Value-Based Health Care Delivery

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Harvard Business School

BWH Orthopaedic Grand Rounds
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This presentation draws on Michael E. Porter and Elizabeth Olmsted Teisberg: Redefining Health Care: Creating Value-Based Competition on Results, Harvard Business School Press, May 2006, and “How Physicians Can Change the Future of Health Care,” Journal of the American Medical Association, 2007; 297:1103:1111. 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 Olmsted Teisberg. Further information about these ideas, as well as case studies, can be found on the website of the Institute for Strategy & Competitiveness at http://www.isc.hbs.edu.
Principles of Value-Based Health Care Delivery

The fundamental issue in health care is **value for patients**, not access, volume, convenience, or cost containment.

\[
\text{Value} = \frac{\text{Health outcomes}}{\text{Costs of delivering the outcomes}}
\]

- Outcomes are the **full set of patient health outcomes** over the care cycle.
- Costs are the **total costs of care for the patient’s condition**, not just the cost of a single provider or a single service.

How to design a health care system that **dramatically improves patient value**.
Principles of Value-Based Health Care Delivery

**Quality improvement** is the key driver of cost containment and higher value, where quality is **health outcomes**

| Better health is the goal, not more treatment |
| Better health is inherently less expensive than poor health |

| - Prevention | - Fewer complications |
| - Early detection | - Fewer mistakes and repeats in treatment |
| - Right diagnosis | - Faster recovery |
| - Right treatment to the right patient | - More complete recovery |
| - Early and timely treatment | - Less disability |
| - Treatment earlier in the causal chain of disease | - Fewer relapses or acute episodes |
| - Rapid cycle time of diagnosis and treatment | - Slower disease progression |
| - Less invasive treatment methods | - Less need for long term care |
| | - Less care induced illness |
Cost versus Quality Sweden
Health Care Spending by County, 2008

Health Care Cost per Capita

County Council Quality Index

Higher cost

Higher Quality

Lower cost

Lower Quality

Note: Cost including: primary care, specialized somatic care, specialized psychiatry care, other medical care, political health- and medical care activities, other subsidies (e.g. drugs)
Source: Öpnna jämförelser, Socialstyrelsen 2008; Sjukvårdsdata i fokus 2008; BCG analysis
Aligning Competition with Value

• **Competition for patients/subscribers** is a powerful force to encourage restructuring of care and continuous improvement in value

• Today’s competition in health care **is not aligned with value**

| Financial success of system participants | ≠ | Patient success |

• Creating positive-sum **competition on value** is a central challenge in health care reform in every country
Value-Based Health Care Delivery
The Strategic Agenda

1. Organize into Integrated Practice Units around the Patient’s Medical Condition (IPUs)
   - Including primary and preventive care for distinct patient populations

2. Measure Outcomes and Cost for Every Patient

3. Move to Bundled Prices for Care Cycles

4. Integrate Care Delivery Across Separate Facilities

5. Grow by Expanding Excellent IPUs Across Geography

6. Create an Enabling Information Technology Platform
1. Organize into Integrated Practice Units
Migraine Care in Germany

Existing Model:
Organize by Specialty and Discrete Services

1. Organize into Integrated Practice Units
Migraine Care in Germany

Existing Model:
Organize by Specialty and Discrete Services

New Model:
Organize into Integrated Practice Units (IPUs)

### The Care Delivery Value Chain

#### Acute Knee-Osteoarthritis Requiring Replacement

<table>
<thead>
<tr>
<th>ACCESSING</th>
<th>PREPARING</th>
<th>INTERVENING</th>
<th>RECUPERATING</th>
<th>MONITORING/MANAGING</th>
<th>MEASURING</th>
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</thead>
<tbody>
<tr>
<td><strong>HEALTH DEMOGRAPHICS</strong></td>
<td><strong>PHYSICAL EXAM</strong></td>
<td><strong>DIAGNOSING</strong></td>
<td><strong>INTERVENTING</strong></td>
<td><strong>RECOVERING</strong></td>
<td><strong>MONITORING/MANAGING</strong></td>
</tr>
<tr>
<td>- Age</td>
<td>- BMI</td>
<td>- Gender</td>
<td>- Medical history</td>
<td>- Pain level</td>
<td>- Physical activity</td>
</tr>
<tr>
<td><strong>HEALTH END POINTS</strong></td>
<td><strong>PREVENTING</strong></td>
<td><strong>PREVENTING</strong></td>
<td><strong>PREVENTING</strong></td>
<td><strong>PREVENTING</strong></td>
<td><strong>PREVENTING</strong></td>
</tr>
<tr>
<td>- Pain</td>
<td>- Function</td>
<td>- Disability</td>
<td>- Quality of life</td>
<td>- Compliance</td>
<td>- Cost effectiveness</td>
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</tbody>
</table>

#### Key Steps:
- **Diagnosis**
- **Preparation**
- **Intervention**
- **Recovery**
- **Monitoring/Managing**
- **Measuring**

