Value-Based Health Care Delivery

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Harvard Business School
Value Based Health Care Intensive Seminar

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Creating A High Value Delivery Organization

• The core issue in health care is the **value of health care delivered**

  Value: Patient health outcomes per dollar spent

• Delivering high and improving value is the **fundamental purpose** of health care

• Value is the only goal that can **unite the interests** of all system participants

• Improving value is the only real **solution** to reforming health care versus **cost shifting to patients, restricting services, or reducing provider compensation**
Creating a Value-Based Health Care System

• Significant improvement in value will require fundamental restructuring of health care delivery, not incremental improvements
• Today’s delivery approaches reflect a legacy of medical science, organizational structures, management practices, and payment models that are obsolete.

Care pathways, process improvements, safety initiatives, care coordinators, disease management and other overlays to the current structure can be beneficial, but not sufficient
“Magic Bullets” Have Had Limited Impact

• Turning patients into consumers
  - Price and outcome information is lacking
• Global capitation to control spending
  - Reduces spending, but does not improve value
• Prior authorization
  - Raises costs while services are rarely disapproved
• Eliminating fraud and self dealing
  - Does not address root causes of low-value health care
• Eliminating errors
  - Reducing errors does not itself lead to a redesign of overall care that improves value
• Evidence-based medicine/clinical effectiveness research/guidelines
  - Guidelines fail to cover many services and individual patient circumstances
• Care Coordinators
  - Layered onto the existing structure will have limited impact
• New low cost models of primary care
  - Limited effect on the great majority of healthcare costs
• Electronic medical records
  - IT alone, without reorganizing care, has limited impact on value. Siloed IT systems work against value.
Creating The Right Kind of Competition

• Patient choice and competition for patients are powerful forces to encourage continuous improvement in value and restructuring of care

• However, today’s competition in health care is not aligned with value

Financial success of system participants ≠ Patient success

• Creating positive-sum competition on value for patients is fundamental to health care reform in every country
Principles of Value-Based Health Care Delivery

Value = \frac{\text{Health outcomes that matter to patients}}{\text{Costs of delivering the outcomes}}

- Value is measured for the care of a patient’s medical condition over the full cycle of care
  - Outcomes are the full set of health results for a patient’s condition over the care cycle
  - Costs are the total costs of care for a patient’s condition over the care cycle
Creating a Value-Based Health Care Delivery System

The Strategic Agenda

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

2. Measure Outcomes and Costs for Every Patient

3. Move to Bundled Payments for Care Cycles

4. Integrate Care Delivery Systems

5. Expand Geographic Reach

6. Build an Enabling Information Technology Platform
1. Organize Care Around Patient Medical Conditions

Migraine Care in Germany

Existing Model:
Organize by Specialty and Discrete Service

1. Organize Care Around Patient Medical Conditions
Migraine Care in Germany

Existing Model:
Organize by Specialty and Discrete Service

New Model:
Organize into Integrated Practice Units (IPUs)

