Value-Based Health Care Delivery:
Core Concepts

Professor Michael E. Porter
Harvard Business School

Value Measurement for Health Care
Boston, MA
August 5, 2019

This presentation draws heavily on Professor Porter’s research in health care delivery including Redefining Health Care (with Elizabeth Teisberg), What is Value in Health Care, NEJM, and The Strategy That Will Fix Health Care, HBR (with Thomas Lee). A fuller bibliography is attached. 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. For further background and references on value-based health care, see the website of the Institute for Strategy and Competitiveness.
The Health Care Problem Remains a Global Issue

Health Care Spending vs GDP and Income

<table>
<thead>
<tr>
<th>Country</th>
<th>Index (1990=100)</th>
<th>HC expenditure 2018:</th>
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<tbody>
<tr>
<td>US</td>
<td>500</td>
<td>17.2% of GDP</td>
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<tr>
<td>UK</td>
<td>400</td>
<td>9.8% of GDP</td>
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<td>8.9% of GDP</td>
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<td>400</td>
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<td>11.5% of GDP</td>
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<td>I</td>
<td>400</td>
<td>9.3% of GDP</td>
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Wages: Average annual wages per full-time and full-year equivalent employee in the total economy

Source: EIU GDP (USD), Average Wages (USD) and Healthcare expenditure (USD) from 1990-2018; ECIP Article 2011
Creating a Value-Based Health Care System

• Today’s care delivery approaches reflect legacy organizational structures, management practices, and payment models based on historical medical science and delivery practices.

• There have been significant advances medical science yet service delivery practices have not evolved.

• Health care has gotten lost in the complexity of health care, and the pursuit of multiple goals including patient experience, safety, efficacy, access, research, training, etc.

• In order to transform the system, we need a single, unifying goal that aligns all interests.
Incremental “Solutions” Have Had Limited Impact

- Evidence-based medicine
- Safety/eliminating errors
- Prior authorization
- Patients as paying customers
- Electronic medical records
- “Lean” process improvements
- Care coordinators

- Retail clinics / urgent care
- Programs to address high cost areas (e.g. readmissions, post acute)
- Mergers and consolidation
- Personalized medicine
- Population health
- Analytics and big data (IBM Watson)

• Restructuring health care delivery is needed, not incremental improvements
Solving the Health Care Problem

• The fundamental **goal and purpose** of health care is to deliver high and improving **value for patients**

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

• Delivering high value health care is the **definition of success**

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

• Improving value is the **only real solution** to reducing the burden of health care on citizens

• The questions are how to design a health care delivery system that **substantially improves patient value**, and shift competition to **competing on value**
Principles of Value-Based Health Care Delivery

• Value cannot be understood at the level of a hospital, a care site, a specialty, an intervention, a primary care practice or a broad patient population

• Value is created in caring for a patient’s medical condition(s) (acute, chronic, behavioral) over the full cycle of care

Value = \frac{\text{The set of outcomes that matter for the condition}}{\text{The total costs of delivering these outcomes over the full care cycle}}

• In primary and preventive care, value is created in serving segments of patients with similar primary and preventive needs

• The medical condition is the fundamental unit of value creation and value measurement in health care delivery
Creating Value-Based Health Care Delivery

The Strategic Agenda

1. Re-organize care around patient conditions, into integrated practice units (IPUs)
   - For primary and preventive care, IPUs serve distinct patient segments

2. Measure outcomes and costs for every patient

3. Move to value-based reimbursement models, and ultimately bundled payments for conditions and primary care segments

4. Integrate and coordinate multi-site care delivery systems

5. Allocate care across geography to improve value: the right care in the right location

6. Build an enabling information technology platform
Re-organize Care Around Patient Medical Conditions
Headache Care in Germany

Organize by Department, Specialty, and Discrete Service

- Imagining Centers
- Outpatient Physical Therapists
- Outpatient Neurologists
- Inpatient Treatment and Detox Units
- Outpatient Psychologists
- Primary Care Physicians

Organize around the Patient’s Condition, or family of related conditions, into an Integrated Practice Unit (IPU)

- Affiliated Imaging Unit
- West German Headache Center
  - Neurologists
  - Psychologists
  - Physical Therapists
  - "Day Hospital"
- Essent Univ.
  - Hospital Inpatient Unit
- Affiliated “Network” Neurologists

