Linking Incomes to Outcomes

Did You Really Get What They Said You Got?

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Overview

- Creating a Value-Driven Health Care Market
- Affordable Data We Can Believe In
- Comparative Performance of Alternative Data Sets
- From Information to Understanding to Action
- Accountability in a Value-Driven Market
Creating a Value-Driven Health Care Market
Creating a Value-Driven Health Care Market
Managing Seven Essential Rs

- **Risks**
- **Dynamic Processes**
- **Resources, Roles & Relationships**
- **Rewards**
- **Static Structures**
- **Responsibilities**

**ADVERSE OUTCOMES IN PERCENT**
- 5%
- 10%
- 15%
- 20%
- 25%
- 30%
- 35%
- 40%

- Predicted
- Observed

Characteristics of a Value-Driven Market

- Aligns Risks and Responsibilities
- Links Results and Rewards
- Balances Quality and Cost
- Combines Individual Choice and Market Discipline
- Provides Accurate, Relevant Information
- Holds All Participants Accountable
Accountability and Performance Measures

Accountability

- Requires Measures
- Invites Authority

Roles

- Conveys Authority
- Defines

Responsibility

- Assigns
- Requires Accountability and Performance Measures
Linking Data, Decisions, and Accountability

Data

- Requires

Evaluation

- Invite

Risk-Adjustment
Mutes
Extraneous
Influences

- Guide

Understanding

- Supports

Information

- Provides

Decisions

- Invites
Affordable Data
We Can Believe In
Data for Monitoring Clinical Performance

◆ Claims Data
  • HCFA Mortality Reports
  • HealthGrades.com
  • HCUP Inpatient Quality and Patient Safety Indicators

◆ Clinical Data
  • APACHE
  • Pennsylvania Health Care Cost Containment Council
  • Cleveland Health Quality Choice
  • Specialty Society Registries (e.g., STS, ACC)
Claims Data Versus Clinical Data

Data Is the Foundation for:
- Public Reporting
- Performance-Based Reimbursement
- Quality Improvement Initiatives

Must Balance the Need for:
- Accurate Measurement of Clinical Performance
- Ease and Cost of Data Collection
Relative Ease of Data Collection

- Standard Claims
- Numerical Laboratory
- Vital Signs
- Other Clinical Data

Data Collection

Manual

Automated

Claims Data

Clinical Data
### Efficient Use of Clinical Data

#### Analytic Power

<table>
<thead>
<tr>
<th>Cost to Collect</th>
<th>Low</th>
<th>High</th>
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<tbody>
<tr>
<td>Albumin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental Status</td>
<td></td>
<td></td>
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<tr>
<td>Hemoglobin</td>
<td></td>
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<td>FEV1</td>
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Enhancing Claims Data

- Present-on-Admission Coding
  - Mayo Clinic
  - New York State’s SPARCS Database
  - California’s OSHPD Database
  - UB-04
  - CMS’s New Coding Requirements

- Numerical Laboratory Data
  - Michael Pine and Associates
  - Agency for Healthcare Research and Quality (AHRQ)

- AHRQ’s New Hybrid Database Demonstrations
Creating a Hybrid Database

Clinical Data
- Other Clinical Data
- Vital Signs
- Numerical Laboratory

Claims Data
- Present-on-Admission
- Standard Claims

Hybrid Data
Potential Benefits of a Hybrid Database

- Explicitly Distinguish Between
  - Comorbidities That Are Present on Admission
  - Complications That Occur During Hospitalization

- Provide Objective Clinical Data
  - Validate the Subjective Assignment of Diagnoses
  - Aid in Defining the Severity of Diagnosed Conditions
  - Aid in Delineating Underlying Pathophysiology
Comparative Performance of Alternative Data Sets
Sources of Data for Analysis

- 188 Pennsylvania Hospitals for Primary Analyses
  - Claims Data for Discharges from 7/00 to 6/03
  - Corresponding Atlas™ Clinical Data
    - Abstracted from Medical Records
    - Hospital Day Recorded for Each Data Element

- New York and California Claims Data
  - Identify Potentially Problematic Risk Factors
  - Assess Effect of Improperly Designated Complications
Inpatient Quality Indicators (Mortality)

- Medical Conditions
  - Acute Myocardial Infarction
  - Cerebrovascular Accident
  - Congestive Heart Failure
  - Gastrointestinal Hemorrhage
  - Pneumonia

- Surgical Procedures
  - Abdominal Aortic Aneurysm Repair
  - Coronary Artery Bypass Graft Surgery
  - Craniotomy
Patient Safety Indicators (Complications)

- Elective Surgical Procedures

- Complications
  - Physiologic / Metabolic Abnormalities
  - Pulmonary Embolus / Deep Vein Thrombosis
  - Sepsis
  - Respiratory Failure
Data Used in CLAIMS Models

- Age and Sex
- Principal Diagnosis
- Secondary Diagnoses
  - Chronic Conditions
  - Conditions Generally Present on Admission
- Selected Surgical Procedures
Data Used in POA and HYBRID Models