### 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>• Imaging</td>
<td>• Specialty office</td>
<td>• Specialty office</td>
<td>• Operating room</td>
<td>• Immediate return to OR for manipulation, if necessary</td>
<td>• Consult regularly with patient</td>
</tr>
<tr>
<td>• Meanings of diagnosis</td>
<td>• Baseline health status</td>
<td>• Pre-op evaluation center</td>
<td>• Baseline health status</td>
<td>• Blood loss</td>
<td>• Baseline health status</td>
<td>• Blood loss</td>
<td>• Post-operative complications</td>
<td>• Prescribe prophylactic antibiotics when needed</td>
</tr>
<tr>
<td>• Prognosis (short- and long-term outcomes)</td>
<td>• Joint-specific symptoms and function (e.g., ASA score)</td>
<td>• Imaging facility</td>
<td>• Joint-specific symptoms and function (e.g., ASA score)</td>
<td>• Complications</td>
<td>• Joint-specific symptoms and function (e.g., ASA score)</td>
<td>• Complications</td>
<td>• Inpatient length of stay</td>
<td>• Set long-term exercise plan</td>
</tr>
<tr>
<td>• Drawbacks and benefits of surgery</td>
<td>• Overall health</td>
<td>• Physical therapy clinic</td>
<td>• Overall health</td>
<td>• Operating room</td>
<td>• Overall health</td>
<td>• Overall health</td>
<td>• Ability to return to normal activities</td>
<td>• Revise joint, if necessary</td>
</tr>
<tr>
<td>MONITOR</td>
<td>• Conduct PCP exam</td>
<td>• PCP office</td>
<td>• MONITORING/PREVENTING</td>
<td>• DIAGNOSING</td>
<td>• PREPARING</td>
<td>• INTERVENING</td>
<td>• RECOVERING/REHABBING</td>
<td>• MANAGING</td>
</tr>
<tr>
<td>• Refer to specialists, if necessary</td>
<td>• Joint-specific symptoms and function and function (e.g., WOMAC scale)</td>
<td>• Imaging facility</td>
<td>• CLINICAL EVALUATION</td>
<td>• OVERALL PREP</td>
<td>• SURGICAL PREP</td>
<td>• ANESTHESIA</td>
<td>• SURGICAL PROCEDURE</td>
<td>• MEDICAL</td>
</tr>
<tr>
<td>PREVENT</td>
<td>• Prescribe anti-inflammatory medicines</td>
<td>• PCP office</td>
<td>• CLINICAL EVALUATION</td>
<td>• Conduct home assessment</td>
<td>• Perform cardiology, pulmonary evaluations</td>
<td>• Administer anesthesia (general, epidural, or regional)</td>
<td>• Monitor coagulation</td>
<td>• LIVING</td>
</tr>
<tr>
<td>• Recommend exercise regimen</td>
<td>• Set weight loss targets</td>
<td>• PCP office</td>
<td>• CLINICAL EVALUATION</td>
<td>• Monitor weight loss</td>
<td>• Run blood labs</td>
<td>• Insert device</td>
<td>• Provide daily living support (showering, dressing)</td>
<td>• PHYSICAL THERAPY</td>
</tr>
<tr>
<td>• Set weight loss targets</td>
<td>• Infections</td>
<td>• PCP office</td>
<td>• CLINICAL EVALUATION</td>
<td>• Conduct pre-op physical exam</td>
<td>• Cement joint</td>
<td>• Track risk indicators (fever, swelling, etc.)</td>
<td>• Daily or twice daily PT sessions</td>
<td>• Orthopedic Specialist</td>
</tr>
<tr>
<td>• Orthopedic Specialist</td>
<td>• Joint-specific symptoms and function</td>
<td>• PCP office</td>
<td>• CLINICAL EVALUATION</td>
<td>• CONDUCT PREP</td>
<td>• SURGICAL PREP</td>
<td>• MEDICAL</td>
<td>• RECOVERING/REHABBING</td>
<td>• Other Provider Entities</td>
</tr>
<tr>
<td>• Home</td>
<td>• Longitudinal care plan</td>
<td>• PCP office</td>
<td>• CLINICAL EVALUATION</td>
<td>• OVERALL PREP</td>
<td>• SURGICAL PREP</td>
<td>• MEDICAL</td>
<td>• RECOVERING/REHABBING</td>
<td>• Other Provider Entities</td>
</tr>
<tr>
<td>• Importance of exercise, maintaining healthy weight</td>
<td>• Joint-specific symptoms and function</td>
<td>• PCP office</td>
<td>• CLINICAL EVALUATION</td>
<td>• CLINICAL EVALUATION</td>
<td>• CLINICAL EVALUATION</td>
<td>• MEDICAL</td>
<td>• RECOVERING/REHABBING</td>
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<table>
<thead>
<tr>
<th>CLINICAL EVALUATION</th>
<th>OVERALL PREP</th>
<th>SURGICAL PREP</th>
<th>ANESTHESIA</th>
<th>SURGICAL PROCEDURE</th>
<th>PHYSICAL THERAPY</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Review history and imaging</td>
<td>• Conduct home assessment</td>
<td>• Perform cardiology, pulmonary evaluations</td>
<td>• Administer anesthesia (general, epidural, or regional)</td>
<td>• Monitor coagulation</td>
<td>• Daily or twice daily PT sessions</td>
</tr>
<tr>
<td>• Perform physical exam</td>
<td>• Monitor weight loss</td>
<td>• Run blood labs</td>
<td>• Insert device</td>
<td>• Provide daily living support (showering, dressing)</td>
<td>• PHYSICAL THERAPY</td>
</tr>
<tr>
<td>• Recommend treatment plan (surgery or other options)</td>
<td></td>
<td>• Cement joint</td>
<td></td>
<td>• Track risk indicators (fever, swelling, etc.)</td>
<td></td>
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</table>
Integrating Across the Care Cycle
An Orthopedic Surgeon Teaches A Course to Physical Therapists
About Treatment Post-Surgery
What is a Medical Condition?

