surgical services with substance use disorder

IMPACT Model Improving Patient Outcomes and Engagement

- 521 of 600 Patients seen from July 2015-September 2017 engaged with IMPACT in the hospital
- 61% Of patients initiated medications for addiction treatment in the hospital
- 68% Of patients were referred to addiction treatment in the community post-discharge
- Hospital staff reported improved morale, disease understanding, and patient care experience

\textsuperscript{1} Oregon Health & Science University.
\textsuperscript{2} Improving Addiction Care Team.

Source: Englander, H. et al., “Planning and designing the Improving Addiction Care Team (IMPACT) for hospitalized adults with substance use disorder,” Journal of Hospital Medicine, May 2017; Health Care Advisory Board interviews and analysis.
Case in Brief: Oregon Health & Science University

- Three-hospital academic medical center based in Portland, OR
- Identified unique opportunity to reach patients with substance use disorder, improve care quality and provider experience, and reduce costs by beginning treatment during hospitalization
- Launched Improving Addiction Care Team (IMPACT) model in July 2015
Incorporate MAT\(^1\) into Existing Outpatient Assets

Mobilize Existing System Resources to Treat Opioid Addiction

**Geisinger Upskilling Existing Clinical Pharmacists**

- Trained **pharmacists embedded in primary care clinics** on pain management and recognition for risk of addiction
- Now have **nine pharmacist pain-management specialists** able manage patient cases collaboratively with primary care and specialty physicians
- Fewer ER visits over 12 months from patients working with a trained pharmacist

**Lapis Health\(^2\) Building Out Staffing at Current Community Clinics**

- In the past year, **staffed community addiction specialists** at local health centers and school-based clinics
- Now able to **transition stable patients back to the community** expanding capacity at the hospital’s central treatment center

**Case in Brief: Geisinger Health System**

- 12-hospital system based in Danville, PA, with 58 existing pharmacists embedded in primary care clinics
- Implemented pharmacist pain-management training program

**Case in Brief: Lapis Health**

- Integrated delivery system in the West
- Staffed certified addiction counselors in four community health centers and social workers with addiction specialties in six school-based clinics

Source: Health Care Advisory Board interviews and analysis.

---

1) Medication Assisted-Treatment.
2) Pseudonym.
Introducing a Different-In-Kind Clinic

Fill Clear Market Gaps with Financial Support

Boston Medical Center Established Opioid Urgent Care with State Grant Funding

Traditional Acute Services at Medical Center

Co-located Opioid Urgent Care Clinic

Case in Brief: Boston Medical Center

- 496-bed hospital based in Boston, MA
- Launched the Faster Paths to Treatment Opioid Urgent Care in August, 2016
- Staffed with seven MA-licensed alcohol and drug counselors, five X-waivered addiction physician specialists, three fellows, and one nurse addiction specialist
- Counselors conduct psych-social exams to place patients in appropriate treatment

$2.9M
MA Dept. of Public Health funding over four years

1,275
Patients treated in program’s first year

1) Medication Assisted-Treatment.
Unprecedented Funding for Large-Scale Initiatives

Working with State Administration Key to Success

Providers Have Variety of Funding Options

Solicit Philanthropic Dollars
Donors interested in philanthropy with clear impacts or newsworthy topics will eagerly contribute to this cause

Negotiate with Commercial Payers
Providers may be able to secure flexible funding from insurers eager to confront this issue directly

Engage with State Agencies to Capture State, Federal Funding
State governments have emergency funding resources as well as access to federal public health grants

States Already Offering Grants, Applying for Federal Dollars

$500K
Arizona tapped emergency fund to increase state education, prevention, treatment options

$4M
Alaska applying for two-year, federal grant to increase MAT1 availability

$15M
Alabama applying for two-year federal grant to create comprehensive opioid response plan

1) Medication-Assisted Treatment.

# Health Systems Can’t Solve Addiction Alone

## Drive Holistic Change with Community Engagement, Education

### Upskill Local Providers
- Emergency services
- Local primary, behavioral, specialist clinicians
- Pharmacists
- Dentists

### Gain Broad Community Buy-in
- Government officials, agencies
- Law enforcement, drug courts, DEA\(^1\)
- School systems
- Community members

### Key Stakeholders
- Emergency services
- Local primary, behavioral, specialist clinicians
- Pharmacists
- Dentists

### Sample Tactics
- In-person workshops
- Online seminars
- Toolkits
- Regional summits
- Community coalitions
- Brochures, advertising

### UC Davis Online Education Program Results
- 59% Are less likely to prescribe opioids
- 66% Are working to taper patients off opioids

### Columbia Pacific CCO’s Summits\(^2\)
- Launched annual community-wide educational meetings in 2016
- One county voted to open a needle exchange; four clinics now interested in offering MAT\(^3\)

---

1) Drug Enforcement Administration.
2) Entity owned by CareOregon, Portland, OR.
3) Medication-Assisted Treatment.

Source: “UC Davis ECHO Pain Management TeleMentoring,” UC Davis Health Center for Advancing Pain Relief; Health Care Advisory Board interviews and analysis.
Uniquely Positioned to Serve as Conveners

Health Systems Leading Change Across a Spectrum of Initiatives

Beyond the Hospital Walls

Community Care of North Carolina (NC):
• Held community coalition meetings to mitigate community stigma toward addiction in 74/100 NC counties
• Succeeded in encouraging several counties to allow police to carry overdose rescue medication

Mercy Hospital of Portland (ME):
• Established a regional leadership team of local stakeholders
• Constructing an integrated cross-community, data platform for data integration, real-time alerts, reporting, treatment standardization, and predictive analytics

Comprehensive Ownership of Community Response

Intermountain Health Care (UT):
• Contributed $3.5M to general community efforts, 2015-2017
• Committed additional $2M in 2018 for provider education and public awareness

Community Hospital of the Monterey Peninsula (CA):
• Convened 17 clinical and non-clinical organization leaders
• Developed community opioid mitigation efforts
• Saw 59% reduction in county-wide recurrent opioid-related ED visits

1) With assistance from Open Lattice, a technology public benefit company from CA.
2) Including: implementing county-wide opioid prescription protocols, community education, safe disposal sites, increased access to pain management services.

Source: “Prescribe Safe Monterey County,” Community Hospital of Monterey Peninsula, 2017; Health Care Advisory Board interviews and analysis.
Key Takeaways

Confronting the Opioid Epidemic

1. Every provider organization should have a strategy for preventing new cases of addiction

   Prescribing patterns have been a crucial driver of the opioid crisis; health systems have an obligation to work with clinicians to change their approach to pain management.

2. Existing inpatient and outpatient capabilities and resources present a unique opportunity for systems to expand addiction treatment

   Health systems should mobilize current resources and expertise to confront opioid addiction presenting internally; for the most part, existing assets provide clear channels for advancing and expanding treatment options.

3. Health systems should take advantage of state, federal, and philanthropic grants to construct a comprehensive opioid response

   Systems cannot solve the opioid crisis alone; however, providers are uniquely positioned to capitalize on new funding opportunities and convene community stakeholders to develop new clinical capabilities, fund local programs, and increase community interconnectivity.

4. The opioid crisis is not only a Medicaid problem, but it has disproportionately impacted the Medicaid population

   Systems must address the opioid epidemic not just as a part of their overall strategy, but specifically as a component of their journey to build a financially viable community safety net.

Related Resource: Reducing Opioid Misuse and Abuse

Dive deeper into building your response to the opioid epidemic with this white paper detailing three imperatives for provider organizations.
Addressing Avoidable Low-Margin Utilization Flashpoints

1. Stratify super-utilizers to customize level of intervention
2. Minimize high-acuity mental health needs through crisis management
3. Establish bidirectional community clinic partnerships
4. Address most prevalent non-clinical drivers of inappropriate utilization
ED Utilization a Ubiquitous Challenge

Low-Margin Medicaid ED Volumes Only Growing with Time

Rate of ED Utilization Increasing
Annual Rate of ED Visits, in Millions

<table>
<thead>
<tr>
<th>Year</th>
<th>ED Visits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>118</td>
</tr>
<tr>
<td>2008</td>
<td>127</td>
</tr>
<tr>
<td>2010</td>
<td>136</td>
</tr>
</tbody>
</table>

Proportion of Medicaid Patients in ED Rising Over Time

- 23% of ED patients on Medicaid, 2006
- 32% of ED patients on Medicaid, 2014

Rate of ED Utilization Increasing

- Total cost of ED use by Medicaid patients, 2014: $54.4B
- Average profit margin from Medicaid ED visits: (36%)
- Proportion of ED visits that could likely be treated in a non-emergency setting: 27%

Inpatient Volumes Increasingly Non-Accretive

Financial Impact of Hospitalizations Depends on Reimbursement, Capacity

Inpatient Volumes Decreasing, But Not For Medicaid Patients

2.4 M
Decrease in total number of inpatient stays, 2005-2014

15.7%
Increase in proportion of inpatient stays covered by Medicaid, 2005-2014

Many Leading Causes of Medicaid Hospitalization Potentially Avoidable

Leading Diagnoses for Medicaid Hospitalizations:
- Mood Disorders
- Pneumonia
- Psychotic disorder
- Asthma
- Septicemia¹
- Skin infection
- Diabetes complications
- Epilepsy, convulsions
- Acute bronchitis
- COPD

6 of 10
Conditions preventable through outpatient care

16%
of all Medicaid hospitalizations caused by these six conditions²


¹ Excludes septicemia as a result of labor and delivery.
² Excludes maternal and neonatal hospitalizations.
Three Critical Drivers of Preventable Utilization

Current Models for Behavioral, Physical, Non-Clinical Needs Falling Short

<table>
<thead>
<tr>
<th>Unmanaged Behavioral Health Issues</th>
<th>Lack of Access to Lower-Acuity Care Sites</th>
<th>Prevalence of Non-Clinical Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>20% of Medicaid population with one or more behavioral health conditions</td>
<td>25% of adult enrollees using ED because other sites aren’t open</td>
<td>22% of ED frequent-users(^1) report being homeless during the previous year</td>
</tr>
<tr>
<td>48% of total Medicaid spending attributable to those with one or more behavioral health conditions</td>
<td>34% of adult enrollees report barriers finding a doctor or delays in getting needed care</td>
<td>61% of dual-eligibles require help with daily self-care activities (eating, bathing, dressing)</td>
</tr>
</tbody>
</table>

Small Group of Medicaid “Super-Utilizers” Driving Outsized Spending

| 5% of total Medicaid population | 55% of total annual Medicaid spend | 4% of total Medicaid population | 19% of total Medicaid ED charges |


1) “Frequent Users” here defined as individuals with 4+ ED visits in the previous 12 month period.
Four Priorities to Reduce Preventable Volumes

1. Stratify super-utilizers to customize level of intervention

2. Minimize high-acuity mental health needs through crisis management

3. Establish bidirectional community clinic partnerships

4. Address most prevalent non-clinical drivers of inappropriate utilization

Source: Health Care Advisory Board interviews and analysis.
1. Stratify super-utilizers to customize level of intervention

A Comprehensive Approach to Managing the Top 5%

Further Stratify Highest Utilizers to Determine Appropriate Strategy

Intensity of Intervention Varies Based on Frequency of Visits

High Utilizers: 5% of patients; often with co-occurring physical and behavioral health conditions and non-clinical barriers to care

- Top <50 patients
- 30+ annual ED visits
- 10+ annual ED visits

Proactive, high-touch, intensely personalized care management services

Proactive care management engagement to prevent future inappropriate use

Care management resources when they next appear in the ED

Source: Health Care Advisory Board interviews and analysis.
Embed Resources in ED for Broadest Reach

CRMC Flags High-Utilizers, Demonstrates Potential ROI to Engage Stakeholders

1. **Mine Data to Identify Frequent Users**
   - Pulled data from ED’s EMR
   - Found 575 patients with 9+ ED visits in 12-month period; 8,897 visits total

2. **Present Findings to Generate Buy-In**
   - Program coordinator met with hospital board and community stakeholders
   - Calculated cost and ROI projections

3. **Hardwire Referral Process**
   - ED social work staff fill out referral form
   - ED social worker emails or faxes form to Community Connections team

4. **Program Staff Deliver Services**
   - Community Connections staff meet with referred patient
   - In first two years, staff conducted 1,204 face-to-face contacts

---

**Case in Brief: Community Regional Medical Center**

- 626-bed community hospital in Fresno, CA
- In 2009, created Community Connections, a frequent-user program that expands beyond the scope of the ED to provide outreach, engagement, and case management

**An Immediate Impact**

*Participant utilization six months post-intervention*

- Decrease in ED visits: 52%
- Decrease in IP admissions: 58%

Source: Health Care Advisory Board interviews and analysis.
Deploy Proactive Outreach for Smaller Subset

Super-Utilizers Targeted for Intensive Needs Assessment

Carolinas Stratifies ED Users Into Cohort Suitable For Intervention

Data-Mining-Identified Super-Utilizer Cohort:
- 158 Patients
- 7,000 Total visits
- $22M Total charges

Care Management Team Contacts Super-Utilizers, Creates Personal Care Plans

Nurse, Community Health Worker, Behavioral Health Specialist team reach out to Super-Utilizers via phone or in-person visit

Patients connected to PCPs, community clinics, social work, supportive resources as needed

Reduction in ED use among Super-Utilizer cohort six months post-intervention

Source: Health Care Advisory Board interviews and analysis.
Deploy Proactive Outreach for Smaller Subset

Continued

Case in Brief: Carolinas Healthcare System

- 47-hospital system based in Charlotte, NC
- Avoidable ED utilization a statewide issue, with 53% of ED visits classified as “non-emergent”
- Stratified patient utilization data to identify frequent users (10+ ED visits), which returned an unmanageably high number of patients
- Stratified to identify super-utilizers (30+ ED visits), which returned a manageable cohort of 158 individuals
- Care managers reached out to super-utilizers for personal care planning that addressed clinical and non-clinical needs
Invest in Personal Touch For Highest-Use Patients

Peninsula Regional Provides Super High Utilizers with Hands-On Support

High-Touch Navigation Reduces Readmission Risk for Top 25 Patients

- Team of nurse and community health workers meet patient at time of discharge and review discharge instructions together
- Drive patient home to build personal connection, rapport
- Follow-up with patient at home to ensure adherence to discharge instructions for three months post-discharge

Case in Brief: Peninsula Regional Medical Center

- 289-bed community hospital located in Salisbury, MD; subsidiary of Peninsula Regional Health System
- Collaborated with Lower Shore Clinic, a community-based outpatient clinic offering behavioral health and primary care services, to launch the CareWrap care management program targeting 20-30 chronically ill super-utilizers

66% Reduction in hospitalizations within two years
$10K Average cost to readmit patient
$5-6K Average cost to engage in CareWrap

Source: Health Care Advisory Board interviews and analysis.

1) FY2016.
Four Priorities to Reduce Preventable Volumes

Source: Health Care Advisory Board interviews and analysis.

1. Stratify super-utilizers to customize level of intervention
2. Minimize high-acuity mental health needs through crisis management
3. Establish bidirectional community clinic partnerships
4. Address most prevalent non-clinical drivers of inappropriate utilization

Deploy Targeted Strategy for Highest Utilizers

Fill Highest-Need Network Gaps
2. Minimize high-acuity mental health needs through crisis management

Start with Most Pressing Gap to Goal

Medicaid Behavioral Health Needs Cross the Acuity Spectrum

Medicaid Patients Present with Wide Range of Behavioral Health Needs

LOW
E.g., children who need screening, referral, and treatment for attention deficit hyperactivity disorder

MODERATE
E.g., chronically-ill adults with co-morbid physical and behavioral health conditions

HIGH
E.g., adults with disabilities or substantial psychosocial limitations and severe psychoses

Comprehensive Approach Spans Care Continuum

Improve Access to Preventive Services for Low-to-Moderate Acuity Patients

Deploy Crisis Management for Moderate-to-High Acuity Patients in the ED

Source: Health Care Advisory Board interviews and analysis.
Ensure Effective Navigation of Existing Assets

Training Community Paramedics to Assess, Treat, and Triage

**Case In Brief: Wake County Emergency Medical Services**

- EMS organization in Wake County, NC
- In 2009, Community Care of Wake and Johnson Counties (CCWJC) initiated a multi-stakeholder collaboration with the Wake County community paramedicine program to reduce inappropriate ED utilization by frequent utilizers
- 16 advanced practice paramedics (APPs) provide a range of home-based services including assessment of mental health, injury risk, and chronic condition management, and also divert mental health patients away from medical EDs based on screening protocol

**Paramedics Train to Expand Responsibilities**

Paramedics receive 200 hours of didactic and clinical training prior to serving as an APP

1. Assessment and Treatment
2. Disease Education
3. Triage to ED or lower-acuity care setting

**Program Impact for Duke-Raleigh Hospital**

$325K Estimated cost savings due to a 34% reduction in ED visits from 2012 to 2014 for a sample of 25 patients
Maximize Community Resources Through Technology

Telepsychiatry Positions Services at Right Place and Right Time

**Telepsychiatry Program Details**

- Connects 17 community-based, outpatient mental health centers with over 20 hospital EDs across the state.
- Service is available 16 hours per day, with psychiatrists from the South Carolina DMH offering rotating coverage.
- Program is funded by grants from The Duke Endowment; participating hospitals also pay subscription fee.

**Program Outcomes**

- Participating patients diverted from an inpatient admission: 43%
- Reduction in overall length of stay for participating hospitals: 53%
- Estimated cost savings for the hospital per episode of care: $1,400+

**Case in Brief: South Carolina Department of Mental Health (DMH)**

- State-operated system of 17 community-based, outpatient mental health centers, each with clinics and satellite offices, which serve all 46 counties in the state.
- Operates statewide telepsychiatry network available for all hospitals in state operating EDs.

Source: Health Care Advisory Board interviews and analysis.
Unity Center Coordinates Services, Reduces Loss Through Four-System Partnership

**Legacy Health**
donated real estate, covered costs of remodeling, and licenses the PES unit as an ED; takes on 40% of profits and losses

**OHSU**
contributes provider recruitment, medical staffing, and residents; takes on 20% of profits and losses

**Kaiser Permanente**
provided strategic planning expertise, takes on 20% of profits and losses

**Adventist Health**
transferred psychiatric beds to Unity Center; takes on 20% of profits and losses

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1) Temporary status for a health care facility in which it informs local emergency medical services and ambulances that its beds are full and it cannot take new patients.

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Source: Health Care Advisory Board interviews and analysis.
Case in Brief: Unity Center for Behavioral Health

- 102-bed inpatient behavioral health facility and psychiatric ED in Portland, OR
- Legacy Health, Kaiser Permanente, Adventist Health, and Oregon Health & Science University established a partnership to address market-wide shortage of appropriate psychiatric treatment services
- Creation of Unity Center decreased volume of psychiatric patients presenting in hospital EDs, increased connections with community support services
Taking a More Proactive Approach

Comprehensive Strategy Reaches into Ambulatory Space

Three Steps to Developing a Proactive Approach to Behavioral Health Management

1. Screen for behavioral health needs in the primary care setting
2. Use care transitions to detect and support behavioral health
3. Collaborate with other providers to build a robust behavioral health continuum

Study in Brief: Proactive Behavioral Health Management
Download this briefing for three steps to building a robust behavioral health continuum.
Four Priorities to Reduce Preventable Volumes

1. Stratifity super-utilizers to customize level of intervention

2. Minimize high-acuity mental health needs through crisis management

3. Establish bidirectional community clinic partnerships

4. Address most prevalent non-clinical drivers of inappropriate utilization

Source: Health Care Advisory Board interviews and analysis.
Ensure Access to Lower-Cost Alternatives

Falling Short in Primary and Specialty Care Needs

Chronic Disease, Maternity Care Two Major Drivers of Utilization in Medicaid

- Of non-dual Medicaid beneficiaries have 4+ chronic conditions: 33%
- Of maternal and neonatal ED visits are covered by Medicaid: 58%

Three Major Low-Acuity Access Needs

3. Establish bidirectional community clinic partnerships

In Search of an Access Partner

Community Clinics Better Positioned to Serve Needs of Medicaid Population

Community Clinics Combine Critical Clinical and Social Services

- Laboratory Services
- Pediatric Dental Clinic
- Primary Care Clinic
- Community Resource Specialist
- Social Work Coordinator
- Enrollment Specialist

Playing a Crucial Role in the Safety Net

- 1,128 Federally Qualified Health Centers
- 20 M Patients served annually by FQHCs and “look-alikes”
- 85% of patients at FQHC and look-alike clinic have Medicaid or no insurance

Mutual Support Required for Long-Term Sustainability

Moving Beyond a Simple Redirection Relationship

Expand and Improve Clinical Capabilities

- Support partner to offer specialty care on-site

Solidify Clinician Relationships to Ensure Referrals

- Ensure alignment of partnership value-add across all stakeholders

Provide Direct Support to Increase Capacity

- Address potential financial, material challenges in offering new partnership services

Identify a Best-in-Class Partner

- Carefully assess strengths and needs of community partner, beginning relationship with clear expectations

**Degree of Collaboration**

Source: Health Care Advisory Board interviews and analysis.
Critically Assess Partnership Opportunities

High-Value Relationships a Two-Way Street, Success Not Guaranteed

**Community Partner Checklist:**
- Provides high quality services valuable to Medicaid population
- Conveniently located near crowded, high-Medicaid system EDs
- Articulates clear value to system, with demonstrable ROI
- Maintains open, transparent communication channels
- Willing to meet clinical standardization expectations
- Willing to progress toward risk-based arrangements

**Hallmarks of Effective Relationships**
- Enthusiastic buy-in from leadership and frontline staff
- Sustainable infrastructure for stakeholder engagement, feedback
- Clear metrics for measuring ROI, transparency, accountability
- Aligned back office capabilities for data transparency, continuity
- Shared mission and culture

Source: Health Care Advisory Board interviews and analysis.
Financial Support Vital to Expanding Capacity

Funding for Uninsured Referrals Ensures Continued Viability

Case in Brief: Dignity Health AZ
- Seven-hospital system based in Phoenix, AZ
- Established partnership with local free clinic Mission of Mercy to divert ED volumes to more appropriate site of care; Mission proposed regular financial support
- Dignity agreed to cover first-year startup costs, annual support based on number of “patient slots” allotted for referrals

Dignity Provides Per-Patient Funding to Local Community Clinic to Divert Non-Acute ED Volumes

- Mission of Mercy’s average patient encounter cost: $200
- Number of “patient slots” allotted for Dignity referrals: 1,240
- Cost to Mission of Mercy: $250K
- Annual operational support from Dignity to offset costs: $125K

Financial Support Only Scratching the Surface
- Donated facilities, capital
- Subsidized grant writing
- Leadership training
- Clinical development
- Shared technology
- Coordinated marketing
- Coordinated advocacy
- Shared recruitment
- EHR platforms
- Pharmacy distribution

Source: Advisory Board Company, “Meet Your Community Partner in Improving Population Health,” 2016; Health Care Advisory Board interviews and analysis.
Physician Relationships Solidify Partnerships

Ambassadors Ensure Timely Referrals Between Hospital and FQHC

Unfamiliar with Community Resources, Hospitalists Delay Discharge
- Highly complex and time-consuming care planning
- Uncertain volumes for FQHCs
- Longer LOS for complex patients

Ambassador Program Solidifies Professional, Personal Trust
- Face-to-face meetings increase familiarity, collaboration
- Patients consistently referred to FQHC for follow-up
- Care is delivered at appropriate, lower-cost site

Case in Brief: Lapis Health
- Integrated delivery system in the West
- Operates Medicaid managed care plan
- Hospitalists unfamiliar with community resources uncomfortable discharging complex patients
- Ambassador Program encourages partners to communicate, better understand programs and support services available to patients after hospital discharge

Source: Health Care Advisory Board interviews and analysis.

1) Pseudonym.
Extend Specialty Assets to Primary Care Partners

OB/GYN a Clear Opportunity to Enhance Community Clinic Capabilities

Building a Quality Obstetrics Care Pathway

- **CHC PCP**: Evaluates patients and refers to OB
- **Mercy OB/GYN**: Treats patients part-time at CHC
- **Mercy MFM\(^1\) Specialist**: Provides care to high-risk patients at CHC one day per week
- **Mercy Hospital Springfield**: OB delivers CHC patients at Mercy
- **Other Mercy Specialists**: Connected as deemed necessary by OB/GYN

**Case in Brief: Mercy Hospital Springfield and Jordan Valley CHC**
- 562-bed hospital member of Mercy Health System; seven-clinic FQHC based in Springfield, MO
- Partnered to provide prenatal care to low-income expectant mothers, providing OB/GYN and specialist access to promote healthier pregnancies and safer deliveries

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1) Maternal fetal medicine.
2) Neonatal intensive care unit.

E-Consults Expand Range of Shareable Specialties

Connecticut Becomes First State to Secure Medicaid Reimbursement

CHC Pilots E-Consults For High-Demand Specialties, Secures CMS Reimbursement

- PCP submits referral to cardiologist, endocrinologist, or nephrologist (high Medicaid demand services)
- Specialist accesses PCP notes, patient records
- Clinician confirms care plan or advises follow-up
- E-Consults reimbursed by CMS beginning in 2016

70%
Of PCP referrals are resolved without need for a specialist appointment

Case in Brief:
Community Health Center

- Non-profit primary care network with 200 locations across Connecticut
- Created an online consultation platform in partnership with community-based research center The Weitzman Institute and CA-based care coordination tool developer Safety Net Connect
- CMS approved the program for Medicaid reimbursement in 2016

Source: Wicklund E., “Telehealth Tackles Medicaid’s Challenges with eConsult Program,” mHealthIntelligence, May 2017; Health Care Advisory Board interviews and analysis.
Four Priorities to Reduce Preventable Volumes

1. Stratify super-utilizers to customize level of intervention
2. Minimize high-acuity mental health needs through crisis management
3. Establish bidirectional community clinic partnerships
4. Address most prevalent non-clinical drivers of inappropriate utilization

Source: Health Care Advisory Board interviews and analysis.
Non-Clinical Interventions Warrant Due Diligence

Current Strategies Failing to Achieve Sustainable Impact

Three Predominant Issues Prevent Systems from Achieving Long-Term Goals

An Overwhelming Set of Opportunities to Pursue
System investment in interventions is haphazard, based on pick-and-choose of myriad options

Current Efforts Ad-Hoc Passion Projects
Passion projects are steered by individual stakeholders rather than data-informed approach

Funding Precludes Comprehensive Approach
Even the most thoughtfully-designed programs struggle with inconsistent funding

Targeted, High-Value Interventions
System investments in addressing non-clinical drivers of poor health, inappropriate utilization show clear ROI

Source: Health Care Advisory Board interviews and analysis.
Home in on Most Pressing Community Needs

Keren Health’s¹ Multi-Stage Analysis Isolates Opportunities for High-Impact Intervention

1. Identify hospital EDs with the highest utilization rates
   → Three local EDs crowded with repeat utilizers

2. Break down most prevalent diagnoses for frequent utilizers
   → High frequency of asthma, respiratory distress

3. Layer in claims, demographic data to identify common factors
   → Patients’ ZIP codes have housing sanitation violations

4. Create targeted intervention for affected population
   → Contract with exterminator to clean out homes

Case in Brief: Keren Health

- Large integrated system in the Northeast
- Applying analytics to identify trends, potentially inflectable underlying causes of high utilization
- Early results have identified non-clinical intervention opportunities with greater ROI than standard clinical responses

¹ Pseudonym.
Don’t Hesitate to Sunset Programs if Ineffective

Limited Resources Necessitate Regular Evaluation of ROI

Annual Review Process Checks Programs Against Four Key Metrics

Case in Brief: Lehigh Valley Health Network

• Eight-campus health system based in Allentown and northeast PA
• Department of Community Health (DCH) maintains a diverse portfolio of outreach, education, and health improvement programs and uses collaborative cycles of improvement
• DCH leadership conducts annual sustainability review of every current project, determines which programs will be scaled up, continued, or discontinued

Source: Health Care Advisory Board interviews and analysis.
Introducing Your Population Health Advisor

Explore In-Depth Research to Guide Effective Interventions

Addressing Avoidable ED Utilization: Primer Series
Explore the reasons patients seek care in the ED, the business case for intervening, and solutions for reducing unnecessary ED use

Building the Business Case for Community Partnership
Four steps for building effective community partnerships to extend care team reach, engage consumers, and improve cost and quality

Closing the Housing Gap through Strategic Partnerships
A blueprint for reducing housing insecurity and improving community health outcomes

FOR MORE RESOURCES
on this topic, visit advisory.com

Source: Health Care Advisory Board interviews and analysis.
## Key Takeaways

### Addressing Avoidable Low-Margin Utilization Flashpoints

1. **Every health system should have a dedicated super-utilizer strategy**
   
   Curbing utilization among the highest utilizers of the ED presents the biggest near-term opportunity to improve Medicaid margins.