Care by Individuals

Care by a Team

Defining the 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 care for common **co-occurring conditions, comorbidities and complications**
  – E.g., diabetes, breast cancer, knee osteoarthritis

• IPUs should be organized around **conditions** or **groups of related conditions** involving a similar team and care process
  – E.g., head and neck cancers, joint replacement
# Integrating Over The Cycle of Care

## Acute Hip and Knee-Osteoarthritis

### Operating room
- Determine approach (e.g., minimally invasive)
- Insert device
- Cement joint

### Recovery room
- Conduct pre-op physical exam

### Orthopedic floor at hospital or specialty surgery center
- Run blood labs
- Conduct physical exam

### Specialty office
- Conduct physical exam

### Pre-op evaluation center
- Conduct physical exam

### Imaging facility
- Conduct physical exam

### Specialty office
- Conduct physical exam

### Home
- Conduct physical exam

### Nursing facility
- Conduct physical exam

### Rehab facility
- Conduct physical exam

### Physical therapy clinic
- Conduct physical exam

### Primary care office
- Conduct physical exam

### Health club
- Conduct physical exam

### PCP office
- Conduct physical exam

### Health club
- Conduct physical exam

### Physical therapy clinic
- Conduct physical exam

### Orthopedic Surgeon

### Monitoring/Preventing
- 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

### Anesthesia
- Administer anesthesia (general, epidural, or regional)

### Surgical Prep
- Perform cardiology, pulmonary evaluations
- Run blood labs

### Surgical Procedure
- Determine approach (e.g., minimally invasive)
- Insert device
- Cement joint

### Pain Management
- Prescribe preemptive multimodal pain meds

### Monitoring/Rehabbing
- Consult regularly with patient
- Set long-term exercise plan

### Manage
- Prescribe prophylactic antibiotics when needed
- Set long-term exercise plan

### Monitor
- Conduct PCP exam
- Refer to specialists, if necessary

### Prevent
- Prescribe anti-inflammatory medicines
- Recommend exercise regimen
- Set weight loss targets

### Monitoring/Engaging
- Importance of exercise, weight reduction, proper nutrition
- Prognosis (short- and long-term outcomes)
- Drawbacks and benefits of surgery

### Measuring
- Baseline health status
- Fitness for surgery (e.g., ASA score)
- Blood loss
- Operative time
- Complications

### Living
- Provide daily living support (showering, dressing)
- Track risk indicators (fever, swelling, other)

### Physical Therapy
- Daily or twice daily PT sessions

### Technical
- Blood loss
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The Playbook for Integrated Practice Units (IPUs)

1. Organized around a medical condition, or group of closely related conditions, over the full cycle of care.
   - Defined patient segments for primary care
2. Care includes common co-occurring conditions and complications
3. Care is delivered by a dedicated, multidisciplinary team devoting a significant portion of their time to the condition
   - IPUs can also involve affiliated staff and integration with partner services
4. Co-located in dedicated facilities. A hub and spoke structure connecting multiple or affiliated sites, incorporating telemedicine where appropriate
5. Optimize the location of care across services
6. Patient education, engagement, adherence, follow-up, and prevention are integrated into the care process
7. A physician team captain, clinical care manager or both oversee each patient’s care
8. IPUs have a clear clinical leader, a common scheduling and intake process, and unified financial structure (single P + L)
9. IPUs routinely measure outcomes, costs, care processes, and patient experience using a common platform, and accept joint accountability for results
10. The team regularly meets formally and informally to discuss individual patient care plans, process improvements, and how to improve results
## Mechanisms for Care Integration
### The Software of IPUs

<table>
<thead>
<tr>
<th>Design</th>
<th>Care Processes</th>
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<tbody>
<tr>
<td>• IPU leadership team</td>
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<tr>
<td>• Co-location and shared work areas</td>
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<tr>
<td>• Patient team captain</td>
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<tr>
<td>• Integrated clinician scheduling</td>
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<tr>
<td>• Care coordinators, care managers</td>
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<tr>
<td>• Patient liaisons</td>
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<tr>
<td>• Recruit trainees and new staff who embrace the model</td>
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<tr>
<td>• Process mapping/protocols</td>
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<tr>
<td>- Including location for specific services</td>
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<tr>
<td>• Handoffs/rituals</td>
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<tr>
<td>• Clear timelines</td>
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<tr>
<td>• Multidisciplinary rounds</td>
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<tr>
<td>• Repeated relationships with outside specialists with condition specific expertise</td>
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<tr>
<td>• Cultural norms around collaboration and learning</td>
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<thead>
<tr>
<th>Role of Meetings</th>
<th>Finance and Incentives</th>
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<tbody>
<tr>
<td>• Case management meetings (agree on treatment plan)</td>
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<td>• Multidisciplinary rounds</td>
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<tr>
<td>• Difficult case reviews</td>
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<tr>
<td>• Outcomes reviews and improvement processes</td>
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<td>• Literature workshops</td>
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<td>• Single P+L</td>
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<tr>
<td>• Compensation reflecting team goals on value, not volume</td>
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IPU Volume Enhances Value

