

# Value-Based Health Care Delivery: Implications for Radiology

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This presentation draws on Porter, Michael E. and Thomas H. Lee. "The Strategy that Will Fix Health Care," *Harvard Business Review*, October 2013; Porter, Michael E. with Thomas H. Lee and Erika A. Pabo. "Redesigning Primary Care: A Strategic Vision to Improve Value by Organizing Around Patients' Needs," *Health Affairs*, March 2013; Porter, Michael E. and Robert Kaplan. "How to Solve the Cost Crisis in Health Care," *Harvard Business Review*, September 2011; Porter, Michael E. "What is Value in Health Care" and supplementary papers, *New England Journal of Medicine*, December 2010; Porter, Michael E. "A Strategy for Health Care Reform—Toward a Value-Based System," *New England Journal of Medicine*, June 2009; Porter, Michael E. and Elizabeth Olmsted Teisberg. Redefining Health Care: Creating Value-Based Competition on Results. (2006) Additional information about these ideas, as well as case studies, can be found at the Institute for Strategy and 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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# 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**

$$\text{Value} = \frac{\text{Health outcomes that matter to patients}}{\text{Costs of delivering the outcomes}}$$

- 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

$$\text{Value} = \frac{\text{Health outcomes that matter to patients}}{\text{Costs of delivering the outcomes}}$$

- 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

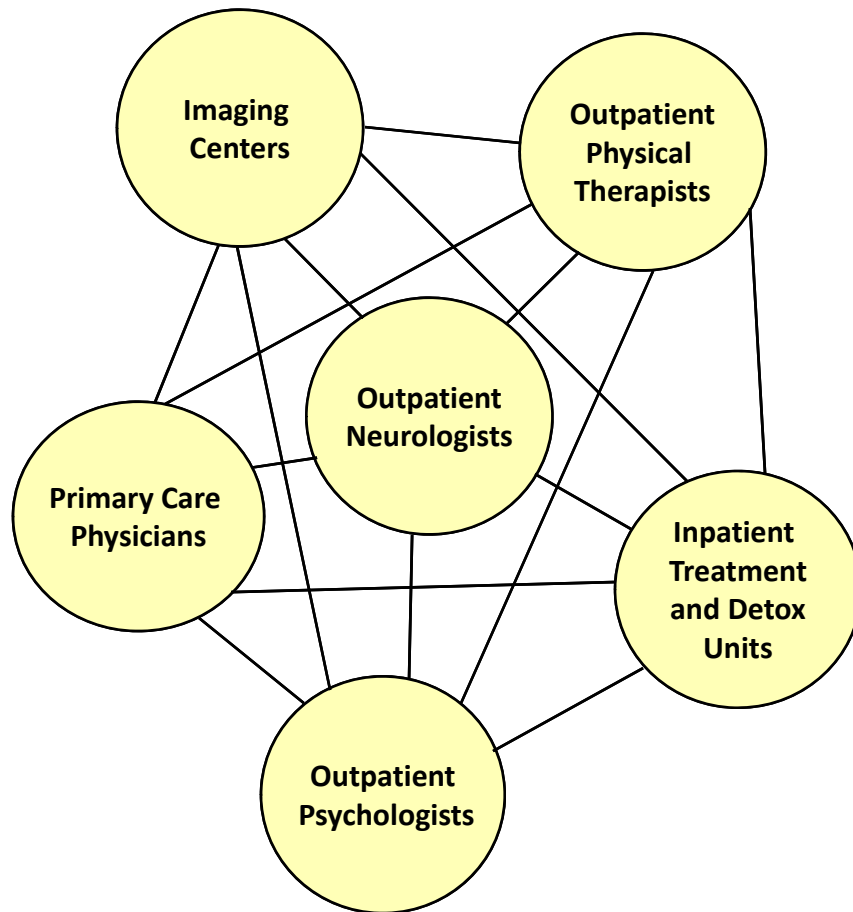
1. Organize Care into **Integrated Practice Units (IPUs)** around Patient Medical Conditions
  - For primary and preventive care, organize to serve **distinct patient segments**
2. Measure **Outcomes** and **Costs** for Every Patient
3. Move to **Bundled Payments** for Care Cycles
4. Integrate Care Delivery **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

