

# Value-Based Health Care Delivery: Outcomes 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.

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# Creating a Value-Based Health Care Delivery Organization

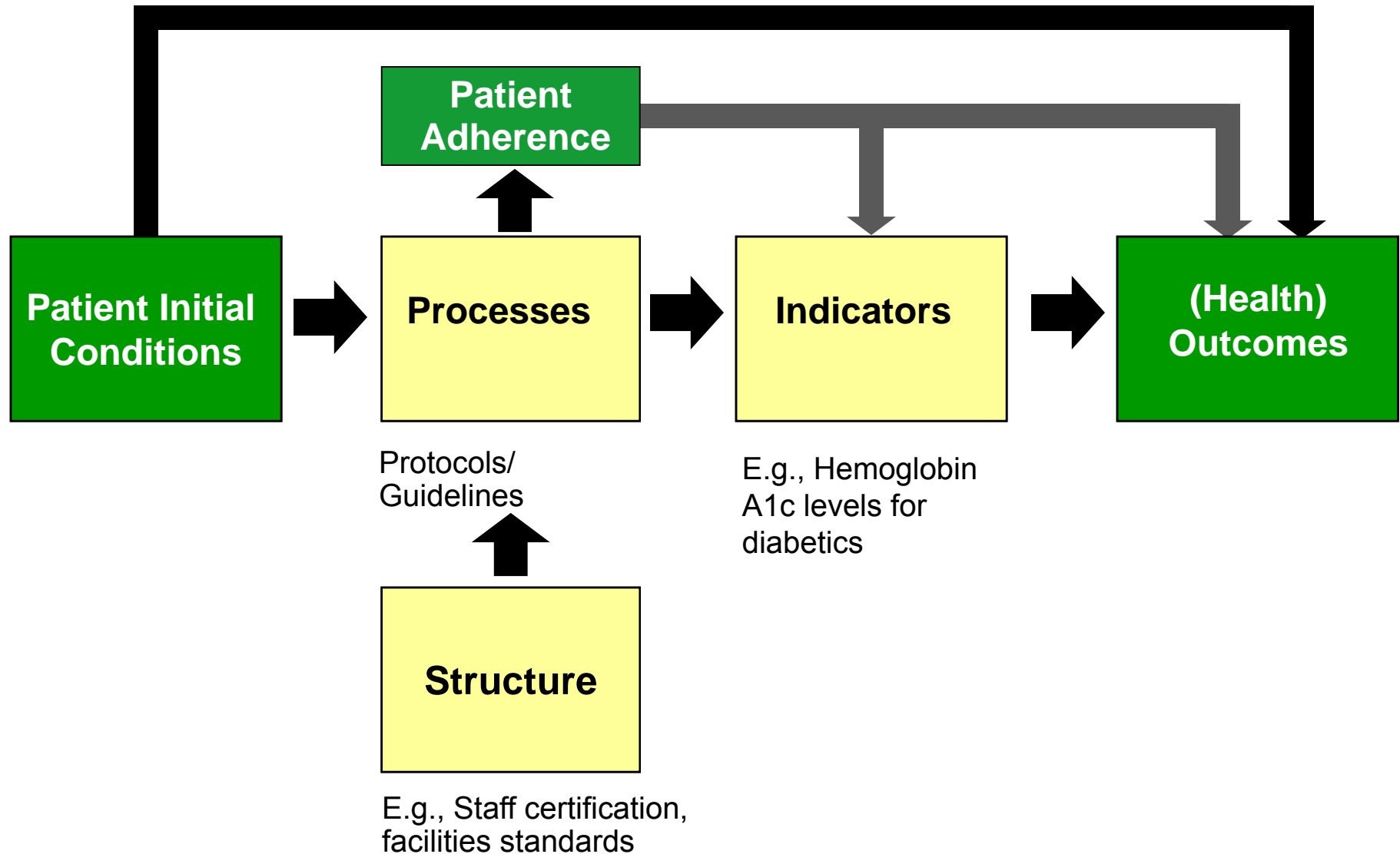
## The Strategic Agenda

1. Organize into Integrated Practice Units (IPUs) around Patient **Medical Conditions**
  - Organize primary and preventive care to serve **distinct patient segments**


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 **Areas of Excellence**
6. Create an Enabling **Information Technology Platform**