2. **Delivering appropriate care to the Medicaid population requires fundamentally different access strategies**
   
   Simply increasing the number of access points is not enough to inflect Medicaid utilization patterns. Systems must improve ease of access by expanding existing services, with high-need services prioritized.

3. **Health systems should not try to be all things for Medicaid patients; optimize the delivery network through partnership rather than ownership where possible**
   
   Most systems do not possess the full set of assets that make up a Medicaid-tailored delivery network. Rather than building them out alone, prioritize a partnership that supports an existing provider’s ability to better meet Medicaid needs.

4. **Providers must apply the same rigor to evaluating community health interventions as they do any other system investment**
   
   Initiatives targeting the safety-net population are particularly prone to be borne of individual passion projects. With limited resources, however, any intervention must be backed up by real evidence of ROI.
Extending Risk Strategy into Medicaid

5. Predicate transition to Medicaid risk on care management capabilities
6. Target manageable entry point to establish baseline experience
7. Capitalize on emerging opportunities to rapidly expand risk strategy
Navigating the Path Forward

An Economic Incentive to Change the Reimbursement Model

Three Potential Responses to Medicaid Cuts

1. Advocate for Increased Medicaid Reimbursement
   - $75M
     Montana’s 2017 budget shortfall due to Medicaid
   - 11%
     Texas’ proposed decrease to Medicaid reimbursement rates

2. Terminate Existing Medicaid Contracts
   - “DMH, HSHS no longer accepting Molina Medicaid”
   - “University of Chicago Medicine severs ties with Medicaid insurer IlliniCare”

3. Transform Payment Model by Taking on Medicaid Risk
   - 8.3%
     Of 936 total ACOs hold a Medicaid risk contract
   - “Our risk-based population health strategy is our growth strategy.”
     SVP Population Health, Hospital in the Midwest


1) According to the Leavitt Partners Database.
States Pushing Providers Toward Risk

Private Payers Beginning to Follow Suit

State-Based Medicaid Accountable Care Organizations
Active or Proposed Models, June 2017

We’re afraid to take on Medicare or commercial risk because we know payers will insist we take risk for our Medicaid contract and we’re just not ready to manage that population yet.”

SVP Population Health, Health System in the Northeast

<table>
<thead>
<tr>
<th>States with active or proposed Medicaid ACO programs</th>
<th>Increase in active or proposed Medicaid ACO programs, 2015-2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>35%</td>
</tr>
</tbody>
</table>

Source: Center for Health Care Strategy, “Medicaid Accountable Care Organizations: State Update,” June 2017; Health Care Advisory Board interviews and analysis.
An Opportunity to Deliver on Both Mission and Margin

New Economic Model Brings New Benefits and Challenges

Flexible Funding Advances Overall Organizational Goals

1. Advance Mission
   - Reorient toward prevention rather than treatment

2. Boost Margin
   - Capitalize on risk-based incentive structures

But Undeniable Challenges Accompany Medicaid Risk

- Lower reimbursement rates than any other payer
- Complex patient population with significant non-clinical needs
- Intricate contracting environment with no established path and significant regulatory oversight

Source: Health Care Advisory Board interviews and analysis.
Extending Risk Strategy into Medicaid

Three Key Questions to Guide an Intentional Medicaid Risk Strategy

Making the Go, No-Go Decision

Do we have the necessary clinical infrastructure and risk experience to succeed under Medicaid risk?

Predicate transition to Medicaid risk on care management capabilities

Developing an Entry Strategy

What should we prioritize for our first Medicaid risk contract?

Target manageable entry point to establish baseline experience

Ensuring Long-Term Success

How do we evolve our Medicaid risk strategy over the long term?

Capitalize on emerging opportunities to rapidly expand risk strategy

Source: Health Care Advisory Board interviews and analysis.
5. Predicate transition to Medicaid risk on care management capabilities

Evaluating Existing Capabilities the First Step

Medicaid Requires Additional Care Management Investment

Foundational Investments for **Any Risk Contract**
- Nurse Care Managers
- Telehealth
- Risk Stratification Analytics

Additional Investments for **Medicaid Risk**
- Community Health Workers
- Community Resource Inventory
- Social Workers
- Behavioral Health Specialists
- Preferred Post-Acute Partner Network
- Medical Homes
- Patient Engagement Tools
- Health Literacy Resources
- Social Determinants of Health Screening Tools

Source: Health Care Advisory Board interviews and analysis.
Staging Your Entry Into Risk

Risk in Other Segments Prepared Summit for Managing Medicaid

Sample of Summit’s Step-Wise Journey in Tennessee

- **2012**
  - Entered MA<sup>1</sup>
  - Upside-Only Risk
  - Clinical Infrastructure Development
    - Built robust annual wellness visit program capturing 85% of Medicare beneficiaries

- **2015**
  - Entered Medicaid
  - Upside-Only Risk
  - Enhanced Population Health Management
    - Expanded wellness visits to commercial and Medicaid

- **2016**
  - Entered MA, Commercial
  - Downside Risk
  - Targeted Intervention Development
    - Developing process to capture social determinants of health; analyzing drivers of ED overutilization

- **2017**
  - Contract with State for Medicaid PCMH
  - 19,000 Medicaid patients now attributed to Summit
  - Potential for Downside Medicaid Risk

<sup>1</sup> Medicare Advantage

Source: Health Care Advisory Board interviews and analysis.
Staging Your Entry Into Risk

Continued

Case in Brief: Summit Medical Group

• Physician-owned primary care group with 55 office locations based in Knoxville, TN

• Currently holds one Medicare Advantage contract, two commercial risk contracts, and recently entered an upside-only agreement with three Medicaid ACOs; 14 Summit sites are participating in CPC+
Assessing Your Medicaid Risk Readiness

Three Potential Paths Forward

Large safety-net population?

Invested in clinical care management?

In a favorable contracting environment?

Evaluate Large-Scale Medicaid Risk

NO

Experience in other risk models?

Invested in clinical care management?

NO

YES

YES

NO

NO

Stage Entry into Medicaid Risk

Build Experience in Other Risk Models

Source: Health Care Advisory Board interviews and analysis.
Medicare Risk Provides Foundational Experience

Those Unready for Medicaid Risk Should Explore Other Risk Options

Three Steps to Establishing a Sustainable Medicare Risk Strategy

1. Redefine Path to Risk for Traditional Medicare
   - Set foundation for overall Medicare strategy by determining appropriate level of risk, considering implications of physician strategy on MACRA response

2. Expand Into Medicare Advantage Market
   - Complement traditional Medicare strategy with customized approach to MA contracting based on organizational, market readiness

3. Ensure Longevity of Medicare Risk Strategy
   - Engage partners and patients to ensure maximal financial performance over time

Related Resource: Medicare Risk Strategy
Imperatives to guide the creation of your intentional Medicare risk strategy

Source: Health Care Advisory Board interviews and analysis.
Extending Risk Strategy into Medicaid

Three Key Questions to Guide an Intentional Medicaid Risk Strategy

1. Making the Go, No-Go Decision
   - Do we have the necessary clinical infrastructure and risk experience to succeed under Medicaid risk?

2. Developing an Entry Strategy
   - Target manageable entry point to establish baseline experience
   - What should we prioritize for our first Medicaid risk contract?

3. Ensuring Long-Term Success
   - Capitalize on emerging opportunities to rapidly expand risk strategy
   - How do we evolve our Medicaid risk strategy over the long-term?

Source: Health Care Advisory Board interviews and analysis.
Array of Entry Points

Opportunities Vary by Region

Providers Confronted with Three Major Options

**Contracting with the State**
- **Option Exists if:** State does not have mandatory managed care

**Pros:**
- State has unique flexibility, control over policy and budgetary decisions

**Cons:**
- State programs often inflexible once set

**Contracting with an MCO**
- **Option Exists if:** State allows MCOs

**Pros:**
- MCOs have flexibility to evolve contract quickly

**Cons:**
- MCOs payments, structure must align with state policy decisions

**Launching an MCO**
- **Option Exists if:** State allows MCOs

**Pros:**
- Can take full ownership over PMPM\(^1\) dollar

**Cons:**
- Must have the insurance, clinical infrastructure to run a health plan, manage total cost of care

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1) Per-member, per-month payment.

Source: Health Care Advisory Board interviews and analysis.
Identify Targeted Entry Point for Risk

Critically Deliberate System Capabilities, Market Offerings

**1. Evaluate if there is a clear opportunity to take on risk for a specific population**

- Do we have the necessary clinical infrastructure and patient volumes to succeed?
- Is there a regional payer willing to offer a population-specific contract?

**2. Identify mechanisms to narrow scope of initial risk contracts**

- What level of risk can we take on?
- How many patients can we manage at once?
- What services are we comfortable managing?

Source: Health Care Advisory Board interviews and analysis.
Pediatric ACOs an Increasingly Popular Strategy

For Those With Substantial Pediatric Capabilities, a Natural Starting Point

Pediatric ACOs Growing in Prevalence
Representative Sample Organizations

Examples of Achieved Cost Savings

<table>
<thead>
<tr>
<th>Provider</th>
<th>Population Served</th>
<th>% Reduction or $ Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arkansas Children’s Hospital</td>
<td>CSHCN¹: 67% Medicaid 33% Commercial</td>
<td>Hospital Admissions 40%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Per Child Cost 30%</td>
</tr>
<tr>
<td>Colorado Medical Homes for Children</td>
<td>Medicaid/CHIP</td>
<td>Hospital Admissions 18%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Savings per patient $169-$530</td>
</tr>
<tr>
<td>St. Joseph’s Children’s (Tampa)</td>
<td>CSHCN¹: 85% Medicaid 15% Commercial, Self-pay</td>
<td>Hospital Days 20%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ER Visits 33%</td>
</tr>
</tbody>
</table>

¹ Children with Special Healthcare Needs.

### Clear Pathways to Risk for Dual-Eligible Population

Several Opportunities to Build on Medicare Risk Capabilities

<table>
<thead>
<tr>
<th><strong>Payer-Led Option</strong></th>
<th><strong>Provider-Led Option</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dual Eligible Special Needs Plan (D-SNP)</strong></td>
<td><strong>Program for All-Inclusive Care for the Elderly (PACE)</strong></td>
</tr>
<tr>
<td>29 States with D-SNP participation option</td>
<td>33 States with PACE participation option</td>
</tr>
<tr>
<td>- <strong>Program details:</strong> Insurance Plan specifically targeted at dual-eligible enrollees in which the state helps cover some Medicare costs</td>
<td>- <strong>Program details:</strong> Providers are responsible for covering all services in the home, community, and PACE center in exchange for a PMPM; only covers those eligible for nursing home-level care</td>
</tr>
<tr>
<td>- <strong>Sample organizations:</strong> WellCare Health Plans, Health Net, Signature Advantage</td>
<td>- <strong>Sample organizations:</strong> Trinity Health, CarePartners, Cheyenne Regional Medical Center</td>
</tr>
</tbody>
</table>

Assess Readiness Before Taking Next Steps

Trinity Health Cautiously Launches New PACE Programs

Launching PACE Program Dependent on System, Market Features

- Existing clinical experience, infrastructure
- PACE eligible individuals present in selected market¹
- >2K
- $5-7M Available capital to develop facility, jumpstart program

Upkeep Requires Ongoing Recruitment

- 35-40 New people that must be reasonably expected to join program annually to maintain average target of ~200 patients

"Our job is to keep people out of nursing homes and we succeed 90% of the time.”

John Capasso
EVP, Continuing Care

Case in Brief: Trinity Health

- Cross-state health system operating 93 hospitals and 121 continuing care locations
- Formed in 2013, when Trinity Health and Catholic Health East merged
- Operates 14 PACE programs across the country

¹ 55+, dual-eligible, nursing home eligible.

Source: Health Care Advisory Board interviews and analysis.
Don’t Overestimate the Benefits of Scale

No Matter the Path, Start Small

Three Critical Considerations for Any Initial Risk Model

1. **Level of Risk**
   - **Upside-Only:** shared savings, pay-for-performance
   - **Upside-Downside:** shared savings/losses, percent of premium
   - **Full Capitation:** PMPM payments, total cost of care management

2. **Number of Lives**
   - **Attributed Patients:** capped PCP patient panels, limited clinician availability
   - **Risk Contracts:** risk contract restricted to patients of payer partners

3. **Scope of Services**
   - **Specific Services:** emergency care, designated specialists
   - **Out-of-Network Utilization:** external clinicians, pharmaceutical costs

Source: Health Care Advisory Board interviews and analysis.
Three Key Questions to Guide an Intentional Medicaid Risk Strategy

1. Making the Go, No-Go Decision
   Do we have the necessary clinical infrastructure and risk experience to succeed under Medicaid risk?

2. Developing an Entry Strategy
   What should we prioritize for our first Medicaid risk contract?

3. Ensuring Long-Term Success
   How do we evolve our Medicaid risk strategy over the long-term?

4. Target manageable entry point to establish baseline experience

5. Predicate transition to Medicaid risk on care management capabilities

6. Capitalize on emerging opportunities to rapidly expand risk strategy

Source: Health Care Advisory Board interviews and analysis.
Stay on the Lookout for Changing State Policies, Payment Models

Areas to Watch for Potential Opportunities to Expedite Risk Strategy Development

State Policy Changes
- Medicaid expansion
- Waiver-enabled changes (e.g. All-Payer, ACOs)
- Introduction of MCOs or switch to mandatory managed care
- Mandated minimum targets for value-based contracts

New Funding Sources
- DSRIP\(^1\) funding
- Novel state grant funding
- New funding directed at specific initiatives (e.g. opioid use reduction, natural disaster relief)

Changes in Leadership
- State and federal executive, legislative elections
- Administrative leadership transitions

\(^1\) Delivery System Reform Incentive Payment Program.

Source: Health Care Advisory Board interviews and analysis.
Evolving to a Global Risk Arrangement

Reliant Increasing Scope of Risk Contract Under Massachusetts' New Waiver

Case in Brief: Reliant Medical Group

- 500-provider group practice headquartered in Worcester, MA
- Held contract for 100% risk on professional fees and 50/50 risk on hospital expenses since 2000
- Capitalizing on DSRIP funding to enhance infrastructure to manage total cost of care of 30K Medicaid patients

Massachusetts received a $52.5B five-year waiver in 2017 to restructure the state Medicaid program to transition toward ACO models
# Key Takeaways

## Extending Risk Strategy into Medicaid

1. **Medicaid risk is not the right starting point for most; only those with existing clinical care management capabilities should consider Medicaid risk.**

   Due to poor reimbursement, a complicated contracting environment, and a more complex population, success under Medicaid risk is even more difficult than under risk with other payers. Ensure organizational competencies are in place before jumping into risk.

2. **Systems new to Medicaid risk should start small; scale is less critical in Medicaid risk than in Medicare and commercial risk.**

   Systems should construct initial Medicaid risk contracts that focus on a specific subpopulation (pediatrics, dual-eligibles) or limit contract terms based on level of risk, population size, or scope of services. No matter the specific path, systems should work to harmonize terms across all risk contracts to minimize administrative, clinical burdens.

3. **Providers must be prepared to capitalize on fortuitous state and federal policy changes to radically advance their Medicaid risk strategies.**

   State, federal funding, policy, and leadership changes all represent fleeting, potential opportunities to gain new support and enter previously unavailable risk contracts. Systems should be prepared to capitalize when these chances arise.

Source: Health Care Advisory Board interviews and analysis.
Succeeding Under Medicaid Risk

8. Augment staffing model to include non-clinical roles
9. Hone risk stratification methodology with social determinants of health
10. Recruit patients to care management system
Medicaid Risk Requires Expanded Set of Capabilities

Care Management Needs Higher in Medicaid Population

Foundational Investments for Any Risk Contract

- Nurse Care Managers
- Telehealth
- Risk Stratification Analytics
- Patient Engagement Tools
- Medical Homes
- Preferred Post-Acute Partner Network

Additional Investments for Medicaid Risk

- Community Health Workers
- Community Resource Inventory
- Social Workers
- Health Literacy Resources
- Behavioral Health Specialists
- Social Determinants of Health Screening Tools
- Medical Homes
- Patient Engagement Tools
- Preferred Post-Acute Partner Network

Source: Health Care Advisory Board interviews and analysis.
The More Complex Patient

Clinical, Non-Clinical Factors Complicate Treatment Plans for Medicaid

Common Clinical and Non-Clinical Factors Among Medicaid Population

Clinical Needs

46%
Of Medicaid adults have a functional limitation

35%
Of Medicaid adults have two or more chronic conditions

26%
Of Medicaid adults in fair/poor health

10%
Of Medicaid adults in serious psychological distress

Non-Clinical Needs

Fluctuating eligibility
Inconsistent employment
Food insecurity
Unstable housing
Unreliable transportation
Multiple caregiver responsibilities

Extending Reach into the Community

Representative Community Health Initiatives

**Targeted**

**Montefiore School Health Program** partners with local schools to provide health education (including nutrition and exercise) and access to primary care, oral health, mental health, and community health.

**Enos Park Access to Care Collaborative** is a collective made up of three providers that implemented a multi-part initiative in a specific neighborhood to improve access to care through a holistic approach.

**Continuum of Initiatives**

**University of Vermont Medical Center** reimburses partners for beds and case management across a range of affordable housing programs matched to patient acuity; saved $500,000 annually for permanently housed patients.

**Ballad Health** is a new system comprised of two previously competing health systems that promises to improve 28 access and 25 population health metrics for the region under state oversight for accountability and transparency.

Three Near-Term Care Management Priorities

Expanding Care Management Capabilities to Address Unique Medicaid Challenges

- **Ensure Patient Engagement**
  - Recruit patients to care management system

- **Adapt Existing Infrastructure**
  - Hone risk stratification methodology with social determinants of health

- **Maintain Foundational Investments**
  - Augment staffing model to include non-clinical roles

Source: Health Care Advisory Board interviews and analysis.
8. Augment staffing model to include non-clinical roles

Meet the Medicaid Care Management Team

<table>
<thead>
<tr>
<th>Role</th>
<th>Main Tasks</th>
<th>Education &amp; Training</th>
<th>Median Pay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurse Care Manager</td>
<td>Central contact and care coordinator for medically-complex patients; located in clinical setting</td>
<td>Registered Nurse; many years of experience</td>
<td>$68,450 per year</td>
</tr>
<tr>
<td>Social Worker</td>
<td>Counsels patients to cope with clinical, non-clinical stresses; located in clinical setting</td>
<td>Bachelor’s or Master’s; several years experience</td>
<td>$46,890 per year</td>
</tr>
<tr>
<td>Community Health Worker</td>
<td>Assists patients with non-clinical components of health; typically goes out into the home, community</td>
<td>High school diploma; receives on-the-job training</td>
<td>$37,330 per year</td>
</tr>
</tbody>
</table>

- Manages patients with multiple chronic conditions post-discharge
- Provides ongoing support to more fragile patients
- Coordinates across sites of care and manages referrals
- Assists patients through poverty, abuse, addiction, physical illness, divorce, bereavement, disability, and mental illness
- Provides community resource referrals and legal services
- Connects patients with community resources; serves as liaison between clinical and non-clinical organizations
- Assists patients with navigating health care expenses, coverage

Non-Clinical Staff Step Into Leading Role

Main Point of Contact Assigned Based on Main Utilization Drivers

Partners’ Integrated Care Management Program

Full model following transition to Medicaid Risk

<table>
<thead>
<tr>
<th>Main Risk Factor</th>
<th>Model under Medicare risk</th>
<th>Additions to care team following transition to Medicaid risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complex Medical Issue</td>
<td>Nurse 180-200 patients</td>
<td>Behavioral Health Issue</td>
</tr>
<tr>
<td></td>
<td>Social Worker 80-100 patients</td>
<td>Social Support Issue</td>
</tr>
<tr>
<td></td>
<td>CHW 30 patients</td>
<td></td>
</tr>
</tbody>
</table>

Support staff for all patients: Pharmacists and Community Resource Specialist

Case in Brief: Partners HealthCare

- Eight-hospital health system in Boston, MA
- 500,000+ patients in some form of risk contract; 30,000 of which are Medicaid
- After expanding to Medicaid risk, adapted Integrated Care Management Program to address social determinants

1) Specifically charged with helping patients navigate financial or coverage issues.

Source: Health Care Advisory Board interviews and analysis.
The Case for Non-Clinical Staff

Community Health Workers Deliver Clear ROI

University of New Mexico, Molina Healthcare, and Hidalgo Medical Services CHW\(^1\) Pilot Program

**Background**

Team of 10, including six CHWs, assigned to 448 high utilizer Medicaid managed care patients

**Results**

**Program Costs vs. Savings**

<table>
<thead>
<tr>
<th>Costs</th>
<th>Savings</th>
<th>ROI</th>
</tr>
</thead>
<tbody>
<tr>
<td>$521K</td>
<td>$2M</td>
<td>4:1</td>
</tr>
</tbody>
</table>

**Impact**

Model has since been expanded to all 13 counties in New Mexico and replicated in 12 states

Case in Brief: Centennial Care

- Medicaid program of New Mexico since January 2014; BlueCross BlueShield, Molina Healthcare, Presbyterian, and UnitedHealthcare operate MCOs\(^2\) for the program

- Expanded on a CHW pilot originally conducted by University of New Mexico, Molina Healthcare, and Hidalgo Health Center deploying community health workers to establish trusting relationships with high-risk enrollees and significantly reduce caseload for traditional case managers

Source: Johnson, D. et al. “Community Health Workers and Medicaid Managed Care in New Mexico,” *Journal of Community Health*, June 2012; Health Care Advisory Board interviews and analysis.

---

1) Community health worker.
2) Managed Care Organization.
3) Control group not managed by CHWs had 53% fewer inpatient admissions.

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New Staff Model Requires New Analytic Model

Non-Clinical Data Crucial for Connecting Patients to the Right Intervention

Multiple Dimensions of Risk Provide Additional Analytic Advantages

<table>
<thead>
<tr>
<th>Risk Type</th>
<th>Data Elements</th>
<th>Advantage Gained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Risk</td>
<td>• Age, gender</td>
<td>Allows clinician to identify culturally competent wraparound support services for individual patient</td>
</tr>
<tr>
<td></td>
<td>• Level of social support</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Home environment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Social relationships</td>
<td></td>
</tr>
<tr>
<td>Geographic Risk</td>
<td>• Average income</td>
<td>Quantifies community-level risk factors, prioritizes patients and community-level interventions</td>
</tr>
<tr>
<td></td>
<td>• Housing value</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Distance from health care services</td>
<td></td>
</tr>
<tr>
<td>Behavioral Risk</td>
<td>• Anxiety</td>
<td>Alerts clinician to prioritize behavioral health interventions</td>
</tr>
<tr>
<td></td>
<td>• Depression</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Stress</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Mental health symptoms</td>
<td></td>
</tr>
<tr>
<td>Patient Activation</td>
<td>• Health understanding</td>
<td>Provides guidance on intensity and approach to behavior change management</td>
</tr>
<tr>
<td></td>
<td>• Health literacy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Engagement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Confidence</td>
<td></td>
</tr>
</tbody>
</table>

Source: Health Care Advisory Board interviews and analysis.
Make the Most of the Primary Care Visit

Incorporate Simple Data Collection into Clinical Visits

Expanding Risk Stratification to Include Social Determinants of Health

1. Housing Insecurity
2. Social Isolation
3. Stress, Depression
4. Making Ends Meet
5. Transportation
6. Food Insecurity
7. Child Care
8. Legal Issues
9. Intimate Partner Violence
10. Substance Abuse
11. Health Literacy

Case in Brief: Lapis Health

- Integrated delivery system in the West
- Operates Medicaid managed care plan
- To enhance risk stratification methodology, embedded screening for social determinants of health into primary care visit workflow

Source: Health Care Advisory Board interviews and analysis.
### Efficiently Connecting Patients to the Right Resources

Technology Platforms Centralize and Expedite Process

#### Screening and Resource Connection Process

<table>
<thead>
<tr>
<th>Screening</th>
<th>Resource Identification</th>
<th>Navigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient fills out survey during visit to identify potential health-related social needs</td>
<td>Technology platform(^1) produces a printout of community resources for patients that identify needs</td>
<td>Navigators made available to provide additional support</td>
</tr>
</tbody>
</table>

---

#### Case in Brief: Allina Health

- 12-hospital system based in Minneapolis, MN
- Cares for at risk Medicaid patients through the state Integrated Health Partnership model
- Implemented a pilot to test a screening, referral, and limited navigation process for their Medicaid patients

#### Initial Pilot Results

- 39% of screened patients identified at least one need
- 35% of patients called in follow up used the resources provided

---

1) Allina uses NowPow, a community resource database and referral tool.

