Value-Based Health Care Delivery: Implications for Radiology

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Challenges Facing Radiology

- Declining reimbursement
- **Commoditization** as “report producers”
- Skepticism of the value of imaging studies
- **Self-referral** among non-radiology specialties
- **Teleradiology** as a competitor
Solving the Health Care Problem

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

\[
\begin{array}{c}
\text{Value} = \\
\frac{\text{Health outcomes that matter to patients}}{\text{Costs of delivering the outcomes}}
\end{array}
\]

• 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 further cost shifting, restricting services, or dramatically reducing the compensation of health care professionals
## Principles of Value-Based Health Care Delivery

<table>
<thead>
<tr>
<th>Value</th>
<th>Health outcomes that matter to patients</th>
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<td>Costs of delivering the outcomes</td>
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- 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 and Serve Populations

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)

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

# Integrating Across the Cycle of Care
## Breast Cancer

<table>
<thead>
<tr>
<th>INFORMING AND ENGAGING</th>
<th>MEASURING</th>
<th>ACCESSING THE PATIENT</th>
<th>MONITORING/PREVENTING</th>
<th>DIAGNOSING</th>
<th>PREPARING</th>
<th>INTERVENING</th>
<th>RECOVERING/REHABING</th>
<th>MONITORING/MANAGING</th>
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</thead>
<tbody>
<tr>
<td>• Advice on self screening • Consultations on risk factors</td>
<td>• Self exams • Mammograms</td>
<td>• Office visits • Mammography unit • Lab visits</td>
<td>• Medical history • Control of risk factors (obesity, high fat diet) • Genetic screening • Clinical exams • Monitoring for lumps</td>
<td>• Medical history</td>
<td>• Choosing a treatment plan</td>
<td>• Surgery (breast preservation or mastectomy, oncoplastic alternative)</td>
<td>• In-hospital and outpatient wound healing • Treatment of side effects (e.g. skin damage, cardiac complications, nausea, lymphedema and chronic fatigue) • Physical therapy</td>
<td>• Periodic mammography • Other imaging • Follow-up clinical exams • Treatment for any continued or later onset side effects or complications</td>
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<tr>
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<td>• Medical history • Determining the specific nature of the disease (mammograms, pathology, biopsy results) • Genetic evaluation • Labs</td>
<td>• Choosing a treatment plan • Surgery prep (anesthetic risk assessment, EKG) • Plastic or oncoplastic surgery evaluation • Neo-adjuvant chemotherapy</td>
<td>• Surgery (breast preservation or mastectomy, oncoplastic alternative)</td>
<td>• In-hospital and outpatient wound healing • Treatment of side effects (e.g. skin damage, cardiac complications, nausea, lymphedema and chronic fatigue) • Physical therapy</td>
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<td>• Explaining patient treatment options/ shared decision making • Patient and family psychological counseling</td>
<td>• Counseling on the treatment process • Education on managing side effects and avoiding complications • Achieving compliance</td>
<td>• Counseling on rehabilitation options, process • Achieving compliance • Psychological counseling</td>
<td>• Counseling on long term risk management • Achieving compliance</td>
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# The Care Delivery Value Chain

## Acute Knee-Osteoarthritis Requiring Replacement

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<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>• Imaging facility</td>
<td>• Operating room</td>
<td>• OR</td>
<td>• Nursing facility</td>
<td>• Specialty office</td>
</tr>
<tr>
<td>• Meanings of diagnosis</td>
<td>• Overall health</td>
<td>• Health club</td>
<td>• Perform and evaluate MRI and x-ray</td>
<td>• Specialty office</td>
<td>• Recovery room</td>
<td>• Rehab facility</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Prognosis (short- and long-term outcomes)</td>
<td>• Joint-specific symptoms and function</td>
<td>• Physical therapy clinic</td>
<td>• Assess cartilage loss</td>
<td></td>
<td>• Orthopedic floor at hospital or specialty surgery center</td>
<td>• PT clinic</td>
<td></td>
<td></td>
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<tr>
<td>• Drawbacks and benefits of surgery</td>
<td>• Overall health</td>
<td></td>
<td>• Assess bone alterations</td>
<td></td>
<td></td>
<td>• Home</td>
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<td></td>
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</tbody>
</table>

