Engaging Physician Specialists in Population Health Management
A Clinical Agenda Based on Value

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Staff Cardiologist, Massachusetts General Hospital
Fellow in Health Policy and Management, Massachusetts General Physicians Organization
Chapter 54, 2006
Massachusetts now has the lowest rate of un-insurance in the country

With coverage near-universal, costs have become the singular policy focus

A wave of regulatory activity has followed
The economic challenge... less for everything else

Increasing Health Care Spending Squeezes Out Other MA Spending Priorities

MASSACHUSETTS STATE BUDGET, FY2001 VS. FY2011
STATE SPENDING (BILLIONS OF DOLLARS)

- Health Care Coverage (+$5.1 B, +59%)
- Public Health (-38%)
- Mental Health (-33%)
- Education (-15%)
- Infrastructure/Housing (-23%)
- Human Services (-13%)
- Local Aid (-50%)
- Public Safety (-11%)

Source: Massachusetts Budget and Policy Center Budget Browser
New 2012 Law – Cost Controls
Chapter 224

New Oversight Entities & Activities
• Push for providers to take financial risk on TME (public and private payers)
• A new Health Policy Commission

Health Care Cost Growth Limits
• 2013-2017: No more than growth in the state economy (GSP)
• 2018-2022: State GSP less 0.5%

Table 1. Councils, Commissions, Committees, Task Forces and Boards in Massachusetts’ Chapter 224.

<table>
<thead>
<tr>
<th>Committee/Board</th>
<th>Number of Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Planning Commission</td>
<td>10</td>
</tr>
<tr>
<td>Health Planning Commission Advisory Board</td>
<td>13</td>
</tr>
<tr>
<td>Health Policy Commission Agency</td>
<td>Unknown staff #s</td>
</tr>
<tr>
<td>Health Policy Commission Board (HPC)</td>
<td>11</td>
</tr>
<tr>
<td>Health Policy Commission Advisory Council (at minimum 11 members)</td>
<td>11</td>
</tr>
<tr>
<td>Center for HC Information and Analysis (CHIA)</td>
<td>Unknown staff #s</td>
</tr>
<tr>
<td>Advisory Committee on Quality Measure</td>
<td>10</td>
</tr>
<tr>
<td>Errors Reduction Board</td>
<td>4</td>
</tr>
<tr>
<td>Healthcare Workforce Advisory Board</td>
<td>19</td>
</tr>
<tr>
<td>Healthcare Workforce Trust Fund Advisory Board</td>
<td>16</td>
</tr>
<tr>
<td>Commission on Prevention &amp; Wellness</td>
<td>20</td>
</tr>
<tr>
<td>Commission on Prevention &amp; Wellness Advisory Board</td>
<td>17</td>
</tr>
<tr>
<td>Medicaid Study Committee (for coverage for kids under 19)</td>
<td>6</td>
</tr>
<tr>
<td>Special Commission to review Public Payer Reimbursement Rates</td>
<td>13</td>
</tr>
<tr>
<td>Medical Malpractice Task Force</td>
<td>11</td>
</tr>
<tr>
<td>Pharma Cost Containment Commission</td>
<td>16</td>
</tr>
<tr>
<td>Diagnostic Accuracy Task Force</td>
<td>9</td>
</tr>
<tr>
<td>Behavioral, Mental Health &amp; Substance Abuse Task Force</td>
<td>19</td>
</tr>
<tr>
<td>Graduate Medical Education Commission</td>
<td>13</td>
</tr>
<tr>
<td>Special Commission on Price Variation</td>
<td>18</td>
</tr>
<tr>
<td>Flexible Spending Accounts, Health Savings Accounts Study Commission</td>
<td>12</td>
</tr>
<tr>
<td>Personal Care Attendant Quality Home Care Workforce Council</td>
<td>9</td>
</tr>
<tr>
<td>Health Information Technology Council</td>
<td>21</td>
</tr>
<tr>
<td><strong>Total Appointments</strong></td>
<td><strong>278+</strong></td>
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</tbody>
</table>

Note: No staff numbers are included for the HPC or CHIA (the two largest agencies) because the number is still undetermined. CHIA is a reconfigured Division of Health Care Finance and Policy. HPC is a significantly altered Health Care Quality and Cost Council. Source: Author’s compilation.
Our new contracts...almost 2 years in
Lives under the Accountable Care Model

1. Medicare
   Pioneer Accountable Care Organization
   Elderly population, care management central to trend management
   Covered lives: ~75k

2. Commercial
   Alternative Quality Contract (AQC)
   Younger population, specialists critical to management
   Covered lives: ~350K

3. Medicaid
   NHP
   Population with significant disability, mental health, and substance abuse challenges
   Covered lives: ~25K

4. Self Insured
   Partners Plus
   Commercial population, but savings accrue directly to Partners, and improves our own lives
   Covered lives: ~80k

Partners currently manages roughly 500,000 lives in various accountable care relationships
How are we approaching implementation of PHM?