Specialty Care

- A medical condition is an interrelated set of patient medical circumstances best addressed in an integrated way
  - Defined from the patient’s perspective
  - Involving multiple specialties and services
  - Including common co-occurring conditions and complications

Examples: diabetes, breast cancer, knee osteoarthritis

Primary/Preventive Care

- The corresponding unit of value creation is defined patient segments with similar preventive, diagnostic, and primary treatment needs (e.g. healthy adults, patients with complex chronic conditions, frail elderly)

- The medical condition / patient segment is the proper unit of value creation and value measurement in health care delivery

Attributes of an Integrated Practice Unit (IPU)

1. Organized around a medical condition or set of closely related conditions (or around defined patient segments for primary care)
2. Care is delivered by a dedicated, multidisciplinary team who devote a significant portion of their time to the medical condition
3. Providers on the team see themselves as part of a common organizational unit
4. The team takes responsibility for the full cycle of care for the condition
   - Encompassing outpatient, inpatient, and rehabilitative care, as well as supporting services (such as nutrition, social work, and behavioral health)
5. Patient education, engagement, follow-up, and secondary prevention are integrated into care
6. The IPU has a single administrative and scheduling structure
7. Much of care is co-located in one or more dedicated sites
8. A physician team captain or a clinical care manager (or both) oversees each patient’s care process
9. The team measures outcomes, costs, and processes for each patient using a common measurement platform
10. The providers on the team meet formally and informally on a regular basis to discuss patients, processes, and results
11. Joint accountability is accepted for outcomes and costs
Volume and experience will have an even greater impact on value in an IPU structure than in the current system.
### Role of Volume in Value Creation

#### Fragmentation of Hospital Services in Sweden

<table>
<thead>
<tr>
<th>DRG</th>
<th>Number of admitting providers</th>
<th>Average percent of total national admissions</th>
<th>Average admissions/provider/year</th>
<th>Average admissions/provider/week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knee Procedure</td>
<td>68</td>
<td>1.5%</td>
<td>55</td>
<td>1</td>
</tr>
<tr>
<td>Diabetes age &gt; 35</td>
<td>80</td>
<td>1.3%</td>
<td>96</td>
<td>2</td>
</tr>
<tr>
<td>Kidney failure</td>
<td>80</td>
<td>1.3%</td>
<td>97</td>
<td>2</td>
</tr>
<tr>
<td>Multiple sclerosis and cerebellar ataxia</td>
<td>78</td>
<td>1.3%</td>
<td>28</td>
<td>1</td>
</tr>
<tr>
<td>Inflammatory bowel disease</td>
<td>73</td>
<td>1.4%</td>
<td>66</td>
<td>1</td>
</tr>
<tr>
<td>Implantation of cardiac pacemaker</td>
<td>51</td>
<td>2.0%</td>
<td>124</td>
<td>2</td>
</tr>
<tr>
<td>Splenectomy age &gt; 17</td>
<td>37</td>
<td>2.6%</td>
<td>3</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Cleft lip &amp; palate repair</td>
<td>7</td>
<td>14.2%</td>
<td>83</td>
<td>2</td>
</tr>
<tr>
<td>Heart transplant</td>
<td>6</td>
<td>16.6%</td>
<td>12</td>
<td>&lt;1</td>
</tr>
</tbody>
</table>