Source: Health Care Advisory Board interviews and analysis.
Designing Distinct Prioritization Scores for Subgroups

CCNC¹ Applies Dedicated Methodologies to Target Impactable Costs in Three Areas

- **Complex Patients Score**
  - *Predicts* efficacy of complex care management program
  - *Impacts* total cost of care through reduced inpatient and ER visits

- **Transitional Care Score**
  - *Predicts* efficacy of care management of hospital to home care episode
  - *Impacts* total cost of care through reduced readmissions

- **Maternal and Infant Score**
  - *Predicts* efficacy of care management of prenatal care episode
  - *Impacts* total cost of care through reduction in low birth weight (or preterm) deliveries

---

**Case in Brief: Community Care of North Carolina**

- Public-private partnership based in Raleigh, NC that provides case management, data analysis, quality improvement, and training activities for primary care practices
- Patient-centered care model includes 5,000 providers and 1.6 million patients
- Developed Impactability Score program which combines utilization, clinical risk, and social determinant data along with care management intervention results to identify opportunities to lower total cost of care and improve quality measures

---

¹ Community Care of North Carolina.

Download *How to Prioritize Population Health Interventions*, on advisory.com

Source: Health Care Advisory Board interviews and analysis.
The Virtuous Care Management Cycle

Cautiously Applying Lessons Across Populations

Medicare Care Management Focus

Non-Clinical Expertise
- Community Health Workers
- Social Determinants of Health Screening Tools
- Community Resources Inventory

Clinical Expertise
- Nurse care managers
- Preferred post-acute partner network
- Patient-centered medical home
- Disease management

Medicaid Care Management Focus

The Virtuous Care Management Cycle

Source: Health Care Advisory Board interviews and analysis.
Three Near-Term Care Management Priorities

Expanding Care Management Capabilities to Address Unique Medicaid Challenges

1. Adapt Existing Infrastructure
2. Maintain Foundational Investments
3. Hone risk stratification methodology with social determinants of health
4. Augment staffing model to include non-clinical roles
5. Recruit patients to care management system

Source: Health Care Advisory Board interviews and analysis.
10. Recruit patients to care management system

Hard to Reach, Hard to Engage

Overcoming the Perennial Medicaid Challenge

Recruitment Complexities

40% of low-income adults likely to experience a change in eligibility status within 12 months

15-20% average appointment no-show rate in underserved populations

Four Steps of Engagement

Proactive Insurance Enrollment

Systematic New Enrollee Onboarding

High-Risk Patient Engagement

Disconnected Low-Risk Patient Engagement

Proactively Enroll High-Utilizing Uninsured Groups

Targeting a Clear Opportunity for Inflection

Initiating Relationship With High-Utilizers Improves Coverage, Coordination

PA-led\(^1\) Street Medicine team visits homeless individuals on-site to provide basic care

Social workers assist with Medicaid enrollment, coordinated connections to community resources and health care

2015-2017 Results

\begin{align*}
\textbf{Increase} & \text{ in Medicaid enrollment}^2 \\
24\% & \rightarrow 74\% \\
\textbf{Decrease} & \text{ in ED utilization rate}^3 \\
204 & \rightarrow 55 \\
\textbf{Downstream revenue} & \text{ attributed to Street Medicine Program enrollment} \\
$4.3M$
\end{align*}

Case in Brief: Lehigh Valley Health Network

- Eight-campus health system based in Allentown and northeast PA
- Identified group of uninsured homeless individuals who only interacted with the network through ED and inpatient stays
- Launched Street Medicine pilot to bring basic care to homeless individuals, connect with resources

\(^{1}\) Physician Assistant. \\
\(^{2}\) Two-year longitudinal performance (n = 1,300). \\
\(^{3}\) ED utilization rate per 100 patients within same cohort for those whose care originated in street/shelter clinic (n=901).

Source: Health Care Advisory Board interviews and analysis.
Onboard New Enrollees to System

Pilot Tests Proactive Onboarding for Medicaid Population

Ensuring Appropriate Engagement From the Outset

Navigators conduct telephonic outreach to all new Medicaid members for onboarding

New Medicaid Patient Onboarding Agenda

- Assign a primary care physician
- Assess care needs (e.g., pregnancy, immediate acute needs) and schedule appointments
- Ensure successful medication transfer

Potential Follow-Ups

- Patient attends scheduled primary care, specialty visits
- Complex patients connected with high-risk care manager

Case in Brief: Ebbit Medical Group

- Independent medical group with risk-based Medicaid contract in the Northeast
- Piloting Medicaid-specific onboarding protocol for portion of the managed care population

1) Pseudonym.

Source: Health Care Advisory Board interviews and analysis.
Warm Handoff to Care Management a Must

Build on Existing Relationships to Increase Engagement

Outreach Roadmap for Complex Managed Medicaid Patients

- Risk management system flags patient to case managers
- Phone call from physician
- Stop outreach after 3 calls

Initial Outreach
- Invitation letter sent from case manager

Follow-Up Outreach
- 2-3 calls by case manager over several weeks

Enrollment
- Patient comes in for a “super visit” with physician and case manager

Case in Brief: Henry Ford Health System
- 1,679-bed, not-for-profit system with five hospitals in the Midwest
- 650,000 members in their subsidiary Health Alliance Plan; ~100,000 are in Medicaid
- Employed introduction from physicians to initiate patient engagement with care management program

Keys to Success
- Market care management program as a free resource
- Case managers embedded in physician office and maintain patient relationship over time

Source: Population Health Advisor, “Care Management Enrollment for Complex Managed Medicaid Patients,” Advisory Board, 2015; Health Care Advisory Board interviews and analysis.
Replicating the Medicare Wellness Visit

Summit Medical Group Targeted Patients Not Seen for Two Years to Build Relationship

Outreach Approach

1. Seven practices piloting HealthGrid platform to automate text- and phone-based outreach
2. Remaining practices conduct outreach manually through receptionists
3. Health plan partners also deploy staff to conduct outreach

Annual Wellness Visit

- Occur in primary care office or at health fairs
- Covers required and recommended screenings, diagnostics, and immunizations based on age

Case in Brief: Summit Medical Group

- 55-practice primary care group based in Knoxville, TN
- Upside-only risk agreements with three Medicaid Managed Care Organizations
- Applied their Medicare Annual Wellness Visit process to their less complex Medicaid patients in order to establish and maintain relationships

Source: Health Care Advisory Board interviews and analysis.
Tracking Down “Unreachable” Patients

Deploy Specialized Staff to Track Current and Potential Patients

Three Outreach Tactics

Dedicated Research Team

Track down phone numbers that are reachable

Consistent Presence in Community

Use social workers and CHWs\(^1\) in the field who have built trust with a patient peer group

Leverage Utilization Points

Track utilization of potential beneficiaries in primary care, inpatient, or pharmacological settings

Percentage of “Unreachable” Potential Beneficiaries

<table>
<thead>
<tr>
<th>Year</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>43%</td>
</tr>
<tr>
<td>2017</td>
<td>32%</td>
</tr>
</tbody>
</table>

Source: Health Care Advisory Board interviews and analysis.

Case in Brief: Commonwealth Care Alliance

- Not-for-profit, community-based health plan based in Boston, MA
- Created two D-SNPs\(^2\) that serve individuals with complex care needs who are dually eligible for Medicaid and Medicare
- Deployed a research team to track down potential clients because so many were considered “unreachable”

\(^1\) Community health worker.

\(^2\) Dual-Eligible Special Needs Plans.
Key Takeaways

Succeeding Under Medicaid Risk

1. Nurse-led care management models addressing medical complexity are necessary but insufficient under Medicaid risk.

   Compounding non-clinical issues make Medicaid care management particularly challenging. Organizations must modify both their care management staffing models and analytics platforms to address social determinants of health.

2. Medicaid care management systems must include strategies to proactively recruit patients to the system.

   Low levels of health literacy and transience among certain segments of the Medicaid population present unique challenges. Proactive enrollment and onboarding strategies, in addition to warm handoffs to care management are crucial to ensuring desired levels of engagement.

3. Care management investments made for the Medicaid population can be scaled across all populations under risk.

   While Medicaid warrants outsized focus on social determinants of health, patients across all payer segments present with non-clinical needs. While Medicaid risk may provide the financial incentive to address these issues, solutions should be scaled across the broader population.

Source: Health Care Advisory Board interviews and analysis.
Current State of the Safety Net

Preserving the Community Safety Net

Our Mission Imperative
## Preserving the Community Safety Net

### 10 Imperatives for Designing a Sustainable Medicaid Strategy

<table>
<thead>
<tr>
<th>Stabilize Under Current Economics</th>
<th>Transform Business Model</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong> Addressing Avoidable Low-Margin Utilization Flashpoints</td>
<td><strong>2</strong> Extending Risk Strategy into Medicaid</td>
</tr>
<tr>
<td><strong>2</strong> Deploy Targeted Strategy for Highest Utilizers</td>
<td>5. Predicate transition to Medicaid risk on care management capabilities</td>
</tr>
<tr>
<td>1. Stratify super-utilizers to customize level of intervention</td>
<td>6. Target manageable entry point to establish baseline experience</td>
</tr>
<tr>
<td><strong>3</strong> Fill Highest-Need Network Gaps</td>
<td>7. Capitalize on emerging opportunities to rapidly expand risk strategy</td>
</tr>
<tr>
<td>2. Minimize high-acuity mental health needs through crisis management</td>
<td><strong>3</strong> Succeeding Under Medicaid Risk</td>
</tr>
<tr>
<td>3. Establish bidirectional community clinic partnerships</td>
<td>8. Augment staffing model to include non-clinical roles</td>
</tr>
<tr>
<td>4. Address most prevalent non-clinical drivers of inappropriate utilization</td>
<td>9. Hone risk stratification methodology with social determinants of health</td>
</tr>
<tr>
<td><strong>Special Report:</strong></td>
<td>10. Recruit patients to care management system</td>
</tr>
<tr>
<td>Confronting the Opioid Epidemic</td>
<td></td>
</tr>
</tbody>
</table>
**Embracing Our Ambition**

**Striking a Balance Across Conflicting Priorities**

**Protect Margins**
- Mitigate losses under FFS
- Evaluate potential to transform reimbursement model

**Enhance Access**
- Maintain ability to provide crucial services
- Expand access by filling network gaps

---

**Preserve Stability of the Community Safety Net**
- Refrain from strategies that actively harm safety-net counterparts
- Engage in partnerships to preserve, enhance market stability

Source: Health Care Advisory Board interviews and analysis.
All In This Together

Safety Net Strategy a Multi-Stakeholder Effort

Expanding Our Community Impact

Scope

- **Health System**: Holistic care that connects to community resources
- **Neighborhood**: Provider-provider partnerships to expand access and address community-wide challenges
- **Region**: Multi-market reach to impact more complex, long-term determinants of health

Source: Health Care Advisory Board interviews and analysis.
The New Cost Mandate

Eight Strategies to Contain Future Cost Growth
1. Unpacking the Margin Management Challenge

2. Meeting the New Cost Mandate

3. Positioning for Long-Term Success
Understandably Distracted By Our Luminosity

However, Fundamental Problems Lurk Beneath the Surface

Source: Available at: https://commons.wikimedia.org/wiki/File%3AINfrared_Rho_Ophiuchi_Complex.jpg; Health Care Advisory Board interviews and analysis.
Approaching Our Antares Moment?

Hospital Industry Experiencing Margin Deterioration Across the Board

Excess Margin\(^1\) Medians of Freestanding Hospitals, Single-State & Multi-State Healthcare Systems, by Broad Rating Category

<table>
<thead>
<tr>
<th></th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aa</td>
<td>7.2%</td>
<td>7.6%</td>
<td>8.4%</td>
<td>7.2%</td>
</tr>
<tr>
<td>Baa</td>
<td>5.1%</td>
<td>5.3%</td>
<td>6.1%</td>
<td>5.7%</td>
</tr>
<tr>
<td>Median</td>
<td>3.3%</td>
<td>2.8%</td>
<td>4.2%</td>
<td>1.6%</td>
</tr>
</tbody>
</table>

1) Excess margin = (total operating revenue - total operating expense + non operating revenue) / (total operating revenue + non-operating revenue) *100.
2) Operating margin = (total operating revenue - total operating expense) / total operating revenue *100.

Expenses Rapidly Growing

In the Short Term, a Cost-Driven Margin Challenge

Revenue and Expense Growth Rates for Non-Profit Hospitals

2009-2016 Medians, n=444

- Costs outgrowing revenue
- Gap bigger than in 2012 and 2013
- Record cost growth since 2009
- Approximately three percentage point cost growth since 2014

<table>
<thead>
<tr>
<th>Year</th>
<th>Revenue Growth</th>
<th>Expense Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>6.5%</td>
<td>5.7%</td>
</tr>
<tr>
<td>2010</td>
<td>4.0%</td>
<td>4.0%</td>
</tr>
<tr>
<td>2011</td>
<td>5.4%</td>
<td>5.0%</td>
</tr>
<tr>
<td>2012</td>
<td>5.5%</td>
<td>5.1%</td>
</tr>
<tr>
<td>2013</td>
<td>4.3%</td>
<td>3.9%</td>
</tr>
<tr>
<td>2014</td>
<td>4.7%</td>
<td>4.6%</td>
</tr>
<tr>
<td>2015</td>
<td>7.4%</td>
<td>6.2%</td>
</tr>
<tr>
<td>2016</td>
<td>7.5%</td>
<td>6.6%</td>
</tr>
</tbody>
</table>


1) Preliminary median.
We’ve Been Here Before

Select Advisory Board Cost-Saving Resources

Capture Value Through Supply Purchasing
Explores strategies to optimize supply cost-savings by increasing physician engagement and maximizing partnerships with suppliers

Achieving Cost-Savings Goals Through Care Variation Reduction
Showcases nine tactics one organization uses to engage – and empower – physicians to reduce unnecessary care variation

Rising Above the Bottom Line
Provides nurse leaders with a four-step manual for reducing their labor costs while safeguarding their staff and the care they deliver

The Sustainable Acute Care Enterprise
Features four opportunities to radically restructure costs and operations to break even on Medicare

Untapped Opportunities for Saving Millions
Details 11 cost-cutting strategies for reducing premium labor, modernizing outdated care protocols, eliminating supply waste, and restructuring unfavorable contract terms

Realizing the Potential of Energy Savings
Highlights eight insights CFOs need to know about reducing energy costs

Source: Health Care Advisory Board interviews and analysis.
Volumes Increasingly Vulnerable

Market Forces Both Reducing and Redirecting Lucrative Business

Key Trends Threatening Future Volume Growth

- Continued outmigration of profitable procedural care
- Patients with high-deductible health plans foregoing care
- Narrow networks redirecting market share
- Growth of outpatient procedures stagnating
- Population health and care management reducing utilization
- New competitors disrupting established referral chains

A Perilous Cross Subsidy

-6% Cumulative change in total inpatient admissions, 2006-2015

-0.2% Change in outpatient surgeries, 2013-2014

Death by a Thousand Cuts

Pricing Trends Reveal a Structural, Revenue-Driven Margin Challenge

Wide Array of Downward Pricing Pressures

Direct Pricing Threats

- Medicare productivity adjustment
- Commercial denials
- RAC\(^1\) reemergence
- Site-neutral payments
- DSH cuts
- HDHPs fueling bad debt

New Payment Models

- Pay-for-performance programs
- Bundled payment models
- Accountable Care Organization (ACO) programs
- Merit-based Incentive Payment System (MIPS)

Ongoing Payer and Case Mix Shifts

- Increases in lower reimbursed, publicly insured cases
- Growth in lower margin medical care
- Continued uncompensated care in states without Medicaid expansion

---

1) Recovery audit contractor.

Source: Health Care Advisory Board interviews and analysis.
A Cost Solution to a Revenue Problem

Industry-Wide Agreement on Focal Point for Margin Performance

CBO Projects Negative Margins at Current Course and Speed

“Our analysis showed that if hospitals were unable to increase their productivity (or reduce cost growth in some other way), then the share of hospitals with negative profit margins would increase to 60 percent in 2025, and the average profit margin would fall to negative 0.2 percent.”

Congressional Budget Office

MedPAC Calls Out The Impact of Future Costs on Margins

“The level of Medicare margins for 2018 may depend largely on hospital’s ability to control cost growth.”

MedPAC, March 2017

Moody’s Points to Labor, Pharma as Key Cost Drivers

“The three-year operating revenue CAGR of 6.2% [in 2016] outpaced the three-year expense CAGR of 5.8% for the second consecutive year. This dynamic will be reversed in the near term as revenue pressures persist and expenses are stressed by salary, benefits and premium labor, pension funding, as well as pharmaceutical costs pushing supply expenses up.”

Moody’s, May 2017

Introducing Antares Health System

Our Model for Today’s Conversation

Antares Health System Profile¹

- $1B in operating revenue
- $970M in operating expenses
- Operating at a 3% margin
- Eastern U.S., suburban location
- Five hospitals
- 820 beds
- 6,400 employees
  - 390 employed physicians
  - 3,320 non-physician clinical staff
  - 2,690 non-clinical employees

Operating Expense Structure, 2017

- Salaries and wages (50%)
- Supplies (20%)
- Purchased services (15%)
- Benefits (10%)
- Other (5%)

¹ Advisory Board-created, model health system.

Source: Health Care Advisory Board interviews and analysis.

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Houston, We Have a Problem

Antares Headed Toward a Rapid Collapse

Antares’s Margin Absent Intervention, 2017-2025

<table>
<thead>
<tr>
<th>Year</th>
<th>Margin</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>3.0%</td>
</tr>
<tr>
<td>2018</td>
<td>2.2%</td>
</tr>
<tr>
<td>2019</td>
<td>1.4%</td>
</tr>
<tr>
<td>2020</td>
<td>0.5%</td>
</tr>
</tbody>
</table>

Cumulative cost avoidance necessary between 2017 and 2025 to achieve 3% margin in 2025

$320-350M

Modeling Assumptions

- Cost growth gradually returns to post-ACA low of 4%
- During same period, revenue growth steadily decelerates to 3%

Source: Health Care Advisory Board interviews and analysis.
Growth Projection Methodology

- Created model health system with $1B in operating revenue and $970M in operating expenses, yielding a 3% margin.
- Began with Moody’s 2015-2016 hospital operating revenue and operating expense growth rates:
  - Operating revenue: 6.6%
  - Operating expenses: 7.5%
- Continued these rates beginning in 2017 and into 2018.
- Projected revenue growth to decelerate based on cumulative pricing threats, payer and case mix shifts, and changing consumer demands.
- Slowed revenue growth by 0.8 percentage points per year to 3% growth then held constant. This yields an average eight-year revenue growth rate of 4.3%.
- Projected cost growth returning to post-2009 best performance of 4%.
- Slowed cost growth by 0.8 percentage points per year to 4% growth then held constant. This yields an average eight-year cost growth rate of 5.2%.
- In this scenario, model health system has -4.21% operating margin in 2025, with $1.39B in operating revenue and $1.45B in operating expenses.
- Created alternate cost growth projection which slows cost growth by an average of 0.83 percentage points per year to 2.5%. This yields an average eight-year cost growth rate of 4.3%, matching average revenue growth during the same period.
- In this solution scenario, model health system has 3% margin in 2025, with $1.39B in operating revenue and $1.35B in operating expenses.
Annualized cost avoidance necessary to achieve 3% margin in 2025

$40-44M

Setting the Gap to Goal

Fortunately, Slowing Cost Growth Can Close the Gap

Projected Operating Revenue and Expenses, 2017-2025
Growth Still Critical to Margin Strategy

Top Line Growth Key to Avoiding Aggregate Cost Cuts

Select Advisory Board Revenue and Growth Resources

The Blueprint for Revenue Cycle Transformation
Highlights our three-pillared best practice approach to improve overall revenue cycle performance

Unlocking Radical Growth
Profiles opportunities and strategies for transformative system growth, both in and out of market

Competing on Consumer Experience
Discusses how successful systems move beyond investing in patient acquisition to converting positive initial encounters into durable relationships to secure repeat business

Customized Assessment Portal
Provides a direct gateway to pre-populated, customized analyses highlighting the financial impact of various payment policies

Source: Health Care Advisory Board interviews and analysis.
Target Outsized Savings Opportunities

Comparison of Cost Avoidance Opportunities at Antares Health System

- Pharmaceutical Utilization
- Energy Conservation
- Scaled Non-Clinical Labor
- Outsourcing Non-Core Functions
- Renegotiating Supply Contracts
- Performance-Based Supplier Contracting
- Mix of Preference Items
- Physician Efficiency
- Increased Productivity
- Reengineering Workflows
- Managing Benefits Spending
- Price of Purchased Services
- Refinancing
- Managed Demand for Nursing Labor

Not included: Mass layoffs | Decreasing compensation | Cutting benefits

Source: Health Care Advisory Board interviews and analysis.
Starting with the End in Mind

Develop a Purposeful Approach to Cost Containment

Pillars of Sustainable Cost Avoidance

1. Early Wins Compound Over Time
   Frontload rebasing strategies that will pay dividends over time as savings compound

2. Labor Market Realities Dictate Approach
   Seek to slow workforce growth based on operational realities of labor shortages and competition

3. Operating Expenses Map to Capacity
   Sustain slower operating expense growth by right-sizing capacity and rationalizing service lines

Protect Quality and Safety
   Make clear the organization’s unyielding commitment to quality and safety throughout the process

Source: Health Care Advisory Board interviews and analysis.
Charting the Path Forward

Contain Cost Growth to Sustain Future Margins

Meet the Mandate

1. Rebasin External Spending
   Elevate decision-making to reduce purchased services and supply spending

2. Cultivating the Cost-Effective Workforce
   Increase productivity and rationalize service lines to slow labor cost growth

Position for the Long Term

Transforming Fixed Costs
   Right-size fixed cost structure to support variable expense goals

Margin-diluting cost growth
Margin-sustaining cost growth

Source: Health Care Advisory Board interviews and analysis.
# The New Cost Mandate

## Eight Strategies to Contain Future Cost Growth

<table>
<thead>
<tr>
<th>1.</th>
<th>Rebasing External Spending</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Strategic outsourcing of non-core functions</td>
</tr>
<tr>
<td>2.</td>
<td>System-level purchased services contracting</td>
</tr>
<tr>
<td>3.</td>
<td>Hardwired escalation policy for local supply selections</td>
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<tr>
<td>4.</td>
<td>Precise pharmaceutical utilization management</td>
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</tbody>
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<table>
<thead>
<tr>
<th>2.</th>
<th>Cultivating the Cost-Effective Workforce</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td>Scaled administrative roles and responsibilities</td>
</tr>
<tr>
<td>6.</td>
<td>Top-of-license clinician role redesign</td>
</tr>
<tr>
<td>7.</td>
<td>LOS-driven labor demand management</td>
</tr>
<tr>
<td>8.</td>
<td>Selective service-line rationalization</td>
</tr>
</tbody>
</table>

Source: Health Care Advisory Board interviews and analysis.
1. Unpacking the Margin Management Challenge

2. Meeting the New Cost Mandate

3. Positioning for Long-Term Success
Rebasing External Spending

1. Strategic outsourcing of non-core functions
2. System-level purchased services contracting
3. Hardwired escalation policy for local supply selections
4. Precise pharmaceutical utilization management
Capitalize on Opportunities to Rebase

External Spending Smaller but Easier to Inflect than Labor

Barriers to Rebasining Labor Spending

- Fair market value limits wage flexibility
- Labor shortages demand competitive compensation and benefits
- Salaried employees not true variable expense, no benefit to reduced utilization

50-60%
Average percent of health system spending on salaries, wages, and benefits

Factors that Permit Rebasining External Spending

- Vendor competition keeps prices down
- Widespread availability enables opportunity for active shopping
- Rationalized utilization drives savings for variable external costs

30-40%
Average percent of health system spending on supplies and purchased services

## Reining in Runaway External Spending

### Antares’s Necessary Cost Avoidance

#### Supply Spending Absent Intervention

<table>
<thead>
<tr>
<th>2017 Status Quo Spending</th>
<th>$194 M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating at 3% Margin</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2025 Spending Absent Intervention</th>
<th>$291 M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating at -4.2% Margin</td>
<td></td>
</tr>
</tbody>
</table>

#### Purchased Services Spending Absent Intervention

<table>
<thead>
<tr>
<th>2017 Status Quo Spending</th>
<th>$146 M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating at 3% Margin</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>2025 Spending Absent Intervention</th>
<th>$218 M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating at -4.2% Margin</td>
<td></td>
</tr>
</tbody>
</table>

### Minimum Necessary Supply Cost Avoidance

**Operating at 3% Margin by 2025**

| Cumulative eight-year supply cost savings | $95-105M |
| Annualized supply cost savings          | $11-13M  |

### Minimum Necessary Purchased Services Cost Avoidance

**Operating at 3% Margin by 2025**

| Cumulative eight-year services cost savings | $30-40M |
| Annualized services cost savings          | $3-5M   |

Source: Health Care Advisory Board interviews and analysis.
Here We Go Again?

Despite Longstanding Focus, Clear Opportunities Remain

Disproportionate Supply Cost Growth
Not-For-Profit Hospital Growth Rates, 2015-16

Total Operating Expense Growth  Supply Expense Growth
7.5%  8.7%

Two Primary Drivers

1. Common Cost Reduction Tactics Unsustainable
   - Focus limited to target specialty areas such as orthopedics and cardiology
   - Initiatives attempted only where there is an existing clinical champion
   - Solutions designed as short-term fixes—not structural changes—allowing for recidivism

2. Facing New and Growing Cost Pressures
   - Purchased services were fastest growing expenses for six of the nine largest not-for-profit health systems from 2011-2016

“In 2014, the U.S. healthcare system spent $373.9 billion on drugs—13.1% more than it did the previous year and the highest rate of spending growth since 2001.” —Forbes

1) Size measured using net patient revenue; analysis only includes systems that report purchased services, professional fees, or contract labor as separate expense line item in consolidated financial reports.