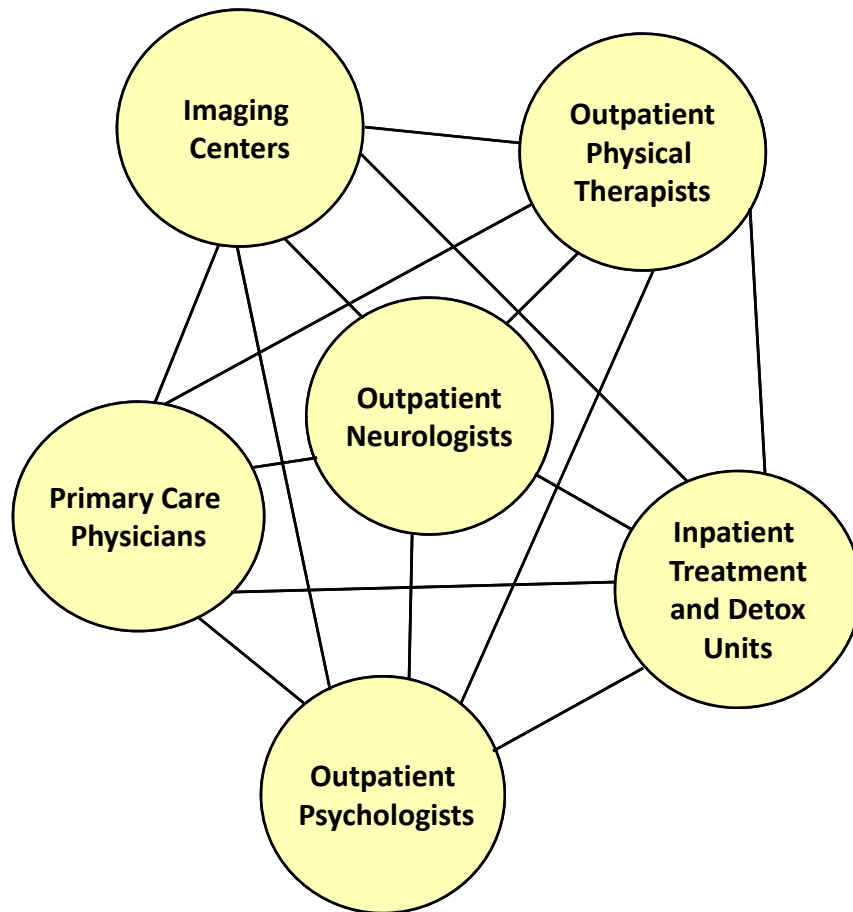


# 1. Organize Care Around Patient Medical Conditions

## Migraine Care in Germany

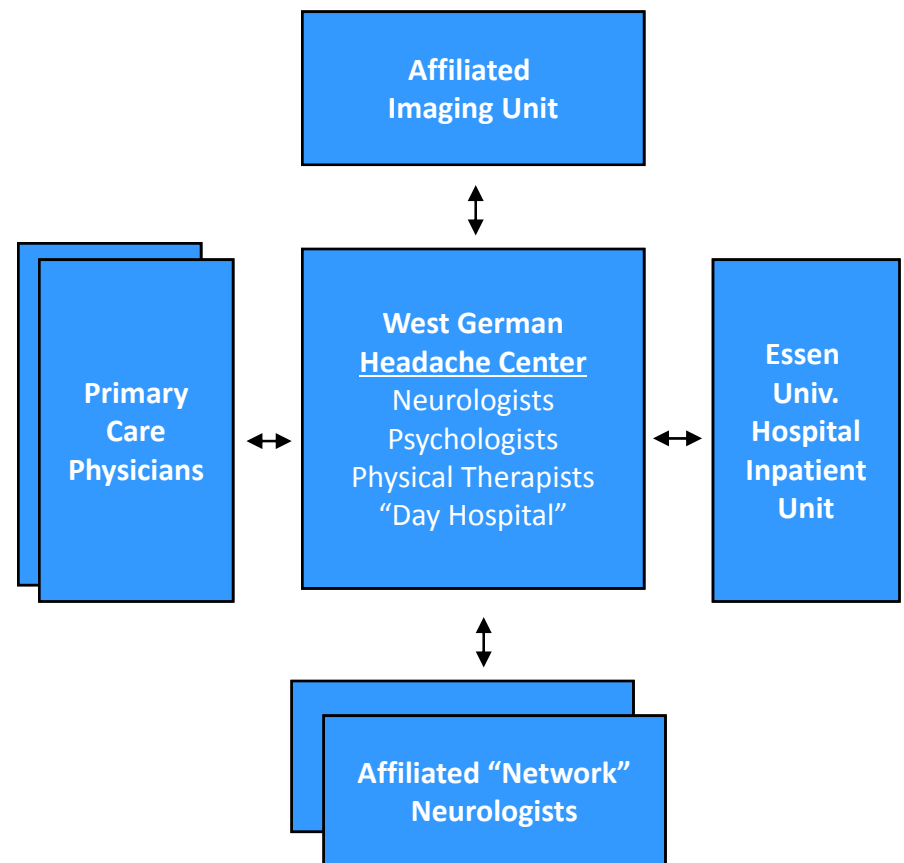
### Existing Model:

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

<b>INFORMING AND ENGAGING</b>	<ul style="list-style-type: none"> <li>• Advice on self screening</li> <li>• Consultations on risk factors</li> </ul>	<ul style="list-style-type: none"> <li>• Counseling patient and family on the diagnostic process and the diagnosis</li> </ul>	<ul style="list-style-type: none"> <li>• Explaining patient treatment options/ shared decision making</li> <li>• Patient and family psychological counseling</li> </ul>	<ul style="list-style-type: none"> <li>• Counseling on the treatment process</li> <li>• Education on managing side effects and avoiding complications</li> <li>• Achieving compliance</li> </ul>	<ul style="list-style-type: none"> <li>• Counseling on rehabilitation options, process</li> <li>• Achieving compliance</li> <li>• Psychological counseling</li> </ul>	<ul style="list-style-type: none"> <li>• Counseling on long term risk management</li> <li>• Achieving compliance</li> </ul>	
	<b>MEASURING</b>	<ul style="list-style-type: none"> <li>• Self exams</li> <li>• Mammograms</li> </ul>	<ul style="list-style-type: none"> <li>• Mammograms</li> <li>• Ultrasound</li> <li>• MRI</li> <li>• Labs (CBC, etc.)</li> <li>• Biopsy</li> <li>• BRACA 1, 2...</li> <li>• CT</li> <li>• Bone Scans</li> </ul>	<ul style="list-style-type: none"> <li>• Labs</li> </ul>	<ul style="list-style-type: none"> <li>• Procedure-specific measurements</li> </ul>	<ul style="list-style-type: none"> <li>• Range of movement</li> <li>• Side effects measurement</li> </ul>	<ul style="list-style-type: none"> <li>• MRI, CT</li> <li>• Recurring mammograms (every six months for the first 3 years)</li> </ul>
	<b>ACCESSING THE PATIENT</b>	<ul style="list-style-type: none"> <li>• Office visits</li> <li>• Mammography unit</li> <li>• Lab visits</li> </ul>	<ul style="list-style-type: none"> <li>• Office visits</li> <li>• Lab visits</li> <li>• High risk clinic visits</li> </ul>	<ul style="list-style-type: none"> <li>• Office visits</li> <li>• Hospital visits</li> <li>• Lab visits</li> </ul>	<ul style="list-style-type: none"> <li>• Hospital stays</li> <li>• Visits to outpatient radiation or chemotherapy units</li> <li>• Pharmacy visits</li> </ul>	<ul style="list-style-type: none"> <li>• Office visits</li> <li>• Rehabilitation facility visits</li> <li>• Pharmacy visits</li> </ul>	<ul style="list-style-type: none"> <li>• Office visits</li> <li>• Lab visits</li> <li>• Mammographic labs and imaging center visits</li> </ul>
<b>MONITORING/ PREVENTING</b>		<b>DIAGNOSING</b>	<b>PREPARING</b>	<b>INTERVENING</b>	<b>RECOVERING/ REHABING</b>	<b>MONITORING/ MANAGING</b>	
<ul style="list-style-type: none"> <li>• Medical history</li> <li>• Control of risk factors (obesity, high fat diet)</li> <li>• Genetic screening</li> <li>• Clinical exams</li> <li>• Monitoring for lumps</li> </ul>		<ul style="list-style-type: none"> <li>• Medical history</li> <li>• Determining the specific nature of the disease (mammograms, pathology, biopsy results)</li> <li>• Genetic evaluation</li> <li>• Labs</li> </ul>	<ul style="list-style-type: none"> <li>• Choosing a treatment plan</li> <li>• Surgery prep (anesthetic risk assessment, EKG)</li> <li>• Plastic or oncologic surgery evaluation</li> <li>• Neo-adjuvant chemotherapy</li> </ul>	<ul style="list-style-type: none"> <li>• Surgery (breast preservation or mastectomy, oncoplastic alternative)</li> <li>• Adjuvant therapies (hormonal medication, radiation, and/or chemotherapy)</li> </ul>	<ul style="list-style-type: none"> <li>• In-hospital and outpatient wound healing</li> <li>• Treatment of side effects (e.g. skin damage, cardiac complications, nausea, lymphedema and chronic fatigue)</li> <li>• Physical therapy</li> </ul>	<ul style="list-style-type: none"> <li>• Periodic mammography</li> <li>• Other imaging</li> <li>• Follow-up clinical exams</li> <li>• Treatment for any continued or later onset side effects or complications</li> </ul>	

# 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>
<b>ACCESSING</b>	<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>PT 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>MONITORING/PREVENTING</b>	<b>DIAGNOSING</b>	<b>PREPARING</b>	<b>INTERVENING</b>	<b>RECOVERING/REHABBING</b>	<b>MONITORING/MANAGING</b>
<b>CARE DELIVERY</b>	<b>MONITOR</b> <ul style="list-style-type: none"> <li>Conduct PCP exam</li> <li>Refer to specialists, if necessary</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>OVERALL PREP</b> <ul style="list-style-type: none"> <li>Conduct home assessment</li> <li>Monitor weight loss</li> </ul>	<b>ANESTHESIA</b> <ul style="list-style-type: none"> <li>Administer anesthesia (general, epidural, or regional)</li> </ul>	<b>SURGICAL</b> <ul style="list-style-type: none"> <li>Immediate return to OR for manipulation, if necessary</li> </ul>	<b>MONITOR</b> <ul style="list-style-type: none"> <li>Consult regularly with patient</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>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>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>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>MEDICAL</b> <ul style="list-style-type: none"> <li>Monitor coagulation</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> </ul>
		<b>PHYSICAL THERAPY</b> <ul style="list-style-type: none"> <li>Daily or twice daily PT sessions</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>	<ul style="list-style-type: none"> <li>Revise joint, if necessary</li> </ul>

