Leadership Workshop: Strategy for Health Care Delivery

Outcomes Measurement

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This presentation draws on Redefining Health Care: Creating Value-Based Competition on Results (with Elizabeth O. Teisberg), Harvard Business School Press, May 2006; “A Strategy for Health Care Reform—Toward a Value-Based System,” New England Journal of Medicine, June 3, 2009; “Value-Based Health Care Delivery,” Annals of Surgery 248: 4, October 2008; “Defining and Introducing Value in Healthcare,” Institute of Medicine Annual Meeting, 2007. Additional information about these ideas, as well as case studies, can be found the Institute for Strategy & Competitiveness Redefining Health Care website at http://www.hbs.edu/rhc/index.html. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means — electronic, mechanical, photocopying, recording, or otherwise — without the permission of Michael E. Porter and Elizabeth O. Teisberg.
Creating a Value-Based Health Care Delivery System

The Strategic Agenda

1. Organize Care into Integrated Practice Units (IPUs) around Patient Medical Conditions
   - Organize primary and preventive care to serve distinct patient segments

2. Measure Outcomes and Cost for Every Patient

3. Reimburse through Bundled Prices for Care Cycles

4. Integrate Care Delivery Across Separate Facilities

5. Expand Geographic Coverage by Excellent Providers

6. Build an Enabling Information Technology Platform
2. Measuring Outcomes and Cost for Every Patient
   The Measurement Landscape

- **Patient Initial Conditions**
- **Processes**
  - Protocols/Guidelines
  - E.g., Hemoglobin A1c levels for diabetics
- **Indicators**
  - E.g., Staff certification, facilities standards
- **Patient Adherence**
- **(Health) Outcomes**
Process Measurement is Not Enough
Overall survival time (95% CI) free of signals for updating.

Principles of Outcome Measurement

1. Outcomes should be measured by **medical condition** or **primary care patient segment**

2. Outcomes should reflect the **full cycle of care**

3. Outcomes are **multi-dimensional** and should include the health circumstances **most relevant to patients**

4. Measurement should include **initial conditions/risk factors** to allow for risk adjustment

5. Outcome measures should be **standardized across institutions** to enable comparison and learning
Conditions versus Procedures

- Traditional model: Measure by procedure or specialty

  - Outcomes for interventional cardiology
  - Outcomes for outpatient cardiology
  - Outcomes for cardiac surgery

- Hinders comparison of different interventions on outcomes
Conditions versus Procedures

- Traditional model: Measure by procedure or specialty
  - Hinders comparison of different interventions on outcomes

- Value-based model: Measuring around the underlying condition of the patient
  - Facilitates comparison of interventions and selection of highest value treatment model

Outcomes for coronary artery disease patients

Outcomes for outpatient cardiology

Outcomes for interventional cardiology

Outcomes for cardiac surgery
Outcomes Should Be Measured Across The Full Care Cycle
Acute Knee-Osteoarthritis Requiring Replacement

<table>
<thead>
<tr>
<th>Monitoring/Preventing</th>
<th>Diagnosing</th>
<th>Preparing</th>
<th>Intervening</th>
<th>Recovering/Rehabbing</th>
<th>Monitoring/Managing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Monitor</strong></td>
<td><strong>Imaging</strong></td>
<td><strong>Overall prep</strong></td>
<td><strong>Anesthesia</strong></td>
<td><strong>Surgical</strong></td>
<td><strong>Monitor</strong></td>
</tr>
<tr>
<td>- Conduct PCP exam</td>
<td>- Perform and evaluate MRI and x-ray</td>
<td>- Conduct home assessment</td>
<td>- Administer anesthesia (general, epidural, or regional)</td>
<td>- Immediate return to OR for manipulation, if necessary</td>
<td>- Consult regularly with patient</td>
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<tr>
<td>- Refer to specialists, if necessary</td>
<td>- Assess cartilage loss</td>
<td>- Monitor weight loss</td>
<td>- Surgical procedure</td>
<td>- Monitor coagulation</td>
<td>- Prescribe prophylactic antibiotics when needed</td>
</tr>
<tr>
<td><strong>Prevent</strong></td>
<td><strong>Surgical prep</strong></td>
<td><strong>Pain management</strong></td>
<td><strong>Surgical</strong></td>
<td><strong>Living</strong></td>
<td>- Set long-term exercise plan</td>
</tr>
<tr>
<td>- Prescribe anti-inflammatory medicines</td>
<td>- Perform cardiology, pulmonary evaluations</td>
<td>- Prescribe preemptive multimodal pain melds</td>
<td>- Indication for surgery</td>
<td>- Provide daily living support</td>
<td>- Revise joint, if necessary</td>
</tr>
<tr>
<td>- Recommend exercise regimen</td>
<td>- Run blood labs</td>
<td>- Orthopedic floor at hospital/specialty center</td>
<td>- Joint-specific symptoms and function</td>
<td>- Track risk indicators</td>
<td>-</td>
</tr>
</tbody>
</table>
Measuring the Long-Term Results of Hip Replacement

- Measurement often stops 30 days, 90 days, or a year post-intervention, but many critical outcomes that matter to patients are revealed over time.
- Measuring across the full cycle of care is necessary for a complete and accurate picture of value delivered.