**Organization**
- Central support, local oversight of programs/implementation
- PHM also supports:
  - Health benefit design for our own employees
  - Our health insurance plan (NHP)

**Budget/Incentives**
- Approx 1% tax on clinical revenue allows for system-wide infrastructure investments
  - Total annual cost for PHM program when fully implemented = $100m; 2015 budget = $50m

- Investments in primary care (Phase 1)
- Investments in specialty care (Phase 2/3)
A Modified “Golden Rule” for Health Care Organizations

Creagh E. Milford, DO, and Timothy G. Ferris, MD, MPH

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<td>Appropriateness</td>
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<td>Chronic condition management</td>
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<td><strong>Hospital Care</strong></td>
<td></td>
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<tr>
<td>EHR with decision support and order entry</td>
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<tr>
<td>Variance reporting/performance dashboards</td>
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<tr>
<td>Quality metrics: clinical outcomes, satisfaction</td>
<td></td>
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<tr>
<td>Incentive programs</td>
<td></td>
</tr>
<tr>
<td>Costs/population</td>
<td>Costs/episode</td>
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</table>

Public reporting
Readmissions
Virtual Visits
E-consults
Variation Analyses
Procedural decision support
Barriers for physicians

- History of capitation in the 1990s
- FFS culture: “You eat what you kill”
- Concerns regarding public reporting and risk-adjustment and internal metrics
- Perception of medico-legal risk being mitigated by traditional care delivery mechanisms
Reporting can be public reporting or internal within systems.

Reporting is only meaningful if:

(1) Risk adjusted without unmeasured confounders
(2) Clinical data rather than claims data (harder to do)
(3) There is no manipulation of data by clinicians (either conscious or unconscious)

Physicians trusting metrics is essential to success.

Wasfy et al *Circulation* 2015
Physician trust

- Physicians want to improve quality of care for their patients

- Ethical commitment to patients directly

- Important to emphasize the value imperative:
  1. Access to care for patients
  2. Preserving health for future generations
  3. PHM makes care cheaper – but also better!
Readmissions

- Section 3025 of the Affordable Care Act of 2010
- Hospital Readmission Reduction Program (HRRP)
- First applied to AMI, CHF, pneumonia, then expanded to elective arthroplasty and COPD
- Penalties up to 3% of all Medicare Part A reimbursements
- Largely specialty care
Why PCI Readmissions Matter for Population Health

- Overlap with Medicare HRRP penalties for AMI
- Bed availability
- Public reporting
- Patient convenience
- Trend expense
A national problem

- PCI readmission costs $359 million/year to Medicare alone
- 14.6% of Medicare patients are readmitted to hospital within 30 days of discharge

Figure 2: Mean Unadjusted Hospital Readmission Rates by Hospital Decile of Readmission

Proportion of readmissions with (purple) and without (pink) an associated revascularization procedure.

Curtis et al. JACC 2009
### PCI Readmissions Are Preventable

> 40% of 30-day post-PCI readmissions thought to be preventable

<table>
<thead>
<tr>
<th>Ratings for reviewer #1</th>
<th>Not preventable</th>
<th>Possibly preventable</th>
<th>Probably preventable</th>
<th>Definitely preventable</th>
</tr>
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<tr>
<td>Not preventable</td>
<td>408 (45.6%)</td>
<td>81 (9.1%)</td>
<td>46 (5.1%)</td>
<td>66 (7.4%)</td>
</tr>
<tr>
<td>Possibly preventable</td>
<td>25 (2.8%)</td>
<td>10 (1.1%)</td>
<td>13 (1.5%)</td>
<td>11 (1.2%)</td>
</tr>
<tr>
<td>Probably preventable</td>
<td>24 (2.7%)</td>
<td>9 (1.0%)</td>
<td>31 (3.5%)</td>
<td>19 (2.1%)</td>
</tr>
<tr>
<td>Definitely preventable</td>
<td>20 (2.2%)</td>
<td>15 (1.7%)</td>
<td>17 (1.9%)</td>
<td>99 (11.1%)</td>
</tr>
</tbody>
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Wasfy et al *JAHA* 2014
PCI Readmissions Are Often Low-Risk Chest Pain

- 9,288 PCI patients, 893 (9.8%) readmitted at MGH and BWH within 30 days
- 6.2% complications of PCI, 38.1% suspicion for angina

Wasfy et al Circ Intv 2014 only 2.6% TLR!
PCI Readmission Risk Can Be Predicted

Variables known before PCI can predict readmission risk prospectively (C-statistic = 0.69).