Orthopedic Specialist  
 Other Provider Entities

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

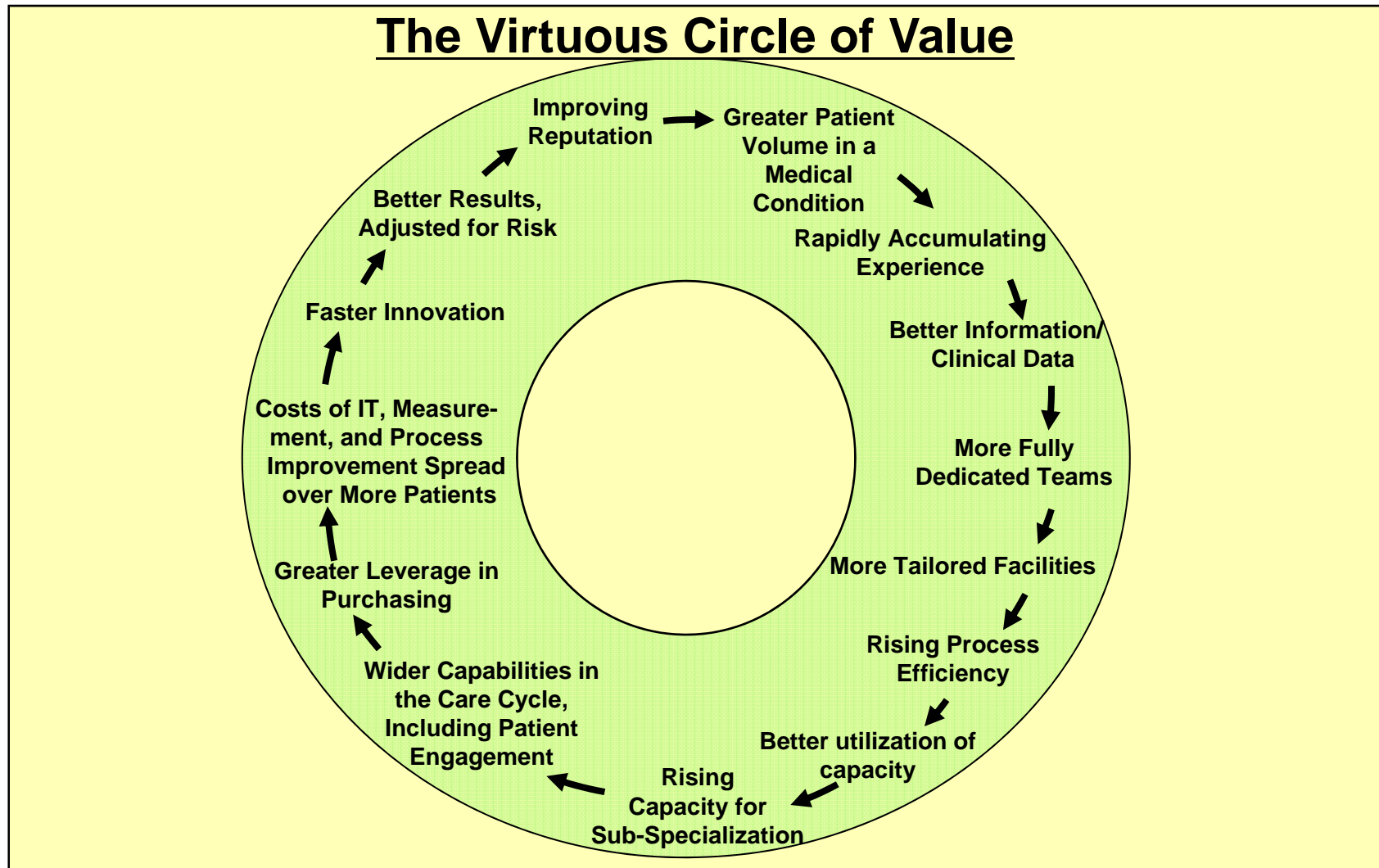


# Attributes of an Integrated Practice Unit (IPU)

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 in a Medical Condition Enables Value



- 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**

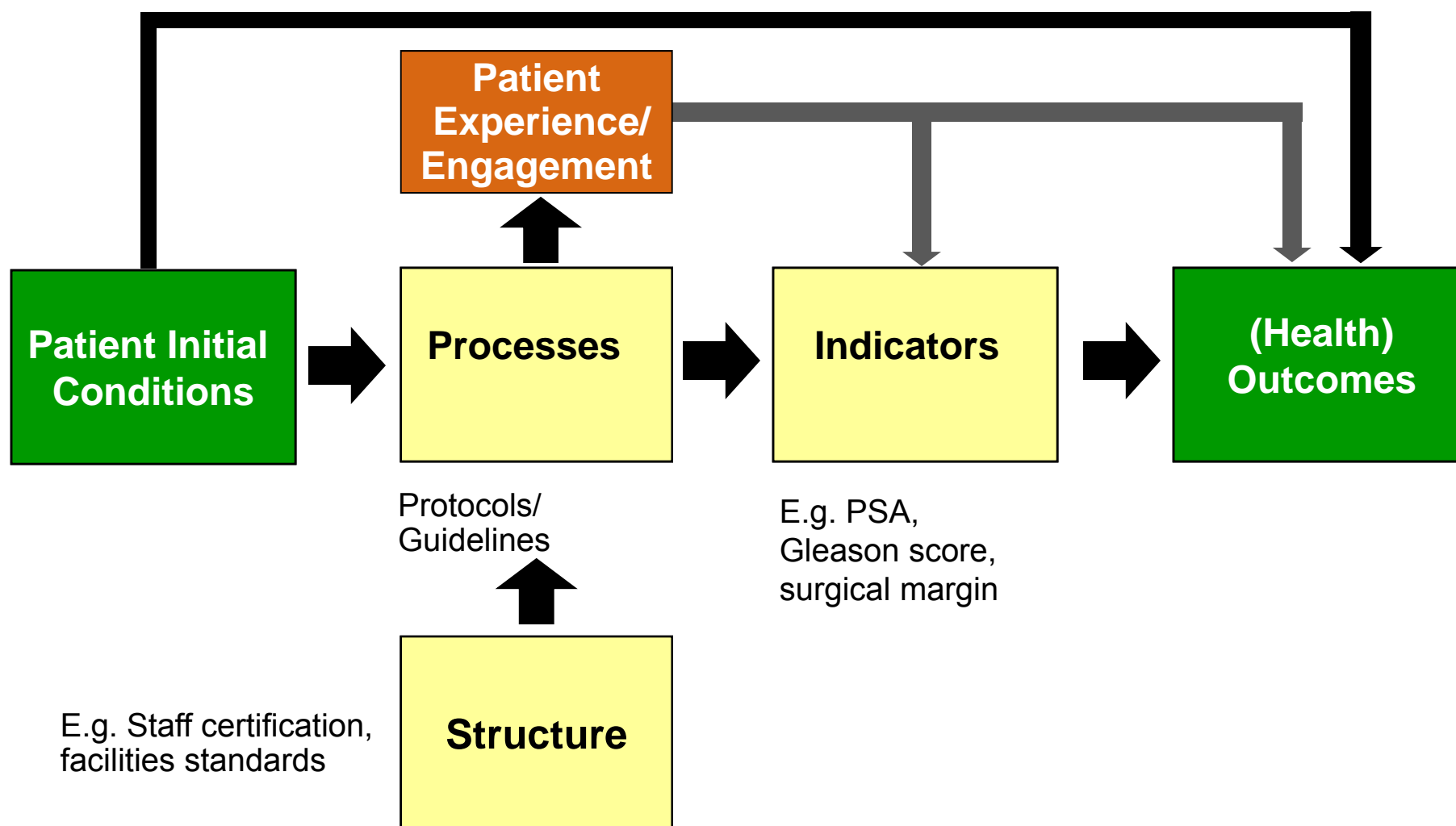
### **Fragmentation of Hospital Services in Sweden**