## CARE DELIVERY

- **INFORMING AND ENGAGING**
  - Importance of exercise, weight reduction, proper nutrition
  - Joint-specific symptoms and function
  - Overall health

- **MEASURING**
  - Loss of cartilage
  - Baseline health status
  - Blood loss

- **ACCESSING**
  - specialty office
  - Imaging facility
  - Pre-op evaluation center
  - Operating room

- **MONITORING/PREVENTING**
  - Conduct PCP exam
  - Refer to specialists, if necessary
  - IMAGING
  - Perform and evaluate MRI and x-ray

- **DIAGNOSING**
  - Review history and imaging
  - Perform physical exam
  - CLINICAL EVALUATION
  - Review joint range

- **PREPARING**
  - Conduct home assessment
  - Monitor weight loss
  - OVERALL PREP
  - OR

- **INTERVENING**
  - Administer anesthesia (general, epidural, or regional)
  - SURGICAL PREP
  - Cardiology, pulmonary evaluations

- **SURGICAL PROCEDURE**
  - Insert device
  - Cement joint
  - PAIN MANAGEMENT
  - Prescribe preemptive multimodal pain meds

- **RECOVERING/REHABBING**
  - Immediate return to OR for manipulation, if necessary
  - MEDICAL
  - Monitor coagulation

- **PHYSICAL THERAPY**
  - Daily or twice daily PT sessions

- **MONITORING/MANAGING**
  - Consult regularly with patient
  - Prescribe prophylactic antibiotics when needed
  - Set long-term exercise plan
  - Revise joint, if necessary

**Other Provider Entities**

- Orthopedic Specialist
- Other Provider Entities

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Integrating Across the Care Cycle
An Orthopedic Surgeon Teaches A Course to Physical Therapists
About Rehabilitation After Shoulder Surgery
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.
## 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>
</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>

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

Structure

E.g. PSA, Gleason score, surgical margin
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
  - Care-related pain/discomfort
  - Errors and Complications
  - Reintervention/readmission

Tier 3
Sustainability of Health
- Sustainability of health/recovery and nature of recurrences
  - Long-term clinical status
  - Long-term functional status

Source: NEJM Dec 2010

Long-term consequences of therapy (e.g., care-induced illnesses)
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
Measuring the Cost of Care Delivery: Principles

- Cost is the **actual expense** of patient care, not the **tariff** billed or collected
- Cost should be measured around the **patient**, not just the department or provider organization
- 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**

Global budget

Fee for service

Global capitation
Bundled Payment in Practice
Hip and Knee Replacement in Stockholm, Sweden

- **Components** of the bundle

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

- 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
- Bundle 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
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

- Central DuPage Hospital, IL
  Cardiac Surgery

- Chester County Hospital, PA
  Cardiac Surgery

- CLEVELAND CLINIC

- St. Vincent Indianapolis, IN
  Kidney Transplant

- Cape Fear Valley Medical Center, NC
  Cardiac Surgery

- Pikeville Medical Center, KY
  Cardiac Surgery

- McLeod Heart & Vascular Institute, SC
  Cardiac Surgery

- Cleveland Clinic Florida Weston, FL
  Cardiac Surgery

- Charleston, WV
  Kidney Transplant

- Rochester General Hospital, NY
  Cardiac Surgery
Eight Questions for Radiologists in a Value Based System

1. What medical conditions are you involved in?

2. What is your role(s) in the cycle of care?

3. What are the outcomes for the condition(s)?

4. Which of these do you affect / influence?

5. How can you perform your role in the care cycle more efficiently?

6. Where do you focus your practice to maximize your value?

7. How can you better embed yourself in the care team and the IPU?

8. How could you affiliate with other organizations to expand your reach and volume in your area of expertise?