Wasfy et al Circ Qual Outcomes 2013
Anxiety and ED visits predict readmission

Consistent with the matching process, cases and controls had similar predicted risk (16.3% for cases vs. 16.2% for controls, p = 0.748)

Cases and controls were significantly different with respect to proportions of:

- **ED visits/past year**: 1.12 for cases, 0.77 for controls, p < 0.001

# New triage protocols

<table>
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<th>Presentation</th>
<th>Default recommendations</th>
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</thead>
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<tr>
<td><strong>HIGH</strong></td>
<td>- Activate cath emergency line for STEMI</td>
</tr>
<tr>
<td></td>
<td>- Emergent cardiology consult</td>
</tr>
<tr>
<td>• Cardiac arrest</td>
<td></td>
</tr>
<tr>
<td>• STEMI</td>
<td></td>
</tr>
<tr>
<td><strong>MEDIUM</strong></td>
<td>- Discussion with cardiologist and consider admission</td>
</tr>
<tr>
<td>• Diabetes</td>
<td></td>
</tr>
<tr>
<td>• Concerning symptoms</td>
<td></td>
</tr>
<tr>
<td>• Newly (+) or rising troponin</td>
<td></td>
</tr>
<tr>
<td><strong>LOW</strong></td>
<td>- ETT/MIBI/TTE</td>
</tr>
<tr>
<td>• (-) or decreasing troponin</td>
<td>- EDOU + same-day* cardiology consult to consider admission vs. discharge</td>
</tr>
<tr>
<td>• Clinical symptoms low risk on presentation</td>
<td></td>
</tr>
</tbody>
</table>

* for presentations after 5 pm, the cardiology consult can occur next morning
Automated notifications

Continuity of Care (CCI) for inpatients

From: PHS Admit Notification
To: Mannstadt, Michael, M.D.; Wasfy, Jason H., M.D., M.Phil.
Subject: CCI Inpatient Admit Notification

Apollo (all MGH PCI) → LCS (all MGH readmissions) → PDSA

True denominator

Numerator #1

MGH Index RR: OUTCOME 1
Numerator #2: Mass-DAC, longer term data lag

Numerator #1
True denominator
We’re making progress

30-day Readmission Rates for PCI Patients Discharged from MGH in 2008-2014

- Linear equation: $y = -0.0037x + 0.0946$
- $R^2 = 0.5009$

- Graph shows the number of discharged PCI patients from 2008 to 2014, with bar charts for those with and without 30-day readmissions.

- 30-day readmission rate is decreasing over the years with a linear trend.
<table>
<thead>
<tr>
<th><strong>Technology</strong></th>
<th><strong>MGH Pilots</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Email</td>
<td>Provider reviews patient’s pre-visit questionnaire to determine treatment options and assess the need for visit or phone appointment.</td>
</tr>
<tr>
<td>Videoconferencing</td>
<td>Psychiatrist conducts a follow-up visit with an adolescent patient with autism for medication management.</td>
</tr>
<tr>
<td>Telephone</td>
<td>Cardiologist calls stable CAD patient to check-in on medications and symptoms between annual visits.</td>
</tr>
<tr>
<td>Text Messaging</td>
<td>• Physician is alerted of ‘alarm symptom’ in a patient who is completing an asynchronous virtual visit via web portal.</td>
</tr>
<tr>
<td>Electronic Consult</td>
<td>• Specialist reviews referral requests and triages to e-consult – answers PCP questions by email.</td>
</tr>
</tbody>
</table>
Telehealth Terminology

**Visits**

**Real Time “Synchronous”**

**Virtual Visit**

Video visit between MGH MD and patient

**Store and Forward “Asynchronous”**

**eVisit**

Online exchange of medical info between MGH MD & patient

**Virtual Consult**

Video consult from MGH MD to patient’s MD

**eConsult**

Online consult from MGH MD to patient’s local MD

---

1. Exchange where the provider gives the patient medical advice
2. Exchange where the MGH consultant “Expert” gives MGH provider or external community provider medical advice
Virtual Visit Volume by Dept - 2013 & 2014