<b>DRG</b>	<b>Number of admitting providers</b>	<b>Average percent of total national admissions</b>	<b>Average admissions/ provider/ year</b>	<b>Average admissions/ provider/ week</b>
Knee procedure	68	1.5%	55	1
Diabetes age > 35	80	1.3%	96	2
Kidney failure	80	1.3%	97	2
Multiple sclerosis and cerebellar ataxia	78	1.3%	28	1
Inflammatory bowel disease	73	1.4%	66	1
Implantation of cardiac pacemaker	51	2.0%	124	2
Splenectomy age > 17	37	2.6%	3	<1
Cleft lip & palate repair	7	14.2%	83	2
Heart transplant	6	16.6%	12	<1

Source: Compiled from The National Board of Health and Welfare Statistical Databases – DRG Statistics, Accessed April 2, 2009.

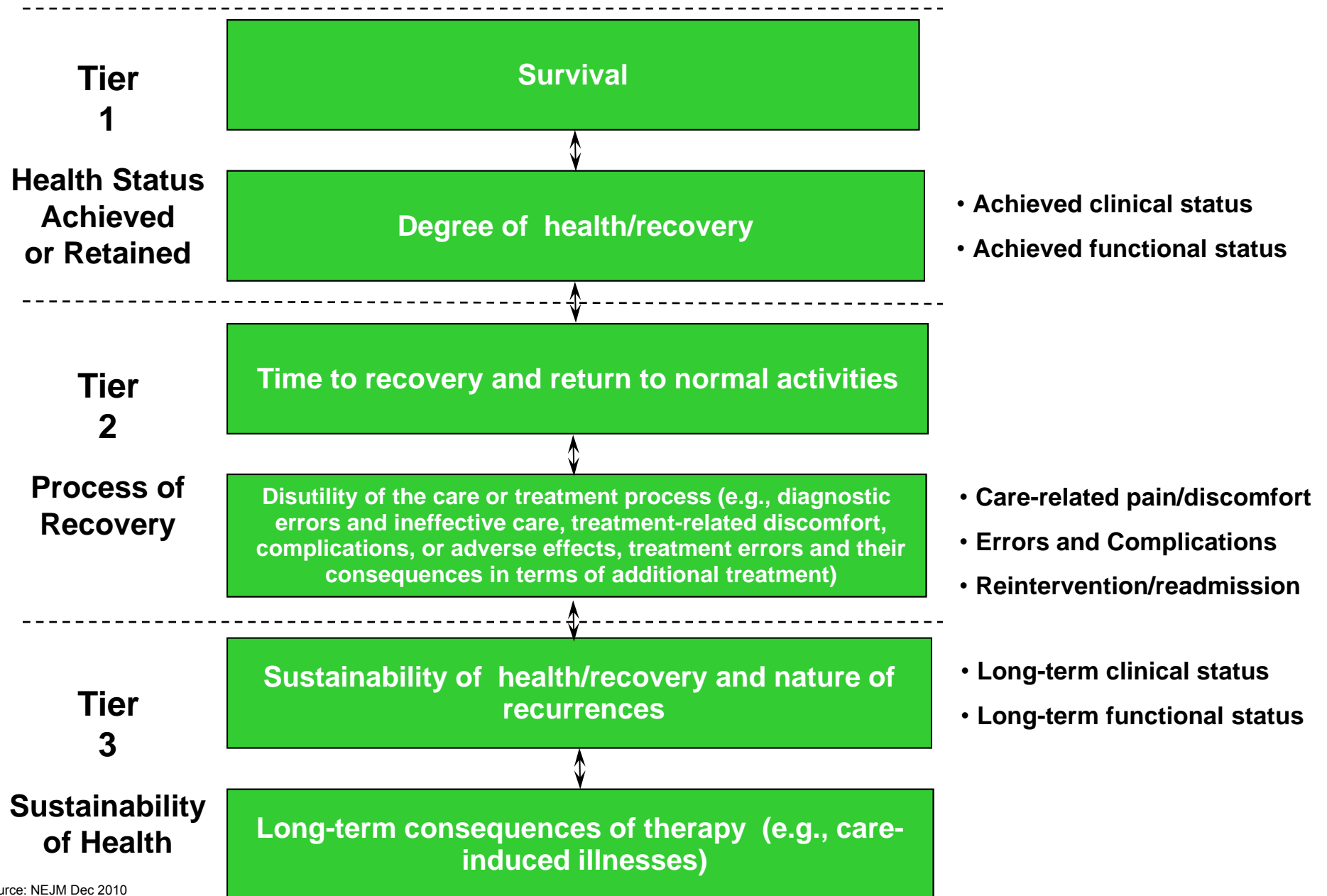
## 2. Measure Outcomes and Costs for Every Patient

