Value-Based Health Care Delivery Part II: Integrated Practice Units, Outcome and Cost 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 into Integrated Practice Units (IPUs) Around Patient Medical Conditions
   - Organize primary and preventive care to serve distinct patient populations

2. Establish Universal Measurement of Outcomes and Cost for Every Patient

3. Move to Bundled Prices for Care Cycles

4. Integrate Care Delivery Across Separate Facilities

5. Expand Excellent IPUs Across Geography

6. Create an Enabling Information Technology Platform
1. Organize Around Patient Medical Conditions
Migraine Care in Germany

Existing Model:
Organize by Specialty and Discrete Services

New Model:
Organize into Integrated Practice Units (IPUs)

### Integrating Across the Cycle of Care

#### Breast Cancer

<table>
<thead>
<tr>
<th><strong>Informing and Engaging</strong></th>
<th><strong>Measuring</strong></th>
<th><strong>Accessing the Patient</strong></th>
<th><strong>Monitoring/Preventing</strong></th>
<th><strong>Diagnosing</strong></th>
<th><strong>Preparing</strong></th>
<th><strong>Intervening</strong></th>
<th><strong>Recovering/Rehabing</strong></th>
<th><strong>Monitoring/Managing</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Advice on self screening</td>
<td>- Self exams</td>
<td>- Office visits</td>
<td>- Medical history</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</td>
<td>- Periodic mammography</td>
</tr>
<tr>
<td>- Consultations on risk factors</td>
<td>- Mammograms</td>
<td>- Mammography</td>
<td>- Control of risk factors (obesity, high fat diet)</td>
<td>- Determining the specific nature of the disease (mammograms, pathology, biopsy results)</td>
<td>- Surgery prep (anesthetic risk assessment, EKG)</td>
<td>- Treatment of side effects (e.g., skin damage, cardiac complications, nausea, lymphedema and chronic fatigue)</td>
<td>- Other imaging</td>
<td>- Follow-up clinical exams</td>
</tr>
<tr>
<td>- Counseling patient and family on the diagnostic process and the diagnosis</td>
<td>- Mammograms</td>
<td>- Lab visits</td>
<td>- Genetic screening</td>
<td>- Genetic evaluation</td>
<td>- Plastic or oncoplastic surgery evaluation</td>
<td>- Adjuvant therapies (hormonal medication, radiation, and/or chemotherapy)</td>
<td>- Treatment for any continued or later onset side effects or complications</td>
<td>- Treatment for any continued or later onset side effects or complications</td>
</tr>
<tr>
<td>- Explaining patient treatment options/shared decision making</td>
<td>- Labs</td>
<td>- Office visits</td>
<td>- Clinical exams</td>
<td>- Labs</td>
<td>- Neo-adjuvant chemotherapy</td>
<td>- Physical therapy</td>
<td>- In-hospital and outpatient wound healing</td>
<td>- Initial imaging</td>
</tr>
<tr>
<td>- Patient and family psychological counseling</td>
<td>- MRI, CT</td>
<td>- Hospital stays</td>
<td>- Monitoring for lumps</td>
<td>- Biopsy</td>
<td>- Surgery (breast preservation or mastectomy, oncoplastic alternative)</td>
<td>- Physical therapy</td>
<td>- Other imaging</td>
<td>- Follow-up clinical exams</td>
</tr>
<tr>
<td>- Counseling on the treatment process</td>
<td>- Recurring mammograms (every six months for the first 3 years)</td>
<td>- Visits to outpatient radiation or chemotherapy units</td>
<td>- Determining the specific nature of the disease (mammograms, pathology, biopsy results)</td>
<td>- BRACA 1, 2...</td>
<td>- Adjuvant therapies (hormonal medication, radiation, and/or chemotherapy)</td>
<td>- Physical therapy</td>
<td>- Follow-up clinical exams</td>
<td>- Treatment for any continued or later onset side effects or complications</td>
</tr>
<tr>
<td>- Education on managing side effects and avoiding complications</td>
<td></td>
<td>- Pharmacy visits</td>
<td>- Genetic evaluation</td>
<td>- Labs</td>
<td>- Adjuvant therapies (hormonal medication, radiation, and/or chemotherapy)</td>
<td>- Physical therapy</td>
<td>- In-hospital and outpatient wound healing</td>
<td>- Other imaging</td>
</tr>
<tr>
<td>- Achieving compliance</td>
<td></td>
<td>- Rehabilitation facility visits</td>
<td>- Lab visits</td>
<td>- CT</td>
<td>- Physical therapy</td>
<td>- Physical therapy</td>
<td>- In-hospital and outpatient wound healing</td>
<td>- Other imaging</td>
</tr>
<tr>
<td>- Counseling on long term risk management</td>
<td></td>
<td>- Pharmacy visits</td>
<td>- Mammograms</td>
<td>- Bone Scans</td>
<td>- Physical therapy</td>
<td>- Physical therapy</td>
<td>- In-hospital and outpatient wound healing</td>
<td>- Other imaging</td>
</tr>
<tr>
<td>- Achieving compliance</td>
<td></td>
<td>- Mammograms</td>
<td>- Ultrasound</td>
<td>- MRI</td>
<td>- Physical therapy</td>
<td>- Physical therapy</td>
<td>- In-hospital and outpatient wound healing</td>
<td>- Other imaging</td>
</tr>
</tbody>
</table>