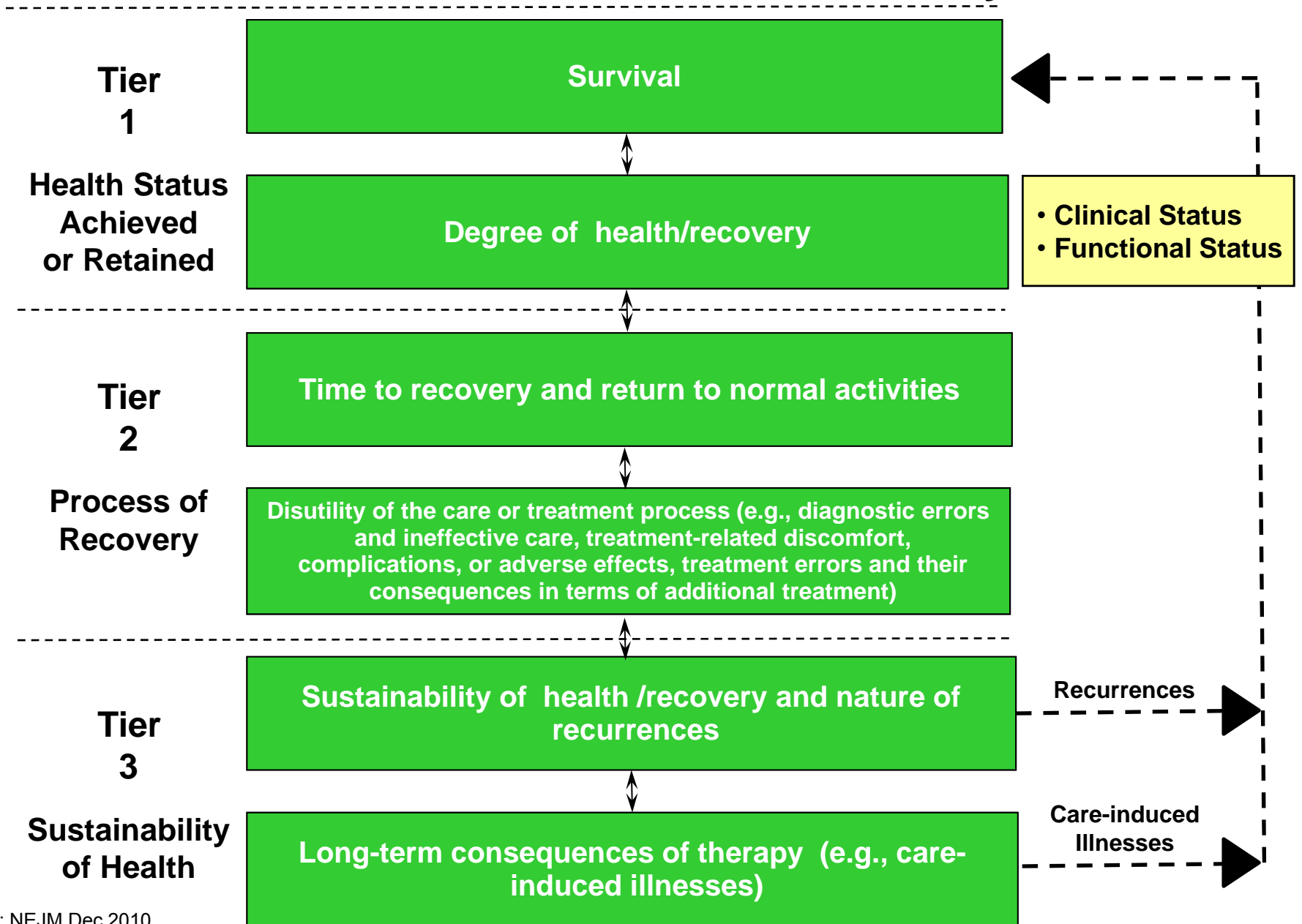
## 2. Measuring Outcomes and Cost for Every Patient