#### Core Components:
- **Accessing**
- **Preparation**
- **Intervention**
- **Recovery**
- **Monitoring/Managing**
- **Measuring**

#### Actions:
- **Review MRIs and results**
- **Exercise physical examination**
- **Surgery procedure options**
- **Immediate return to OR for surgical repair**
- **Range of motion (ROM) at 90° (Hinge)**
- **Pain level (0-10)**
- **Activity level (0-10)**
- **Heel spur (0-10)**
- **Physical activity (0-10)**
- **Weight loss (0-10)**
- **Pain relief (0-10)**
- **Satisfaction (0-10)**
- **Economic impact (0-10)**

#### Outcomes:
- **Self-reported loss of function**
- **Pain levels**
- **Satisfaction with treatment**
- **Cost effectiveness**
- **Quality of life improvement**

#### Additional Notes:
- **Counseling**
- **Shared decision making**
- **Immediate steps and ongoing care**
- **Assuring team consistency**
- **Maintaining)**

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**Orthopedic Specialist**

**Other Provider Entities**

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**Other Provider Entities**
Volume and experience have an **even greater** impact on value in an IPU structure than in the current system.
## Fragmentation of Hospital Services

**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>
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</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>
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<tr>
<td>Multiple sclerosis and cerebellar ataxia</td>
<td>78</td>
<td>1.3%</td>
<td>28</td>
<td>&lt;1</td>
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<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>
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<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>

2. Measure Outcomes and Cost For Every Patient

- **Patient Initial Conditions**
  - Protocols/Guidelines

- **Processes/Activities**
  - E.g., Hemoglobin A1c levels for diabetics

- **Indicators**

- **(Health) Outcomes**
The Outcome Measures Hierarchy

Tier 1
Health Status Achieved
- Survival

Tier 2
Process of Recovery
- Degree of health/recovery
- Time to recovery or return to normal activities
- Disutility of care or treatment process (e.g., discomfort, complications, adverse effects, errors, and their consequences)

Tier 3
Sustainability of Health
- Sustainability of health or recovery and nature of recurrences
- Long-term consequences of therapy (e.g., care-induced illnesses)
The Outcomes Measures Hierarchy
Acute Knee-Osteoarthritis Requiring Replacement

1. **Survival**
   - Mortality

2. **Degree of recovery / health**
   - Range of motion achieved
   - Pain level achieved
   - Functional level achieved
   - Degree of independence
   - Ability to return to work
   - Extent of return to physical activities
   - Level of satisfaction with outcome

3. **Time to recovery or return to normal activities**
   - Time to maximum range of motion
   - Time to lowest pain level
   - Time to highest functional level
   - Time to post-deterioration independence
   - Time to return to work
   - Time to return to physical activities

4. **Disutility of care or treatment process**
   (e.g., treatment-related discomfort, complications, adverse effects, diagnostic errors, treatment errors)
   - Surgical pain
   - Length of hospital stay independent of complications
   - Deep vein thrombosis
   - Delirium
   - Infection rate (Urinary Tract)
   - Pneumonia
   - Pulmonary embolism
   - Myocardial infarction

5. **Sustainability of recovery or health over time**
   - Maintained range of motion
   - Ongoing pain status
   - Functional level
   - Ability to live independently
   - Ability to continue working
   - Maintained activities
   - Need for revision/re-operation (immediate failure, implant failure secondary to wear)

6. **Long-term consequences of therapy**
   (e.g., care-induced illnesses)
   - Loss of mobility due to inadequate rehab
   - Complications of cardiac issues
   - Risk of complex fracture
   - Susceptibility to infection
   - Stiff knee due to unrecognized complication
   - Regional pain syndrome
The Outcomes Measures Hierarchy
Hip Arthroplasty Register, Sweden

1. Survival
   - 90 day mortality following surgery

2. Degree of recovery / health
   - Pain/Discomfort
   - Mobility
   - Self-care
   - Anxiety/Depression

3. Time to recovery or return to normal activities
   - Pain/Discomfort over time
   - Mobility over time
   - Self-care over time
   - Anxiety/Depression over time

4. Disutility of care or treatment process (e.g., treatment-related discomfort, complications, adverse effects, diagnostic errors, treatment errors)
   - 30 day post surgical re-admission
   - Infection
   - Dislocation

5. Sustainability of recovery or health over time
   - Pain/Discomfort over time
   - Mobility over time
   - Self-care over time
   - Anxiety/Depression over time

6. Long-term consequences of therapy (e.g., care-induced illnesses)
   - 5/10 year implant survival
   - Reoperations and revisions and reason for revision
   - Reoperation rates within two years

   - Ability to return to usual activities

   - Point when able to return to normal activities

   - Ability to maintain activities
Adult Kidney Transplant Outcomes, U.S. Center Specific Results 1987-1989

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

- 16 greater than predicted survival (7%)
- 20 worse than predicted survival (10%)
Adult Kidney Transplant Outcomes, U.S. Center Specific Results 1998-2000