Other Provider Entities

Breast Cancer Specialist
What is Integrated Care?

Attributes of an Integrated Practice Unit (IPU):

1. Organized around the patient’s medical condition
2. Involves a dedicated, multidisciplinary team who devote a significant portion of their time to the condition
3. Where providers are part of a common organizational unit
4. Utilizing a single administrative and scheduling structure
5. Providing the full cycle of care for the condition
   - Encompassing outpatient, inpatient, and rehabilitative care as well as supporting services (e.g. nutrition, social work, behavioral health)
   - Including patient education, engagement and follow-up
6. Co-located in dedicated facilities
7. With a physician team captain and a care manager who oversee each patient’s care process
8. Where the team meets formally and informally on a regular basis
9. And measures outcomes and processes as a team, not individually
10. Accepting joint accountability for outcomes and costs
# Integrated Cancer Care
## MD Anderson Head and Neck Center

<table>
<thead>
<tr>
<th>Dedicated</th>
<th>Shared</th>
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</thead>
<tbody>
<tr>
<td><strong>Dedicated MDs</strong></td>
<td><strong>Shared</strong></td>
</tr>
<tr>
<td>- 8 Medical Oncologists</td>
<td>- Endocrinologists</td>
</tr>
<tr>
<td>- 12 Surgical Oncologists</td>
<td>- Other specialists as needed</td>
</tr>
<tr>
<td>- 8 Radiation Oncologists</td>
<td>(cardiologists, plastic surgeons, etc.)</td>
</tr>
<tr>
<td>- 5 Dentists</td>
<td></td>
</tr>
<tr>
<td>- 1 Diagnostic Radiologist</td>
<td></td>
</tr>
<tr>
<td>- 1 Pathologist</td>
<td></td>
</tr>
<tr>
<td>- 4 Ophthalmologists</td>
<td></td>
</tr>
<tr>
<td><strong>Skilled Staff</strong></td>
<td><strong>Skilled Staff</strong></td>
</tr>
<tr>
<td>- 22 Nurses</td>
<td>- Dietician</td>
</tr>
<tr>
<td>- 3 Social Workers</td>
<td>- Inpatient Nutritionists</td>
</tr>
<tr>
<td>- 4 Speech Pathologists</td>
<td>- Radiation Nutritionists</td>
</tr>
<tr>
<td>- 1 Nutritionist</td>
<td>- Smoking Cessation Counselors</td>
</tr>
<tr>
<td>- 1 Patient Advocate</td>
<td></td>
</tr>
<tr>
<td><strong>Patient Access Center</strong></td>
<td><strong>Shared Facilities (located nearby)</strong></td>
</tr>
<tr>
<td><strong>Facilities</strong></td>
<td>- Radiation Therapy</td>
</tr>
<tr>
<td>- Dedicated Outpatient Unit</td>
<td>- Inpatient Wards</td>
</tr>
<tr>
<td></td>
<td>→ Medical Wards</td>
</tr>
<tr>
<td></td>
<td>- Pathology Lab</td>
</tr>
<tr>
<td></td>
<td>→ Surgical Wards</td>
</tr>
<tr>
<td></td>
<td>- Ambulatory Chemo Unit</td>
</tr>
<tr>
<td></td>
<td>- ORs (grouped by needs)</td>
</tr>
</tbody>
</table>

What is Not Integrated Care?