# Principles of Outcome Measurement

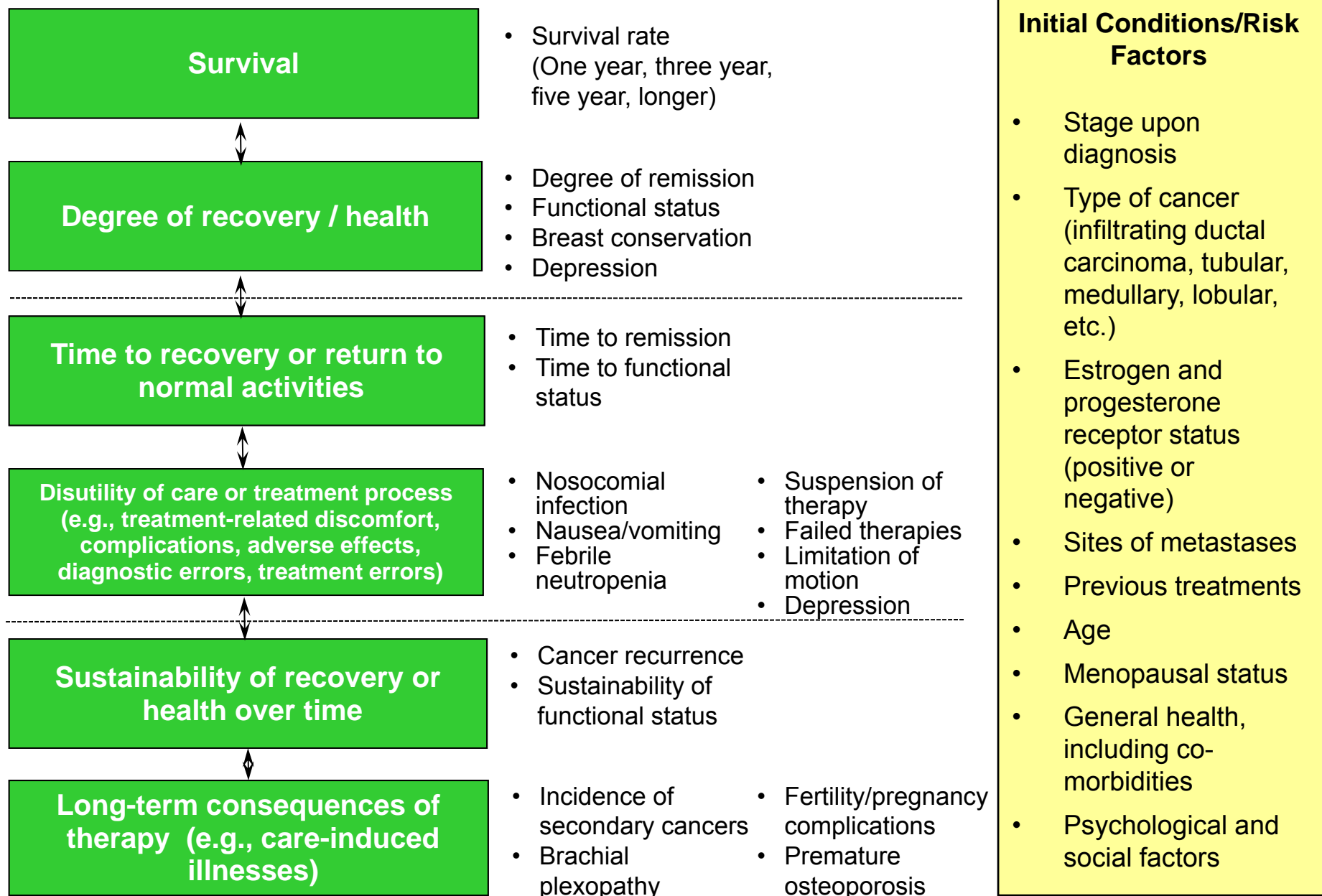
- Outcomes should be measured by **medical condition** or **primary care patient segment**
  - Outcomes are **multi-dimensional** and should include the health circumstances **most relevant to patients**
  - Outcomes should reflect the **full cycle of care**
  - Outcomes should encompass **near-term** and **longer-term** patient health, covering a period that reflects the ultimate results of care
  - Measurement should include **initial conditions/risk factors** to allow for risk adjustment
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- Ultimately, outcome measurement should be **real time** and **in the line of care**, not just retrospective or in clinical studies