Low Volume Undermines Value
Mortality of Low-birth Weight Infants in Baden-Württemberg, Germany

- **Minimum volume standards** are an interim step to drive value and service consolidation in the absence of rigorous outcome information

Source: Hummer et al, Zeitschrift für Geburtshilfe und Neonatologie, 2006; Results duplicated in AOK study: Heller G, Gibt et al.
2. Measure Outcomes and Costs for Every Patient
The Measurement Landscape

- **Patient Initial Conditions**
- **Processes**
- **Indicators**
- **(Health) Outcomes**

**Patient Experience/Engagement**
- E.g. PSA, Gleason score, surgical margin

**Structure**
- E.g. Staff certification, facilities standards

**Protocols/Guidelines**
- E.g. PSA, Gleason score, surgical margin
The Outcome Measures Hierarchy

Tier 1
Health Status
Achieved or Retained

Tier 2
Process of Recovery

Tier 3
Sustainability of Health

---

**Survival**

**Degree of health/recovery**

- Achieved clinical status
- Achieved functional status

**Time to recovery and return to normal activities**

- Care-related pain/discomfort
- Complications
- Reintervention/readmission

**Sustainability of health/recovery and nature of recurrences**

- Long-term clinical status
- Long-term functional status

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

Source: NEJM Dec 2010
Measuring Multiple Outcomes
Prostate Cancer Care in Germany

- 5 year disease specific survival

- Average hospital: 94%
- Best hospital: 95%

Source: ICHOM
Measuring Multiple Outcomes -- Continued
Prostate Cancer Care in Germany

5 year disease specific survival
- Average hospital: 94%
- Best hospital: 95%

Severe erectile dysfunction after one year
- Average hospital: 75.5%
- Best hospital: 17.4%

Incontinence after one year
- Average hospital: 43.3%
- Best hospital: 9.2%

Source: ICHOM
Adult Kidney Transplant Outcomes
U.S. Centers, 1987-1989

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%)
Adult Kidney Transplant Outcomes
U.S. Center Results, 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%)
Measuring the Cost of Care Delivery: Principles

• Cost is the **actual expense** of patient care, not the **charges** billed or collected.

• Cost should be measured around the **patient**, not just the department.

• Cost should be aggregated over the **full cycle of care for the patient’s medical condition**.

• Cost depends on the **actual use of resources** involved in a patient’s care process (personnel, facilities, supplies).

Major Cost Reduction Opportunities in Health Care

• Reduce **process variation** that lowers efficiency and raises inventory without improving outcomes

• Eliminate **low- or non-value added** services or tests
  – Sometimes driven by protocols or to justify billing

• Rationalize redundant **administrative** and **scheduling** units

• **Improve utilization** of expensive physicians, staff, clinical space, and facilities by reducing duplication and service fragmentation

• Minimize use of **physician and skilled staff** time for less skilled activities

• Reduce the provision of routine or uncomplicated services in **highly-resourced** facilities

• **Reduce cycle times** across the care cycle

• **Optimize total care cycle cost** versus minimizing cost of individual service

• Increase **cost awareness** in clinical teams

• Many cost reduction opportunities will actually **improve outcomes**
3. Move to Bundled Payments for Care Cycles

Bundled Price
- A single price covering the **full care cycle for an acute medical condition**
- Time-based reimbursement for overall care of a **chronic condition**
- Time-based reimbursement for **primary/preventive care** for a **defined patient segment**
Bundled Payment in Practice
Hip and Knee Replacement in Stockholm, Sweden