From Cyclical to Structural Solutions

Deploying Durable and Comprehensive Strategies

Three Key Stages of Maturity When Rebasing External Spending

*Increasing Demand for Financial and Clinical Alignment*

**Eliminate Waste**
- Price renegotiations
- System-level contracting, oversight
- **Goal**: Decide what to buy; buy at best price

**Leverage Scale**
- Contract curation, reduced product mix
- Volume aggregation at system level
- **Goal**: Buy from fewer suppliers

**Rationalize Utilization**
- Optimized clinician compliance
- Predictability-driven pricing accuracy
- **Goal**: Buy fewer things

**Primary Lever for Cost Reduction**
- Price
- Mix
- Utilization
Building on Past Success

Fortunately, Few Organizations Starting from Scratch

Industry-Wide Progress Toward Cost Control in Major External Spending Categories

<table>
<thead>
<tr>
<th></th>
<th>Price</th>
<th>Mix</th>
<th>Utilization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchased Services</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Devices and Commodities</td>
<td>☑</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Pharmaceuticals</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
</tr>
</tbody>
</table>

Source: Health Care Advisory Board interviews and analysis.
Meeting the Mandate in External Spending

Antares’s Eight-Year Cost Avoidance Targets in Purchased Services, Supplies, and Pharmaceuticals

- **Purchased Services**
  - ~$33M

- **Devices and Other Supplies**
  - ~$60M

- **Pharma**
  - ~$35M

**Primary Cost Avoidance Strategies**

1. Strategic outsourcing of non-core functions
2. System-level purchased services contracting
3. Hardwired escalation policy for local supply selections
4. Precise pharmaceutical utilization management

Source: Health Care Advisory Board interviews and analysis.
Inconsistency Abounds

No Clear Industry Standard, Even for Commonly Outsourced Functions

Advisory Board Survey Reveals Variable Purchasing Practices

Business Function

- Food and nutrition
- Linen and laundry
- Environmental services
- Patient transport
- Security
- Plant operations
- Equipment maintenance

Source: Health Care Advisory Board interviews and analysis.
Beyond Financial Considerations

Non-Price Reasons for Outsourcing and Insourcing

Major Reasons to **Outsource**

- Leverage external expertise and scale
  - Purchased service core to vendor’s business; will invest in R&D\(^1\), innovation

- Reduce employer responsibilities
  - Vendor responsible for recruitment, onboarding, management, etc.

- Enable staffing flexibility
  - System can adjust or eliminate contract as demand changes; less disruptive than employee layoffs

Major Reasons to **Insource**

- Maintain consistent leadership
  - System can prevent management turnover, develop and retain strong leaders

- Preserve jobs in the community
  - Choosing third-party vendors sometimes means loss to vital jobs in local community

- Ensure access to business intelligence
  - System has immediate, unrestricted access to information; decreases likelihood of confidentiality breaches

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\(^1\) Research and development.

Source: Health Care Advisory Board interviews and analysis.
Establish Clear Principles for Purchasing Services

Service Outsourcing Decision Guide

1. Is this service core to our strategy and mission?
2. Does this service require very specific skills and/or experience to deliver effectively?
3. Does managing this service pull time and focus away from leadership and other teams?
4. Does this service require a one-time or ongoing capital investment to maintain?
5. Is the demand for this service cyclical or time-limited?
6. Taking these factors into consideration, can a third party provide the service at a lower total cost of ownership?

Two Essential Applications
1. Reevaluate past decisions to insource or outsource
2. Apply rigor to new decisions going forward

Source: Health Care Advisory Board interviews and analysis.
Reevaluate ROI from Existing Partnerships

Missouri Delta Medical Center Found Savings by Bringing Collections Back In-House

New CFO commits to revenue cycle improvement
- Identified as 2015 strategic priority due to leadership turnover and insufficient performance against key metrics
- High days AR\(^1\) outstanding and AR greater than 180 days old

Analysis uncovers major inefficiencies in collections
- Use of collections agency preventing visibility and control
- Despite poor performance, CFO discovered that collections agency was being paid more than entire business office

Collections function brought into hospital business office
- Over six to eight months, rolled back collections agency contract
- Hired 10 additional FTEs to perform back-end follow-up function internally

**Staffing Investment Less Expensive Than Outsourced Contract**

$1M

Annualized expected savings in year two and beyond from bringing collections function in-house

**Near Immediate AR Performance Improvement**

<table>
<thead>
<tr>
<th>Days</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>63.4</td>
<td>49.5</td>
</tr>
</tbody>
</table>

1) Accounts receivable.

Source: Health Care Advisory Board interviews and analysis.
Reevaluate ROI from Existing Partnerships

Continued

Case in Brief: Missouri Delta Medical Center

- 144-bed hospital located in Sikeston, MO
- While looking into higher-than-average days AR\(^1\) outstanding, new CFO discovered that outsourced collections agency cost more than the entire business office
- Brought collections back in-house by hiring 10 additional FTEs; increased visibility and control improved AR performance and is expected to yield annualized savings of approximately $1M after the first year

\(^1\) Accounts receivable.

Source: Health Care Advisory Board interviews and analysis.
Purchasing Scale and Expertise

Systems Nationwide Finding New Opportunities to Outsource

**Modern Healthcare**
“Quest buys some PeaceHealth labs, will manage others”

**Health Leaders Media**
“USA Health System slashes 70 jobs, outsourcing billing services”

**Becker’s Hospital Review**
“Financially troubled Centegra to lay off 131 employees, outsource 230 jobs”

**Reuters**
“Labcorp to acquire pathology associates medical laboratories from Providence Health & Services and Catholic Health Initiatives”

**Fierce Healthcare**
“The outsourcing explosion: Hospitals turn to outside firms to provide more clinical services”

**Common Candidates for Outsourcing**
- Medical laboratory management
- Certain revenue cycle functions
- Health information technology support
- Imaging services, equipment management

Avoiding the Next Hiring Spree
Outsourcing Advantageous When Labor Demand is Time-Limited

Case in Brief: Augmedix
- Health care start-up company based in San Francisco, CA
- Developed a platform powered by Google Glass™ to streamline physician data entry, alert delivery, and electronic health record interactions at the point of care

Could Millennial Physicians Change Demand for Scribes?
- Of physicians in the US workforce are under 35
  - 15%
  - #1 "Technology use" the number one factor millennials use to define their generation

Decentralized Purchasing Running Up the Tab

Systems Lack Visibility into Total Purchased Services Spending

Current State of Purchased Services Contracting

- Decentralized purchasing control
- No established tracking system
- Inconsistent involvement of financial and service area experts
- >200 Categories of purchased services in hospitals
- ~90% Purchased services not formally sourced through hospital supply chain

Lack of Standardization Creates Major Spending Blind Spot at Sirius Health¹

Agency Labor Spending, 2016

Supply Chain Leaders' Spending Estimate: $40M
Actual Spending: $130M

Primary Reasons for Discrepancy:
- Decentralized oversight, local spending control at disparate sites
- Agency labor demand unreported to financial, supply chain leaders

¹) Pseudonym.

Decentralized Purchasing Running Up the Tab

Continued

Case in Brief: Sirius Health¹

- Large not-for-profit health system located in the Midwest
- Finance and supply chain leaders estimated agency labor spending to account for $40M, but analysis revealed spending was closer to $130M
- Discrepancy largely attributed to decentralized oversight of purchased services and underestimated demand for agency labor across the system

¹ Pseudonym.
Apply Traditional Supply Chain Practices

Securing Better and Lower Cost Purchased Services Contracts

Best Practices in Supply Chain Management Equally Applicable to Purchased Services

- **System-Level Contracting**
  - Contract negotiations conducted by system-level staff; where applicable, single contract established for entire system or region

- **Value Analysis Team Collaboration**
  - Key finance, supply chain, and clinical service area stakeholders make purchasing decisions and work together to optimize contract terms

- **Shared Data Infrastructure**
  - Both system- and local-level spending and utilization tracked in a shared system to enable transparency

- **Continuous Improvement**
  - Contracts consistently revisited to evaluate return on investment, product necessity

Source: Health Care Advisory Board interviews and analysis.
Realize System Advantage in Contract Negotiations

YNHHS\(^1\) Uses System Volumes to Negotiate Savings on Purchased Services Contracts

- Prior to cost-cutting initiative, purchased services contracted for at **local level**
- Analysis showed **suboptimal pricing** from contracting for same service, sometimes from same vendor, at multiple sites

<table>
<thead>
<tr>
<th>Local Contracts</th>
<th>System Contract</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior to cut</td>
<td>10% Savings</td>
</tr>
<tr>
<td>Analysis</td>
<td></td>
</tr>
<tr>
<td>suboptimal</td>
<td></td>
</tr>
<tr>
<td>pricing</td>
<td></td>
</tr>
<tr>
<td>contracting for</td>
<td></td>
</tr>
<tr>
<td>same service</td>
<td></td>
</tr>
<tr>
<td>sometimes</td>
<td></td>
</tr>
<tr>
<td>from same vendor</td>
<td></td>
</tr>
<tr>
<td>at multiple sites</td>
<td></td>
</tr>
</tbody>
</table>

**Case in Brief: Yale New Haven Health System**

- Five-hospital health system and academic multispecialty group practice based in New Haven, CT and affiliated with Yale University
- In 2013, Yale New Haven deployed a four-year value initiative to cut $125M in costs and reduce cost per case by 20%
- Achieved significant savings in purchased services by consolidating duplicative contracts at the system level; unlocked 10% average price reduction on each consolidated contract

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1) Yale New Haven Health System.
Confronting the Costs of Devolved Control

Navigating Tension Between Standardization and Frontline Consensus

Case in Brief: Brigham and Women’s Hospital

- 793-bed hospital located in Boston, MA; flagship teaching hospital of Brigham Health and founding member of Partners HealthCare
- Due largely to falling patient volumes, Brigham challenged with cutting $50M from operating expenses in 2017
- While struggling to meet medical supplies savings goal, hospital COO uncovered decision made by nurses not to use standard mattress pads used by the rest of the Partners system
- COO reverses decision, saving $400K per year

Brigham’s Supply Standardization Timeline

2014
Partners’ hospitals test mattress pads in effort to standardize around single product for volume discount

2014-2016
Brigham nurses make decision to continue using old pad; only hospital not to adopt new standard

2017
COO reverses nurses’ decision; Brigham switches to standard mattress pad contract resulting in $400K annualized savings

“People always like the one they’re used to. I don’t believe we knew we were the only outliers.”

Dorothy Bradley
Director for Nursing Simulation

Source: STAT, “Not even the mattress pads were spared: An inside look at a top hospital’s struggle to cut costs,” 2017; Health Care Advisory Board interviews and analysis.
Establishing Clear Protocols for Escalation

Rigel’s¹ Executive Involvement Accelerates Progress, Improves Results

**System-Level Steering Committee Sets PPI² Initiative Agenda**
- Overseen by two executives and led by three physicians
- Comprised of other supply chain, administrative, and clinical leaders
- Meet monthly to discuss PPI contracting initiatives identified by supply chain financial and quality analyses

**Executive Escalation Prevents Deadlock**
- Steering committee executives review decisions at impasse
- Can reverse recommendations against standardization or mandate accelerated timelines

**Value Analysis Teams Make Product Recommendations**
- Steering committee designates two physician leaders from relevant clinical areas to lead product tests and other PPI value-based analyses
- Where applicable, VATs³ make recommendations around product standardization and timeline

**Steering Committee Reviews Clinical Decisions**
- Product recommendations from VATs brought back to steering committee for approval, further discussion

Source: Health Care Advisory Board interviews and analysis.

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1) Pseudonym.
2) Physician preference items.
3) Value analysis teams.
Establishing Clear Protocols for Escalation

Continued

Case in Brief: Rigel Health System¹

- 10-hospital health system based in the Northeast
- In the middle of a major cost-cutting initiative which is set to cut over $500M from the system’s operating budget
- System will continue to reduce PPI spending through a dedicated governance structure and executive escalation pathway
- So far, achieved average annual savings of $6-8M

¹ Pseudonym.

Source: Health Care Advisory Board interviews and analysis.
Accelerate Product Standardization Initiatives

Balance Local Involvement with Executive Oversight

**Devices and Implants**
- Significant involvement from clinical leaders necessary to determine product mix
- Standardization may take longer, but decision-making escalation protocol critical due to size of spend
- E.g., orthopedic implants

**Surgical and Medical Supplies**
- Some input necessary from clinical experts
- Executive oversight should enable quick standardization timeline
- E.g., catheters, scalpels

**Commodities**
- Assuming same or better quality, lowest-cost items should be substituted with clinical leader awareness, but not consensus
- E.g., bed pads, gloves

Source: Health Care Advisory Board interviews and analysis.
No End in Sight

Pharmaceutical Costs Continue to Climb

Drug Costs Challenging System Margins

Over the next year, rising labor and pharmaceutical costs will continue to pressure the expense growth rate, and revenue growth will temper amid declining reimbursement from both private and governmental payors.

*Moody’s Investors Service*

More than 90% of hospitals report drug price increases have moderate or severe impact on their budgets.

Price Growth Largely Out of Provider Control

↑ 14.77%
Change in brand drug prices, 2015
- Market exclusivity
- FDA’s Office of Generics backlog
- Manufacturers’ refusal to share drug samples with generic drug manufacturers

↑ 9.21%
Change in specialty drug prices, 2015
- High cost
- May require special storage or handling
- Often limited distribution

↑ 2.93%
Change in generic drug prices, 2015
- Consolidation of generic manufacturers
- Raw materials shortages
- Manufacturing disruptions

Traditional Pharmacy Strategies Running Dry

After Focus on Price and Mix, Opportunity Remains in Utilization

Common Tactics for Drug Cost Containment

- Improved purchasing contracts
- Generic substitutions
- Formulary management
- Waste reduction
- Inventory control

$86.5B
National potential annual cost savings through improved drug use management across all care settings

Not all Pharmaceutical Utilization a Cost Center

- Most inpatient drugs reimbursed under the DRG payment
- Systems must carefully manage these costs to maintain profitability
- Reimbursement based on the price of the outpatient drug plus a percentage markup
- Increased spending correlated with increased revenues, typically an indication of healthy growth in pharmacy business

## Pinpointing the Factors Underlying Drug Spending

OhioHealth Quantifies Impact of Individual Drivers

### Projected Site-Level Drug Budget Inflation

<table>
<thead>
<tr>
<th>Site</th>
<th>Price</th>
<th>Formulary</th>
<th>Utilization</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8.0%</td>
<td>7.7%</td>
<td>1.8%</td>
<td>17.5%</td>
</tr>
<tr>
<td>2</td>
<td>8.0%</td>
<td>26.9%</td>
<td>-1.1%</td>
<td>33.8%</td>
</tr>
<tr>
<td>3</td>
<td>7.6%</td>
<td>0.0%</td>
<td>-0.6%</td>
<td>7.0%</td>
</tr>
<tr>
<td>4</td>
<td>7.5%</td>
<td>7.8%</td>
<td>16.7%</td>
<td>32.1%</td>
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</tbody>
</table>

Global increase in price of drug X adjusted for site-level product mix

Physicians at Site Two confirm intent to prescribe new-to-market drug

Acquisition of new neurology practice adds volume of high-cost drugs at Site Four

New prescribing protocol implemented at Site Two to substitute for lower-cost alternatives

2%

Budget variance with pharmacy-led long-range financial planning processes

Source: Health Care Advisory Board interviews and analysis.
Case in Brief: OhioHealth

- 10-hospital, not-for-profit health system headquartered in Columbus, OH; consists of 12 pharmacies, 65 clinics, and 11 infusion clinics across Central and Southeast Ohio
- VP of Pharmacy Services identified need to transform and take ownership of pharmacy long-range financial planning (LRFP) processes due to lack of pharmacy knowledge among budgeting team
- VP created a team to take on pharmacy LRFP processes; team includes VP of Pharmacy, System Pharmacy Business Director, Pharmacy Finance Manager, Procurement Manager, Supervisor for Oncology Pharmacists, financial analysts, Revenue Integrity Team Manager, and several administrative pharmacy residents
- Over the course of three consecutive budget cycles, the team made changes to the pharmacy LRFP process, improving their budget accuracy each year, and increasing their oversight of those processes
- In FY16, the team produced a budget that saw just 2% variance
Elevate Pharmacy’s Role in Utilization Management

Pharmacist-Led Value Analysis Team Key to Success

Polaris Health Center’s¹ Value Analysis Team

- Pharmacy-led team created in 2012 by Executive Director of Pharmacy
- Conducts more than 20 utilization management initiatives per year, focusing on quality and ensuring cost-effective use of drugs
- Generates an average of $2M per year through standardized process of identifying opportunities and developing new protocols

Benefits of Formalizing Team Initiatives

- Remain agile in reaction to unexpected price increases
- Establish pharmacy’s role in utilization management
- Create a forum for collaboration with physicians

1) Pseudonym.

Source: Health Care Advisory Board interviews and analysis.
Case in Brief: Polaris Health Center

- Academic medical center located in the South consisting of two hospitals, specialty and primary care clinics, and community pharmacies
- To improve care quality while ensuring cost-effective use of drugs, the Executive Director of Pharmacy created a pharmacy-led Value Analysis Team (VAT) in 2012; team was charged with critically assessing the value of each drug used in the health system in terms of safety, efficacy, uniqueness, reimbursement, and contribution to total cost of care
- The VAT oversees 16-24 initiatives per year, using strategies around formulary management, inventory management, and patient care improvement to enhance quality while reducing costs
- Four clinical pharmacists serve as Drug Policy Coordinators on the VAT, identifying, developing, and monitoring the impact of those initiatives over the course of a year
- The average annual cost savings produced through VAT initiatives is $2M; savings reached as much as $3.5M in some years

1) Pseudonym.
Introducing the Pharmacy Executive Forum

Develop Market-Leading Strategy

- **Executive briefings** on key pharmacy issues speed consensus building and facilitate decision-making
- **Insight into the C-suite perspective** through exposure to broader Advisory Board research
- **Networking conference calls** with small groups of pharmacy leaders to compare notes on hot topics and discuss common challenges
- **Confidential review** of your strategic plan by a Pharmacy Executive Forum expert provides an objective third-party perspective and new ideas

Implement Proven Best Practices

- **National meetings** led by Advisory Board faculty convene pharmacy leaders to discuss the latest strategic and operational research
- **Webconferences**—both live and recorded—facilitate your team’s access to our research and reinforce key lessons
- **Best practice publications** provide in-depth case studies from best-in-class health systems
- **Online resource libraries** aggregate sample documents from health systems across the country

Accelerate Implementation

- **Expert consultation** to gain an outside perspective, consider new ideas, and strategize for implementation
- **Resource mapping** to determine how Pharmacy Executive Forum resources can support your priorities
- **Benchmarks** on operational, financial, and clinical measures
- **Decision guides** help to develop and refine your strategy

For more information, contact:

**LINDSAY CONWAY**
Managing Director, Pharmacy Executive Forum
P 202.266.5845
ConwayL@advisory.com
advisory.com/PEF

Source: Health Care Advisory Board interviews and analysis.
Quantifying Savings from Best-in-Class Strategies

$125-$145M
Antares’s external spending cost avoidance mandate, 2017-2025

Applying Today’s Strategies to Antares

1. Strategic outsourcing of non-core functions ~$16M
2. System-level purchased services contracting ~$15M
3. Hardwired escalation policy for local supply selections ~$26M
4. Precise pharmaceutical utilization management ~$27M

~$84M Eight-year cumulative savings from four primary cost avoidance strategies

Highlighted Advisory Board Tactics for Additional Savings in External Spending

- Prevent unnecessary surgical supply waste
- Minimize PPI contract savings leakage
- Revisit unfavorable contract terms
- Contract directly for preference items
- Realize the potential of energy savings
- Revise blood utilization policies
- Dedicate a pharmacist to ED medication reconciliation

FOR MORE INFORMATION on these topics, see The Finance Leader’s Resource Guide at advisory.com

Source: Health Care Advisory Board interviews and analysis.
Best Practices for Rebasing External Spending

Capture Value Through Supply Purchasing
10 Strategies for Reducing Supply Costs and Engaging Stakeholders

Partnering with Physicians for Supply Chain Reform
Designing Physician Alignment Models to Achieve Meaningful Supply Cost Savings

Revisiting Supply Cost Strategies
A Disciplined Approach to Managing Your GPOs in Today's Cost Environment

Next-Generation Supply Cost Savings
Remaking Partnerships with Suppliers and Physicians to Achieve Sustainable Value

The Sustainable Acute Care Enterprise
Radically Restructuring Costs and Operations to Break Even on Medicare

Best Practices for Bending the Expense Growth Curve
Managing supply costs by working with physicians and vendors to reduce variation among preference items

Pharmacy System Strategy
Leveraging scale to increase efficiency, enhance quality, and improve the patient experience

Realizing the Potential of Energy Savings
Eight insights CFOs need to know about reducing energy costs

Source: Health Care Advisory Board interviews and analysis.
Key Takeaways

1. Capitalize on opportunities to compound savings by rebasing external spending at the outset

   Health systems can generate outsized savings in external spending by frontloading cost avoidance strategies that rebase spending and compound the effect over time. Achieving outsized cost avoidance in external spending translates to fewer necessary savings in labor. Further, investments in strategic outsourcing will help stabilize labor cost growth.

2. Reevaluate purchased services portfolio using consistent standards; apply same rigor to outsourcing decisions moving forward

   Health systems should not assume that they are receiving strategic value from currently outsourced functions, or that currently insourced services cannot be performed more efficiently and effectively by a third-party vendor. System executives should actively seek new opportunities to outsource non-core services when a vendor can deliver greater value.

3. Leverage existing supply chain management infrastructure to build a foundation for effective purchased services contracting

   Organizations should apply best practices from supply chain management to their process for contracting with third-party vendors. Involve all critical stakeholders in the contracting process and unlock the benefits of scale in volume pricing by negotiating at the system-level whenever possible.

4. Balance clinical consensus and speed-to-impact when standardizing supply mix

   The next wave of supply savings will come from standardizing mix around a limited set of high-value products. Clinical expertise is necessary to identify the right mix, but executive oversight will prevent consensus from becoming a rate-limiting factor.

5. Elevate the role of pharmacy experts in financial planning and utilization management to limit the impacts of drug price growth

   Health systems face ongoing drug price growth and are reaching the limits of traditional drug cost management tactics. Pharmacy experts should be an integral part of budgeting and utilization management efforts to support financial sustainability.

Source: Health Care Advisory Board interviews and analysis.
Cultivating the Cost-Effective Workforce

5. Scaled administrative roles and responsibilities
6. Top-of-license clinician role redesign
7. LOS-driven labor demand management
8. Selective service-line rationalization
Theory in Brief: William Baumol’s “Cost Disease”

- Productivity in labor-intensive service industries grows much more slowly than the overall economy
- Wages must grow with the overall economy to maintain talent
- This combination increases costs and reduces return on investment

“The number of players, the number of instruments, the amount of time it took to ‘produce’ a Mozart quartet in the 18th century will not have changed one whit two centuries later.”

Sen. Daniel Patrick Moynihan presenting Baumol’s work to the Senate Finance Committee

The Hiring Spree Continues

Labor Growth Projected to Increase

Job Growth in Health Care Compared to All Other Employment Sectors

2004-2014 and Projected 2014-2024

<table>
<thead>
<tr>
<th>Year</th>
<th>Non-health care</th>
<th>Health care</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004-2014</td>
<td>3.0%</td>
<td>20.3%</td>
</tr>
<tr>
<td>2014-2024</td>
<td>4.8%</td>
<td>21.8%</td>
</tr>
</tbody>
</table>

Growth of Physicians and Administrators¹, 1970-2013

Source: Diamond, D., “Obamacare, the secret jobs program,” Politico, July 13, 2016; US Department of Labor, Bureau of Labor Statistics, Employment Projections program: Table 1.9, 2014-24 Industry Occupation Matrix Data, by Industry; and Table 2.7, Employment and Output by Industry; Health Care Advisory Board interviews and analysis.

¹ Spans three occupational categories: management, non-financial administrative support, and financial administrative support.
Adding Fuel to the Fire

System-Level Inefficiencies Exacerbate Demand for Labor

Suboptimal Inpatient Occupancy Drives Inefficient Use of Labor

*Implications of Low Occupancy Rates*

- Clinicians treating fewer than optimal number of patients
- Redundant administrative staff, leadership to oversee services
- Increased pressure on volume-driven staffing systems to predict open beds

Unwarranted Length of Stay Increases Demand for Clinical Staff

*2016 Medicare ALOS¹ Data*

<table>
<thead>
<tr>
<th>Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.2</td>
</tr>
<tr>
<td>4.5</td>
</tr>
<tr>
<td>4.1</td>
</tr>
<tr>
<td>3.7</td>
</tr>
<tr>
<td>3.0</td>
</tr>
</tbody>
</table>

Average Inpatient Occupancy Rates, 2015

62% Average among all hospitals

---

¹ Average Length of Stay.
Reaching the Limits of Sustainability

65+ Layoff Events in First Half of 2017

Locations of Layoff Events

Source: Gooch, K., "72 Healthcare Layoffs so far in 2017, Becker's Hospital Review, July 18, 2017; Health Care Advisory Board interviews and analysis.
Addressing Antares’s Labor Expenses

Significant Yet Achievable Cost Avoidance

Labor Expenses at Antares

2017 and 2025 Projected (Absent Intervention)

2017 Status Quo

<table>
<thead>
<tr>
<th>Physician</th>
<th>Nursing</th>
<th>Other Clinical</th>
<th>Non-Clinical</th>
<th>Total Labor Expense: $485M</th>
</tr>
</thead>
<tbody>
<tr>
<td>68M</td>
<td>146M</td>
<td>155M</td>
<td>116M</td>
<td>Operating Margin: 3%</td>
</tr>
</tbody>
</table>

2025 Projected

<table>
<thead>
<tr>
<th>Physician</th>
<th>Nursing</th>
<th>Other Clinical</th>
<th>Non-Clinical</th>
<th>Total Labor Expense: $725M</th>
</tr>
</thead>
<tbody>
<tr>
<td>102M</td>
<td>218M</td>
<td>232M</td>
<td>173M</td>
<td>Operating Margin: -4.2%</td>
</tr>
</tbody>
</table>

Antares’s Necessary Labor Cost Avoidance to Achieve 3% Margin in 2025

$160-170M Cumulative eight-year labor cost avoidance

$20-22M Average per year labor cost avoidance

~22% Cost avoidance as a percent of projected labor expenses

Source: Health Care Advisory Board interviews and analysis.
Sizing Antares’s Labor Cost Avoidance Targets

Antares’s Labor Opportunity Assessment

- Non-Clinical: ~$84M
- Physicians and Other Clinical: ~$50M
- Nursing: ~$33M

Primary Cost Avoidance Levers

1. Selective service-line rationalization
2. LOS-driven labor demand management
3. Top-of-license clinician role redesign
4. Scaled administrative roles and responsibilities

Source: Health Care Advisory Board interviews and analysis.
5. Scaled administrative roles and responsibilities

So Far, Economies of Scale Beyond Our Reach

Bigger Has Not Meant Much Better in Revenue Cycle

Cost to Collect Not Correlated with Health System Net Patient Revenue

Holding Company Mentality Generates Fragmentation, Suboptimal Performance

As an organization, we suffer from an ongoing struggle of whether we are a holding company or an operating company. Some CFOs are operators, others are accountants. I'm a big believer that we need to start more actively operating at the corporate level.

Chief Financial Officer System with +$10B in Net Patient Revenue

1) Net patient revenue.

Achieving Scale in Administrative Functions

Three Components of the Scaled Administrative Infrastructure

1. Reduced Duplication
   - Eliminate redundancy in frontline and managerial roles and responsibilities

2. Balanced Span of Control
   - Establish standardized direct report ratios for all managerial positions

3. Value-Driven Integration
   - Harness benefits of colocation to improve business unit performance

Source: Health Care Advisory Board interviews and analysis.
Centralization Necessary But Insufficient

Traditional Efforts Not Yielding Scale

Centralization and Consolidation offer additional benefits and savings.