# The Outcome Measures Hierarchy



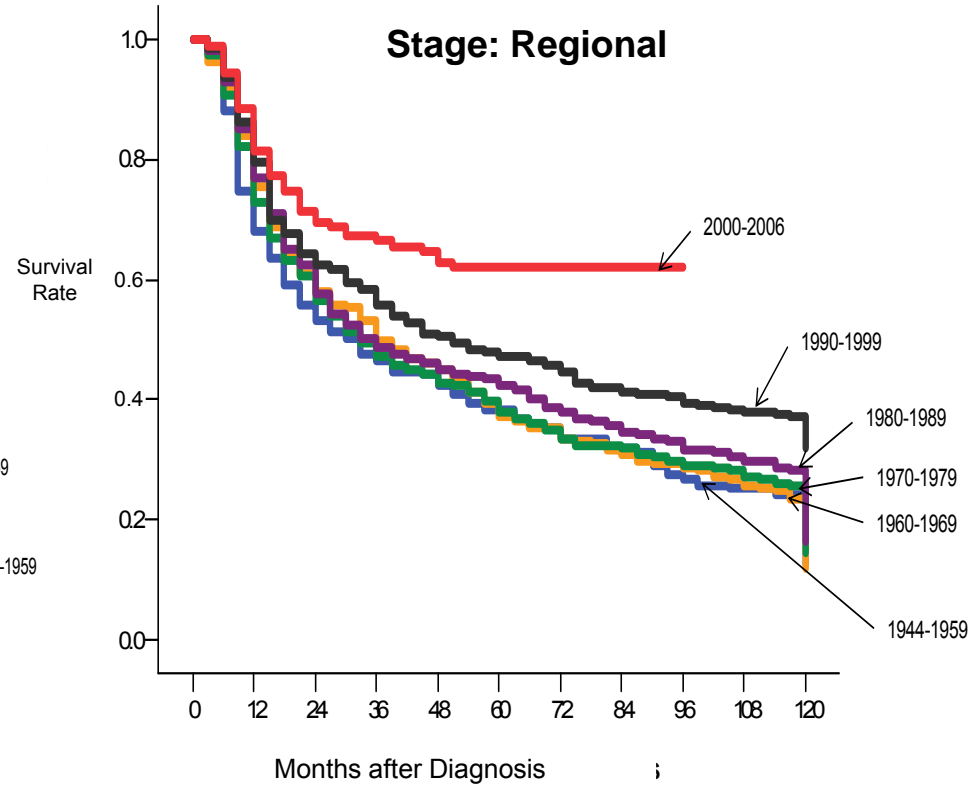
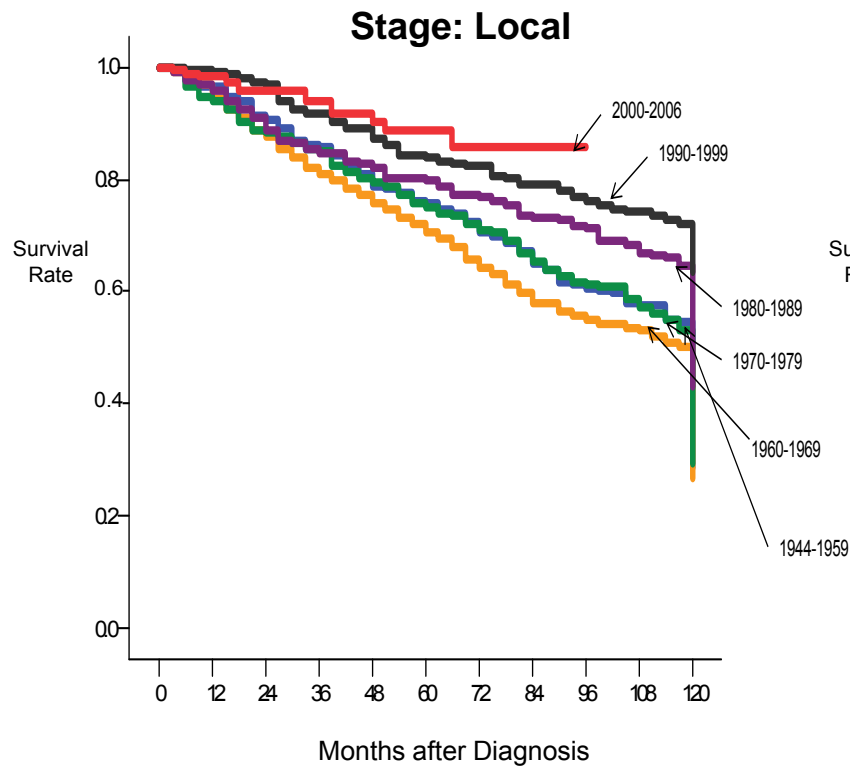
# The Outcome Measures Hierarchy