- **Components** of the bundle

<table>
<thead>
<tr>
<th>Pre-op evaluation</th>
<th>All physician and staff fees and costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab tests</td>
<td>1 follow-up visit within 3 months</td>
</tr>
<tr>
<td>Radiology</td>
<td>Any additional surgery to the joint</td>
</tr>
<tr>
<td>Surgery &amp; related admissions</td>
<td>within 2 years</td>
</tr>
<tr>
<td>Prosthesis</td>
<td>If post-op infection requiring</td>
</tr>
<tr>
<td>Drugs</td>
<td>antibiotics occurs, guarantee extends</td>
</tr>
<tr>
<td>Inpatient rehab, up to 6 days</td>
<td>to 5 years</td>
</tr>
</tbody>
</table>

- Currently applies to all **relatively healthy patients** (i.e. ASA scores of 1 or 2)
- The same **referral process** from PCPs is utilized as the traditional system
- **Mandatory reporting** by providers to the joint registry plus supplementary reporting
- Applies to all qualifying patients. Provider participation is **voluntary**, but all providers are continuing to offer total joint replacements

- The Stockholm bundled price for a knee or hip replacement is about **US $8,000**
4. Integrate Care Delivery Systems

Children’s Hospital of Philadelphia Care Network

Network Hospitals:
- CHOP Newborn Care
- CHOP Pediatric Care
- CHOP Newborn & Pediatric Care

Wholly-Owned Outpatient Units:
- Pediatric & Adolescent Primary Care
- Pediatric & Adolescent Specialty Care Center
- Pediatric & Adolescent Specialty Care Center & Surgery Center
- Pediatric & Adolescent Specialty Care Center & Home Care

The Children’s Hospital of Philadelphia®

DELAWARE

NEW JERSEY

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Four Levels of Provider System Integration

1. **Define the overall scope of services** where the provider can achieve high value

2. **Concentrate volume in fewer locations** in the conditions that providers treat

3. Choose the **right location for each service** based on medical condition, acuity level, resource intensity, cost level and need for convenience
   - E.g., shift routine surgeries out of tertiary hospitals to smaller, more specialized facilities

4. **Integrate care across appropriate locations** through IPU structures
5. Expand Geographic Reach
The Cleveland Clinic Affiliate Programs

CLEVELAND CLINIC

Central DuPage Hospital, IL
Cardiac Surgery

Chester County Hospital, PA
Cardiac Surgery

St. Vincent Indianapolis, IN
Kidney Transplant

Charleston, WV
Kidney Transplant

Pikeville Medical Center, KY
Cardiac Surgery

Cape Fear Valley Medical Center, NC
Cardiac Surgery

McLeod Heart & Vascular Institute, SC
Cardiac Surgery

Cleveland Clinic Florida Weston, FL
Cardiac Surgery

Rochester General Hospital, NY
Cardiac Surgery
6. Build an Enabling Integrated IT Platform

Utilize information technology to enable restructuring of care delivery and measuring results, rather than treating it as a solution itself.

- Common data definitions
- Combine all types of data (e.g. notes, images) for each patient
- Data encompasses the full care cycle, including care by referring entities
- Allow access and communication among all involved parties, including with patients
- Templates for medical conditions to enhance the user interface
- “Structured” data vs. free text
- Architecture that allows easy extraction of outcome measures, process measures, and activity-based cost measures for each patient and medical condition
- Interoperability standards enabling communication among different provider (and payor) organizations
A Mutually Reinforcing Strategic Agenda

1. Organize into Integrated Practice Units (IPUs)

2. Measure Outcomes and Cost For Every Patient

3. Move to Bundled Payments for Care Cycles

4. Integrate Care Delivery Systems

5. Expand Geographic Reach

6. Build an Integrated Information Technology Platform
Why We Have Been Stuck
The Legacy System

1. Organized around specialties and departments, with private-practice physicians

2. Measures process compliance and charges

3. Fee-for-service payments based on volume of services delivered

4. Each hospital or practice offers a full line of services

5. Providers limited to serving their immediate geographic area

6. Siloed IT systems for functions, services, and departments
Getting Unstuck

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Value-Based System Agenda

1. Organize into Integrated Practice Units (IPUs)
2. Measure outcomes and cost for every patient
3. Move to bundled payments for care cycles
4. Integrate care delivery systems
5. Expand geographic reach
6. Build an integrated information technology platform