### The Measurement Landscape



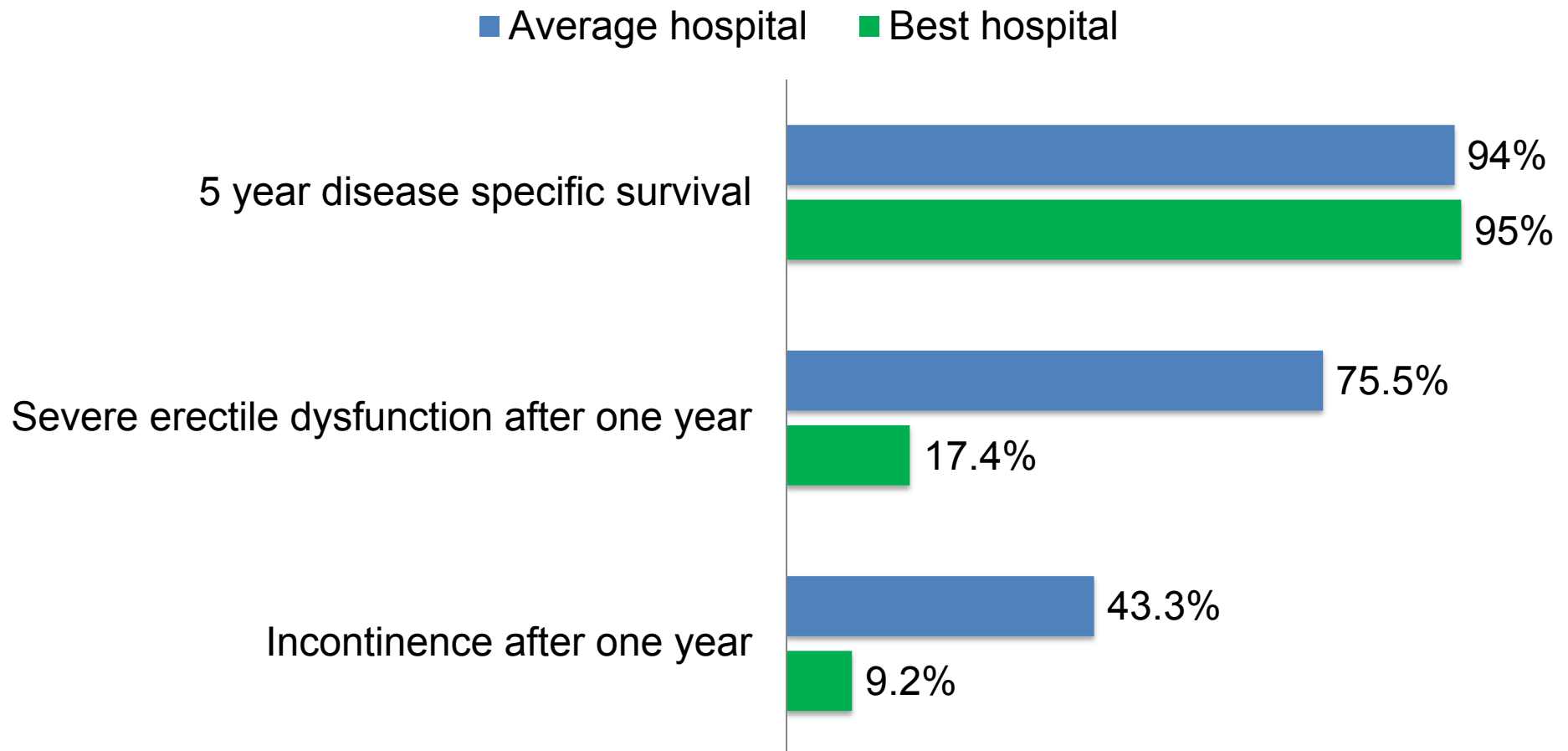


# The Outcome Measures Hierarchy



# Measuring Multiple Outcomes -- Continued

## Prostate Cancer Care in Germany



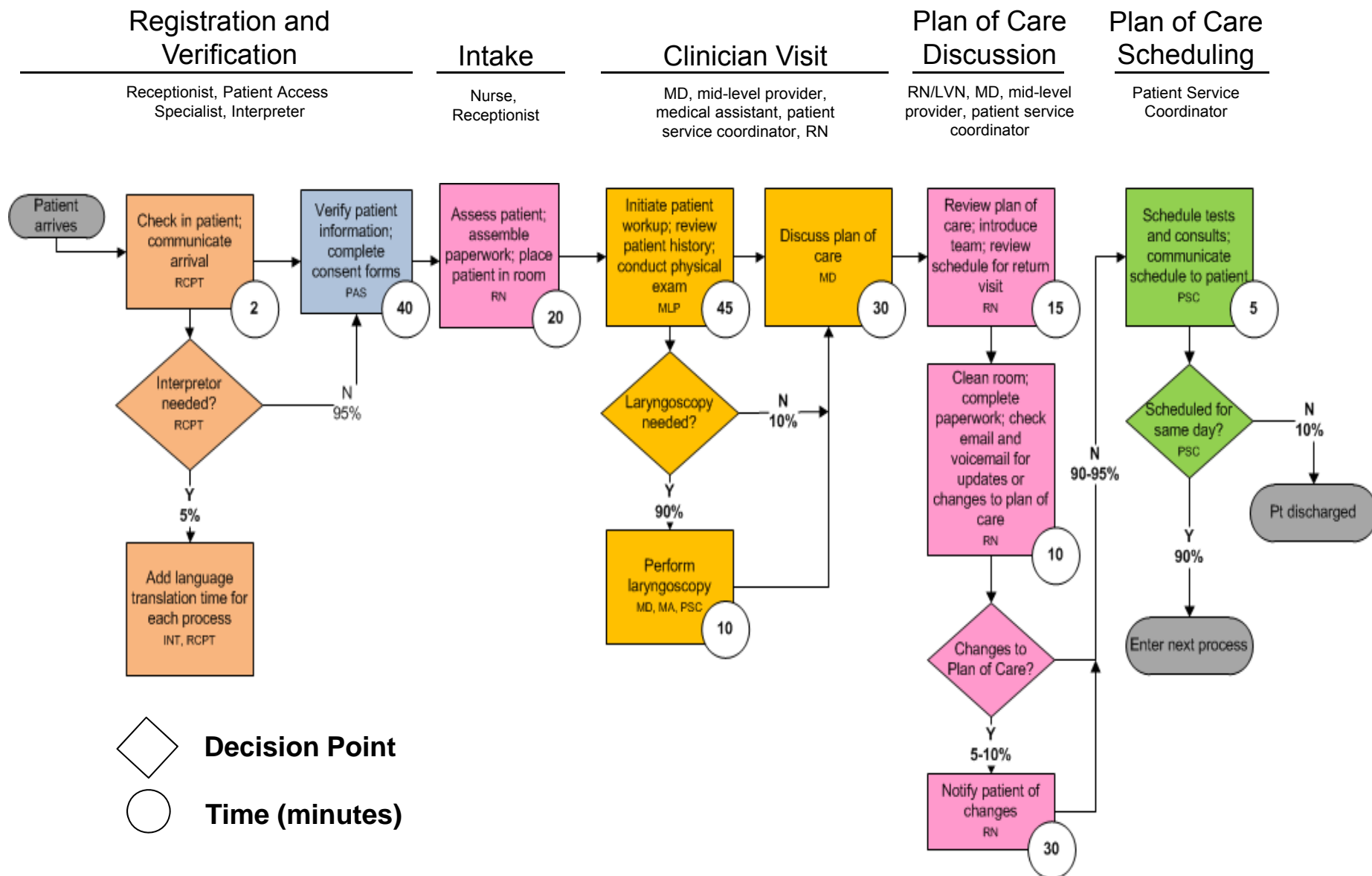
Source: ICHOM

# 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)

# Mapping Resource Utilization

## MD Anderson Cancer Center – New Patient Visit

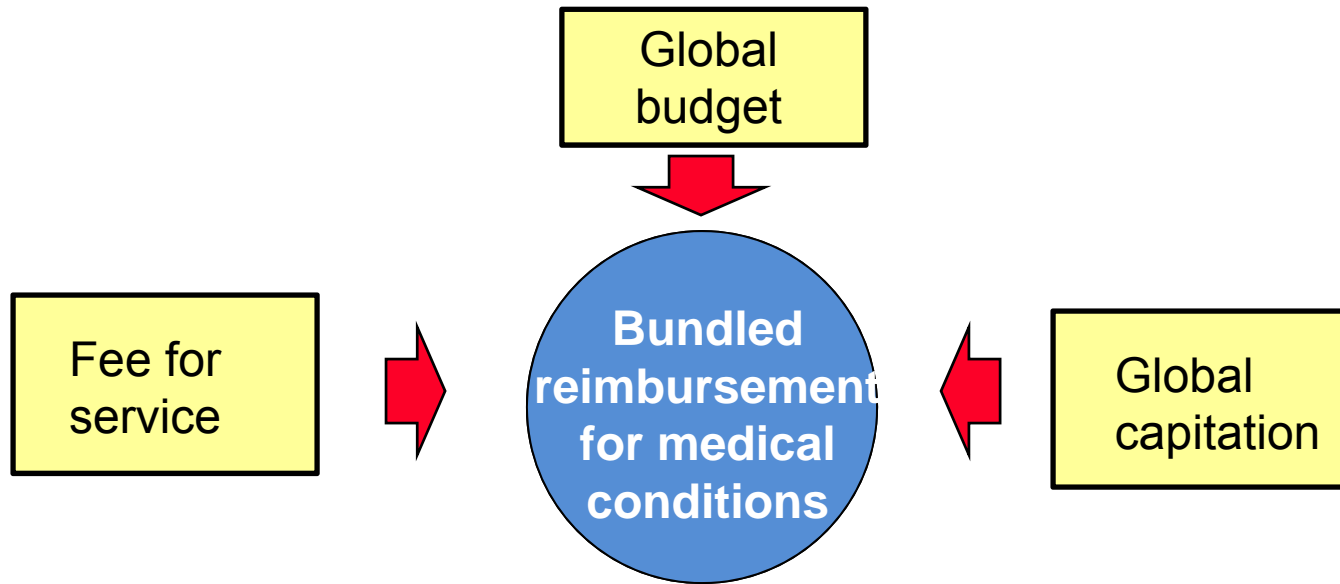