Centralization Savings Levers
- Reduced space expense
- Reduced utilities expense
- Eliminated role duplication
- Expanded span of control

Consolidation Savings Levers
- Reduced space expense
- Reduced utilities expense
- Eliminated role duplication
- Expanded span of control

Source: Health Care Advisory Board interviews and analysis.
Protect Engagement While Reducing Duplication

Castor¹ Pursues Alternatives to Mass Reductions in Force

Tried and True Strategies

Perform an open position audit evaluating business need for new hires

Benchmark business function productivity to establish savings targets

Identify duplication and develop strategy to eliminate redundant roles

Offer alternatives to layoffs including payouts, voluntary separation, retirement

Case in Brief: Castor Health¹

- Three-hospital system located in the South
- Benchmarked system-wide labor productivity and established four-year $100M savings target
- Removed more than 800 roles out of corporate overhead through voluntary separation, achieving $50M in savings

$50M
Savings achieved in first two years of consolidation

¹) Pseudonym.

Source: Health Care Advisory Board interviews and analysis.
Establish Thresholds for Managerial Span of Control

Too Many, Too Few Direct Reports Problematic

Case in Brief: Hadar Health System¹

- Nine-hospital system located in the Midwest
- Consolidated administrative functions in marketing, compliance, legal, revenue cycle, and care management
- Assessed span of control at corporate level to identify management-level duplication
- Established threshold of five to 20 direct reports for corporate administrators
- Achieved $20M in savings

¹ Pseudonym.
Re-scoping Leadership Roles at Antares

Quantifying Savings From 50\textsuperscript{th} to 75\textsuperscript{th} Percentile Improvement

Direct Reports (FTEs) per Hospital Non-Nursing Administrator

Antares Management Structure Before and After Improvement

**Executives**

<table>
<thead>
<tr>
<th>25th</th>
<th>50th</th>
<th>75th</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.8</td>
<td>3.6</td>
<td>6.1</td>
</tr>
</tbody>
</table>

**Directors**

<table>
<thead>
<tr>
<th>25th</th>
<th>50th</th>
<th>75th</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>1.4</td>
<td>2.3</td>
</tr>
</tbody>
</table>

**Non-Nursing Managers**

<table>
<thead>
<tr>
<th>25th</th>
<th>50th</th>
<th>75th</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>31</td>
<td>42</td>
</tr>
</tbody>
</table>

18 → 10  
84 → 51  
147 → 108

$1.77\text{M}$  
Immediate savings from improving executive span of control

$3.63\text{M}$  
Immediate savings from improving director span of control

$3.28\text{M}$  
Immediate savings from improving manager span of control

Source: Span of Control Benchmark Generator, HR Advancement Center; Health Care Advisory Board interviews and analysis.
Evolving from Consolidation to Integration

Striving to Make Revenue Cycle Integration More Than the Sum of its Parts

Revenue Cycle Consolidation Myths

- IT integration is always the answer
- Physical co-location is the pinnacle of integration
- Standardized workflows generate productivity gains

Level of Centralization Uncorrelated with Lower Cost to Collect

<table>
<thead>
<tr>
<th># of RCM Functions Centralized</th>
<th>Cost to Collect as Percent of Net Patient Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Keys to Effective Revenue Cycle Integration

1. Shared Reporting Structure
2. Shared Economies of Intellect
3. Shared Accountability

Still in Search of Top-of-License Care

Primary Principles for Achieving Top-of-License Clinical Care

1. Labor Substitution
   Elevating the role of advanced practitioners to ensure maximum physician productivity

2. Technology Enablement
   Leveraging technology to alleviate administrative burdens and eliminate physician time waste

Past Top-of-License Publications

- The Sustainable Acute Care Enterprise: Radically Restructuring Costs and Operations to Break Even on Medicare
- Five Steps to Build the Advanced Medical Home
- Re-engineering Practice Workflows: Alleviating the Growing Administrative Burden on the Practice of Medicine

Source: Health Care Advisory Board interviews and analysis.
Prioritize Physician Productivity Gains

Still Substantial Running Room to Manage Labor Cost Growth

**Physician Productivity**

2016 wRVU¹ Productivity per Primary Care FTE

<table>
<thead>
<tr>
<th>25th</th>
<th>50th</th>
<th>75th</th>
</tr>
</thead>
<tbody>
<tr>
<td>4,773</td>
<td>5,323</td>
<td>6,338</td>
</tr>
</tbody>
</table>

**Employment Remains Expensive**

$400K

Expected per physician losses at multi-specialty employed medical group²

**Trends Point to Continued Growth**

49% Increase in the number of hospital employed physicians, 2012-2015

“Physician compensation is like college tuition: We all realize the rising costs are not sustainable, but no one knows what to do…. Nobody else in our health system gets the year-over-year wage growth that our physicians do. But on the other hand, everything else that costs that much is bricks and mortar, and you can’t fill those beds without providers.”

*Medical Group CEO of an Eight-Hospital System*

---

¹ Work relative value unit.
² For a bottom quartile performing medical group with 150 or fewer physicians.

Source: Integrated Medical Group Benchmark Generator (2017), Medical group strategy council; Health Care Advisory Board interviews and analysis.
Physician Productivity Key to Slowing Cost Growth

Multiple Avenues for Reducing Physician Labor Expense

Cut Staffing Levels
Suboptimal considering potential loss in volumes and net patient revenue

Reduce Compensation
Infeasible considering competitive dynamics in most labor markets

Improve Productivity
Enable top of license to reduce need for new physician hires over time

To explore these topics in more depth, refer to:

Source: Health Care Advisory Board interviews and analysis.
Improving Clinician Labor-Cost Efficiency

Provider Skills Map to Care Type Not Problem Type

Classifying Primary Care Visits

Diagnostic

- Stomach pain
- Headache
- Weight loss
- Weight gain

Proposed Distribution: Care Type

- Sore throat
- UTI
- Diabetes
- Asthma

Protocol-Driven

Acute

Chronic

Typical Distribution: Problem Type

Physician Advantage

- Physicians trained in differential diagnosis
- Shorter visits help meet productivity expectations
- Average compensation: $235,592

Advanced Practitioner (AP) Advantage

- APs trained in patient education techniques
- Cost-effective to spend more time with patient
- Average compensation: $100,584

1) Urinary tract infection.
2) Average annual compensation for Internal Medicine MD.
3) Average annual compensation for Internal Medicine NP.

Source: Health Care Advisory Board interviews and analysis.
Elevating APs’ Prominence in the Practice

Protect Physician Capacity for Complex Cases

Reimagining the Physician Role with Team-Based Care

Physicians refer low-level cases to APs

APs perform all protocol-driven care

Physicians refer higher-acuity patients to physicians

Case in Brief: Sargas Health Systems

- 12-hospital system located in the Midwest
- Increasing advanced practitioner-to-physician ratio over time by backfilling physicians with advanced practitioners
- Expected savings of $4-5M per year

Expected savings from increasing AP:MD ratio and expanding AP scope of responsibilities

$4-5M

1) Pseudonym.

Source: Health Care Advisory Board interviews and analysis.
Long Term, Labor Substitution an Incomplete Solution

Rising Wages and Nursing Shortage Limit Benefits

Mean Annual Wages by Occupation

*Individuals Employed at General Medical and Surgical Hospitals, May 2016*

- **Physicians and Surgeons**: $176,720
- **Nurse practitioners**: $109,030
- **Physician assistants**: $103,570
- **Registered nurses**: $74,270

Nursing Shortage Only Projected to Worsen Across Next Decade

*The Atlantic*

**The U.S. Is Running Out of Nurses**

“The country has experienced nursing shortages for decades, but an aging population means the problem is about to get much worse.”

- **700K** Nurses expected to retire or leave the labor force by 2024
- **1.2M** Projected job openings due to growth and replacement needs, 2014-2024


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1) Anesthesiologists, family and general practitioners, Internists, Ob/Gyns, Pediatricians, Psychiatrists, Surgeons.
Numerous Opportunities Ahead in Technology-Enabled Role Redesign

**Mobile Diagnostics**
At home technology can diagnose specific conditions and monitor vitals

**Enhanced Self Care**
Mobile apps can monitor patient status, update care team, direct patient to appropriate care

**Data Analytics**
New emerging partnerships use machine learning to predict hospitalizations, and monitor patients

**Robotics**
Projected increase of 65% in the market for health care robots (e.g., surgical robots) by 2021

- **Mobile Diagnostics**
  - At home technology can diagnose specific conditions and monitor vitals

- **Enhanced Self Care**
  - Mobile apps can monitor patient status, update care team, direct patient to appropriate care

- **Data Analytics**
  - New emerging partnerships use machine learning to predict hospitalizations, and monitor patients

- **Robotics**
  - Projected increase of 65% in the market for health care robots (e.g., surgical robots) by 2021

**Note:**
- **(3%)**
  - Projected decrease in worldwide health care jobs from widespread use of telemedicine
- **36%**
  - Estimate of technical potential for automation in health care
- **$2B**
  - H1 2016 venture funding in digital health technologies

Source:

2) McKinsey cross-industry analysis.
Finding Technology Solutions for Administrative Tasks

Physicians Overburdened, Underproductive, and Burned Out

Allocation of Physician Time in Ambulatory Practice

- **Clinical patient-facing time**: 27%
- **Administrative and non-clinical time**: 73%

**Top Drivers of Non-Clinical Time**
- **38.5%**: EHR documentation and review
- **19.1%**: Administrative tasks related to insurance or billing

**Physician’s Current Role**
- **Practicing Below License**: Treating low-acuity patients better suited for AP-level care
- **Seeing Suboptimal Patient Volumes**: Overburdened with administrative tasks causing burnout, hindering productivity

**Physician’s Future Role**
- **Practicing at Top-of-License**: Using EHR to optimize workflows, generate acuity-driven care pathway
- **Treating Optimal Number of Patients**: Leveraging telemedicine to reduce travel time, treat higher volumes

Beyond Traditional Nursing Productivity Tactics

Balance Focus on Enhancing Supply with Decreasing Demand

Traditional Supply-Side Strategies
- ✔ Volume-driven staffing
- ✔ Top-of-license practice
- ✔ Minimum productivity standards

Emerging Demand-Side Focus
- Decrease demands on nurses by improving average length of stay in ICU and general med/surg beds

Leading Opportunities to Reduce Costs Through Care Variation Reduction (CVR)\(^1,2\)

LOS Reduction Accounts for Over One-Third of Total CVR Savings Opportunity

<table>
<thead>
<tr>
<th></th>
<th>ICU/CCU Length of Stay</th>
<th>Routine Bed Unit Length of Stay</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOS Reduction</td>
<td>20.7%</td>
<td>17.9%</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>16.5%</td>
<td>10.7%</td>
</tr>
<tr>
<td>Labs and Imaging</td>
<td>10.7%</td>
<td>8.9%</td>
</tr>
<tr>
<td>Medical and Surgical Supplies</td>
<td>17.9%</td>
<td></td>
</tr>
</tbody>
</table>

1) Based on Advisory Board analysis of hospitals in the Crimson Continuum of Care cohort in 2014, n=650.
2) As a percentage of total cost reduction opportunity for the cohort of 300-400 bed hospitals.

Clear Opportunities Within Our Own Organizations

Health Systems Experiencing Intra-System Variation

Capella¹ Facilities’ Knee Replacement ALOS

<table>
<thead>
<tr>
<th>Facility</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALOS</td>
<td>2.3</td>
<td>2.5</td>
<td>2.6</td>
<td>2.9</td>
<td>2.9</td>
<td>2.9</td>
<td>3.2</td>
<td>3.2</td>
<td>3.3</td>
<td>3.4</td>
<td>3.5</td>
</tr>
</tbody>
</table>

Cases

<table>
<thead>
<tr>
<th>Facility</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
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<td>121</td>
<td>151</td>
<td>229</td>
<td>124</td>
<td>17</td>
<td>260</td>
<td>516</td>
<td>22</td>
<td>31</td>
</tr>
</tbody>
</table>

System-Wide Avoidable Days if ALOS at all Capella¹ Facilities Matched Site B

Knee and hip replacement volume at given facility

×

ALOS difference between 25th percentile and given facility

=

Opportunity for facility (to calculate total system opportunity, sum opportunity for each facility)

Capella Facilities’ Hip Replacement ALOS

<table>
<thead>
<tr>
<th>Facility</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
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<td>3.2</td>
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<td>3.7</td>
<td>3.8</td>
<td>4.3</td>
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Cases

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<th>Facility</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
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<tbody>
<tr>
<td>Cases</td>
<td>311</td>
<td>133</td>
<td>176</td>
<td>70</td>
<td>84</td>
<td>185</td>
<td>56</td>
<td>153</td>
<td></td>
</tr>
</tbody>
</table>

1,168 days

Annual avoidable days ALOS if all facilities matched system’s own 25th percentile ALOS (563.7 from knees, 604.7 from hips)

Source: Health Care Advisory Board interviews and analysis.

1) Pseudonym.
Clear Opportunities Within Our Own Organizations

Continued

Case in Brief: Capella Health System

1) Pseudonym.

- 11-hospital system located in the Midwest
- Represents a typical volume and level of variability in multi-facility health systems analyzed by Advisory Board’s “Systemness” Model of Clinical Standardization Opportunity

Source: Health Care Advisory Board interviews and analysis.
Sizeable Savings for Antares from Top 10 MS-DRGs Alone

Length of Stay Improvement from 50th to 80th Percentile

2016 Top 10 Highest-Volume MS-DRGs

<table>
<thead>
<tr>
<th>MS-DRG</th>
<th>50th</th>
<th>80th</th>
<th>Change in ALOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>189- Pulmonary edema &amp; respiratory failure</td>
<td>4.20</td>
<td>3.36</td>
<td>0.84</td>
</tr>
<tr>
<td>190- Chronic obstructive pulmonary disease w mcc</td>
<td>4.18</td>
<td>3.37</td>
<td>0.81</td>
</tr>
<tr>
<td>193- Simple pneumonia &amp; pleurisy w mcc</td>
<td>4.88</td>
<td>3.97</td>
<td>0.90</td>
</tr>
<tr>
<td>194- Simple pneumonia &amp; pleurisy w cc</td>
<td>3.70</td>
<td>3.05</td>
<td>0.66</td>
</tr>
<tr>
<td>291- Heart failure &amp; shock w mcc</td>
<td>4.80</td>
<td>3.90</td>
<td>0.91</td>
</tr>
<tr>
<td>292- Heart failure &amp; shock w cc</td>
<td>3.79</td>
<td>3.14</td>
<td>0.66</td>
</tr>
<tr>
<td>392- Esophagitis, gastroent &amp; misc digest disorders w/o mcc</td>
<td>3.00</td>
<td>2.51</td>
<td>0.49</td>
</tr>
<tr>
<td>470- Major joint replacement or reattachment of lower extremity w/o mcc</td>
<td>2.94</td>
<td>2.36</td>
<td>0.58</td>
</tr>
<tr>
<td>871- Septicemia or severe sepsis w/o mv 96+ hours w mcc</td>
<td>5.41</td>
<td>4.46</td>
<td>0.95</td>
</tr>
<tr>
<td>872- Septicemia or severe sepsis w/o mv 96+ hours w/o mcc</td>
<td>4.10</td>
<td>3.43</td>
<td>0.67</td>
</tr>
</tbody>
</table>

37 Additional daily free beds due to ALOS improvement across 10 highest-volume MS-DRGs

21,900 Fewer nursing hours demanded per year for these 10 MS-DRGs

$5.8M Total potential nursing cost avoidance over eight years

Improving Performance to Industry Best Practice

Source: Health Care Advisory Board interviews and analysis.
Questioning Conventional Wisdom

“We’ve always had the mindset that all business is good business. But for the first time I’m seeing us talk about whether we really want to have this particular business in this location.”

Vice President, Finance
System with $1B+ Net Patient Revenue

“You have to ask, ‘Are we programmatically efficient? Do we need to offer everything everywhere?’”

Chief Financial Officer
System with $7B+ Net Patient Revenue
Confronting Difficult Decisions

Altair’s Adult Day Center Business Unsustainable in Current Market

Case in Brief: Altair Healthcare System
- One-hospital system based in the Northeast
- Adult Day Center experiencing low volumes, market competition
- System incurs losses for 15 years, no downstream revenue
- In process of selling operating license to avoid future $600,000 per year losses

Rationalization Checklist
- Steady volumes
- Few competitors
- Critical to mission
- Positive operating margin
- Downstream revenue

Source: Health Care Advisory Board interviews and analysis.
Fine Tuning the Clinical Service Portfolio

Geographic Proximity Enables Clinical Economies of Scale Post Acquisition

**YNHHS¹ Post-Acquisition Service Line Allocation**

<table>
<thead>
<tr>
<th>York Street</th>
<th>Both Campuses</th>
<th>Saint Raphael</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Major Trauma</td>
<td>• Behavioral Health</td>
<td>• Musculoskeletal Center</td>
</tr>
<tr>
<td>• Cardiac Surgery</td>
<td>• Emergency Services</td>
<td>• Low-risk, High Amenities Obstetrics</td>
</tr>
<tr>
<td>• Oncology</td>
<td>• General Medicine</td>
<td>• Specialty Geriatrics</td>
</tr>
<tr>
<td>• Transplant</td>
<td>• Heart &amp; Vascular</td>
<td>• Specialty GI Surgery</td>
</tr>
<tr>
<td>• High-risk Obstetrics</td>
<td>• Neurosciences</td>
<td>• Neurovascular</td>
</tr>
<tr>
<td>• Children’s Hospital</td>
<td>• Urology</td>
<td>• Medical Heart Failure</td>
</tr>
<tr>
<td>• Women’s Services</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Cost to acquire Hospital of Saint Raphael: **$160M**

One-time savings attributable to consolidation of clinical services, economies of scale: **$200M**

---

**Case in Brief: Yale New Haven Health System**

- Five-hospital health system and academic multispecialty group practice based in New Haven, CT and affiliated with Yale University
- Acquired Hospital of Saint Raphael located eight blocks away from main hospital campus
- Immediately consolidated trauma, cardiac surgery, and cancer care
- Consolidation led to 300 FTE decrease, including seven senior executives
- No adverse impact to community services offered

---

Essential Elements of Service Rationalization

Identifying Top Opportunities

- Low Margin
- Low Volume
- Low Growth
- High Capital

$10M
Average savings per consolidated service line

Applying a Principled Approach

- **Staff Transitions**
  - Responsibilities appropriately reassigned, transition tailored to retain highest quality staff members

- **Purposeful Planning**
  - System ensures that each goal of eliminating duplication corresponds with a deliberate action plan

- **Staged Timeline**
  - Process of eliminating duplication follows appropriate schedule, enabling timely execution of essential tasks

- **Physician Engagement**
  - Needs of clinical staff affected by transition addressed through transparent involvement of leadership

Study in Brief: The Hospital of the Future

Health Care Advisory Board research report on how to eliminate unnecessary duplication, right-size hospital capacity, and rethink acute care models

Source: Health Care Advisory Board interviews and analysis.
Quantifying Savings from Best-in-Class Strategies

$160-170M
Antares’s labor spend cost avoidance mandate, 2017-2025

Applying Today’s Strategies to Antares

5. Scaled administrative roles and responsibilities ~$55M

6. Top-of-license clinician role redesign ~$14M

7. LOS-driven labor demand management ~$10M

8. Selective service-line rationalization ~$30M

~$109M Eight-year cumulative savings from four primary cost avoidance strategies

Highlighted Advisory Board Tactics for Additional Savings in Labor Spending

• Make your employees accountable for their health costs
• Flex staffing to demand
• Build a value-driven staffing model
• Stop millennial turnover in the first three years of employment
• Tie employee compensation to enterprise-wide performance

FOR MORE INFORMATION on these topics, see The Finance Leader’s Resource Guide at advisory.com

Source: Health Care Advisory Board interviews and analysis.
Additional Advisory Board Resources

Best Practices and Tools for Avoiding Labor Cost Growth

Bending the Labor Cost Curve
Discover "next-generation" labor savings tactics that peer executives believe most warrant further investment of time and resources.

Medical Group Benchmark Generator
Explore benchmarks on medical group practice performance to accurately assess your performance relative to peers.

Realizing Full Value of the Care Team
Strategies for designing advanced practitioner clinical roles, strengthening physician-advanced practitioner collaboration, and managing the advanced practitioner cohort.

Achieving Top of License Nursing Practice
Explore 20 best practices for ensuring frontline nurses have the time and interprofessional support they need to practice to the full extent of their training and skills.

Span of Control Benchmark Generator
Explore the results from our national benchmarking survey on hospital span of control, where you can slice and dice the data to compare your organization's performance to your peers'.

Care Transformation Business Model
Outlines strategies for building an attractive network, adding covered lives, securing favorable contracts, and attaining strong long-term network performance.

Source: Health Care Advisory Board interviews and analysis.
# Key Takeaways

| 1 | Slow workforce growth by eliminating duplication, improving productivity, and ensuring the appropriate distribution of services across the system |
| 2 | Capture increased value from consolidation by moving from centralization to integration |
| 3 | Enable top-of-license practice to slow the rate of additional clinician employment over time |
| 4 | Balance traditional tactics that increase nurse productivity with new strategies designed to reduce the demand for nursing labor |
| 5 | Achieve clinical economies of scale through selective service-line rationalization |

Health systems should prioritize labor strategies that create structural changes and bend the cost curve rather than implement cyclical tactics, such as decreasing compensation or benefits. As health systems’ largest operating expense category, slowing the growth of labor will be critical to long-term system sustainability.

To date, physical colocation of non-clinical staff has been insufficient to achieve administrative economies of scale. As health systems continue to grow, they must evolve beyond basic centralization by eliminating duplication, improving span-of-control, and pursuing integration in business functions.

While health systems must strive to manage the investment in employed medical groups, efforts to reduce headcount or compensation will be ineffective. Organizations can achieve long-term physician cost avoidance by improving productivity through top-of-license role redesign and using technology to make workflows more efficient.

Health systems have typically focused on supply-side solutions to improve nurse productivity. Given labor market forces, organizations should also reduce the demand for nurse labor within a given episode of care by improving length-of-stay.

Health systems should evaluate their clinical service portfolios to determine the most appropriate distribution of services across the system. Rationalizing sub-scale service lines will allow organizations to more accurately map labor to volumes.

Source: Health Care Advisory Board interviews and analysis.
1. Unpacking the Margin Management Challenge

2. Meeting the New Cost Mandate

3. Positioning for Long-Term Success
The New Cost Mandate

Eight Strategies to Contain Future Cost Growth

1. Strategic outsourcing of non-core functions
2. System-level purchased services contracting
3. Hardwired escalation policy for local supply selections
4. Precise pharmaceutical utilization management

5. Scaled administrative roles and responsibilities
6. Top-of-license clinician role redesign
7. LOS-driven labor demand management
8. Selective service-line rationalization

Source: Health Care Advisory Board interviews and analysis.
Systemness Not Optional

Unlocking an Array of Cost Advantages

Source: Health Care Advisory Board interviews and analysis.
Achieving High Reliability Enterprise-Wide

Advisory Board Framework for Minimizing Care Variation at Scale

- High Reliability Compact
- Prioritize
- Measure
- (Re)Design
- Embed

Culture

Flywheel

Foundation

- Actionable Clinical Analytics
- Frontline Clinician Engagement
- Implementation-Oriented Clinical Governance
- Effective Supply Chain Management

Source: Health Care Advisory Board interviews and analysis.
# Rebuilding the Delivery System

## New Economics Necessitate a New Footprint

### A Bleak Outlook for MSBI\(^1\) Hospital

- **50%**
  - Portion of hospital’s beds occupied each day

- **$250M**
  - Sustained losses over the past three years

- **$1.3B**
  - Investment needed to renovate hospital as is

### Downsizing Inpatient Capacity

- New, smaller hospital will be located two blocks from current hospital

- System will have 220 beds, down from 799 beds
  - 150 behavioral health beds at 16\(^{th}\) St. campus
  - 70 beds at new 14\(^{th}\) St. hospital

### Expanding Ambulatory Network

- **Urgent Care Center**
- **Behavioral Health Institute**
- **Respiratory Institute**
- **Women’s Cancer Center**
- **Disease Management**
- **Hospital at Home Program**

---

1) Mount Sinai Beth Israel.

Source: “The Transformation of Mount Sinai Beth Israel,” Mount Sinai; Health Care Advisory Board interviews and analysis.
Rebuilding the Delivery System

Continued

Case in Brief: Mount Sinai Health System

- Seven-hospital system in the New York metropolitan area
- Announced $500M plan to downsize MSBI1 Hospital, expand ambulatory network
- New, smaller hospital will be located two blocks from current hospital; system will have 220 beds, down from 799 beds
- Ambulatory expansion of Mount Sinai Downtown Union Square includes new Urgent Care Center, renovations to current facilities, and new service offerings including endoscopy, disease management, Respiratory Institute, and enhanced procedural capabilities
- Plan to create New Comprehensive Behavioral Health Institute to serve downtown Manhattan area
- Opening new Women’s Cancer Center at Mount Sinai Downtown Chelsea Center
- Will be New York’s largest freestanding care center at 275,000 square feet
- A Mobile Acute Care Team will provide home-based, essential acute care services for the Hospital at Home Program

1) Mount Sinai Beth Israel.

Source: Mount Sinai, “The Transformation of Mount Sinai Beth Israel”; Health Care Advisory Board interviews and analysis.
Cost Control at the Core

Delivery System Transformation Central to Future Success

- **Rebuild Health System**: High Value, Low Potential
  - Unsustainable fixed costs
  - Insufficient scale, market relevance
  - Unrealized system advantages

- **Transform Care Delivery Model**: High Value, High Potential
  - Continued site-of-care shifts
  - Greater total cost of care accountability

- **Reduce Cost of Operations**: Low Value, Low Potential
  - Outsized pharma cost growth
  - Rapid workforce growth

Source: Health Care Advisory Board interviews and analysis.
Beyond Meaningful Use

Capturing Clinical and Financial Returns on Major Investments in Enterprise IT Systems
1. The Digital Health System Defined

2. Five Foundational Lessons for Realizing IT Value

3. Leveraging IT to Achieve Specific Strategic Aims

4. Four Leadership Imperatives
Digital health systems take full advantage of digital technologies and IT-related capabilities to redefine business models; rethink processes, quality, and cost structures; and identify and address customer or patient needs.
On the Edge of a Technological Revolution

IT Capabilities Now Evolving at an Exponential Rate

Moore’s Law Generalized

Many experts believe we are at the “knee of the curve”

(Deceptive Exponential Growth)

Disruptive stress or opportunity

Computer power and capacity

Networks and sensors (IoT)

Artificial intelligence (AI)

Robotics and drones

3D printing

VR and AR

Material sciences

Synthetic biology

1) Internet of things.
2) Three dimensional.
3) Virtual reality.
4) Augmented reality.

