Value-Based Health Care Delivery

Introduction to Social Medicine
Professor Michael E. Porter
October 10, 2013
Solving the Health Care Problem

• 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** versus cost shifting or restricting services
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 **legacy**, medical science, organizational structures, management practices, and payment models that are obsolete.

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**Care pathways, process improvements, safety initiatives, care coordinators, disease management and other overlays to the current structure are beneficial, but not sufficient.**
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

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

Financial success of system participants \neq \text{ 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
   - Organize primary and preventive care 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)

# Over The Full Cycle of Care
## Acute Knee-Osteoarthritis Requiring Replacement

### Informing and Engaging
- Importance of exercise, weight reduction, proper nutrition
- Meaning of diagnosis
- Prognosis (short- and long-term outcomes)
- Drawbacks and benefits of surgery
- Setting expectations
- Importance of nutrition, weight loss, vaccinations
- Home preparation
- Expectations for recovery
- Importance of rehab
- Post-surgery risk factors
- Importance of rehab adherence
- Longitudinal care plan
- Importance of exercise, maintaining healthy weight

### Measuring
- Joint-specific symptoms and function (e.g., WOMAC scale)
- Overall health (e.g., SF-12 scale)
- Loss of cartilage
- Change in subchondral bone
- Joint-specific symptoms and function
- Overall health
- Baseline health status
- Fitness for surgery (e.g., ASA score)
- Blood loss
- Operative time
- Complications
- Infections
- Joint-specific symptoms and function
- Inpatient length of stay
- Ability to return to normal activities
- Joint-specific symptoms and function
- Weight gain or loss
- Missed work
- Overall health

### Accessing
- PCP office
- Health club
- Physical therapy clinic
- Specialty office
- Imaging facility
- Pre-op evaluation center
- Operating room
- Recovery room
- Orthopedic floor at hospital or specialty surgery center
- Nursing facility
- Rehab facility
- Physical therapy clinic
- Home
- Specialty office
- Primary care office
- Health club

### Monitoring/Preventing
- Monitor
  - Conduct PCP exam
  - Refer to specialists, if necessary
- Prevent
  - Prescribe anti-inflammatory medicines
  - Recommend exercise regimen
  - Set weight loss targets
- Imaging
  - Perform and evaluate MRI and x-ray
  - Assess cartilage loss
  - Assess bone alterations
- Overall Prep
  - Conduct home assessment
  - Monitor weight loss
- Surgical Prep
  - Perform cardiology, pulmonary evaluations
  - Run blood labs
  - Conduct pre-op physical exam
- Clinical Evaluation
  - Review history and imaging
  - Perform physical exam
  - Recommend treatment plan (surgery or other options)
- Anesthesia
  - Administer anesthesia (general, epidural, or regional)
- Surgical Procedure
  - Determine approach (e.g., minimally invasive)
  - Insert device
  - Cement joint
- Pain Management
  - Prescribe preemptive multimodal pain meds
- Surgical
  - Immediate return to OR for manipulation, if necessary
- Medical
  - Monitor coagulation
- Living
  - Provide daily living support (showering, dressing)
  - Track risk indicators (fever, swelling, other)
- Physical Therapy
  - Daily or twice daily PT sessions
- Monitor
  - Consult regularly with patient
- Manage
  - Prescribe prophylactic antibiotics when needed
  - Set long-term exercise plan
  - Revise joint, if necessary

### Interventing
- Monitor
- Anesthesia
- Surgical Prep
- Clinical Evaluation
- Imaging
- Overall Prep
- Pain Management

### Recovering/Rehabbing
- Surgical
- Medical
- Living
- Physical Therapy

### Monitoring/Managing
- Orthopedic Specialist
- Other Provider Entities
Integrate Across the Care Cycle
An Orthopedic Surgeon Teaches A Course to Physical Therapists About Treatment Post-Surgery
What is a Medical Condition?

• 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

• In primary / preventive care, the unit of value creation is defined patient segments with similar preventive, diagnostic, and primary treatment needs (e.g. healthy adults, 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 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, and follow-up are integrated** into care
6. The unit has a **single administrative and scheduling structure**
7. To a large extent, **care is co-located in dedicated facilities**
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.
# The 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>
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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>
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<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>
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<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-Würtemberg, 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**
  - Protocols/Guidelines
    - E.g. Staff certification, facilities standards
  - E.g. PSA, Gleason score, surgical margin

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The Outcome Measures Hierarchy

Tier 1
Health Status Achieved or Retained
- Survival
- Degree of health/recovery

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

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

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The Outcome Measures Hierarchy

Tier 1

Health Status
Achieved or Retained

Survival

Degree of health/recovery

- Achieved clinical status
- Achieved functional status

Tier 2

Process of Recovery

Time to recovery and return to normal activities

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)

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

Tier 3

Sustainability of health/recovery and nature of recurrences

Sustainability of Health

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

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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

- Achieved clinical status
- Achieved functional status
- Care-related pain/discomfort
- Complications
- Reintervention/readmission
- Long-term clinical status
- Long-term functional status
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)
  
  – The **time** devoted to each patient by these resources
  
  – The **capacity cost** of each resource
  
  – The **support costs** required for each patient-facing resource

Mapping Resource Utilization
MD Anderson Cancer Center – New Patient Visit

Registration and Verification
- Receptionist, Patient Access Specialist, Interpreter

Intake
- Nurse, Receptionist

Clinician Visit
- MD, mid-level provider, medical assistant, patient service coordinator, RN

Plan of Care Discussion
- RN/LVN, MD, mid-level provider, patient service coordinator

Plan of Care Scheduling
- Patient Service Coordinator

Decision Point
- Time (minutes)

Flowchart:
- Patient arrives
- Check in patient; communicate arrival
- Verify patient information; complete consent forms
- Assess patient, assemble paperwork; place patient in room
- Initiate patient workup; review patient history; conduct physical exam
- Discuss plan of care
- Review plan of care; introduce team; review schedule for return visit
- Schedule tests and consults; communicate schedule to patient

Branches:
- Interpreter needed?
- Laryngoscopy needed?
- Changes to Plan of Care?
- Scheduled for same day?