- Primary Care: 25
- Neurology: 266
- Anesthesia: 245
- Cardiology: 107
- Dermatology: 331
- Psychiatry: 2,463

[Diagram showing virtual visit volume by department with corresponding numbers.]
Virtual Visits and Consults: Historical Trend

Video visit between MGH MD and patient

2013-2014 Volume
Cumulative Volume: 2,816

Departments (*Home Visits)
- Cancer Center*
- Cardiology*
- Dermatology
- Neurology*
- Pain Management
- Pediatrics
- Primary Care*
- Psychiatry*
- Surgery*
- Urology

Launched in 3/2013
Approaches for managing increasing referrals

**Practice Profile**

A Safety-Net System Gains Efficiencies Through ‘eReferrals’ To Specialists

**eConsults Example**

**Online consult from MGH specialist to MGH physician**

PCP Question for Cardiologist

E-Consult Referral

Dr. Eric Isselbacher
E-Consults in Cardiology

Initial Results of a Cardiac E-Consult Pilot Program

In the United States, health care costs have outpaced improvements in outcomes (1). One component in cost growth is intensification of specialist care (2). New payment policies, such as shared savings programs, have created...

Wasfy et al. JACC 2014
E-Consults in Cardiology

<table>
<thead>
<tr>
<th>100 e-consults requested January-July 2014</th>
<th>Case Outcome (n=100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-consult refused and converted to a traditional visit</td>
<td>14/100 (14%)</td>
</tr>
<tr>
<td>In-person cardiology visit recommended</td>
<td>11/86 (12.8%)</td>
</tr>
<tr>
<td>Patient eventually had a traditional cardiology visit without a visit recommended</td>
<td>10/86 (11.6%)</td>
</tr>
<tr>
<td>Patient did not have any type of traditional cardiology visit within at least 6 months of follow up</td>
<td>65/86 (75.6%)</td>
</tr>
</tbody>
</table>

E-consult patients were younger than traditional consult patients (55.3 vs. 60.4 years, p < 0.001).

Wasfy et al. American Heart Association Quality and Outcomes 2015
E-Consults in Cardiology

- Growth in traditional cardiology consults less than matched specialties (4.5% vs. 10.1%, p < 0.001)
- Satisfaction overwhelming among PCPs and patients

Wasfy et al. in review
Total eConsults

eConsults Program Growth

- Cumulative Total
- Monthly Volume
Variation

Doctors Office A

Doctor A orders more expensive tests.

Do more of Doctor A’s patients need the tests?

Or does Doctor A have a different threshold to test?

Doctors Office B
Variation

Jack Wennberg – rates of tonsillectomies in villages in Vermont in the 1970s

Stowe vs. Waterbury

Provider availability and practice style
Variation

More than 1.3 million cardiac catheterizations performed yearly in US

$2000-$5000 per procedure

Estimated total cost > $ 4 billion per year
## Variation

<table>
<thead>
<tr>
<th>Country</th>
<th>Caths/100000 p-y</th>
<th>CV mortality/100000 p-y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>236</td>
<td>329.7</td>
</tr>
<tr>
<td>Netherlands</td>
<td>117</td>
<td>311.9</td>
</tr>
<tr>
<td>Sweden</td>
<td>113</td>
<td>428.8</td>
</tr>
<tr>
<td>UK</td>
<td>102</td>
<td>429.7</td>
</tr>
<tr>
<td>US</td>
<td><strong>374</strong></td>
<td>369.2</td>
</tr>
</tbody>
</table>

Collins-Nakai et al. *JACC* 1992
Odds ratio (for binary outcomes):
Odds A / Odds B

If doctor A orders 8 tests per 28 visits and doctor B orders 2 tests per 32 visits:

\[
OR = \frac{8/20}{2/30} = 6
\]

“Doctor A has a 6 times greater odds of ordering the test during a given visit than Doctor B”
What if N doctors exist in a group?