- 10 greater than predicted survival (4.5%)
- 14 worse than predicted survival (6.4%)
Adult Kidney Transplant Outcomes, U.S. Center Specific Results 2005-2007

Number of programs: 240
Number of transplants: 38,515
1 year graft survival: 92.56%

- 16 greater than expected graft survival (6.6%)
- 19 worse than expected graft survival (7.8%)
Measuring Cost

Aspiration

• Cost should be measured for each patient, aggregated across the full cycle of care
• Cost should be measured for each medical condition (which includes common co-occurring conditions), not for all services
• The cost of each activity or input attributed to a patient should reflect that patient’s use of resources (e.g. time, facilities, service), not average allocations
• The only way to properly measure cost per patient is to track the time devoted to each patient by providers, facilities, support services, and other shared costs

Reality

• Most providers track charges not costs
• Most providers track cost by billing category, not for medical conditions
• Most providers cannot accumulate total costs for particular patients
• Most providers use arbitrary or average allocation of shared resources, not patient specific allocations
3. Move to Bundled Prices for Care Cycles

Fee for service

Bundled reimbursement for medical conditions

Global capitation

Global budgeting
What is Bundled Payment?

• **Total package price** for the care cycle for a medical condition
  – Includes responsibility for **avoidable complications**
  – Medical condition capitation
• The bundled price should be **severity adjusted**

What is Not Bundled Payment

• Prices for **short** episodes (e.g. inpatient only, procedure only)
• **Separate** payments for physicians and facilities
• **Pay-for-performance** bonuses
• “**Medical Home**” payment for care coordination

• **DRGs** can be a **starting point** for bundled models
Bundled Payment for Orthopedic Care
Hip and Knee Replacement in Sweden

• In 2009, Stockholm County Council began to offer a **bundled price for joint replacement** (hip and knee), that includes:
  - Pre-op evaluation
  - Lab tests
  - Radiology
  - Surgery & related admission
  - Prosthesis
  - Drugs
  - Inpatient rehab, up to 6 days
  - 1 follow-up visit within 3 months
  - Any additional surgery to the joint within 2 years
  - If post-op infection requiring antibiotics occurs, guarantee extended to 5 years

• The bundled price for a knee or hip replacement is about $8,000

• Provider participation is **voluntary** and **universal**
  – 6 public hospitals
  – 4 private providers (up from 1 in 2008)

• Eligibility is restricted to otherwise relatively healthy patients (i.e. ASA scores of 1 or 2)
4. Integrate Care Delivery Across Separate Facilities

Children’s Hospital of Philadelphia (CHOP)
Hospital Affiliates
Levels of System Integration

1. **Rationalize service lines/ IPUs** across facilities to improve volume, avoid duplication, play to strength, and concentrate excellence

2. Offer specific services at the **appropriate facility**
   - E.g. acuity level, cost level, need for convenience
   - Patient referrals across units

3. Clinically integrate care **across facilities**, within an IPU structure
   - Develop consistent protocols and provide access to experts by providers throughout the network
   - **Expand coverage** of the care cycle and **integrate care** across the cycle
   - Connecting **ancillary service** units to IPUs
     - E.g. home care, rehabilitation, behavioral health, social work, addiction treatment (organize within service units to align with IPUs)
   - Linking **preventive/primary care** units to specialty IPUs
5. Grow by Expanding Excellent IPUs Across Geography

The Cleveland Clinic Managed Practices

- Swedish Medical Center, WA
  Cardiac Surgery
- Rochester General Hospital, NY
  Cardiac Surgery
- CLEVELAND CLINIC
  Cardiac Care
- Chester County Hospital, PA
  Cardiac Surgery
- Cape Fear Valley Health System, NC
  Cardiac Surgery
- Cleveland Clinic Florida Weston, FL
  Cardiac Surgery

• Grow in ways that improve value, not just volume
Models of Geographic Expansion

AFFILIATIONS
- Affiliation Agreements with Independent Provider Organizations
- Second Opinions and Telemedicine

NODES
- Dispersed Diagnostic Centers
- Convenience Sensitive Service Locations in the Community
- Complex IPU Components (e.g. surgery) in Additional Locations

HUBS
- Specialty Referral Hospitals in Additional Locations
- Broader-Line Referral Hubs
6. Create an Enabling Information Technology 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 over time
- Data encompasses the full care cycle, including referring entities
- Allowing access and communication among all involved parties, including patients
- “Structured” data vs. free text
- Templates for medical conditions to enhance the user interface
- Architecture that allows easy extraction of outcome, process, and cost measures
- Interoperability standards enabling communication among different provider systems
A Mutually Reinforcing Strategic Agenda

Organize into Integrated Practice Units

Measure Outcomes and Cost For Every Patient

Grow Excellent Services Across Geography

Move to Bundled Prices for Care Cycles

Integrate Care Delivery Across Separate Facilities

Enabling IT Platform