Source: Diamandis P, “Innovation and Disruption on the Road to Healthcare Abundance,” CHIME Presentation, October 2014; Health Care IT Advisor research and analysis.
Exponentiality Lowers Expense of Yesterday’s IT

Boom Boxes, E-Readers, and More, All for the Price of Your Smart Phone

**Functionality**
- Camera
- Video camera
- Video conferencing
- Game player
- Virtual assistant
- Book reader
- GPS navigation and maps
- Music player
- Guitar tuner
- Calculator
- Computer
- Sensors
- And more…
- And, oh yes, a phone

So Why Are We Spending So Much on IT Now?

Unit Costs of Computing Plummeting While Overall Costs Rise

If technology is cheaper, why are we spending more?

Hardware costs are rapidly declining. Other IT-related costs (e.g., software, personnel, networks) are increasing due to:

- **Scope**—from departmental to enterprise to extended enterprise; from systems of record to systems of record, insight, and engagement
- **Scale**—few to many; internal (“users”) to external (e.g., customers and partners)
- **Complexity**—standalone to networked to interoperable and redundant
- **Need**—systems that are accessible, available, reliable, usable, and secure

Source: Health Care IT Advisor research and analysis.
Not Yet Capturing the Value of Increased Digitization

Health Care Lags in Collection, Use of Data

Two Components to Effective Digitization

1. Digitize information about the thing you want to manage

   Data captured: 500 GB per 6 hour flight

2. Digitize processes associated with thing you want to manage

   - Manufacturing
   - Ticketing
   - Air traffic control
   - Baggage handling
   - Maintenance

   Data captured: 0.1 GB per year on average

Source: Health Care IT Advisor research and analysis.
Start-Ups Making Effort to “Digitize the Patient”

Health Nucleus Provides “Personal Health Insights”

High-Definition Brain and Body MRI¹
Advanced imaging scan can detect signals of some early-stage cancers, cardiovascular disease, neuro-degeneration, and neurovascular disease.

Whole Genome Sequence Analysis
Provides insights into your genomic risks for many health conditions and personalized information about impact of different medications.

CT² Scan
Measures calcified plaque in arterial walls to provide insights into risk for coronary artery disease.

Cardiac Rhythm Monitoring
Continuously monitors heart’s rhythm over a two-week period using a wireless patch.

Core Laboratory Blood Testing
Measures key risk markers for cardiovascular and metabolic diseases, as well as organ function.

“Health Nucleus combines cutting-edge technologies to provide you and your physician with personal health insights for early detection, disease prevention and empowering you for a life better lived.”


¹ Magnetic resonance imaging.
² Computed tomography.
Ultimately Necessary for Health Care Transformation

Data and Analytics a Pre-Requisite for Precision Medicine, Pop Health

“Medical thinking has become vastly more complex....The complexity of medicine now exceeds the capacity of the human mind.”

“Only 8% of the data we need for precision medicine and population health resides in today’s EHRs.”


Source: Health Care IT Advisor research and analysis.
Digital Health Funding Continues at a Record Pace

Investments Another Indication of a Maturing Market

Digital Health Funding Snapshot: 2010–2017 YTD

“Substantial amounts of funding continue to pour into digital health. Deal sizes continue to grow as the industry matures. [StartUp Health] expects this trend to continue and see more $100M+ raises as industry leaders find their way into mass market opportunities.”

# Investments Moving Beyond Basic EHRs

Focus: Consumers, Workflow, Analytics, Wellness, Personalized Health

## Market Maturity by Investment Activity—2017 YTD

<table>
<thead>
<tr>
<th>Category</th>
<th>Seed</th>
<th>Series A</th>
<th>Series B</th>
<th>Series C</th>
<th>Series D-H</th>
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<tbody>
<tr>
<td>Patient/Consumer Experience</td>
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<td>8</td>
<td>8</td>
<td>5</td>
<td>3</td>
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<td>Workflow</td>
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<td>12</td>
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<td>2</td>
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<tr>
<td>Big Data/Analytics</td>
<td>8</td>
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<td>3</td>
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<td>Wellness</td>
<td>6</td>
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<tr>
<td>Personalized Health/Quantified-Self</td>
<td>4</td>
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<td>5</td>
<td>2</td>
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<td>Research</td>
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<td>3</td>
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<td>0</td>
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<td>E-Commerce</td>
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<td>1</td>
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<td>1</td>
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<td>Education/Training</td>
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<td>1</td>
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<td>0</td>
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<tr>
<td>EHR</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Some Health Systems Also Playing the Game

Organizations Partnering with Venture Capitalists on Digital Investments

Techstars-Cedars Accelerator
Ascension Ventures
Center for Personalized Health

Summation Health Ventures
Providence Ventures
Partners HealthCare Innovation

Dignity Health.

“Run, Run, Jump” Innovation Program

Kaiser Permanente Ventures

“We have the data in usable, annotated forms, and the ability to validate apps that claim to make a difference in the system.”

Dr. Michael Blum, Director, Center for Digital Health Innovation, UCSF

Market Evolution May Force You to Disrupt Too

As Customer Desires Change, More Than “Sustaining” Innovation Needed

Can We Undermine Our Legacy Business?

“Incumbent companies do need to respond to disruption if it’s occurring, but they should not overreact by dismantling a still-profitable business. Instead, they should continue to strengthen relationships with core customers by investing in sustaining innovations.”

Clay Christensen
Harvard Business Review, December 2015

“Sustaining” Innovations

- Physician practice acquisition
- Freestanding emergency departments
- Partnerships for pricing leverage

“Disruptive” Innovations

- Retail, urgent care footprint
- Telemedicine, remote diagnosis and treatment
- Provider-sponsored health plan

Some Organizations Going Big on Disruptive IT

At Providence St. Joseph, a Goal to Innovate at Scale

Five Key Components

A Unified Mission
The goal is to democratize health care and make it accessible to everyone on their terms. PSJH’s Digital and Innovation team is focused on discovering important digital innovations, demonstrating they work, and bringing them to scale across the organization.

The Right People and Team
The right mix of business/clinical and technical; health care and consumer industry expertise

Innovating at the Ends of the Industry Value Chain
Innovating on what delivers value directly to consumers / patients and providers

Innovating on What Won't Change
The ultimate aim of health care is achieving the quadruple aim—improving the health of populations, improving patient and provider experience, and reducing health care spending. Innovation at scale is one way to work toward this aim.

Going Digital with Our Customers
Driving innovation at scale means going digital—having customers engage and transact online with us.
Key Takeaways

We are witnessing three major concurrent changes
1. Health care is transforming
2. Technology is improving exponentially
3. The focus of IT is expanding beyond automation to digitization, transformation, and innovation

Digitization requires capturing more information about patients and leveraging that information to better manage care processes

The digital health market is growing and maturing; while many market entrants are new, some progressive health systems are also investing in digital innovation

Digital health systems recognize that the needs of their customer base are changing and embrace IT-enabled disruption to transform service delivery

“Typically with any technology, version 1.0 is speeding up or making efficient the current way of doing things, and version 2.0 is changing the way things are done (e.g., business models). Unfortunately, you have to go through 1.0 to get to 2.0.”

Aaron Martin, Chief Digital Officer
Providence St. Joseph Health

Source: Health Care IT Advisor research and analysis.
1. The Digital Health System Defined

2. Five Foundational Lessons for Realizing IT Value

3. Leveraging IT to Achieve Specific Strategic Aims

4. Four Leadership Imperatives
Five Foundational Lessons for Realizing IT Value

1. **You may have to invest more to realize value from IT-related activities**

2. **IT governance is the most highly correlated predictor of value generation**

3. **System optimization requires more than just surface-level technical upgrades**

4. **Some IT initiatives may require a faster, more “agile” implementation process**

5. **Cybersecurity is not just an IT issue**

Source: Health Care IT Advisor research and analysis.
1. You may have to invest more to realize value from IT-related activities

The IT Value Equation

More Spending May Be Required in Shift from Automation to Digitization

Digitization, optimization, interoperability, focus on IT-powered strategy enablement and innovation at scale

“History has repeatedly shown that arguing against technology is a losing proposition.”
Dr. Michael Blum, Director, Center for Digital Health Innovation, UCSF

Benefits

Automation, point solutions justified by ROI

Centralization, standardization to reduce IT spending growth rate

Enterprise apps and analytics, focus on operational excellence

Costs (and Time)

Complexity created by multiple point solutions

(Break-even or Value Point)
Most Health Systems Spend Far Less Than in Other Industries

Health Systems’ IT-related Operating Budget as Percent of Overall Operating Budget

n=29; 2017 Health Care IT Advisor Spending Survey

By contrast, leading digital health systems spend closer to 7%...and financial services organizations spend 8-10% on average.

Other surveys also show 3-4% to be the norm for provider organizations.

Source: Health Care IT Advisor research and analysis.
2. IT governance is the most highly correlated predictor of value generation

**ROI Unlikely Without Effective Oversight**

In theory, governance is the mechanism for achieving alignment on:
- Where the organization is today
- Where it’s going
- What it needs to do
- How to allocate resources
- How to monitor and measure performance, progress, and compliance

“IT governance is the most highly correlated predictor of generating value.”

*Peter Weill and Jeanne W. Ross*

*IT Governance: How Top Performers Manage IT Decision Rights for Superior Results*

Many Systems Falling Short on IT Governance

CIOs Overwhelmed, Cut Off from Larger Corporate Strategy Discussions

**Overwhelming Workloads**
- Endless requests
- Countless tradeoffs
- Rampant juggling
- Lost productivity

**Planning Siloes**
- IT governance separate from corporate planning
- Difficulty coordinating work across departments

**Priorities over Accountabilities**
- Priority discussion dominates meeting time
- Little focus on outcomes

**Misplaced Accountabilities**
- Accountability for success defaults to IT
- Project sponsors offload ownership to IT

**Wrong Yardstick**
- Success measured solely by on-time, on-budget
- Lack of outcome success measures

**Influence Driven Decision-Making**
- Political clout determines outcome
- Flawed analysis to justify decisions

Source: Health Care IT Advisor research and analysis.
Preventing Us from Making Progress on IT Maturity

Technical Challenges Not at the Top of the CIO’s List

Top Challenges for Implementing Envisioned Business Intelligence Environment

- **49%** Cultural Transformation
  - Inverse correlation between transformation challenges and the presence of a strategic plan for business intelligence

- **45%** Data Governance Challenges
  - Institutions with less business intelligence maturity are more likely to have data governance as the #1 challenge

- **37%** Competing More Urgent Priorities
  - Workload prioritization is more often noted as a “top three” challenge

- **37%** Staff Capabilities and Skill Sets
  - Up from 24% in 2013, finding staff with the right skill sets is increasingly becoming a concern

Source: Health Care IT Advisor 2015 BI survey; Health Care IT Advisor research and analysis.
Engage Non-IT Leaders in IT Oversight

Sample (Simplified) IT Governance Structure

Executive IT Steering Committee
- System CEO – Chair
- System President
- System CFO
- Chief Medical Officer
- Chief Information Officer

IT Clinical Steering Committee
- Chief Medical Officer – Chair
- Chief Nursing Officer
- VP Professional Services
- VP Ambulatory Services
- Director – Clinical Informatics
- Director – Ambulatory Services
- Director – Revenue Cycle
- IT Director – Clinical Systems

IT Revenue Cycle Steering Committee
- CFO – Chair
- Director Revenue Cycle
- Director Clinical Informatics
- Director Registration
- Director Billing/HR
- Director HIM
- Director Ambulatory Services
- IT Director – Financial Systems

IT Financial / HR Steering Committee
- CFO – Chair
- VP Human Relations
- Director – Finance
- Director – HR
- Director – Material Management
- IT Director – Financial Systems
- Sr. System Analyst

Source: Health Care IT Advisor research and analysis.
Redefining Our Goals for EMR Optimization

Strategic Value Comes from Leveraging EMR to Meet Key Outcomes

3. System optimization requires more than just surface-level technical upgrades

Emergency Fixes
Address issues affecting patient safety, data flows that interrupt daily operations, functionality or processes that impact the revenue cycle, etc.

Technical/Process Enhancements
Add or improve technical capabilities and/or processes that were missing, incomplete, or incorrectly designed, built or implemented for the original go-live

Ongoing Optimization
Integrate the EMR into long-term, enterprise-wide process and outcome improvement efforts to support strategic organizational goals.

Source: Health Care IT Advisor research and analysis.
Tracking Clinical Outcomes, Not IT-Related Metrics

True Optimization Focused on Whether EMR Helps Improve Care

Sample “Monthly Operating Report” for Benefits Tracking

<table>
<thead>
<tr>
<th>Benefit Category</th>
<th>Base</th>
<th>Target</th>
<th>Jan 09</th>
<th>Feb 09</th>
<th>Mar 09</th>
<th>Apr 09</th>
<th>May 09</th>
<th>Jun 09</th>
</tr>
</thead>
<tbody>
<tr>
<td>% fall interventions charted</td>
<td>76.5%</td>
<td>95%</td>
<td>79</td>
<td>81</td>
<td>80</td>
<td>84</td>
<td>87</td>
<td>85</td>
</tr>
<tr>
<td>Pt falls per 1000 pt days</td>
<td>3.6</td>
<td>2.0</td>
<td>3.5</td>
<td>3.5</td>
<td>3.1</td>
<td>2.9</td>
<td>2.7</td>
<td>2.9</td>
</tr>
<tr>
<td>ADE incidence rate (%)</td>
<td>26.5</td>
<td>20.0</td>
<td>27</td>
<td>25</td>
<td>29</td>
<td>23</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td># of top 10 OS implemented</td>
<td>5</td>
<td>10</td>
<td>8</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
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<tr>
<td>% top 10 order sets used</td>
<td>35.9%</td>
<td>75.0</td>
<td>37</td>
<td>43</td>
<td>50</td>
<td>56</td>
<td>60</td>
<td>65</td>
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<tr>
<td>Cost/case, top 10 DRGs</td>
<td>$4,500</td>
<td>$3,700</td>
<td>$4,460</td>
<td>$4,250</td>
<td>$4,100</td>
<td>$4,043</td>
<td>$3,987</td>
<td>$3,924</td>
</tr>
</tbody>
</table>

Order Set Use and Costs

Top 10 U.S. DRGs

"If you don't know how what you're doing in IT is going to benefit the business, if you can't even verbalize the connection in the investment in IT and a benefit to the business, then why are you doing it at all?"

Stuart McGuigan, CIO, CVS Caremark (CVS)
Different Types of Systems, Different Approaches

“Two-Speed IT” Uses Both Agile and Waterfall Approaches

- **Systems of Record** (e.g. EMRs, ERP\(^1\), RCM\(^2\)) typically use traditional methodologies for initial implementation.

- **Systems of Insight** (e.g. data marts and data warehouses) are well-suited for agile after initial implementation.

- **Systems of Engagement** (e.g. customer-facing systems for access or bill paying) typically use agile methodology.

---

1) Enterprise resource planning.  
2) Revenue cycle management.

Source: Health Care IT Advisor research and analysis.
## Agile and Waterfall Compared

### All Leading Innovators Report Using Agile at Some Level

<table>
<thead>
<tr>
<th></th>
<th>Agile</th>
<th>Waterfall</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Customer Interaction</strong></td>
<td>Frequent</td>
<td>Infrequent; major milestones</td>
</tr>
<tr>
<td><strong>Product Delivery</strong></td>
<td>Start with MVP(^1), then iterative and frequent</td>
<td>“All or nothing”</td>
</tr>
<tr>
<td><strong>Teams</strong></td>
<td>Smaller, dedicated, cross-functional</td>
<td>Specialists (e.g. coders or testers) involved when needed</td>
</tr>
<tr>
<td><strong>Funding</strong></td>
<td>Incremental, venture capital-like approach</td>
<td>Fixed amount for entire initiative</td>
</tr>
<tr>
<td><strong>Scope or Functionality Changes</strong></td>
<td>Inexpensive, frequent based on customer feedback</td>
<td>Expensive, major effort required</td>
</tr>
<tr>
<td><strong>Uses</strong></td>
<td>Frequently combined with Lean, Six Sigma; innovation initiatives where time-to-value is important</td>
<td>Best for systems of fixed scope and known requirements, quality more important than speed</td>
</tr>
</tbody>
</table>

\(^1\) Minimum Viable Product.

Source: Health Care IT Advisor research and analysis.
All Executives Must Be Engaged in Security

"The time has come for CEOs and Boards to take personal responsibility for improving their companies’ cybersecurity. Global payment systems, private customer data, critical control systems, and core intellectual property are all at risk today. As cyber criminals step up their game, government regulators get more involved, litigators and courts wade in deeper, and the public learns more about cyber risks, corporate leaders will have to step up accordingly."

Sameer Bhalotra
Former White House Senior Director for Cybersecurity
Providers an Attractive Target for Cyber Criminals

Understand Why You Are Targeted to Identify Areas for Improvement

<table>
<thead>
<tr>
<th>Complex IT Systems with Marketable Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Multiple databases and interactions between vendors, partners, and affiliates</td>
</tr>
<tr>
<td>• Hundreds of medical devices</td>
</tr>
<tr>
<td>• Valuable data for sale including protected health information (PHI), financial, and clinical data</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lack of Robust Security Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Lack of data encryption</td>
</tr>
<tr>
<td>• Fragmented identity management and access control</td>
</tr>
<tr>
<td>• Under investment in monitoring resources</td>
</tr>
<tr>
<td>• Weak disaster recovery and business continuity</td>
</tr>
<tr>
<td>• Lack of threat intelligence</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Under-Engaged, Under-Involved Leadership</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Senior leaders often not knowledgeable about threats or about their roles in reducing risk</td>
</tr>
<tr>
<td>• Poor incident response preparedness</td>
</tr>
<tr>
<td>• No clear understanding of who makes decisions during an incident</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reactive vs. Proactive Culture</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Culture of openness and helpfulness; staff motivated to help others; often naïve about potential threats</td>
</tr>
<tr>
<td>• High-pressure work environments can result in low tolerance for preventive measures that lower risk at the expense of slowing operations</td>
</tr>
</tbody>
</table>

Source: Health Care IT Advisor research and analysis.
Resiliency Requires More Than Technical Tools

Multiple Domains Needed to Create a Cyber-Secure Ecosystem

**Governance and Policy**
- C-Suite and Board Engagement
- Dashboards
- Governance Standards
- Strategy
- Digital Trading Partners
- Staffing

**Cyber Resilient Organizations**

**Process and Education**
- Training
- Testing
- Incident Response Planning
- Audits
- Business Continuity Planning + Back-ups + Disaster Recovery
- Risk Assessments

**Technology and Services**
- Cyber Intelligence
- IT-Enabled Capabilities
- Cyber Insurance
- Information Sharing

Source: Health Care IT Advisor research and analysis.
# Putting It All Together

Summarizing the “Do’s and Don’ts” for Generating IT Value

<table>
<thead>
<tr>
<th></th>
<th>Do</th>
<th>Don’t</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Investment</strong></td>
<td>✓ Recognize more spending may be required to navigate the transition from automation to digitization</td>
<td>✗ Assume that implementing basic “systems of record” or “systems of insight” alone will yield value</td>
</tr>
<tr>
<td><strong>Governance</strong></td>
<td>✓ Be “business-led and IT powered”—engage non-technical leaders in oversight</td>
<td>✗ Evaluate IT initiatives just by time or budget, rather than impact on corporate strategy</td>
</tr>
<tr>
<td><strong>Optimization</strong></td>
<td>✓ Optimize EMRs based on their ability to achieve strategic goals</td>
<td>✗ Treat the EMR as an end unto itself</td>
</tr>
<tr>
<td><strong>Development</strong></td>
<td>✓ Use “two-tier” IT, deploying both agile and traditional methods as appropriate</td>
<td>✗ Underestimate the role of business and clinical experts on the team</td>
</tr>
<tr>
<td><strong>Cybersecurity</strong></td>
<td>✓ Recognize that cybersecurity is more than an IT issue</td>
<td>✗ Delegate corporate or personal responsibility</td>
</tr>
</tbody>
</table>

Source: Health Care IT Advisor research and analysis.
1. The Digital Health System Defined

2. Five Foundational Lessons for Realizing IT Value

3. Leveraging IT to Achieve Specific Strategic Aims

4. Four Leadership Imperatives
Our Leadership Challenge

Using IT to Meet Goals for Costs, Care Transformation, and Systemness

Time

Value Potential

Low

Near-Term

High

Long-Term

Reduce Cost of Operations

- Outsized pharma cost growth
- Rapid workforce growth

Transform Care Delivery Model

- Continued site-of-care shifts
- Greater total cost of care accountability

Rebuild Delivery System

- Unsustainable fixed costs
- Unrealized system advantages

Source: Health Care IT Advisor research and analysis.
Freeing IT Labor Time Through Use of Agile

Lower Maintenance Burden Means More Opportunity for Innovation

### IT Labor

<table>
<thead>
<tr>
<th>Before Agile</th>
<th>After Agile</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT labor available for projects</td>
<td>IT labor available for projects</td>
</tr>
<tr>
<td>IT labor needed to keep things running</td>
<td>IT labor needed to keep things running</td>
</tr>
</tbody>
</table>

#### Representative Results from Shift to Agile

**Applications Support:**
- Backlogs reduced by up to 80%
- Double the number of projects completed

**IT Operations**
- 60% more work orders completed
- Problem reports reduced by 50%
- Unplanned outages reduced by 50%

**Staff Satisfaction**
- User and IT staff satisfaction increased

Source: Health Care IT Advisor research and analysis.
Using EMR to Realize System-Wide Cost Savings

EMR Arrival at St. Elegius\(^1\) Yields Millions from Process Redesign

### Processes Redesigned
- Arrival Management
- Bed Management
- Case Management
- Charge Capture
- Claims Processing
- Clinical Communications
- Disease Management
- Emergency Department
- Home Health
- MD Processes
- Medical Records
- Meds Management
- Monitoring/Recording
- Order Sets
- Patient Care Transformation
- Patient/Member Satisfaction
- Physician Practice
- Scheduling

### EMR Benefit Targets

<table>
<thead>
<tr>
<th>eCare Benefit Category</th>
<th>Annual Benefit ($mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved Nursing Efficiency</td>
<td>$4.9</td>
</tr>
<tr>
<td>Reduced IT Maintenance</td>
<td>$3.6</td>
</tr>
<tr>
<td>Reduced Medical Records/Transcription</td>
<td>$3.6</td>
</tr>
<tr>
<td>Increased Outpatient Services</td>
<td>$4.8</td>
</tr>
<tr>
<td>Reduced Length of Stay</td>
<td>$3.8</td>
</tr>
<tr>
<td>Improved Pharmacy Process/ADEs(^2)</td>
<td>$3.0</td>
</tr>
<tr>
<td>Reduced Paper/Storage</td>
<td>$2.7</td>
</tr>
<tr>
<td>Other Hospital Improvements</td>
<td>$3.6</td>
</tr>
<tr>
<td>Home Health</td>
<td>$1.8</td>
</tr>
<tr>
<td>System Health Plan</td>
<td>$2.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$35.5</strong></td>
</tr>
</tbody>
</table>

1) Pseudonym. 
2) Adverse drug events.

---

Source: Health Care IT Advisor research and analysis.
A Powerful Mechanism to Reduce Variation

Clinical Decision Support Tools Extend Far Beyond Alerts

$20-30M

Conservative estimate of actionable care variation margin improvement opportunity per $1 billion in revenue for the typical health system⁷

1) Calculation of savings opportunity relative to revenue performed using Advisory Board Crimson Continuum of Care data from over 1,000 hospitals that account for over 35% of inpatient admissions.
2) Clinical decision support.

Source: Office of the National Coordinator for Health IT (ONC) www.healthit.gov; Health Care IT Advisor research and analysis.
IT Integration Crucial to Systemness

Technology Inconsistencies Make It Hard to Unify Operations

IT Challenges to Achieving Health System Integration

“Our systems can’t speak to each other.”

“We’ve done the same test three times, because there was no easy way of knowing if it had already been done.”

“I can’t access my images at my office across town.”

“The data aren’t apples-to-apples.”

“My patient doesn’t know whether she’s allergic to this drug, and I can’t tell from her records.”

“Our colleagues at another practice disagree with us on the most appropriate prophylaxis.”

Source: Health Care IT Advisor research and analysis.
Four Areas of Focus for IT Systemness

Simultaneously standardize infrastructure, systems, and processes

Establish (federalized) balance between system-level centralization and local entities

Focus on creating interoperability between all IT sites and systems

Ensure data access, transparency, and consistency across the organization

The Advisory Board’s Health Care IT Advisor offers a deeper dive into IT systemness and integration in its research materials. Ask your Advisory Board representative for more information.
1. The Digital Health System Defined

2. Five Foundational Lessons for Realizing IT Value

3. Leveraging IT to Achieve Specific Strategic Aims

4. Four Leadership Imperatives
IT Imperatives for Non-IT Leaders

Four Crucial Steps to Realize Full Value of Information Systems

1. Develop a common vision across the C-suite
2. Build a full CEO-CIO partnership
3. Move IT from the “backroom to the boardroom”
4. Ensure that everyone has the right skills

Source: Health Care IT Advisor research and analysis.
Develop a Common Vision Across the C-Suite

What Will Be Your System’s Role as Technology, Health Care Evolve?