Doctor A, Doctor B, Doctor C, Doctor D (N = 4)

You then have (N-1)! Comparisons

3! = 6 [this can get computationally intense]

Odds A = 0.8  Odds B = 0.6  Odds C = 0.5  Odds D = 0.4

\[
\begin{align*}
\text{OR}_{AB} &= 1.33 \\
\text{OR}_{AC} &= 1.60 \\
\text{OR}_{AD} &= 2.00 \\
\text{OR}_{BC} &= 1.20 \\
\text{OR}_{BD} &= 1.50 \\
\text{OR}_{CD} &= 1.25 \\
\end{align*}
\]
MOR = 1.41 (arithmetic mean of $\text{OR}_\text{AB}$ and $\text{OR}_\text{BD}$)
MOR > 1.2 indicates clinically significant variation
Odds ratios

No variation between providers
This example ignores case mix – okay only if case mix is identical

Regression considers case mix (characteristics of patients)

MOR can be used to quantify results from logistic regression models (binary or ordinal outcomes)
Logistic regression (dichotomous, non-normal data)
\[
\ln (Y) = Bx + Cz + Da + Eb \ldots
\]

**Fixed effects** (age, gender, diabetes status)
**Random effects** (which doctor is ordering the test)

The interpretation of fixed/random effects in a logistic model is more complex because of the non-linear relationship between outcomes/predictors.

**Near normal – linear regression**

**Non normal – logistic regression**

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[Diagram showing normal distribution and logistic regression distributions]
Variation
The Importance of Assessing Appropriateness

- **Improved Patient Care:** It’s the right thing to do for our patients
- **Lower Cost:** We are responsible for overuse
- **Improved Administrative Efficiency:** Payers willing to use PrOE instead of prior authorization
- **Meeting Regulatory Requirement:** Required to report appropriateness to registries (MassDAC, STS, ACC, NSQIP)
- **Preparing for Legislative Mandate:** New Sustainable Growth Rate “fix” includes Appropriate Use Criteria (AUC).
- **Increasing Awareness:** Public should be aware of our levels of appropriate procedures.
## PrOE: Assessment

### Appropriateness Scores:

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Therapy Only</td>
<td>5</td>
</tr>
<tr>
<td>CEA</td>
<td>8</td>
</tr>
<tr>
<td>CAS</td>
<td>2</td>
</tr>
</tbody>
</table>

### Risk Scores:

| Risk of Stroke or Death in Hospital for CAS | 1.4% |
| Risk of Stroke or Death in Hospital for CEA | 0.8% |
### Goal 2018: 16 Conditions, Representing ~45 procedures

<p>| | |</p>
<table>
<thead>
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<tbody>
<tr>
<td>1.</td>
<td><strong>Coronary Artery Disease</strong></td>
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<tr>
<td>2.</td>
<td><strong>Carotid Artery Disease</strong></td>
</tr>
<tr>
<td>3.</td>
<td><strong>Valvular disease</strong></td>
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<td>4.</td>
<td><strong>Peripheral Vascular Disease</strong></td>
</tr>
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<td>5.</td>
<td><strong>Osteoarthritis</strong></td>
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<td>6.</td>
<td><strong>Spinal Stenosis</strong></td>
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<td><strong>Herniated Disc Disease</strong></td>
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<td><strong>Prostate Cancer</strong></td>
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<td>10.</td>
<td><strong>Obesity / Gastric Bypass</strong></td>
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<td><strong>Kidney Stones</strong></td>
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<td><strong>Benign Prostatic Hypertrophy</strong></td>
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<td><strong>Breast Cancer</strong></td>
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<td>14.</td>
<td><strong>Colon Cancer</strong></td>
</tr>
<tr>
<td>15.</td>
<td><strong>Rheumatoid Arthritis</strong></td>
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<tr>
<td>16.</td>
<td><strong>Inflammatory Bowel Disease</strong></td>
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### Criteria:

1. High cost, high volume, or both.
2. Clear evidence based guidelines and physician consensus.
3. Physician and administrative champion.

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**Black:** In use  
**Blue:** In progress (2014)  
**Orange:** Planned procedures
Thank you!

Jason Wasfy MD
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@jhwasfy
How the IPF works

Payer 1
Payer 2
Payer 3
Payer 4
Payer 5
Payer 6

Internal Performance Framework

Tactical Programs

IT & Analytics

Financial Incentives

Process Key

--- Risk Adjusted Cost
--- Trend Benchmark
---- Care Management
------- Quality Metrics
---------- Implementation Metrics
Evidence based care improvement tactics

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<th>Episodic Care</th>
<th>Hospital Care</th>
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<td>Incentive programs</td>
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<td>Variance reporting/performance dashboards</td>
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<td>Quality metrics: clinical outcomes, satisfaction</td>
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<td>Costs/population</td>
<td>Costs/episode</td>
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