## Breast Cancer



# Outcome Performance Over Time

## MD Anderson Oral Cavity Cancer Survival by Patient Registration Year

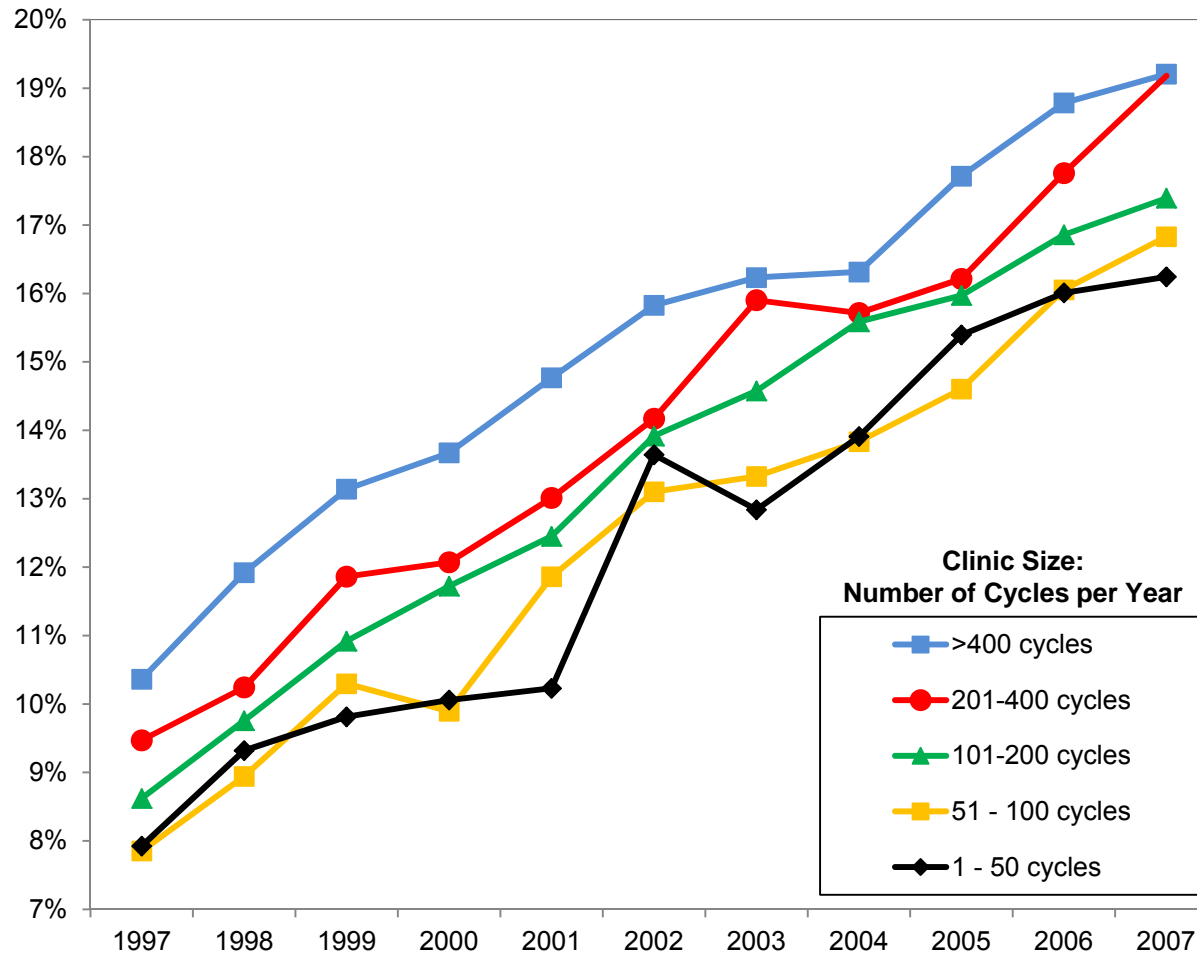


Source: MD Anderson Cancer Center

# Comparative Success Rates Across Centers

## In-vitro Fertilization

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



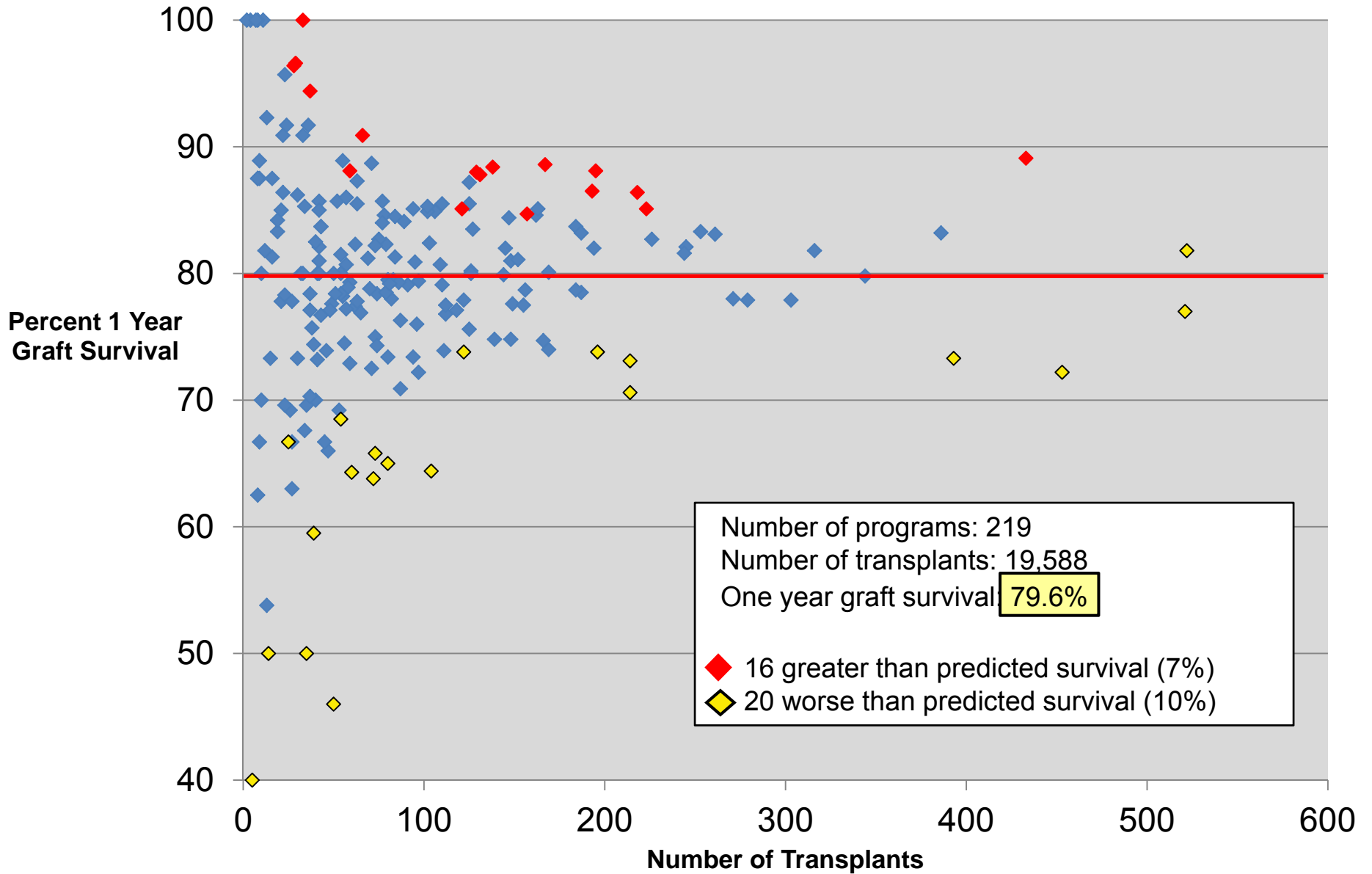
Source: Michael Porter, Saquib Rahim, Benjamin Tsai, *In-vitro Fertilization: Outcomes Measurement*. Harvard Business School Press, 2008

Data: Center for Disease Control and Prevention. "Annual ART Success Rates Reports." <<http://www.cdc.gov/art/ARTReports.htm>>, Dec. 12, 2010.