Competing Visions for Technology and Health Care

<table>
<thead>
<tr>
<th>Technology Substitution</th>
<th>IT-Powered Health Care Transformation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High</strong></td>
<td><strong>Accelerating or exponential change in technology</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Accelerating or exponential change in technology</strong></td>
</tr>
<tr>
<td>Change in Technology Capabilities</td>
<td><strong>No incumbents, new entrants, or substitutions disrupting the industry</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Changes in business models, clinical practices, and the basis for competition, perhaps in large part due to technology</strong></td>
</tr>
<tr>
<td><strong>Low</strong></td>
<td><strong>Rate of change in technology slows considerably or stops</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Rate of change in technology slows considerably or stops</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Forces driving health care change pass</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Changes in business models and the basis for competition</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Status Quo</th>
<th>IT-Enabled Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low</strong></td>
<td>Change in Health Care Industry</td>
</tr>
<tr>
<td><strong>High</strong></td>
<td></td>
</tr>
</tbody>
</table>
## Build a Full CEO-CIO Partnership

### Distinct Roles, But a Clear Need for Collaboration

<table>
<thead>
<tr>
<th>CIO, “IT-Powered Innovators”</th>
<th>CEO and Other Non-IT Leaders</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Key Areas of Interdependence</strong></td>
<td><strong>Vision and Strategy</strong></td>
</tr>
<tr>
<td>• Align with and appropriately shape a clearly defined enterprise vision and strategy</td>
<td>• Clearly define the IT-enabled enterprise vision and strategy and help implement the enterprise strategy for IT</td>
</tr>
<tr>
<td>• Support IT-enabled process transformation and organizational change management</td>
<td>• Support IT-enabled process transformation and organizational change management</td>
</tr>
</tbody>
</table>

**Source:** Health Care IT Advisor research and analysis.
## Move IT from the “Backroom to the Boardroom”

### Generating Value From IT Requires a New, Team-Based Mindset

<table>
<thead>
<tr>
<th>Volume-Based Paradigm</th>
<th>Value and Affordability Paradigm</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT is not essential to implementing and executing our organizational strategy</td>
<td>We need IT-enabled strategies and IT-powered innovation and business models</td>
</tr>
<tr>
<td>These are IT projects</td>
<td>These are IT-enabled business and clinical initiatives</td>
</tr>
<tr>
<td>These are IT’s systems</td>
<td>IT runs your systems—“business-driven, IT-powered”</td>
</tr>
<tr>
<td>It’s the CIO’s job to get value from IT-related investments</td>
<td>IT value is the job of the non-IT leaders, supported and enabled by the CIO</td>
</tr>
<tr>
<td>We need to stop spending on IT so we can move on to other things</td>
<td>Actively manage “keeping the lights on” spending, focus on optimization and innovation</td>
</tr>
<tr>
<td>We’re doing across-the-board cuts, including IT</td>
<td>Assess impacts cost cuts would have on service levels, new initiatives, or costs in other areas</td>
</tr>
<tr>
<td>Our business is health care, not IT</td>
<td>Our business is IT-powered health care</td>
</tr>
</tbody>
</table>

Source: Health Care IT Advisor research and analysis.
Ensure That Everyone Has the Right Skills

Leadership Evolution Through Different Stages of Digital Maturity

<table>
<thead>
<tr>
<th>Non-IT Leadership in IT-Related Matters</th>
<th>IT Efficiencies</th>
<th>IT-Enabled Strategies</th>
<th>Digital Transformation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Functional and departmental leaders</td>
<td>C-level executives</td>
<td>CEO, perhaps supported by a Chief Digital Officer</td>
</tr>
<tr>
<td>Non-IT CxO Skills, Focus</td>
<td>Operations, financial, functional</td>
<td>Enterprise, strategic, T-shaped business and clinical skills, IT-literate</td>
<td>Comfortably knowledgeable about technology limitations, capabilities; visionary; engaged</td>
</tr>
<tr>
<td>CIO Skills</td>
<td>Infrastructure technologies, project management, applications</td>
<td>Business/clinical acumen, digitization (fundamental rethink), data, T-shaped IT skills</td>
<td>Practical IT-powered innovation</td>
</tr>
<tr>
<td>IT-Related Skills</td>
<td>Stovepiped technical</td>
<td>Consultative, “soft skills,” business understanding, integration, interoperability</td>
<td>Knowledge of key business problems, exponential technologies, and how to deploy</td>
</tr>
</tbody>
</table>

“If the CEO doesn’t own innovation, it will die—it’s not even a fair fight.”

Aaron Martin, Chief Digital Officer,
Providence St. Joseph Health

Source: Health Care IT Advisor research and analysis.
The New Innovation Agenda

Eight Clinical Technologies with the Potential to Transform Health Care Delivery
1. The Innovation Imperative

2. Eight Technologies Transforming Clinical Care

3. Rising to the Occasion
“Innovation” Once Meant Tech Assessment, Service Line Planning

Technology Assessment in Advisory Board’s “2008 Clinical Technology Investment Guide”

Laggard | Late Majority | Early Majority | Early Adopter | Innovator
---|---|---|---|---
Spiral CT | 4-slice | 8-slice | 40-slice | 64-slice | Dual-source | Dual-energy | 256-slice | 320-slice

Providers Falling Behind | Leading Providers

Clinical Service Lines Covered
- Cardiovascular Services
- Diagnostic Imaging
- General Surgery
- Neurosciences
- Oncology
- Orthopedics

Key Questions Addressed
- Clinical Advantages
- Coverage, Reimbursement, Demand, Margin Impact
- Strategic and Operational Considerations

“Innovation” Has an Entirely Different Meaning Now

Providers Pushing Beyond Clinical Technology to IT, Operations, and More

**Innovation Focus Areas**

*HCAB Interviews, 2017*

- Accessibility, Retail, Urgent Care Models
- Digital Health, Telemedicine
- Patient Experience, Customer Service
- Clinical IT, Analytics, Interoperability
- Population Health, Payment Reform
- Personalized Medicine Models
- Venture Capital, Start-Ups
- R&D, Commercialization

**Hospitals/Health Systems With Internal Innovation Centers**

*AHA/Avia Survey, 2016; (Includes Existing Centers and Those Planned to Launch by June, 2018)*

- **All Hospitals**: 29% (n=40)
- **AMCs**: 50% (n=40)
- **Hospitals Over 400 Beds**: 72% (n=300)

**Select Advisory Board Resources on Your Stated Areas of Focus**

- **Playbook for the Consumer-Focused Health System**
- **The Consumer Relationship Platform**
- **Virtual Visit Opportunity Audit**
- **Competing on Consumer Experience**
- **Developing High-Impact Innovation Centers**
- **Medicare Risk Strategy**
- **The Retail Service Line**
- **Digital Strategy Blueprint**

No Shortage of Inventions to Track

**Existing Innovations**
- Genetic Screening
- Digital Monitoring
- Consumer Analytics
- Virtual Visits
- Concierge Medicine
- Extended Access Clinics

**Pipeline Innovations**
- Gene Editing
- Regenerative Medicine
- Artificial Intelligence
- 3D Printing
- Machine Learning
- Point-Of-Care Analytics
- Real-Time Risk Analytics

**Innovations on the Horizon**
- Bioelectronics
- CRISPR
- Electroceuticals

**Time to Market Impact**
- 0-2 years
- 3-5 years
- >5 years

Source: Health Care Advisory Board interviews and analysis.
Business Challenges in the Pipeline

Nontraditional Innovators
Consumer interfaces pioneered by disruptive innovators with unclear (or contested) linkages to clinical care—often not reimbursed by insurers

Expensive Niche Treatments
Specialized treatments that apply to relatively narrow markets, carrying astronomical price tags and raising payment model dilemmas

Interdisciplinary, Cross-Service Line Transformation
Key innovation vectors apply across service lines; traditional service-line-oriented business planning models to fall short of perceiving the big picture

Significant Long-Term Demand Destruction
Some clinical technology innovations on the horizon substantially reduce market for downstream services—including some cornerstones of the inpatient service portfolio

Provider Economics Still Up in the Air
Volatile, mixed reimbursement model market makes planning difficult

Source: Health Care Advisory Board interviews and analysis.
What Could Possibly Go Wrong?

“We tend to overestimate the effect of a technology in the short run and underestimate the effect in the long run.”

-Roy Amara
“Amara’s Law”

“Innovator’s dilemma: the logical competent decisions of management that are critical to the success of [incumbent] companies are also the reasons why [incumbents] lose their positions of leadership.”

-Clay Christensen
Innovator’s Dilemma
We Boiled the Ocean

Today’s Analysis in Brief

Research Methodology

- **200+**
  - Review of articles and studies on emerging clinical technologies, trends in venture funding, current clinical trials

- **40+**
  - In-depth conversations with Chief Innovation and Chief Strategy Officers

- **10+**
  - Interviews with experts leading Advisory Board clinical, technology, and planning-focused research programs

Technology Selection Criteria

1. Vector of innovation that substantially lifts the standard of care (across multiple potential/actual applications)
2. Likely to drastically transform care delivery—operations, service mix, and provider economics
3. Will penetrate market in 3-10 years

Source: Health Care Advisory Board interviews and analysis.
Time to Separate the Signal From the Noise

Most Important Innovations Share Goals with System Redesign Efforts

What We Heard:

- Personalization
- Customized Care
- Next-Gen Precision
- Efficiency Gains

Today’s Learning Objective:

- Become conversant in important innovation vectors, foundational concepts, and notable applications
- Learn emerging feasibility and business case considerations, both for the innovation itself, and its impact on downstream services

For the Next-Generation Pro Forma:

How innovation can be leveraged for profitable growth? What core services might it destroy?
- Service line level
- Organization and network level

What impact might it have on provider margins?
- Cost per case
- Streamlining the fixed-cost enterprise
- Under risk scenarios (contractual and de facto)

How might this innovation support our ongoing efforts in staff engagement and culture-building?

Source: Health Care Advisory Board interviews and analysis.
Snapshot of Technology-Enabled Care Transformation

1. Detecting New Indicators of Disease
   - Gather data to accurately detect conditions earlier and with less invasiveness

2. Powering Evidence-Based Decisions
   - Accelerate data processing to support more accurate and specific treatment decisions

3. Delivering Precise Clinical Care
   - Improve clinical outcomes with targeted and customized treatments

Source: Health Care Advisory Board interviews and analysis.
## The New Innovation Agenda

### Eight Clinical Technologies with the Potential to Transform Care Delivery

<table>
<thead>
<tr>
<th>#</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Detecting New Indicators of Disease</td>
</tr>
<tr>
<td>1.1</td>
<td>Polygenic Risk Profiles and Molecular Diagnostics</td>
</tr>
<tr>
<td>1.2</td>
<td>Real-Time Patient Data from “Internet of Things”</td>
</tr>
<tr>
<td>2</td>
<td>Powering Evidence-Based Decisions</td>
</tr>
<tr>
<td>2.1</td>
<td>AI-Guided Decision Support Platforms</td>
</tr>
<tr>
<td>2.2</td>
<td>Next-Generation Natural Language Processing</td>
</tr>
<tr>
<td>3</td>
<td>Delivering Precise Clinical Care</td>
</tr>
<tr>
<td>3.1</td>
<td>Molecular and Gene-Targeted Treatments</td>
</tr>
<tr>
<td>3.2</td>
<td>Engineered Organ Replacements</td>
</tr>
<tr>
<td>3.3</td>
<td>3D Printer-Enabled Surgeries</td>
</tr>
<tr>
<td>3.4</td>
<td>Bioelectronic Device Implants</td>
</tr>
</tbody>
</table>

Source: Health Care Advisory Board interviews and analysis.
1. The Innovation Imperative

2. Eight Technologies Transforming Clinical Care

3. Rising to the Occasion
Detecting New Indicators of Disease

1. Polygenic Risk Profiles and Molecular Diagnostics
2. Real-Time Patient Data from “Internet of Things”
Diagnostics Have Come a Very Long Way

...But Never Good Enough

Shortfalls of Today’s Diagnostic Capabilities

- Detection of many diseases still occurs too late in the disease development cycle
- Many diagnostics are still too invasive and/or toxic for patients
- Tests are not sensitive enough, resulting in duplicative tests, missed diagnoses, missed opportunities to tailor treatment

16% Reduction in complications when using 3D imaging over 2D imaging when implanting Watchman device

10K+ Number of diagnoses that physicians can make

80% Cancer cases detected in the final third of disease stages that are fatal

29K Future cancer diagnoses linked to radiation from CT scans


1) According to Henry Ford Health System research.
Always Chasing the Horizon

Evergreen Challenges at the Start of the Patient Care Pathway

- Proactively Identify Health Risks
- Accurately Diagnose Conditions
- Manage and Prevent Escalation of Diagnosed Disease

Innovations Transforming Data Collection

1. Polygenic Risk Profiles and Molecular Diagnostics
2. Real-Time Patient Data from “Internet of Things”
The Foundation of Precision Medicine

Genomics Becoming Mainstream—With More Breakthroughs to Follow

Biomarkers: Indicators that can be objectively measured to accurately predict medical state

Biobank: A repository of bio-specimens, including blood, saliva, tissue samples, purified DNA, etc.

Polygenic Risk: The effect of multiple genes on one’s susceptibility to health conditions or responsiveness to treatment

Establishing the Foundation for Precision Medicine with Genomic Information

- Identify biomarkers associated with disease
- Integrate research into biobank; create unique patient profile
- Consider polygenic, multifactorial risk factors

Emerging Fronts of Genomics Relevant to Providers

Lower cost sequencing technologies enabling mainstream screening
Pharmacogenomic applications allow providers to cater therapies based on genetic responsiveness to treatment
Emerging research generating new applicable interventions, management strategies based on genetic profiles

Continued Decrease in Cost to Sequence Human Genome

Life-Saving for NICU Patients without a Diagnosis

Rady Children’s Rapid Genetic Sequencing Approach

**Case in Brief: Rady Children’s**
- 551-bed hospital in San Diego, CA
- Created The Rady Children’s Institute for Genomic Medicine in 2014
- Aims to sequence DNA of all NICU infants 4 months or younger with unexplained illnesses; to date, sequenced DNA of 100+ newborns
- Scaling rapid genetic-sequencing approach nationwide; 15 children’s hospitals will start sending DNA samples to Rady by 2018

**Problem:** Genetic diseases and congenital anomalies kill >300K newborns annually in the U.S.

**Obstacle**
- Some infants have unexplained sickness, symptoms

**Rady’s Solution**
- Finds clues by sequencing genome; references database of known mutation links

**Obstacle**
- Genetic tests not reimbursed by payers, costs $8,500

**Rady’s Solution**
- Only sickest newborns in NICU without a diagnosis get DNA sequenced

**Obstacle**
- Saving infant life requires timely diagnosis and intervention

**Rady’s Solution**
- Holds world record for fastest diagnosis from DNA sequencing, 26 hours

**50%**
Percentage of patients that receive a proper diagnosis after getting DNA sequenced

**80%**
Percentage of patients with a genetic diagnosis that receive life-changing treatment as a result of the DNA information

Increasing Uptake with a Curated Screen

NorthShore PCPs Drive Genomic Data Collection and Downstream Growth

Genetic Screening Program at NorthShore

1. Patient Prompted to Complete Genetics and Wellness Questionnaire
   - 30 questions to collect family and health history
   - Algorithm determines applicable gene panel

2. PCP Discusses Next Steps with Patient
   - Explains benefits of receiving certain genetic tests
   - Provides referral to specialists if needed

3. Patient Receives Personalized Counseling Based on Genetic Profile
   - Genetic susceptibilities and preventive strategies explained
   - Potential adjustments to patient care plan or pharmaceuticals made by PCP

4. Care Team Integrates Data into Patient Profile
   - Serves as reference for future episodes/interventions
   - Capability to assess polygenic risk and influence of additional data (e.g., the microbiome)

Future ambition

Program Gaining Meaningful Traction

>8,000
Patients completed Genetics and Wellness Assessment questionnaire in six months

15%
Patients receive a referral for follow-up care after completing questionnaire

35%
Of NorthShore’s patients would change PCPs for access to their genetic screen program

Source: Health Care Advisory Board interviews and analysis.
Increasing Uptake with a Curated Screen

(Continued)

Case in Brief: NorthShore University Health System

• Four-hospital, integrated delivery system based in Evanston, IL

• Built 30-question Genetics and Wellness Assessment tool that addresses common barriers to increasing uptake of preventative genomic screening

• Patients optionally complete the 30-item questionnaire before their annual PCP visit (paper version, or preferably, digitally as part of the e-check in process)

• Best practice algorithm uses NCCN\(^1\) and ACMG\(^2\) to identify genetic tests that could benefit patients based on family and health history

• Providers suggest a curated collection of gene panels for patients and explain why the patient would benefit from receiving the tests; patients may also opt to complete a preventive genetic screening test that looks at 130 common disease-associated risk genes, but pay no more than $500 out-of-pocket on average

• To date, over eight thousand patients have completed the questionnaire, and 15% of those have received follow-up interventions because of genetic test results

• Launched program in March of 2017 at three sites and will be live in 30+ PCP offices by November, 2017; program will eventually consider polygenic risk profile and include EMR-embedded care pathways for genetic profiles

1) National Comprehensive Cancer Network.
2) American College of Medical Genetics and Genomics.
For Some, Partnerships May Be a Logical Path

Partner Companies Can Reduce Barrier to Entry

Case in Brief: Invitae

- Commercial laboratory based in San Francisco, CA
- Provides preventive genetic sequencing as well as genetic counseling services to clients; physicians can order curated tests or the full 139-gene screening tests
- About 15% of patients who are screened receive at least one positive result; tests are returned to patient within 10-14 days

Invitae Building Out Number of Genes They Sequence for Preventive Screens

139 Number of genes tested:

To be included in Invitae’s genomic screening panel:

- Evidence in literature supports gene is disease causing and/or confers increased health risk for a given condition
- There are established clinical management guidelines so that action can be taken once mutation is found

Invitae-NorthShore Partnership:

1. Order Tests: NorthShore clinicians order either a curated gene panel or the full 139 gene test offered by Invitae, then send patient sample to the lab

2. Sequence DNA: Invitae sequences 139 genes representing over 31 health conditions to detect risks for disorders in which medical management is available

3. Interpret Results: Results are sent back to clinician with explanations of positive test results; evidence-based guidelines supporting next steps

4. Counsel Patient: Clinician discusses positive results with patient or refers patient to genetic counselors (Invitae counseling services available as well)

Source: Health Care Advisory Board interviews and analysis.
“Liquid Biopsies” Detect Cancerous DNA in Bloodstream

Case in Brief: GRAIL, Inc.
- Silicon Valley biotech startup that has raised $1.1 billion in funding
- Developing blood test to detect cancer in asymptomatic people that reads circulating tumor DNA for 508 different gene mutations
- In 90% of patients, at least one mutation detected in tumor tissue was also detected in the blood in an early study of 124 patients with advanced breast, prostate, and non-small cell lung cancers

Tests Yielding Actionable Follow-Up

76% Percent of circulating tumor DNA mutations that were specifically associated with targeted treatments and considered “actionable”

Detecting Cancer DNA in the Bloodstream Before Symptoms Develop

1. Cancer DNA extracted
2. DNA sequenced and analyzed
3. Cancer mutations detected and actionable next steps taken

Even Less Invasive Than a Blood Test: Breathalyzer

Commercialization of Nanoscale Sensor Technology in the Works

Breath Analysis Process

Patient breathes into breathalyzer device with artificially intelligent nanotechnology sensors

Sensors detect and quantify pre-identified organic compounds in exhaled air

86% Accuracy of disease detection and discrimination between diseases in tests to date

Benefits of Breathalyzer

☑ No injections or blood draw
☑ Instant results
☑ Lower cost than traditional blood tests

Diseases Detected by Breathalyzer Test

- Lung Cancer
- Colorectal Cancer
- Head and Neck Cancer
- Ovarian Cancer
- Bladder Cancer
- Prostate Cancer
- Kidney Cancer
- Gastric Cancer
- Crohn’s Disease
- Ulcerative Colitis
- Irritable Bowel Syndrome
- Idiopathic Parkinson’s
- Atypical Parkinsonism
- Multiple Sclerosis
- Pulmonary Arterial Hypertension
- Pre-eclampsia
- Chronic Kidney Disease

Source: Nakhleh et al, “Diagnosis and Classification of 17 Diseases from 1404 Subjects via Pattern Analysis of Exhaled Molecules,” ACS Nano, 2017; Health Care Advisory Board interviews and analysis.
Implications for Hospitals and Health Systems

Polygenic Risk Profiles and Molecular Diagnostics

1. **Genetic screening and new molecular diagnostics are growth opportunities**—both because consumers may demand them, and because systems can capture downstream revenue from associated follow-up treatments. While not a make-or-break business opportunity today, genomics will likely become a necessary part of care models in the future.

2. **First movers will have to pave their own path, figuring out immature economic and reimbursement models.** Despite the proliferation of diagnostic tests, providers must only adopt those that are supported by sufficient evidence regarding clinical utility and cost effectiveness—which are also the ones most likely to be covered by insurance.

3. **A growing body of research is revealing new actionable implications for specific genetic variants.** Armed with genetic data, providers can realize profound clinical benefits today, especially in the area of pharmacogenomics. In the future, providers could differentiate their services by considering the influence of multiple genes and other personal health indicators (microbiome, socioeconomic, etc.) on disease susceptibilities and treatment responsiveness.

4. **Having less invasive ways to diagnose active conditions for which clinical interventions exist is a compelling proposition.** In addition, to the degree that non-invasive diagnostics detect the onset of diseases that genetic screens only predict, these two types of diagnostics work well together, because they give providers a range of tools for active surveillance.

Source: Health Care Advisory Board interviews and analysis.
How to Take Advantage of Patient-Generated Data?

...Particularly for Real-Time Condition Management

Market Size and Growth of Internet of Things Devices in Health Care

97.6M
Number of wearable devices expected to be shipped annually by 2021

$163B
Value of IoHT solutions in healthcare space in 2020

38.1%
CAGR of IoHT solutions in healthcare from 2015-2020

Timeline of Development for Devices in the “Internet of Things”

- Consumer-oriented health and wellness devices (e.g. Fitbit)
- Smartphone app integration
- Smart devices connected to Wi-Fi or cellular networks
- Direct-to-consumer health devices with clinical utility (e.g., canes with embedded gyroscope)
- Automated collection, processing, and transmission of patient-generated data to care team
- Implantable sensors and computing systems for real-time clinical insights (i.e. devices that can anticipate health problems)


1) Internet of Healthcare Things.
2) Compound Annual Growth Rate.
Way Beyond the Fitbit Now

“FreeStyle” Glucose Monitoring System
Implants Sensor in Skin

1. Sensor placed underneath skin
2. Sensor continuously measures glucose
3. “Wand” shows reading when waved over sensor

“DermalAbyss” Project Creates
Interactive Tattoo Biosensors on Skin

1. Patient receives tattoo with “smart” tattoo ink
2. Ink changes color when chemistry of surrounding body tissue changes
   - Sodium
   - Glucose
   - Acidity (pH)
3. Patient able to immediately detect changes to internal chemistry

Color signifies high pH

*Image Credit: Maciej Frolow/Getty Images*  
*Image Credit: Viirj Kan, Katia Vega*  

Intervening When it Matters Most

Mercy’s Cardiac High Acuity Monitoring Program (CHAMP)

Details of CHAMP Program

1) Patients On-Boarded to Platform
   - Monitoring Devices
     - Scale
     - Pulse oximeter
     - Heart rate monitor

2) Data Submitted
   - Parents collect and submit measurements from devices

3) Alerts Generated
   - Medical team is alerted when action is needed
   - Data instantly processed in cloud

Parents download app

Parents click “I’m concerned”

Case in Brief: Children’s Mercy

- 367-bed hospital based in Kansas City, MO
- Developed Cardiac High Acuity Monitoring Program (CHAMP) for children with Hypoplastic Left Heart Syndrome
- Indicators of cardiac health, including heart rate, weight, and oxygen saturation measurements are instantly analyzed in the cloud after submission in the Mercy app

CHAMP Program Eliminates Pediatric “Interstage” Mortality

Before CHAMP: 20%
After CHAMP: 0%

Critical to Incorporate into EMR, Workflow

Xealth Enables Clinicians to View, Act on Data from Digital Health Platforms

Case in Brief: Xealth

- Technology start-up created through Providence St. Joseph Health Ventures; platform is live at Providence and UPMC
- Digital content tab embedded into EMR; platform is compatible with all digital content vendors
- Platform enables clinicians to “prescribe” digital content to patients, as well as view and act on data

- Open rate for average patient email sent through Xealth platform: 80%
- Percentage of digital programs that are completed by the patient: 40%
- Patients monitored via CPAP device integrations at Providence St. Joseph Health: >20K

Source: Health Care Advisory Board interviews and analysis.

1) Continuous Positive Airway Pressure.
Implications for Hospitals and Health Systems

Real-Time Patient Data from “Internet of Things”

1

Despite a noisy, consumer-oriented, over-hyped market, it’s increasingly clear that **analysis of real-time patient data can have demonstrable clinical utility.** Collection of patient-generated data is likely to be expected by consumers in the future. However, data should not be collected merely for the sake of doing so. Providers must establish actionable alert systems and follow-up guidelines for a limited number of conditions initially, or else risk overwhelming the care team or the data going unused.

2

Digital health connectivity will apply best to a subset of service lines, types of devices, and patient profiles; for example, consumers that are engaged in their health, new or expecting parents, caregivers, or patients with a life threatening condition that can be managed. **Providers should focus their efforts on specific clinical areas where there is patient need, market demand, potential to create longitudinal relationships with patients, or opportunities to intervene in life-threatening situations.**

3

Realizing both business and clinical benefit remains challenging. **Patient-generated data must be embedded into clinicians’ workflows and some types of data should be automatically processed in real-time.** Incorporating non-physician staff into the team model may be a feasible solution to managing patient-generated data and following up efficiently on alerts.

Source: Health Care Advisory Board interviews and analysis.
Powering Evidence-Based Decisions

3. AI-Guided Decision Support Platforms
4. Next-Generation Natural Language Processing
A Tidal Wave of Information

Diagnostic, Patient-Generated, Academic, and Every Other Source of Data

Signs of the Times

1:1 Ratio of physician time spent per day on “patient office visits” to “desktop medicine”

1. Clinician Information Overload

1,000 Gigabytes of data produced from one GRAIL blood test (equal to 500 hours of movies)

2. Can’t Keep Up with Analytic Demands

How can the health system efficiently process data to improve productivity and enable top-of-license care?

3. AI-Guided Decision Support Platforms

4. Next-Generation Natural Language Processing

Artificial Intelligence Market Booming

Dramatic Growth Expected in Health Care Computing Technology Market

Artificial Intelligence (AI): A field of computer science that uses computer systems to complete tasks or solve complex problems typically requiring human intelligence.

Cognitive Technologies: Applications of AI such as machine learning, natural language processing etc.

Machine Learning: The ability of computer systems to find patterns from data sets and dynamically adapt without human programming to improve performance.

Natural Language Processing: The ability of computer systems to analyze, produce, or communicate with human languages and extract meaning from text.

Market Size for Health Care Artificial Intelligence Technologies

Evolution of Computer Technology

Cognitive Technologies: Applications of AI such as machine learning, natural language processing etc.

1) Compound Annual Growth Rate.

Poised to Address Diverse Provider Challenges

Half of Hospitals to Use AI By 2022

Artificial Intelligence (AI) Rapidly Entering Market

HIMSS Analytics/Healthcare IT News 2017 survey; n=85

- 5% Of hospitals are currently using AI technologies
- 35% Intend to deploy AI technologies within two years
- 50% Intend to deploy AI technologies within five years

Most Cited Applications of AI

- Population health
- Clinical decision support
- Patient diagnosis
- Precision medicine
- Hospital/physician workflow
- Security
- Revenue cycle
- Drug discovery

Major Potential for Raising Provider Efficiency

AI Can Streamline Low-Acuity, Loss-Leader Visits

A Scalable Virtual Urgent Care Clinic—Powered by AI

Case in Brief: Bright.md

- Virtual care vendor based in Portland, OR; clients include Adventist Health, Greenville Health System, and Rush University Medical System
- SmartExam software uses artificial intelligence to dynamically “interview” patients and generate a preliminary diagnosis for one of 300+ low-acuity conditions
- On average, it takes clinicians two minutes to review case and treatment; cost is $20-$25 for patients out-of-pocket

Source: Health Care Advisory Board interviews and analysis.