- **More patients** with the same condition
Measure Outcomes for Every Patient
The Quality Measurement Landscape

**Patient Initial Conditions, Risk Factors**

**Processes**
- Protocols/Guidelines

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

**Patient Experience/Engagement/Adherence**

**Indicators**
- E.g., PSA, Gleason score, surgical margin

**Outcomes**

Without outcomes measurement, the value of measuring other quality dimensions is greatly diminished

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Principles of Outcome Measurement

• Outcomes should be measured by **condition** (including related conditions) or **primary care segment**
  – **Not** for specialties, procedures, or interventions

• Outcomes are **always multi-dimensional** and include what matters most to **patients (and families)**, not just to clinicians
  – **Patient reported outcomes** are important in every condition

• Outcomes cover the **full cycle of care**

• Outcome measurement includes **initial conditions/risk factors** to control for patient differences

• Outcomes must be **standardized** for each condition, to maximize comparison, learning, and improvement

• Outcomes should be measured in the **line of care**

• Value-based measurement differs from the **historical focus** on measuring **provider behavior** measures **overall patient success**
The Outcome Measures Hierarchy

Tier 1
Health Status Achieved or Retained

Degree of health/recovery

- Achieved clinical status
- Achieved functional status

Tier 2
Process of Recovery

Time to recovery and return to normal activities

- Time to diagnosis and treatment
- Time to return home
- Time to return to normal activities
- Care-related pain/discomfort
- Complications
- Re-intervention/readmissions

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
Measuring Multiple Outcomes
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
The Power of Outcomes
Adult Kidney Transplant Outcomes
1987 - 1989

Number of Transplants 1987 – 1989 (Three Year Period)

Number of centers: 209
Number of transplants: 38,370
1 Year Graft Survival: 94.7%

- 4 Greater than expected graft survival (1.9%)
- 5 Worse than expected graft survival (2.4%)
### Standardizing Outcome Sets

**ICHOM**

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<thead>
<tr>
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<tr>
<td>9. Macular Degeneration*</td>
<td>21. Inflammatory Bowel Disease*</td>
<td></td>
<td>37. Personality Disorders</td>
</tr>
<tr>
<td>10. Lung Cancer*</td>
<td></td>
<td></td>
<td>38. Substance Misuse</td>
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<tr>
<td>11. Depression and Anxiety*</td>
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<tr>
<td>12. Advanced Prostate Cancer *</td>
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* Published Thus Far in Peer-Reviewed Journals (19)
Measure Cost for Every Patient

Principles

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

• Properly measuring the cost of care requires **different cost accounting** methods than prevailing approaches in health care such as departmental, charge-based, or RVU-based costing

• Cost should be measured for **each patient** over the **full cycle of care for the condition**

• Cost is driven by the use of **the resources** involved in a patient’s care (personnel, facilities, supplies, and support services)
  – Time and actual **costs** of resource use, not arbitrary allocations

• Understanding costs requires **mapping the care process**

Mapping Resource Utilization
MD Anderson Cancer Center – New Patient Visit

**Registration and Verification**
- Receptionist, Patient Access Specialist, Interpreter
  - Check in patient; communicate arrival (2 minutes)
  - Verify patient information; complete consent forms (40 minutes
    - Interpreter needed? (5%)
      - RCPT
    - Add language translation time for each process

**Intake**
- Nurse, Receptionist
  - Assess patient; assemble paperwork; place patient in room (20 minutes)
  - Laryngoscopy needed? (10%)

**Clinician Visit**
- MD, mid-level provider, medical assistant, patient service coordinator, RN
  - Initiate patient workup; review patient history; conduct physical exam (45 minutes)
  - Discuss plan of care (30 minutes)