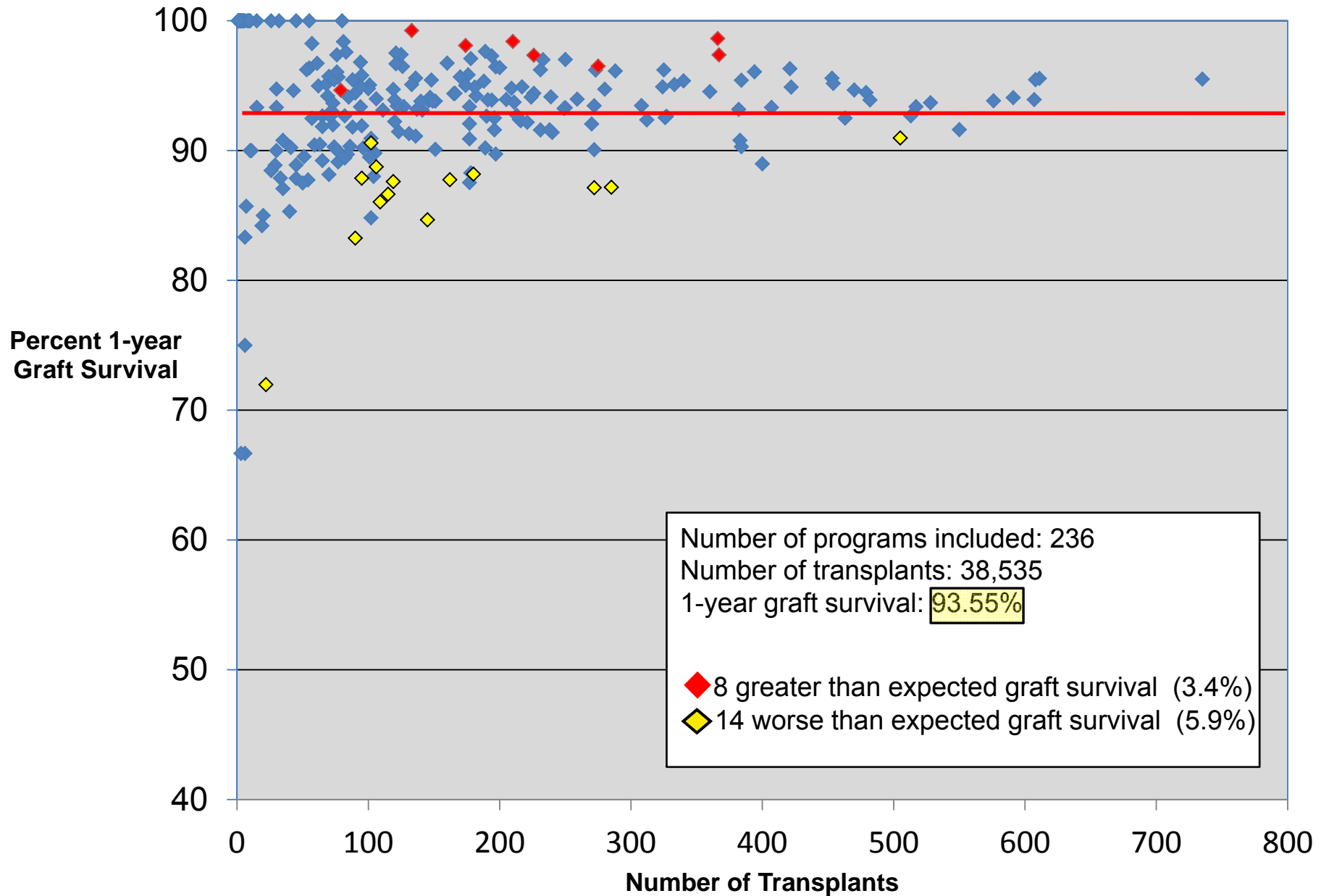
# Adult Kidney Transplant Outcomes

## U.S. Centers, 1987-1989



# Adult Kidney Transplant Outcomes

## U.S. Center Results, 2008-2010



# Steps to Creating an Outcomes Measurement System

1. Designing outcome measures
2. Collecting outcome data
3. Compiling and analyzing outcomes
4. Reporting

# 1. Designing Outcome Measures

- Establish an **outcome measures team** including physicians, nurses and skilled staff involved in the care cycle
- Define the **medical condition**
- Create a **Care Delivery Value Chain** for the condition
- Use the **outcome hierarchy** to define a comprehensive set of **outcome dimensions**, and **specific measures**
  - Engage patients to understand the outcomes **that matter to them**
- Tie the **outcome measures to the CDVC** to check for completeness and start to identify the causal connections between activities and each outcome
- Identify the **set of initial conditions** or **risk factors** necessary to control for patient differences