1) Visit involves video conferencing.
2) Assuming eight hour workday and physician spends full day with patient care interactions.
3) New patients in PCP office; as reported by one Bright.md health system client.

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Efficiency and Access Can Carry High Clinical Stakes

Stanford Testing Advanced AI-Based Diagnostic Capability for Melanoma

Five-Year Melanoma Survival Rates, by Stage of Detection

99% → 14%

Stage 1; small and localized → Stage 4; spread to lymph nodes

Case in Brief: Stanford Health Care

• Academic health system based in Stanford, CA
• Created deep convolutional neural network (CNN)—a type of AI platform—which is able to read skin lesions and identify over 2,000 different types of skin diseases
• AI-based system identified melanoma on sample images with equal or greater accuracy than the average performance of a control group of 21 board-certified dermatologists

Using Neural Networks to Diagnose Skin Cancer from Images

1. 129,450 clinical images of malignant melanoma uploaded to AI platform for analysis
2. 2,032 different diseases recognized
3. Program recognized melanoma with accuracy on par with the average accuracy across a control group of 21 board-certified dermatologists

Future: Platform could be integrated onto consumer-facing smartphone application to provide digital access

5M
Malignant moles, freckles, and skin spots diagnosed annually in the U.S.

$8B
U.S. spending on malignant melanomas annually

Finding Meaning in a Sea of Words

Natural Language Processing Can Streamline Reading and Writing Tasks

Select Applications in Health Care
- Allow providers to dictate notes
- Assist with clinical documentation
- Synthesize clinical information for decision support

15 Seconds for IBM Watson to process 40M documents

Published Citations Added to MEDLINE (2006-2016)

Year

Number of Citations

- 900,000
- 800,000
- 700,000
- 600,000
- 06'07'08'09'10'11'12'13'14'15'16'

Natural Language Processing Applications Dominate Cognitive Computing Market

Total Market Revenue in Cognitive Computing

40% Natural Language Processing

Other


1) Revenue in 2014.
Cutting to the Chase in ED Visits

MedStar’s NLP\(^1\) Algorithm Extracts Key Facts From Medical History

**Case in Brief: MedStar Health**

- 10-hospital health system based in Columbia, MD
- Developed an algorithm that instantly scans the entire patient history and provides recommendations on what facts are most important, based on the patient’s presenting symptoms

**Number of documents in the medical history of an average patient visiting the emergency department at MedStar**

60

**Infeasible for Clinicians to Efficiently Analyze Patient History Comprehensively in the ED**

- Machine learning system scans patient history, identifying important information based on patient symptoms
- Machine generates an executive summary, flagging facts most likely to be pertinent
- Physician’s time freed for top-of-license practice; evaluates recommendations and makes best diagnosis, treatment, and care decision


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1) Natural Language Processing.
Synthesizing Evidence-Based Clinical Literature

Not-For-Profit Network Uses NLP to Keep Guidelines Current

Two Problems with Scaling Evidence-Based Medicine… ...Solved By

1. Efficient synthesis and review of clinical literature
   - Natural Language Processing

2. Dissemination of best practices into clinicians’ workflows
   - Digital EMR Embeddedness

Cochrane Creating Living Reviews

1. Researchers initiate monthly searches of evidence in clinical literature
2. Computer processes clinical trial text
3. Contributors approve and integrate new evidence identified
4. Provider embeds best practice into EMR

“Cochrane Living Review”

Case in Brief: Cochrane “Project Transform”

- Global, independent, information-sharing network consisting of 37,000+ researchers, professionals, patients, caregivers, and others interested in health care
- Building a “living systematic review” of clinical literature in order to disseminate continually updated, evidence-based guidelines to physicians
- Using natural language processing, Cochrane has analyzed 34,000+ clinical trials and synthesized corresponding recommended guidelines into their platform

Machines Can Learn—Sometimes in Mysterious Ways

Many Questions Remain Before Full Potential Can Be Tapped

“Deep Patient” Program at Mount Sinai

Deep Learning model trained using data from >700K patients’ medical records

Using AI platform, computer learns to predict onset of certain diseases when tested on new records without expert instruction—including schizophrenia and liver cancer

“We can build these models, but we don’t know how they work.”
- Joel Dudley, Deep Patient Program Lead
Mount Sinai Health System

Case in Brief: Mount Sinai Health System

- 7-hospital health system based in New York, NY
- Applied deep learning to database of patient records in program called “Deep Patient”
- Model is able to identify patterns hidden in hospital data to predict disease with surprising accuracy—but researchers sometimes unable to understand the basis for predictions

“If [the computer] can’t do better than us at explaining what it’s doing, then don’t trust it.”
- Daniel Dennett, Cognitive Scientist
Tufts University

Implications for Hospitals and Health Systems

Powering Evidence-Based Decisions: AI and NLP

1. There are many applications for AI that enable providers to become more productive and practice at top of license. For example, AI platforms have the ability to support providers in making accurate diagnoses more efficiently and reliably. If providers can harness this potential, they could reap gains on fronts from reduced cost per case to improved clinician engagement and quality of patient care.

2. Natural language processing can accelerate the process of updating evidence-based guidelines. By automating initial reviews of clinical literature, providers can more quickly adopt new standards of care with less reliance on lengthy, manual literature reviews.

3. Machine learning techniques are entering the health care industry rapidly, but significant technological hurdles remain. Many providers may need to seek vendor partners to develop and/or customize solutions.

4. Physicians and regulators will play a large role in the timing and extent of AI adoption. Regulators are currently struggling to balance oversight responsibility with the pace of innovation, and physicians have concerns about safety, accuracy, and defensibility of AI-based insights—which are legitimate. In particular, machine learning algorithms need to be better at explaining insights they generate before they can be relied upon.

Source: Health Care Advisory Board interviews and analysis.
Delivering Precise Clinical Care

5. Molecular and Gene-Targeted Treatments
6. Engineered Organ Replacements
7. 3D Printer-Enabled Surgeries
8. Bioelectronic Device Implants
Where the Rubber Meets the Road

Where Can We Make Progress in Clinical Interventions?

Outstanding Progress in Clinical Treatments…

25% Decline in cancer death rate from 1991-2014

68% Decline in heart disease death rate from 1969-2013

…But Still Progress to Be Made

600K Projected deaths from cancer in the US in 2017

800K Projected deaths from heart disease in the US in 2017

Trends of Tomorrow’s Treatment

- More precise and customized
- Less toxicity with fewer side effects
- Overcoming supply shortfalls to meet unmet demands
- Proactive interventions for diseases and chronic conditions

Four Vectors of Innovation…Each With Clinical and Economic Transformation Potential

5 Molecular and Gene-Targeted Treatments
6 Engineered Organ Replacements
7 3D-Printer-Enabled Surgeries
8 Bioelectronic Device Implants

Pipeline for Molecular and Gene Therapies is Huge

Specialty Drugs Growing at Record Rates

Share of Medicine Spending on Specialty Drugs

70% of medicine spending growth attributed to specialty medicines

36%

Year 2010 2015

Spending on Specialty Medicines, by Disease Classification (Billions)

2015 $151B
2014 $124B
2013 $97B
2012 $88B
2011 $82B

- Oncology
- Autoimmune
- Viral Hepatitis
- Multiple Sclerosis
- HIV Antivirals
- Other Specialty

Growing Market for Specialty Drugs

- 550 Biologics were approved by the FDA from 2000 to 2015
- 504 Gene therapies for cancers, genetic disorders, and infectious diseases currently in clinical trials
- 180+ CAR-T immunotherapies currently in clinical trials

#5: Molecular and Gene-Targeted Treatments

New Targets Increase Therapeutic Precision

New Treatments More Effective, Less Toxic

**Biologics:** Complex (and typically high-cost) drugs manufactured from living microorganisms, plants, or animal cells

**Gene Therapy:** Using genes to treat or prevent disease by:
- Replacing a mutated gene with a healthy copy
- Inactivating a mutated gene
- Inserting a new gene into cells

**Immunotherapy:** A biological therapy that stimulates or suppresses the immune system (or immune cells) to help the body fight disease (e.g., cytokines, vaccines, monoclonal antibodies)

**CAR-T:** Chimeric antigen receptor (CAR) T cell therapy; an emerging type of immunotherapy that reprograms the genes of T-cells to recognize and kill diseased cells

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**Two Ways Therapeutics Target Patients More Precisely**

**Mechanism**

1. Drug binds tightly to specific biomolecules or cell types
   - Influence malfunctioning cellular pathways

2. Genes inserted or altered to combat disease
   - Eradicates source of errant signaling mechanism

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**Editing the Human Genome**

**Outcome**

- Disease-causing mutation replaced

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To Cure More Patients, We Must Target Cancer-Causing Mutations

Case in Brief: Keytruda (Pemprolizumab)

• Checkpoint inhibitor that targets the PD-1/PD-L1 cellular pathway
• First approved drug for use against all tumors that share a common genetic mutation—microsatellite instability-high (MSI-H) or mismatch repair deficient (dMMR)—regardless of location in the body

Identifying a Shared Gene Mutation in Disparate Cancer Types

1. Clinical trial for nearly identical drug, nivolumab, resulted in a colon cancer patient’s tumor disappearing—but only this one patient responded

2. Researchers analyzed that patient’s cancer cells and found a plethora of mutated genes and abnormal proteins

3. Identified tumor mutations (MSI-H and/or dMMR) that prevent tumor from repairing DNA

4. Gathered patients with 12 different types of cancers that shared the MSI-H and/or dMMR mutation to test clinical efficacy of Keytruda; found tremendous response rates

- 53% Percent of tumors with radiographic evidence showing tumor shrinking
- 21% Percent of patients with tumors completely eliminated
- 4% Percent of cancer patients that have the genetic mutation (MSI-H and/or dMMR) susceptible to pembrolizumab (60K patients a year in the U.S.)
- $13K Per-month cost of Keytruda infusion

CAR-T Showing Early Promise in Liquid Cancers

Leukemia Drug Becomes First Gene Therapy Approved by FDA

**Acute Lymphoblastic Leukemia (ALL)**

- 3,100 ALL diagnoses each year
- ~600 Fatal cases annually

**Case in Brief: Kymriah**

- First gene therapy approved by the FDA; therapy is approved for the 20% of pediatric B-cell acute lymphoblastic leukemia unresponsive to traditional treatment
- Patient's own T-cells are engineered to attack cancerous cells with the CD19 receptor

**Reprogramming Immune Cells with CAR-T Therapy**

1. T-Cells Extracted from Patient
2. Genes Manipulated in the Lab
3. T-Cells Trigger Death of Cancerous Cells
4. Engineered Cells Infused into Patient

**Promising Results... at an Exorbitant Cost**

- Remission rate following treatment with Kymriah: 83%
- Cost of one-time Kymriah injection: $475K


1) Within three months.
Exorbitant Price Tags Pushing Payment Innovation

Value-Based Payment Models for Pharmaceuticals

1. Money-Back Guarantee

Drug: Repatha

Use: Helps the liver clear low-density lipoprotein for those with high cholesterol by limiting actions of PCSK9

Cost: $14,000/year

Outcomes:
- 27% reduced risk of heart attack
- 21% reduced risk for stroke
- 22% reduced risk for coronary revascularization

Payment: If patient is hospitalized with heart disease or stroke, Amgen will refund the cost of Repatha to the insurance company

2. Outcomes-Based Payment

Drug: Entresto

Use: Treatment for heart failure patients with reduced ejection fraction (HFrEF) that uses sacubitril and valsartan

Cost: $12.50/day

Outcomes:
- 20% reduction in risk of heart failure hospitalization or cardiovascular death
- 44% less likely to be readmitted for heart failure; 36% fewer patients readmitted for any cause

Payment: If heart failure hospitalizations of patients exceed a pre-determined threshold, Novartis reduces price of Entresto to payers

Source: “Amgen And Harvard Pilgrim Agree To First Cardiovascular Outcomes-Based Refund Contract For Repatha® (Evolocumab),” Amgen, 2017; “Landmark Outcomes Study Shows That Repatha® (Evolocumab) Decreases LDL-C To Unprecedented Low Levels And Reduces Risk Of Cardiovascular Events With No New Safety Issues,” Amgen, 2017; Staton T, “Amgen's Repatha wins in outcomes trial, but is the score high enough?,” FiercePharma, 2017; Walker T, “Novartis signs on to value-based pricing for Entresto,” ModernMedicine; 2016; Health Care Advisory Board interviews and analysis.
CRISPR: Clustered Regularly Interspaced Short Palindromic Repeat (CRISPR); refers to short, partially palindromic repeated DNA sequences in the genomes of bacteria and other microorganisms.

The technique enables a much faster and easier gene editing approach compared to previous methods.

Cost to Edit One Gene

- Conventional Methods: $5,000
- CRISPR: $30

Technology Promises to Cure Disorders Caused by Single-Gene Mutations

>10K Number of known single gene disorders

Single-Gene Disorders
- Cystic Fibrosis
- Sickle Cell Anemia
- Marfan Syndrome
- Huntington’s Disease
- Hemochromatosis
- Hypertrophic Cardiomyopathy

1) In the U.S. by researchers from Oregon Health & Science University; corrected a MYBPC3 mutation in human preimplantation embryos which causes hypertrophic cardiomyopathy.

Implications for Hospitals and Health Systems

Molecular and Gene-Targeted Treatments

1. The shift from blockbuster, broadly applicable drugs to niche therapies (e.g., for specific cancer variants)—has resulted in a pipeline’s worth of interventions that are astronomically expensive. Coverage options will exist for effective drugs, but **expect rigorous prior authorization and significant hurdles around affordability issues among underinsured and high-deductible patients.**

2. Given the high technology expense and limited market size, **not all hospitals and health systems are likely to offer all niche therapies.** Some will build centers of excellence to draw patients regionally or nationally. Other must forge partnerships and referral channels with those providers.

3. **Providers must balance the desire to offer patients access to new treatments with a thoughtful evaluation of inherent risks.** For example, the two approved applications of CAR-T to date have high toxicity and a dearth of data on their long-term efficacy. Clinicians must be prepared to communicate the full cost-benefit—and the unknowns—to patients.

Source: Health Care Advisory Board interviews and analysis.
Could We End the Transplant Wait List?

Cell Engineering Solutions are in the Pipeline

**Organ Transplant Demand Exceeds Supply**

- **117K** Number of people on organ transplant waiting list in 2016
- **34K** Number of people that received an organ transplant in 2016

**Two Emerging Ways to “Engineer” Organs**

1. **Xenotransplants**
   - Adapting animal cells, organs for safe human transplant

2. **Stem Cell Therapies**
   - Triggering the growth of new healthy tissue from non-differentiated cells

**Xenotransplantation**: Any procedure that involves the transplantation of nonhuman organs into humans

**Stem Cells**: Cells with the potential to renew themselves and specialize into many different cell types during early life and growth, and in certain conditions, during tissue repair

New Promise for Xenotransplantation

Gene Editing and Cloning Technologies Enabling Safe Transplantation

>2 Years
Minimum time before first pig-to-human organ transplants could occur

**Case in Brief: eGenesis**
- Newly-formed company aiming to sell genetically altered pig organs
- Using CRISPR gene editing technology and cloning methods to produce pig organs free of harmful retroviruses and immune-activating carbohydrates that have prohibited human transplantation in the past

### Benefits
- Ability to increase supply as needed to meet demand
- Pig organs can be the right size for human transplantation
- General societal acceptance from other decades-long pig transplant applications (e.g., valve replacement)

### Barriers
- Ethical considerations regarding animal exploitation
- Lingering safety concerns regarding transmission of viral diseases and immune rejection

Creating Functional Artificial Organ Systems

Stem Cell Replacement Therapy Mimics the Function of the Pancreas

Type 1 Diabetes in the U.S.

1.25M People living with type 1 diabetes

Case in Brief: PEC-Direct

- Islet cell replacement therapy developed by ViaCyte, Inc.; currently in clinical trials for treatment of patients with high-risk type 1 (autoimmune) diabetes
- Credit-card-sized implant placed just underneath the skin contains embryonic stem cell-derived PEC-01™ pancreatic progenitor cells that mature into insulin-secreting beta cells in the body

Implantable “Organ” to Mimic Pancreatic Function

1. Engineer Organ

Prepare cells

Place cells in credit card-sized “organ” device

2. Implant Device into Patient

3. Allow Cells to Mature

Insulin

Note: immune rejection still a barrier to overcome, but new biologic device in development holds promise

Repairing Patients’ Own Organs

New Promise for Treatment of Heart Disease

Heart Disease in the U.S.

28M Adults with diagnosed heart disease

600K Annual deaths from heart disease

Case in Brief: CardiAMP

- Regenerative cell therapy developed at the University of Wisconsin in partnership with BioCardia
- Currently in phase III clinical trials at 40 medical centers across the country for the treatment of heart failure after a heart attack
- If approved, would be the first approved cardiac cell therapy in the U.S.

Regenerating Healthy Tissue with One’s Own Stem Cells

- Patient has heart attack
- Small amount of bone marrow collected from iliac crest
- Cells processed at point-of-care to trigger regeneration
- 60-90 minute surgery conducted in cath lab using Helix™ delivery system
- Patient discharged same day or after one night stay
- Treatment triggers growth of healthy heart tissue

Transplant and restorative treatments are in high demand and low supply. If new treatments become available, providers will need to build avenues to access these treatments. Large specialized centers will be the first to adopt next-generation transplant capabilities. Smaller hospitals should first work with affiliates or partners on providing access to these treatments, but should also consider offering new restorative treatments themselves as safety and efficacy data matures, and as market demand dictates.

Being procedural in nature, transplants and restorative treatments have a straightforward business case and fall into acute care providers’ traditional wheelhouse. While costly to perform, transplant procedures have historically been well-reimbursed by insurers.

There are both benefits and drawbacks to being a first mover in offering engineered organ treatments. In addition to ethical issues, there are clinical barriers surrounding immune rejection and unclear long-term research regarding side effects and clinical utility that must be resolved.

Source: Health Care Advisory Board interviews and analysis.
#7: 3D Printer-Enabled Surgeries

## 3D Printing Set to Revolutionize Procedural Care

### Broad Range of Applications for Custom-Designed Materials

**3D Printing (a.k.a. “Additive Manufacturing”)**

1. Collect data from MRIs, CT scans, ultrasounds etc.
2. Create a digital model with computer-assisted design
3. Print, layer-by-layer, using plastics, metals, and human tissue

### 3D Printing Applications in Health Care

- **Today**
  - Surgical Models
  - Pharmaceuticals
  - Skin

- **Future**
  - Prosthetics
  - Implantable Devices
  - Whole Organs

### 3D Printing Global Market Size of Total Spending in Health Care

- **$1.2B expected in 2020**

### Source:

### 10% Percent of people in developed world who will be living with 3D-printed objects on or in their body by 2019
Putting the Impossible Within Reach

Surgical Models Help Make Prohibitively Complex Surgeries Take Place

How 3D Printing Saved a Patient’s Leg

Old Approach

Surgeons cannot remove tumor because of its complexity

Physician amputates leg to remove affected areas

New Approach

Rare tumor in pelvis, spread to bones and nerves of sacrum

Engineers create 3D model-scaled-to size-showing bladder, veins, blood vessels, ureters and tumor

 Physicians plot surgical approach to allow for removal of tumor without taking leg

Tumor stops spreading

Case in Brief: Mayo Clinic

• Academic health system based in Rochester, MN
• Created on-site 3D printing lab that uses data from MRIs, CT scans, ultrasounds, and 3D pictures to create anatomical models that surgeons use to plot customized surgical approaches that were previously impossible due to complexity; created 500 3D-printed objects in 2016

3D pelvic model created at Mayo; took 60 hours to print

Image Credit: Mayo Clinic

A Rationalized Design Network Makes Sense

VA Centers Generate System-Wide Economies of Scale and Expertise

3D Printing Network at Veterans Administration

We bring [Veterans] in, they try it. If they’re in-patient they live with it [for awhile] so they know that when they leave, not only can they use it, but they like it…[Veterans] realize new realities that wouldn’t have been possible even ten years ago. It opens worlds. It makes life better.”

Brian Burkhardt, Rehab Engineer Veterans Administration

Ultimate Goal to Advance Assistive Technology for Custom Prosthetics

Model for procedural planning and training

Case in Brief: Veterans Health Administration

- Integrated health system with 170 medical centers and 1,065 outpatient sites serving over 9 million enrolled Veterans each year
- Creating 12-hospital 3D printing network that routes design requests to engineers who specialize in specific orthotics or surgical tools; finished designs are then sent to location closest to the patient for printing

Source: Baum S. “Can a 3D printing network for VA hospitals realize ambitions for customized prosthetics?,” MedCityNews (image: Stratasys’ 3D technology); 2017; “Stratasys Unveils Project with US Department of Veterans Affairs as Part of Corporate Social Responsibility Program,” Stratasys, 2017; "It’s an enhancement to everything.: Harnessing Assistive Technology to Improve the Lives of Veterans,” Medium/The VA Center for Innovation, 2015; Gordon P. “Veteran receives high-tech prosthetic hand,” U.S. Department of Veterans Affairs (image: Jason Miller); Health Care Advisory Board interviews and analysis.
Implications for Hospitals and Health Systems

3D Printer-Enabled Surgeries

1. The advent of 3D printing is likely to disrupt the supply chain as providers take on new capabilities. For some providers, vendor partners will be crucial to overcoming barriers to entry, such as technology costs and adequate device design expertise.

2. There will likely be large consumer demand for custom, 3D-printed prosthetics and implants. These types of procedures will tend to fit within existing reimbursement frameworks—with lower provider-facing costs. First-movers in this space may see significant volumes from patients who are willing to travel for customized care.

3. The extent of 3D printing applications is yet to be determined. Today, 3D printing is most often used for surgical tools and planning. In the future, a more sophisticated range of applications will likely exist. Centers that specialize in certain devices, procedures, or materials will likely take shape. Partnerships, affiliations or network-wide hub-and-spoke models will be necessary to ensure each system’s patients can access the evolving range of 3D printing applications available.

Source: Health Care Advisory Board interviews and analysis.
#8: Bioelectronic Device Implants

Nervous System Treatments Open New Opportunities

Impossible to Treat Nervous System with Existing Methods

Bioelectronics: The field of medicine that aims to use miniature implantable devices (about the size of a grain of rice) to deliver electrical stimulation to nerves in order to modulate cell or organ function.

Think of it as a little volume control on a nerve that controls an organ like the liver, pancreas, kidneys, or spleen. By changing the volume, the signals that go into the nerve, up or down, you can control what the organ does: whether it produces less or more of a particular hormone, or affects the constriction of the airways.

-Kris Famm, President and CEO
Galvani Bioelectronics

Bioelectronics Modulate Nerve Cell Function

Device implanted onto nerve

Device triggers neurotransmitter release; modulates organ function (e.g., constrict airways)

Neuromodulators for Chronic Disease On the Way

Galvani Pioneering Applications for the Peripheral Nervous System

Case in Brief: Galvani Bioelectronics

- UK-based joint venture between Verily (Alphabet Inc.’s life sciences research organization) and GlaxoSmithKline; created in 2016 to enable the research, development, and commercialization of bioelectronics
- Building a “nerve atlas” that describes how each nerve in the body affects organs and diseases
- Preparing to begin proof-of-concept trials by 2018, and goal is to have first product hit the market in mid 2020s

Diseases Galvani Believes it Can Potentially Treat

- Type 2 diabetes
- Asthma
- Arthritis
- Hypertension
- Rheumatoid arthritis
- Unspecified autoimmune disorder
- Unspecified endocrine disorder

$700M Investment that Verily and GlaxoSmithKline have stated they are willing to make to develop prototype devices

Hope for Restoring Motor Function

Potential for Revolutionary Cures in Bridging the Brain-Computer Interface

Paralysis

1. Transcutaneous stimulation (electrode on skin)
2. Epidural spinal stimulation (electrode under skin)
3. Spinal cord stimulation (electrode on spinal cord)

Man in vegetative state for 15 years

Pulses of electricity sent to brain via vagus nerve

Consciousness restored

Restoration of movement in limbs of paralyzed patients

Current Biology

“Restoring consciousness with vagus nerve stimulation”

Bioelectronic Device Implants

Implications for Hospitals and Health Systems

1. Researchers have a long way to go before the full potential of bioelectronics can be realized. Major barriers include mapping the peripheral nervous system to pinpoint neuronal targets, developing an ongoing power supply for implanted devices, and designing surgical techniques to access nerves that are not easy to reach today.

2. Once developed, bioelectronic implants will enable providers to proactively treat conditions that have little or no treatment today, including coma, paralysis, and many chronic conditions that today are merely only monitored and reactively managed.

3. The potential market size for bioelectronics is massive. Bioelectronics could be incorporated into care for many chronic conditions and motor and nervous system disorders. Providers will need to closely monitor the technological development and strategic investments they would need to be ready to take advantage of market opportunities as they materialize.

4. In the long term, bioelectronics have tremendous transformative potential for hospitals and health systems. If the technology comes to market, and revolutionizes how providers manage chronic conditions, those changes will have significant implications for the delivery system as a whole.

Source: Health Care Advisory Board interviews and analysis.
1. The Innovation Imperative

2. Eight Technologies Transforming Clinical Care

3. Rising to the Occasion
# The New Innovation Agenda

## Eight Clinical Technologies with the Potential to Transform Care Delivery

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Source: Health Care Advisory Board interviews and analysis.
Linking Today’s Innovations

Five Common Themes

1. Personalization
   - There is a general recognition that personalized care is mission critical, and a business imperative.

2. Customization
   - Customization at scale can reduce costs by promoting use of clinical standards, and even using custom implants.

3. Information and Computing
   - Even though unit costs for IT have decreased, providers need to invest more in IT-enabled strategies that interconnect and find new information.

4. Precision
   - The drive toward precision medicine will only accelerate, dictating the growth of the enterprise in the future.

5. We’re Here for the Unknown
   - Innovation and disruption are looming and providers must be agile in these times of uncertainty.

Source: Health Care Advisory Board interviews and analysis.
Our Leadership Challenge

Delivery System Transformation Central to Future Success

- Rebuild Health System
  - Un可持续固定成本
  - 不足的规模，市场相关性
  - 未实现的系统优势

- Transform Care Delivery Model
  - 持续的护理转移
  - 更大的整体护理成本
  - 承担责任

- Reduce Cost of Operations
  - 过量的药物成本增长
  - 快速的工作力增长

Source: Health Care Advisory Board interviews and analysis.
Elevating Our Gaze Toward a Higher Purpose

Source: Health Care Advisory Board interviews and analysis.