The Outcome Measures Hierarchy

**Tier 1**
- **Health Status Achieved or Retained**
  - Survival

**Tier 2**
- **Process of Recovery**
  - Time to recovery and return to normal activities

**Tier 3**
- **Sustainability of Health**
  - Sustainability of health/recovery and nature of recurrences
  - Long-term consequences of therapy (e.g., care-induced illnesses)

- **Disutility of the care or treatment process** (e.g., diagnostic errors and ineffective care, treatment-related discomfort, complications, or adverse effects, treatment errors and their consequences in terms of additional treatment)

Source: NEJM Dec 2010

- **Care-induced Illnesses**
- **Recurrences**
- **Clinical Status**
- **Functional Status**
The Outcome Measures Hierarchy

Tier 1
Health Status
Achieved or Retained

Survival

Tier 2
Process of Recovery

Degree of health/recovery

Time to recovery and return to normal activities

Tier 3
Sustainability of Health

Sustainability of health/recovery and nature of recurrences

Long-term consequences of therapy (e.g., care-induced illnesses)

Source: NEJM Dec 2010
The Outcome Measures Hierarchy

Breast Cancer

- Survival rate (One year, three year, five year, longer)
- Degree of remission
- Functional capability
- Breast conservation
- Depression
- Time to remission
- Time to functional status
- Nosocomial infection
- Nausea/vomiting
- Febrile neutropenia
- Suspension of therapy
- Failed therapies
- Limitation of motion
- Depression
- Cancer recurrence
- Sustainability of functional status
- Incidence of secondary cancers
- Brachial plexopathy
- Fertility/pregnancy complications
- Premature osteoporosis

Initial Conditions/Risk Factors
- Stage upon diagnosis
- Type of cancer (infiltrating ductal carcinoma, tubular, medullary, lobular, etc.)
- Estrogen and progesterone receptor status (positive or negative)
- Sites of metastases
- Previous treatments
- Age
- Menopausal status
- General health, including co-morbidities
- Psychological and social factors

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- Age
- Menopausal status
- General health, including co-morbidities
- Psychological and social factors
Comparing Outcomes over Time
MD Anderson Oral Cavity Cancer Survival by Patient Registration Year

Source: MD Anderson Cancer Center
Comparing Outcomes across Centers
In-vitro Fertilization

Percent Live Births per Fresh, Non-Donor Embryo Transferred by Clinic Size
Women Under 38 Years of Age, 1997-2007

Comparing Outcomes across Centers


Number of programs: 219
Number of transplants: 19,588
One year graft survival: 79.6%

- 16 greater than predicted survival (7%)
- 20 worse than predicted survival (10%)
Comparing Outcomes across Centers

Adult Kidney Transplants, US Centers, 2008-2010

Number of programs included: 236
Number of transplants: 38,535
1-year graft survival: 93.55%

8 greater than expected graft survival (3.4%)
14 worse than expected graft survival (5.9%)
Steps to Creating an Outcomes Measurement System

1. Designing outcome measures
2. Collecting outcome data
3. Compiling and analyzing outcomes
4. Reporting
5. Driving improvement
1. Designing Outcome Measures

- Define the medical condition
- Establish an outcome measures team including physicians, nurses and skilled staff involved in the care cycle
- Create a care delivery value chain (CDVC) for the condition
- Use the outcome hierarchy to define a comprehensive set of outcome dimensions, and specific measures
  - Engage patients to understand the outcomes that matter to them
- Tie the outcome measures to the CDVC to check for completeness and start to identify the causal connections between activities and each outcome
The Care Delivery Value Chain
Acute Knee-Osteoarthritis Requiring Replacement