Integrated care is **not** the same as:

- Co-location per se
- Care delivered by the same organization
- A multispecialty group practice
- Freestanding focused factories
- A clinical pathway
- An institute or center
- A Center of Excellence
- A health plan/provider system (e.g. Kaiser Permanente)
- Medical homes
- Accountable care organizations
Integrated Models of Primary Care

• Today’s primary care is fragmented and attempts to address overly broad needs with limited resources

• Organize primary care around teams serving specific patient populations (e.g. healthy adults, type II diabetics) rather than attempting to be all things to all patients

• Deliver defined service bundles covering appropriate prevention, screening, diagnosis, wellness and health maintenance

• Provide services with multidisciplinary teams including ancillary health professionals and support staff, in dedicated facilities

• Form alliances with specialty IPUs covering the prevalent medical conditions represented in the patient population

• Deliver services not only in traditional settings but at the workplace, schools, community organizations, and in other locations offering regular patient contact and the ability to develop a group culture of wellness

• Patient-centered medical homes should be “primary care IPUs,” not just another overlay
Segmenting Primary Care

- Primary care should be organized around patient populations with similar health circumstances and care needs, such as:
  - Healthy children
  - Children with one or more chronic conditions
    - E.g. asthma, obesity
  - Healthy adults
  - Adults with one or more related chronic conditions
    - E.g. diabetes, cardiac disease
  - Healthy elderly
  - Elderly with one or more related chronic conditions
    - E.g. dementia, COPD
- Primary care teams should address both general health and wellness and specific services related to patients’ chronic and associated conditions
  - E.g. diabetic primary care should offer services related to self-management (blood sugar monitoring, patient education), nephropathy (urine tests, blood pressure control), retinopathy (eye exams), foot ulcers (foot exams)
- Services and care delivery settings should reflect patient populations’ social and other non-medical circumstances
Accountable Care Organizations and Value

**Potential**

- **Promoting integration** across full cycles of care for medical conditions

- Accelerating implementation of standardized approaches to universal results measurement and reporting
  - E.g. disease registries, cost measurement

- Enabling patients and referring clinicians to select providers based on excellent results at the medical condition level

- ACOs enable integrated care delivery that facilitate bundled payment

- Promoting value-based competition among multiple providers for each medical condition

**Risks**

- Slightly improved coordination rather than true integration
  - I.e. streamlining patient handoffs rather than minimizing them

- Creating numerous **ACO-level measurement** and reporting systems, which reduce accountability rather than increase it
  - Process, wrong measures at wrong levels

- Locking patients into an ACO system for all types of care, regardless of performance
  - Encouraging hospitals or provider systems to offer full service lines to avoid “losing” patients

- ACOs as primarily reimbursement vehicles (e.g. P4P, global capitation)

- Promoting over-consolidation into large “integrated delivery systems” that compete on bargaining power rather than value
2. Measure Outcomes and Cost for Every Patient

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

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

**Patient Compliance**
- Protocols/Guidelines
- E.g., Hemoglobin A1c levels for diabetics
Principles of Outcome Measurement

• Measure outcomes by **medical condition** and primary care **patient population**

• Outcomes should reflect the **full cycle of care**
  – Spanning the **full range of services** and **providers** that jointly determine results (e.g. inpatient, outpatient, tests, rehabilitation)

• Outcomes measured should reflect the health circumstances **most relevant to patients**

• Outcomes should encompass **near-term** and **longer-term** patient health, covering a period that reflects the ultimate results of care
  – For chronic conditions, ongoing measurement is necessary

• **Risk factors** or **initial conditions** should be measured to allow for risk adjustment

• Ultimately, measurement should be **real time** and **in the course of care**, not just retrospectively or in clinical studies
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
  - 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)

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**Recurrences**

**Care-induced Illnesses**
The Outcome Measures Hierarchy

Breast Cancer

Survival
- Survival rate (One year, three year, five year, longer)

Degree of recovery / health
- Degree of remission
- Functional status
- Breast conservation
- Depression

Time to recovery or return to normal activities
- Time to remission
- Time to functional status

Disutility of care or treatment process (e.g., treatment-related discomfort, complications, adverse effects, diagnostic errors, treatment errors)
- Nosocomial infection
- Nausea/vomiting
- Febrile neutropenia
- Suspension of therapy
- Failed therapies
- Limitation of motion
- Depression

Sustainability of recovery or health over time
- Cancer recurrence
- Sustainability of functional status

Long-term consequences of therapy (e.g., care-induced illnesses)
- 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
MD Anderson Oral Cavity Cancer Survival by Patient Registration Year

Stage: Local

Source: MD Anderson Cancer Center
In-vitro Fertilization
Success Rates Over Time

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

Clinic Size:
Number of Cycles per Year

Adult Kidney Transplant Outcomes, U.S. Center Results, 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, 2005-2007

Number of programs: 240
Number of transplants: 38,515
One year graft survival: 93.2%