Outcome:
- PI discharged
- Enter next process

Time (minutes):
- 2
- 20
- 40
- 45
- 30
- 10
- 15
- 5

Notes:
- Add language translation time for each process
- INT, RCPT
- N 95%
- Y 5%
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. Reimbursing through Bundled Prices 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**

Fee for service ➔ Bundled reimbursement for medical conditions ➔ Global capitation
**Bundled Payment in Practice**  
**Hip and Knee Replacement in Stockholm, Sweden**

- **Components** of the bundle

<table>
<thead>
<tr>
<th>Bundled Components</th>
<th>Included Services</th>
</tr>
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<tbody>
<tr>
<td>Pre-op evaluation</td>
<td>All physician and staff fees and costs</td>
</tr>
<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 within 2 years</td>
</tr>
<tr>
<td>Surgery &amp; related admissions</td>
<td>If post-op infection requiring antibiotics occurs, guarantee extends to 5 years</td>
</tr>
<tr>
<td>Prosthesis</td>
<td></td>
</tr>
<tr>
<td>Drugs</td>
<td></td>
</tr>
<tr>
<td>Inpatient rehab, up to 6 days</td>
<td></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**
• Under bundled payment, volumes shifted from full-service hospitals to **specialized orthopedic hospitals**
• Interviews with specialized providers revealed the following **delivery innovations**:

  - Explicit care pathways
  - Standardized treatment processes
  - Checklists
  - New post-discharge visit to check wound healing
  - More patient education
  - More training and specialization of staff
  - Increased procedures per day
  - Decreased length of stay
4. Integrating Care Delivery Across Separate Facilities
Children’s Hospital of Philadelphia Care Network

The Children’s Hospital of Philadelphia®

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

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Four Levels of Provider System Integration

1. **Define 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 locations through an IPU structure**
5. Expand Geographic Reach
The Cleveland Clinic Affiliate Programs

- Central DuPage Hospital, IL
  Cardiac Surgery

- Chester County Hospital, PA
  Cardiac Surgery

- Cleveland Clinic
  Cardiac Surgery

- St. Vincent Indianapolis, IN
  Kidney Transplant

- Cape Fear Valley Medical Center, NC
  Cardiac Surgery

- Charleston, WV
  Kidney Transplant

- Pikeville Medical Center, KY
  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 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
- 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

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6. Build an Enabling Information Technology Platform
Why Is This So Hard?
(And What Do We Do About It?)
“Magic Bullets” Have Had Limited Impact

• Examples:
  • Evidence-based medicine/clinical effectiveness research/guidelines
    – Fail to represent many individual patient circumstances
  • Eliminating fraud
    – Does not address root causes of low-value health care
  • Eliminating errors
    – This alone does not lead to a redesign of overall care that improves value
  • Global capitation to control spending
    • Reduces spending, but does not improve value
  • Turning patients into consumers
    – Information about price and outcomes is lacking
  • Electronic medical records
    – Silo-ed IT systems make cost/outcomes measurement difficult
  • New low cost models of primary care
    – Limited effect on complex health care costs
Why We Are Stuck
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. Build an Enabling IT Platform
Getting Unstuck

Legacy System

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2. Measure outcomes and cost for every patient
3. Move to bundled payments for care cycles
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6. Build an enabling information technology platform
This Won’t Be Easy …

Common Reactions

• “How can we create real teams if our physicians are not our employees?”
  – “… or even if they are employees, but are paid by RVU?”
• “We can’t ask anyone to stop doing anything as long as we all have our own bottom lines.”
… But We Have to Get Going

Common Reactions

• “How can we create real teams if our physicians are not our employees?”
  – “… or even if they are employees, but are paid by RVU?”
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First Steps

• Measure what matters to patients – benchmark and report
• Use narrative (patient stories) to create organizational shared purpose
• Create financial and nonfinancial incentives for improvement of value
## Creating a Value-Based Health Care Delivery System
### Implications for Physician Leaders

<table>
<thead>
<tr>
<th>1. Integrated Practice Units (IPUs)</th>
<th>- Lead <em>multidisciplinary teams</em>, not specialty silos</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Measure Cost and Outcomes</td>
<td>- Become an expert in <em>measurement</em> and <em>process improvement</em></td>
</tr>
<tr>
<td>3. Move to Bundled Prices</td>
<td>- Proactively develop new <em>bundled reimbursement options and care guarantees</em></td>
</tr>
<tr>
<td>4. Integrate Across Separate Facilities</td>
<td>- Champion <em>value enhancing rationalization, relocation, and integration</em> with sister hospitals, as well as between inpatient and outpatient units, instead of protecting turf</td>
</tr>
<tr>
<td>5. Expand Excellence Across Geography</td>
<td>- Create networks and affiliations to expand high-value care <em>across geography</em></td>
</tr>
<tr>
<td>6. Enabling IT Platform</td>
<td>- Become a <em>champion for the right EMR systems</em>, not an obstacle to their adoption and use</td>
</tr>
</tbody>
</table>
Contact Slide

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