<table>
<thead>
<tr>
<th>Informing and engaging</th>
<th>Measuring</th>
<th>Accessing</th>
<th>MONITORING/ PREVENTING</th>
<th>DIAGNOSING</th>
<th>PREPARING</th>
<th>INTERVENING</th>
<th>RECOVERING/ REHABBING</th>
<th>MONITORING/ MANAGING</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Importance of exercise, weight reduction, proper nutrition</td>
<td>• Joint-specific symptoms and function (e.g., WOMAC scale)</td>
<td>• PCP office</td>
<td>Monitor</td>
<td>Imaging</td>
<td>Overall prep</td>
<td>Anesthesia</td>
<td>Surgical</td>
<td>Monitor</td>
</tr>
<tr>
<td>• Meaning of diagnosis</td>
<td>• Overall health (e.g., SF-12 scale)</td>
<td>• Health club</td>
<td>Prevent</td>
<td>• Perform and evaluate MRI and x-ray</td>
<td>• Conduct home assessment</td>
<td>• Administer anesthesia (general, epidural, or regional)</td>
<td>Surgical procedure</td>
<td>• Consult regularly with patient</td>
</tr>
<tr>
<td>• Prognosis (short- and long-term outcomes)</td>
<td>• Specialty office</td>
<td>• Physical club</td>
<td>Care delivery</td>
<td>• Assess cartilage loss</td>
<td>• Monitor weight loss</td>
<td>• Determine approach (e.g., minimally invasive)</td>
<td>Medical</td>
<td>• Prescribe prophylactic antibiotics when needed</td>
</tr>
<tr>
<td>• Drawbacks and benefits of surgery</td>
<td>• Imaging facility</td>
<td>• Specialty office</td>
<td>• Clinical evaluation</td>
<td>• Assess bone alterations</td>
<td>• Perform cardiology, pulmonary evaluations</td>
<td>• Run blood labs</td>
<td>Living</td>
<td>• Set long-term exercise plan</td>
</tr>
<tr>
<td>• Setting expectations</td>
<td>• Specialty office</td>
<td>• Pre-op evaluation center</td>
<td>• Review history and imaging</td>
<td>• Perform physical exam</td>
<td>• Conduct pre-op physical exam</td>
<td>• Insert device</td>
<td>Physical therapy</td>
<td>• Review joint, if necessary</td>
</tr>
<tr>
<td>• Importance of nutrition, weight loss, vaccinations</td>
<td>• PCP office</td>
<td>• Operating room</td>
<td>• Conduct home assessment</td>
<td>• Cement joint</td>
<td>• Conduct pre-op physical exam</td>
<td>• Insert device</td>
<td>Pain management</td>
<td>• Daily or twice daily PT sessions</td>
</tr>
<tr>
<td>• Home preparation</td>
<td>• Recovery room</td>
<td>• Orthopedic floor at hospital/ specialty center</td>
<td>• Monitor weight loss</td>
<td>• Cement joint</td>
<td>• Conduct pre-op physical exam</td>
<td>• Insert device</td>
<td>Surgical</td>
<td>• Consult regularly with patient</td>
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<td>• Expectations for recovery</td>
<td>• Inpatient length of stay</td>
<td>• Ability to return to normal activities</td>
<td>• Blood loss</td>
<td>• Complications</td>
<td>• Expectations for recovery</td>
<td>• Immediate return to OR for manipulation, if necessary</td>
<td>Monitoring</td>
<td>• Consult regularly with patient</td>
</tr>
<tr>
<td>• Importance of rehab</td>
<td>• Joint-specific symptoms and function</td>
<td>• Importance of exercise, maintaining healthy weight</td>
<td>• Operative time</td>
<td>• Inpatient length of stay</td>
<td>• Importance of exercise, maintaining healthy weight</td>
<td>• Longitudinal care plan</td>
<td>Measuring</td>
<td>• Consult regularly with patient</td>
</tr>
<tr>
<td>• Post-surgery risk factors</td>
<td>• Joint-specific symptoms and function</td>
<td>• Weight gain or loss</td>
<td>• Complications</td>
<td>• Inpatient length of stay</td>
<td>• Joint-specific symptoms and function</td>
<td>• Missed work</td>
<td>Accessing</td>
<td>• Consult regularly with patient</td>
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<td>• Importance of rehab adherence</td>
<td>• Ability to return to normal activities</td>
<td>• Overall health</td>
<td>• Operating room</td>
<td>• Expectations for recovery</td>
<td>• Longitudinal care plan</td>
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2011.09.03 Comprehensive Deck
1. Designing Outcome Measures

• Define the medical condition
• Establish an outcome measures team including physicians, nurses and skilled staff involved in the care cycle
• Create a care delivery value chain (CDVC) for the condition
• Use the outcome hierarchy to define a comprehensive set of outcome dimensions, and specific measures
  – Engage patients to understand the outcomes that matter to them
• Tie the outcome measures to the CDVC to check for completeness and start to identify the causal connections between activities and each outcome
• Identify the set of initial conditions or risk factors necessary to control for patient differences
• Utilize ICHOM data on outcome measures and risk adjustment to identify international best practices
2. Collecting Outcome Data: Initial Steps