**Plan of Care Discussion**
- RN/LVN, MD, mid-level provider, patient service coordinator
  - Review plan of care; introduce tascc; review schedule for return visit (15 minutes)
  - Clean room; complete paperwork; check email and voicemail for updates or changes to plan of care (10 minutes)

**Plan of Care Scheduling**
- Patient Service Coordinator
  - Schedule tests and consults; communicate schedule to patient (5 minutes)
  - Scheduled for same day? (10%)

**Decision Point**
- Time (minutes)

---

Source: HBS, MD Anderson Cancer Center

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Major Cost Reduction Opportunities in Health Care

• Utilize **physicians and skilled staff** at the top of their licenses
• Reduce **process variation** that increases complexity and raises cost
• Eliminate **low- or non-value added** services or tests
• **Reduce cycle times** across the care cycle, which expands capacity with the same staff and facilities
• Invest in additional services (e.g. extra visits, telemedicine), or higher costs inputs that will **lower overall care cycle cost**
• Move uncomplicated services **out of highly-resourced** facilities
• Reduce **service duplication** and **volume fragmentation** across sites
• Rationalize redundant **administrative** and **scheduling** units
• Increase **cost awareness** in clinical teams, (e.g. costs of inputs (sutures vs. staples))
• Improve the efficiency and automation of **claims management** and **billing** processes

• Our work reveals typical **cost reduction opportunities of 30+%**
• Many cost improvements **also improve outcomes**
Move to Value-Based Payment Models

- Both approaches create positive incentives for reducing costs and separate payment from performing particular services.
- Capitation at the hospital or system level can coexist with bundle payment at the condition level.
### Emerging Value-Based Payment Models

#### Capitation (Population-Based)
- A single risk-adjusted payment for the overall care for a life
- Responsible for all needed care in the covered population
- Accountable for population level quality metrics
- At risk for the difference between the sum of payments for the population and overall spending
  - Providers take disease incidence risk, not just execution/outlier risk
- Accountable for overall cost and population level quality measures

#### Bundled Payment
- A single risk adjusted payment for the overall care for a condition
  - Not for a specialty, procedure, or short episode
- Covers the full set of services needed over an acute care cycle, or a defined time period for chronic care or primary care
- Contingent on condition-specific outcomes
  - Including responsibility for avoidable complications
- At risk for the difference between the bundled price and the actual cost of all included services
  - Limits of responsibility for unrelated care and outliers
- Accountable for costs and outcomes, patient by patient, and condition by condition
Walmart Centers of Excellence Programs

Conditions
- Cardiac
- Cancer
- Joint replacement
- Spine
- Transplant
- Weight loss

Centers of Excellence
- Cleveland Clinic (OH)
- Geisinger (PA)
- Kaiser Permanente (CA)
- Johns Hopkins (MD)
- Mayo Clinic (MN)
- Memorial Hermann (TX)
- Northeast Baptist (TX)
- Virginia Mason (WA)
- Emory (GA)

Source: compiled from news.Walmart.com and through publically available news and press releases
Integrate Care Across Sites
Children’s Hospital of Philadelphia Care Network

Wholly-Owned Outpatient Units
- Primary Care Practices
- Specialty Care Centers
- Specialty Care Center, Surgery Center & After-Hours Urgent Care
- Specialty Care & Surgery Centers
- Specialty Care Center, Surgery Center, After-Hours Urgent Care & Home Care

Community Inpatient Partnerships
- CHOP Newborn Care
- CHOP Pediatric Care
- CHOP Newborn & Pediatric Care
- Hospital & Integrated Specialty Program
Shifting The Strategic Logic of Health Systems

Confederation of Standalone Units/Facilities

• Increase volume
• More clout in contracting and purchasing
• Spread “fixed overhead” costs
• Use owned or affiliated primary care practices to “guarantee” referrals

Clinically Integrated Care Delivery System

• Increase value
• Value-based delivery models
• Concentrate, allocate, and integrate care across appropriate sites
• The system is more than the sum of its parts
Four Levels of Provider System Integration

1. Defining the overall scope of services for each site, and for the system as a whole, based on value
   - Affiliate when this creates value

2. Concentrate volume of patients with given conditions in fewer locations, to support IPUs and improve outcomes and efficiency