# Major Cost Reduction Opportunities in Health Care

- 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**

# Bundled Payment in Practice

## Hip and Knee Replacement in Stockholm, Sweden

- **Components** of the bundle

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

- 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







 The Children's Hospital of Philadelphia®

**Network Hospitals:**

-  CHOP Newborn Care
-  CHOP Pediatric Care
-  CHOP Newborn & Pediatric Care

**Wholly-Owned Outpatient Units:**

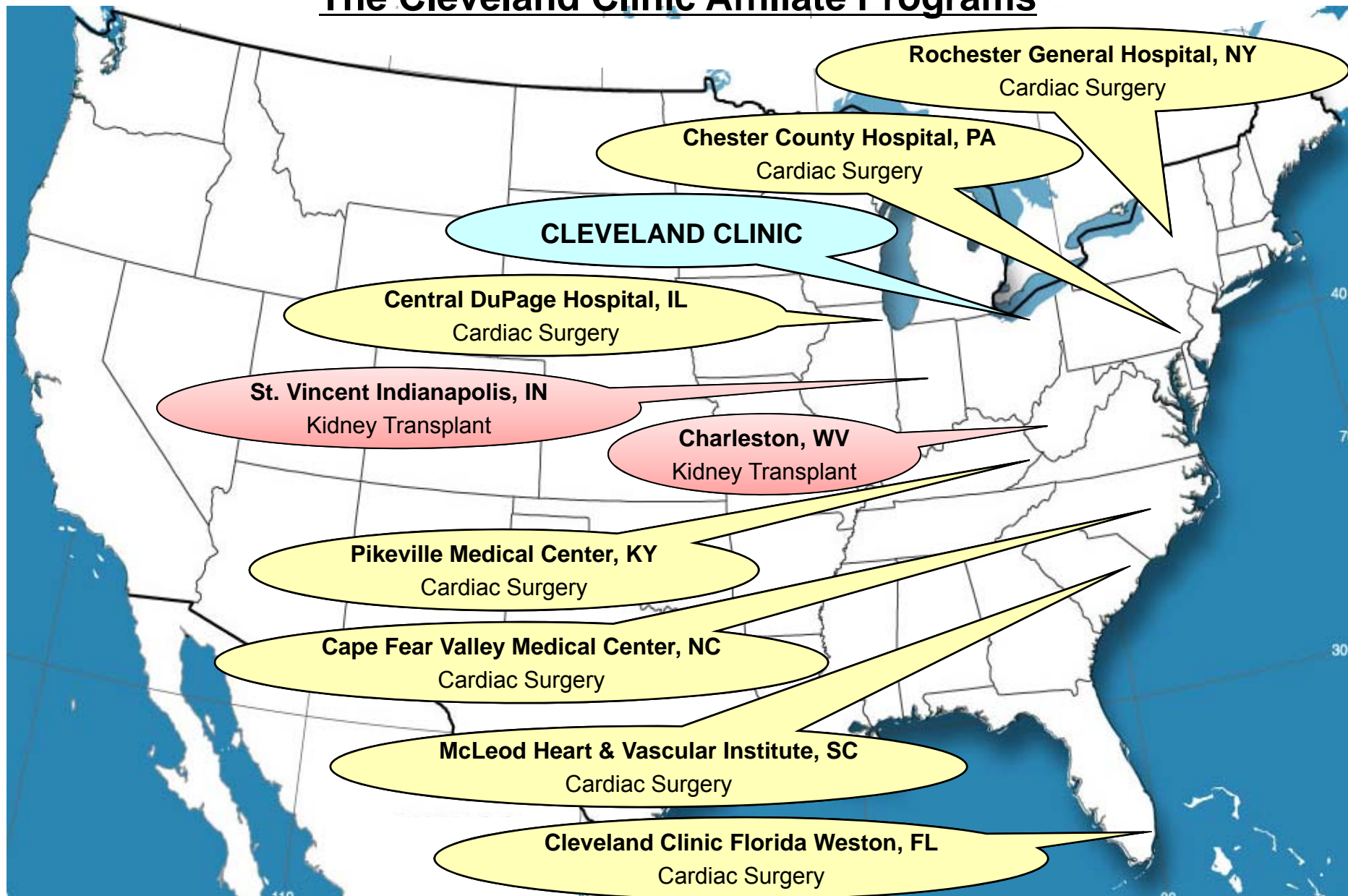
-  Pediatric & Adolescent Primary Care
-  Pediatric & Adolescent Specialty Care Center
-  Pediatric & Adolescent Specialty Care Center & Surgery Center
-  Pediatric & Adolescent Specialty Care Center & Home Care



## 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



# 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?