- 6.6% of programs had greater than expected graft survival
- 7.8% of programs had worse than expected graft survival
Swedish National Quality Registers, 2007*

**Respiratory Diseases**
- Respiratory Failure Register (Swedevox)
- Swedish Quality Register of Otorhinolaryngology

**Childhood and Adolescence**
- The Swedish Childhood Diabetes Registry (SWEDIABKIDS)
- Childhood Obesity Registry in Sweden (BORIS)
- Perinatal Quality Registry/Neonatology (PNQn)
- National Registry of Suspected/Confirmed Sexual Abuse in Children and Adolescents (SÖK)

**Circulatory Diseases**
- Swedish Coronary Angiography and Angioplasty Registry (SCAAR)
- Registry on Cardiac Intensive Care (RIKS-HIA)
- Registry on Secondary Prevention in Cardiac Intensive Care (SEPHIA)
- Swedish Heart Surgery Registry
- Grown-Up Congenital Heart Disease Registry (GUCH)
- National Registry on Out-of-Hospital Cardiac Arrest
- Heart Failure Registry (RiksSvikt)
- National Catheter Ablation Registry
- Vascular Registry in Sweden (Swedvasc)

**Endocrine Diseases**
- National Quality Registry for Stroke (Riks-Stroke)
- National Registry of Atrial Fibrillation and Anticoagulation (AuriculA)

**Gastrointestinal Disorders**
- Swedish Hernia Registry
- Swedish Quality Registry on Gallstone Surgery (GallRiks)
- Swedish Quality Registry for Vertical Hernia

**Musculoskeletal Diseases**
- Swedish Shoulder Arthroplasty Registry
- National Hip Fracture Registry (RIKSHÖFT)
- Swedish National Hip Arthroplasty Register
- Swedish Knee Arthroplasty Register
- Swedish Rheumatoid Arthritis Registry
- National Pain Rehabilitation Registry
- Follow-Up in Back Surgery
- Swedish Cruciate Ligament Registry – X-Base
- Swedish National Elbow Arthroplasty Register (SAAR)

* Registers Receiving Funding from the Executive Committee for National Quality Registries in 2007
Creating an Outcome Measurement System
Schön Klinik

1. Designate medical conditions to measure
   • Define medical conditions and boundaries
   • Chart the CDVC

2. Develop outcome dimensions, measures, and risk adjustments
   • Measures developed by convening groups of involved physicians and members of Schön’s quality improvement team
   • Five metrics per medical condition

3. Data collection infrastructure
   • Physicians and nurses enter data during the patient’s stay
   • Data can be extracted from the EMR reducing the burden of capture
   • Collection of long term follow-up data still done manually

4. Incentives and mechanisms for data reporting
   • Reporting of all metrics is mandated for all physicians
   • Involvement in the metrics development process increases physician buy-in

5. Compliance and accuracy validation
   • Accuracy validated through trend analysis

6. Outcome reporting
   • Outcome data captured for 70% of patients
   • Report results internally at the individual physician level
   • Annual quality report (27 process and outcome measures) disseminated externally

7. Process for outcome improvement
   • Physicians trust metrics and are convinced of their value in driving improvement
   • Physician pay linked to quality of care delivered
Cost Measurement

• Current organization structure and cost accounting practices in health care obscure the understanding of actual costs in care delivery
• Understanding of cost in health care suffers from two major problems:

Cost aggregation
• Cost measurement and aggregation reflects the current organization and billing for care departments, specialties, and line items
• Costs must be aggregated around the full care for the patient’s medical condition rather than for discrete services

Cost allocation
• Costs involving shared resources are not allocated to individual patients, or are allocated using averages or estimates
• Costs must be allocated to individual patients based on their actual use of the resources involved

• The application of time-driven activity-based costing methods, well established in other industries, will enable better understanding of total patient costs and opportunities for improvement
Cost Reduction in Health Care

• Applying modern cost accounting practices to health care reveals major opportunities for cost efficiencies
  – Over-resourced facilities
    ▪ E.g. routine care delivered in expensive hospital settings
  – Under-utilization of expensive clinical space, equipment, and facilities
  – Poor utilization of highly skilled physicians and staff
  – Over-provision of low- or no-value testing and other services in order to justify billing/follow rigid protocols
  – Long cycle times
  – Redundant administrative and scheduling personnel
  – Missed opportunities for volume procurement
  – Excess inventory and weak inventory management
  – Lack of cost knowledge and awareness in clinical teams

• Such cost reduction opportunities do not require outcome tradeoffs, but may actually improve outcomes