3. Perform the right services in the right locations based on acuity level, resource/cost fit, and the benefits of patient convenience for repetitive services
   - E.g., move less complex surgeries out of tertiary hospitals to lower acuity facilities and outpatient surgery centers
   - Affiliate when this creates value

4. Integrate the care cycle across sites via an IPU structure
   - Common scheduling
   - Digital services and telemedicine can help tie together the care cycle
The Geography of Care and Value

• The Traditional Care Geography Model
  - Care organized around specialties and interventions for each site
  - Duplication of services across sites/facilities
  - Sites provide care for multiple acuity levels
  - Limited integration of care across services and sites (multiple hubs)
  - Reinforced by fee-for-service model and siloed IT systems

• Using Geography to Improve Value: Strategic Principles
  - Organize care by condition in IPUs (hubs)
    - Multi-disciplinary teams
    - Responsibility for full care cycle
  - Allocate services across the care cycle to sites based on: site capabilities, care complexity, patient risk, and patient convenience
  - Incorporate telemedicine, incorporating affiliated provider sites, and home services into the care cycle
  - IPUs need formal systems for teams to direct patients to the most appropriate site
Delivering the Right Care at the Right Location
Rothman Institute, Philadelphia

Patient Risk Factors: Age, Weight, Expected Activity, General Health, and Bone Quality

Facility Capability
- Lowest Complexity
- Low Complexity
- Medium Complexity
- Highest Complexity

Price of Total Hip Replacement:
- ~$12,000 USD
- ~$45,000 USD

Rothman Orthopaedic Specialty Hospital
Bryn Mawr Community Hospital
Jefferson University Academic Medical Center

Ambulatory Surgery Center
Build an Enabling IT Platform
Attributes of a Value-Based IT Platform

1. Combines all types of data for each patient across the full care cycle (notes, lab tests, genomics, imaging, costs) using standard definitions and terminology

2. Tools to capture, store, and extract structured data and eliminate free text

3. Data is captured in the clinical and administrative workflow

4. Data is stored and easily extractable from a common warehouse. Capability to aggregate, extract, run analytics and display data by condition and over time

5. Full interoperability allowing data sharing within and across networks, EMR platforms, referring clinicians, and health plans

6. Platform is structured to enable the capture and aggregation of outcomes, costing parameters, and bundled payment eligibility/billing

7. Leverages mobile technology for scheduling, PROMs collection, secure patient communication and monitoring, virtual visits, access to clinical notes, and patient education
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
Value-Based Health Care Thinking and Practice Are Rapidly Diffusing
Peer Reviewed Literature 1990-2018

Redefining Healthcare
ICHOM Founded

y = 8E-12e0.14x
R² = 0.9637

Journal Articles Related to Value-Based Health Care

From: Science Direct; accessed December 2018, Patrick Clapp, Baker Research Services, Harvard Business School
NEJM Catalyst Innovations in Care Delivery is a new digital, peer-reviewed journal from NEJM Group, the publisher of The New England Journal of Medicine.

Publishing six issues each year, NEJM Catalyst Innovations in Care Delivery aims to accelerate health care delivery transformation by publishing real-world examples and practical solutions so that health care leaders can address today’s urgent care delivery challenges and shape the future of health care delivery across the globe.

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**Michael Porter**, PhD, Bishop William Lawrence University Professor, Harvard Business School

Quick Facts:

- **Frequency:** Bimonthly (6x/year)
- **Launch Date:** January 2020
- **Format:** Online only
- **Indexed:** Anticipate indexing in PubMed and MEDLINE
- **Audience:** Health care executives, clinical leaders, clinicians, academics, industry analysts, consultants, policy makers, government officials
The Health Care Transformation is Well Underway

• **We know the path** forward

• **Value for patients** is True North

• **Value based thinking** is restructuring care organization, outcome measurement, payment models and **health system strategy** across multiple countries

• **Standardized outcome measurement** and new **costing practices** are beginning to accelerate value improvement

• **Employers, suppliers, and insurers** can be the next accelerators

• **Government policy** is beginning to reinforce value improvement

• We are anxious to **work with all** of you in accelerating this transformation
Selected References on Value-Based Health Care

- (Forthcoming) Porter M.E., and Lee T. H. “The Geography of Care.”
- Websites Including Videos
  - http://www.isc.hbs.edu/
  - https://www.ichom.org/