# The Care Delivery Value Chain

## Acute Knee-Osteoarthritis Requiring Replacement

<b>INFORMING AND ENGAGING</b>	<ul style="list-style-type: none"> <li>Importance of exercise, weight reduction, proper nutrition</li> </ul>	<ul style="list-style-type: none"> <li>Meaning of diagnosis</li> <li>Prognosis (short- and long-term outcomes)</li> <li>Drawbacks and benefits of surgery</li> </ul>	<ul style="list-style-type: none"> <li>Setting expectations</li> <li>Importance of nutrition, weight loss, vaccinations</li> <li>Home preparation</li> </ul>	<ul style="list-style-type: none"> <li>Expectations for recovery</li> <li>Importance of rehab</li> <li>Post-surgery risk factors</li> </ul>	<ul style="list-style-type: none"> <li>Importance of rehab adherence</li> <li>Longitudinal care plan</li> </ul>	<ul style="list-style-type: none"> <li>Importance of exercise, maintaining healthy weight</li> </ul>
	<ul style="list-style-type: none"> <li>Joint-specific symptoms and function (e.g., WOMAC scale)</li> <li>Overall health (e.g., SF-12 scale)</li> </ul>	<ul style="list-style-type: none"> <li>Loss of cartilage</li> <li>Change in subchondral bone</li> <li>Joint-specific symptoms and function</li> <li>Overall health</li> </ul>	<ul style="list-style-type: none"> <li>Baseline health status</li> <li>Fitness for surgery (e.g., ASA score)</li> </ul>	<ul style="list-style-type: none"> <li>Blood loss</li> <li>Operative time</li> <li>Complications</li> </ul>	<ul style="list-style-type: none"> <li>Infections</li> <li>Joint-specific symptoms and function</li> <li>Inpatient length of stay</li> <li>Ability to return to normal activities</li> </ul>	<ul style="list-style-type: none"> <li>Joint-specific symptoms and function</li> <li>Weight gain or loss</li> <li>Missed work</li> <li>Overall health</li> </ul>
	<ul style="list-style-type: none"> <li>PCP office</li> <li>Health club</li> <li>Physical therapy clinic</li> </ul>	<ul style="list-style-type: none"> <li>Specialty office</li> <li>Imaging facility</li> </ul>	<ul style="list-style-type: none"> <li>Specialty office</li> <li>Pre-op evaluation center</li> </ul>	<ul style="list-style-type: none"> <li>Operating room</li> <li>Recovery room</li> <li>Orthopedic floor at hospital or specialty surgery center</li> </ul>	<ul style="list-style-type: none"> <li>Nursing facility</li> <li>Rehab facility</li> <li>Physical therapy clinic</li> <li>Home</li> </ul>	<ul style="list-style-type: none"> <li>Specialty office</li> <li>Primary care office</li> <li>Health club</li> </ul>
<b>CARE DELIVERY</b>	<b>MONITORING/ PREVENTING</b>	<b>DIAGNOSING</b>	<b>PREPARING</b>	<b>INTERVENING</b>	<b>RECOVERING/ REHABBING</b>	<b>MONITORING/ MANAGING</b>
	<b>MONITOR</b> <ul style="list-style-type: none"> <li>Conduct PCP exam</li> <li>Refer to specialists, if necessary</li> </ul> <b>PREVENT</b> <ul style="list-style-type: none"> <li>Prescribe anti-inflammatory medicines</li> <li>Recommend exercise regimen</li> <li>Set weight loss targets</li> </ul>	<b>IMAGING</b> <ul style="list-style-type: none"> <li>Perform and evaluate MRI and x-ray                             <ul style="list-style-type: none"> <li>-Assess cartilage loss</li> <li>-Assess bone alterations</li> </ul> </li> </ul> <b>CLINICAL EVALUATION</b> <ul style="list-style-type: none"> <li>Review history and imaging</li> <li>Perform physical exam</li> <li>Recommend treatment plan (surgery or other options)</li> </ul>	<b>OVERALL PREP</b> <ul style="list-style-type: none"> <li>Conduct home assessment</li> <li>Monitor weight loss</li> </ul> <b>SURGICAL PREP</b> <ul style="list-style-type: none"> <li>Perform cardiology, pulmonary evaluations</li> <li>Run blood labs</li> <li>Conduct pre-op physical exam</li> </ul>	<b>ANESTHESIA</b> <ul style="list-style-type: none"> <li>Administer anesthesia (general, epidural, or regional)</li> </ul> <b>SURGICAL PROCEDURE</b> <ul style="list-style-type: none"> <li>Determine approach (e.g., minimally invasive)</li> <li>Insert device</li> <li>Cement joint</li> </ul> <b>PAIN MANAGEMENT</b> <ul style="list-style-type: none"> <li>Prescribe preemptive multimodal pain meds</li> </ul>	<b>SURGICAL</b> <ul style="list-style-type: none"> <li>Immediate return to OR for manipulation, if necessary</li> </ul> <b>MEDICAL</b> <ul style="list-style-type: none"> <li>Monitor coagulation</li> </ul> <b>LIVING</b> <ul style="list-style-type: none"> <li>Provide daily living support (showering, dressing)</li> <li>Track risk indicators (fever, swelling, other)</li> </ul> <b>PHYSICAL THERAPY</b> <ul style="list-style-type: none"> <li>Daily or twice daily PT sessions</li> </ul>	<b>MONITOR</b> <ul style="list-style-type: none"> <li>Consult regularly with patient</li> </ul> <b>MANAGE</b> <ul style="list-style-type: none"> <li>Prescribe prophylactic antibiotics when needed</li> <li>Set long-term exercise plan</li> <li>Revise joint, if necessary</li> </ul>