- Collect **baseline circumstances** on all outcome dimensions at the start of care
- Capture already **available** outcome metrics from clinical/administrative systems
- Identify the **best placed individual(s)** for **entering data** and making the **most informed judgment** on each measure
  - E.g. physicians, nurses, patients or dedicated measurement staff
- Exchange data with **other providers** who are part of the care cycle
- Create a processes to **enter measures efficiently**, ideally as part of standard workflow
- Survey patients to measure **patient-reported outcomes**
- Access **payor** information if available to capture care upstream, and longer term
- Create an **auditing system** to eliminate errors, as well as to test the objectivity of qualitative scoring and judgments

- Chart review and **paper-based forms** are starting points in initiating and expanding the measures tracked
2. Collecting Outcome Data: Moving to a Real-time System

EMR Capture
• Modify the **EMR** to allow efficient collection of clinician-reported measures
  – E.g. standardized, medical-condition specific templates

Patient-Reported Outcomes
• Create tablet and web-based tools to **gather patient-reported outcomes**
  – E.g. Dartmouth Spine Center tablets, patient portals

Long Term Tracking
• Develop practical **patient tracking** methods to follow patients over extended time periods
  – Links to registries, payor and government databases (e.g., worker’s compensation, unemployment, death records)
3. Compiling and Analyzing Outcomes

• Compile outcomes data and initial conditions in a **centralized registry or database**
  – Data should be structured around patients and their **medical conditions**, not visits or episodes

• Report to **external disease registries** if available

• Create reports covering **risk-adjusted patient cohorts** over time

• Compare outcomes **across providers and locations**

• **Refine** the measures, collection methods, and risk-adjustment factors over time
4. Reporting

• Begin with **internal reporting to providers**
  – Comparing outcomes over time, then across locations
  – Move from blinded to unblinded data at the individual provider level

• **Expand reporting** over time to include referring providers, payors, and patients
  – An agreed upon **path to external transparency** of outcomes

• Work with provider peers, payors, and government to **standardize reporting measures and methods**, including
  – Standardized metrics
  – Method of stratification/risk adjustment
  – Unit of analysis (individual physician vs. group practice)
  – Process for improving metrics

• Ultimately, **universal reporting of standardized measures** will be the strongest driver in value improvement
5. Driving Improvement

• Convene regular meetings to analyze outcome variations and trends
  – Create an environment that allows open discussion of results with no repercussions for participants willing to learn and make constructive changes

• Utilize outcomes analysis to investigate process improvement and potential care innovations

• Collaborate with external registries and leading national and international providers to benchmark performance and compare best practices

• Combine outcome data with care cycle costing data to examine opportunities for value improvement through better efficiency, reducing redundancy, and eliminating activities that do not contribute to outcome improvement
Enabling Universal Outcomes Measurement: Leverage Points for Government

- **Incentivize** outcomes measurement and reporting
  - Payment incentives for **reporting**
  - **Required** reporting for participation in **new reimbursement models**
    - **Required** reporting for all reimbursement
- **Incorporate** requirements for outcome measurement (and reporting) into **certification** of programs and physicians
- **Remove** **policy hurdles** that impede outcome measurement and registry development and implementation (e.g., complex privacy rules, lack of definitive patient identifiers)
Enabling Universal Outcomes Measurement: Leverage Points for Government, Cont

• Provide **seed funding and guidelines** for registry development

• Promulgate a **medical condition taxonomy** to facilitate standardization

• Strengthen **IT standards** to allow easier exchange of consistent information across data sources
  – Rules to require/encourage **payor information sharing with providers** on individual patients to enable longer-term tracking

• **Stimulate or mandate EMR improvements** that enable efficient data-entry workflow and easy extraction of outcome measures

• Recognize **ICHOM standards** for **minimum sets of measures** and **metric definitions** to accelerate outcome measurement adoption and encourage standardization
Enabling Universal Outcomes Measurement: Leverage Points for Patients, Payors, and Employers

Payors
• Become active consumers of outcome data to inform contracting and guide subscriber choices
• Introduce incentives for outcome reporting and registry participation
  – Tie pay-for-performance programs initially to reporting of outcomes, but eventually to outcomes themselves

Employers
• Use purchasing power to require outcomes reporting by medical condition as a condition for contracting

Patients
• Work with providers to define the outcomes that matter to patients by medical condition
• Expect outcomes data as part of provider selection