Orthopedic Specialist  
 Other Provider Entities

## 2. Collecting Outcome Data: Initial Steps

- Identify the **best placed individual(s)** for **entering data** and making the **most informed judgment** on each measure
  - E.g. physicians, nurses, patients or dedicated measurement staff
- Extract **available** information from clinical and administrative systems
- Create an **auditing system** to eliminate clerical and other errors, as well as to test the objectivity of qualitative scoring and judgments



- **Chart review** and **paper-based forms** are starting points in expanding the measures tracked

## 2. Collecting Outcome Data: Moving to a Real-time System

### EMR Capture

- Modify the **EMR** to allow efficient collection of clinician-reported measures
  - E.g. standardized, medical-condition specific templates
- Create paper or web-based tools that **incorporate patient-reported outcomes**
  - E.g. Dartmouth Spine Center tablets, patient portals

### Long Term Tracking


- Develop practical **patient tracking** methods to follow patients over extended time periods
  - Links to registries and payor and government databases (death records, worker's compensation, unemployment, etc.)

### 3. Compiling and Analyzing Outcomes

- Compile outcomes data and initial conditions in a **centralized registry or database**
  - Structured around patients and their **medical conditions**, not visits or episodes
- Create reports for **risk-adjusted patient cohorts** over time
- Compare outcomes **across providers and locations**
- Convene **regular meetings** to analyze variations and trends
  - Create an environment that allows **open discussion of results** with no repercussions for participants willing to learn and make constructive changes
- Utilize outcome learning to investigate **processes, potential care innovations,** and **other improvement approaches**
  - Combine with care cycle costing data
- **Refine** the measures, collection methods, and risk-adjustment factors over time



## 4. Reporting

- Start first with **internal reporting to providers** - move over time to referring providers, payors, and patients
  - Create an agreed upon path to **external** transparency of outcomes
  - Work with provider peers, payors, and government to **standardize reporting measures and methods**, including
    - Metrics
    - Method of stratification/risk adjustment
    - Unit of analysis (individual physician vs. group practice)
    - Process for improving metrics and practices
  - Collaborate with external registries and leading national and international providers to **benchmark performance and compare best practices**
- 
- Ultimately, **national reporting of standardized measures** will be the strongest driver in value improvement

# The Role of Registries in Outcome Measurement:

## Selected 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)

- National Quality Registry for Stroke (Riks-Stroke)
- National Registry of Atrial Fibrillation and Anticoagulation (Auricula)

### **Endocrine Diseases**

- National Diabetes Registry (NDR)
- Swedish Obesity Surgery Registry (SOReg)
- Scandinavian Quality Register for Thyroid and Parathyroid Surgery

### **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

# Enabling Universal Outcomes Measurement: Leverage Points for Government

- Provide **seed funding** for registry development
- Streamline **policy hurdles** that impede measurement and registry development and implementation (e.g., privacy rules, definitive patient identifiers)
- **Incentivize** outcomes measurement and reporting
  - Initially, incentives for reporting
  - Required reporting for participation in **new reimbursement models**
  - Required reporting for **all** reimbursement
- Strengthen **IT standards** to allow easy transfer of information across data sources
- **Stimulate EMR improvements** that enable efficient data-entry workflow and easy extraction of outcome measures

# **Enabling Universal Outcomes Measurement: Leverage Points for Patients, Payors, and Employers**

## **Patients**

- Work with providers to define the outcomes that **matter to patients** by medical condition
- Utilize **outcomes data** in provider selection

## **Payors**

- Become active **users** of outcome data to inform contracting and guide subscriber choices
- Introduce **incentives** for outcome reporting and registry participation
  - Tie pay-for-performance programs initially to **reporting of outcomes**, but eventually to outcomes themselves
- Create a pathway to **external transparency** of outcomes

## **Employers**

- Use purchasing power to require outcomes reporting by medical condition **as a condition for contracting**