**POA Models**
- All Data Used in CLAIMS Models
- Additional Secondary Diagnoses
  - Frequently Hospital-Acquired
  - Used When Clinical Data Establish Presence on Admission

**HYBRID Models**
- All Data Used in POA Models
- Numerical Laboratory Data
  - Routine Chemistry, Hematology, and Blood Gas Analyses
  - Available in Electronic Form from Most Hospitals

Data Used in CLINICAL Models

- All Data Used in HYBRID Models
- Vital Signs
- Laboratory Data Not in HYBRID Models
e.g., bacteriological analyses, cardiac ejection fraction
- Key Clinical Findings from Medical Records
e.g., immunocompromised, lethargic
- Composite Clinical Scores
e.g., ASA Classification, Glasgow Coma Score
Bias Due to Suboptimal Data

Measured Performance

- Good
- Average
- Poor

Bias

- Problematic
- OK
- Problematic

Bias Due to Suboptimal Data (Mortality)
Bias Due to Suboptimal Data (Complications)
Bias in Measurement of Complications

- Observed vs Predicted Rates of True Complications
- Bias Due to Failure to Risk-Adjust True Complication Rates
- Bias Due to Misclassifying Comorbidities As Complications
## Numerical Laboratory Data

- **22 Tests Enter At Least 1 Model**
- **14 of These Tests Enter 4 or More Models**

<table>
<thead>
<tr>
<th>Test</th>
<th>Model Count</th>
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<tr>
<td>pH</td>
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<tr>
<td>Prothrombin Time</td>
<td>10</td>
</tr>
<tr>
<td>Sodium</td>
<td>9</td>
</tr>
<tr>
<td>White Blood Count</td>
<td>9</td>
</tr>
<tr>
<td>Blood Urea Nitrogen</td>
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<tr>
<td>pO₂</td>
<td>8</td>
</tr>
<tr>
<td>Potassium</td>
<td>7</td>
</tr>
<tr>
<td>SGOT</td>
<td>7</td>
</tr>
<tr>
<td>Platelet Count</td>
<td>7</td>
</tr>
<tr>
<td>Albumin</td>
<td>5</td>
</tr>
<tr>
<td>pCO₂</td>
<td>4</td>
</tr>
<tr>
<td>Glucose</td>
<td>4</td>
</tr>
<tr>
<td>Creatinine</td>
<td>4</td>
</tr>
<tr>
<td>CPK-MB</td>
<td>4</td>
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</table>
Vital Signs, Other Lab Data, Composite Scores

- All Vital Signs Enter 4 or More Models
  - Pulse (8)
  - Temperature (6)
  - Blood Pressure (6)
  - Respirations (5)

- Culture Results Enter 2 Models

- Ejection Fraction Enters 2 Models

- Both Composite Scores Enter 4 or More Models
  - ASA Classification (6)
  - Glasgow Coma Score (4)
Abstracted Key Clinical Findings

- 35 Clinical Findings Enter At Least 1 Model
- Only 3 of These Enter More Than 2 Models
  - Coma (6)
  - Severe Malnutrition (4)
  - Immunosuppressed (4)
- 14 Have Corresponding ICD-9-CM Codes
e.g., coma, severe malnutrition
- Coding Regulations Limit Utility of Claims Data
The Bottom Line

Claims Data Enhanced with Present-on-Admission Modifiers and Numerical Lab Data Can Support Accurate Performance Assessment
From Information to Understanding to Action
From Information to Understanding to Action

Information ➔
Knowledge ➔
Explanation ➔

Understanding ➔ Motivation ➔ Action

Three Barriers to Effective Decision Making

- Inconsistent Reporting of Complications
- Dissociation of Services and Clinical Benefits
- Inability to Relate Outcomes to Processes of Care
Coding Hospital-Acquired Complications

◆ Potential Barriers to Accurate Coding
  • Expertise and Teamwork Required for Accurate Coding
  • Difficulty Achieving Consistency in Reporting
  • Benefits to Hospitals of Not Coding Complications

◆ Consequences of Inconsistent Coding
  • Affects Comparative Assessments of Clinical Quality
  • Affects Reimbursement

◆ Detection of Coding Errors
  • Chart Reviews Are Inefficient and Costly
  • Well-Designed Screens Can Detect Problems Efficiently
Screens for Correct Coding of Complications

◆ Types of Admissions Screened
  • Admissions for High-Risk Medical Conditions
  • Admissions for Elective Surgical Procedures
  • Admissions for Childbirth

◆ Nature of Screens
  • Coding of Chronic Conditions
    • Without Acute Component
    • With Acute Component
  • Coding of Conditions That Often Are Hospital-Acquired
  • Relation of Mortality Rates to When Condition Occurred
  • Relation of Coded Complications to Lengths of Stay
  • Internal Consistency of Obstetrical Coding
Risk-Adjusted Post-Operative Lengths of Stay
All Live Discharges

Risk-Adjusted Post-Operative Lengths of Stay
Live Discharges without Reported Complications

## Distribution of Hospital POA Coding Scores

<table>
<thead>
<tr>
<th>Score</th>
<th>Hospitals (#)</th>
<th>Hospitals (%)</th>
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<tbody>
<tr>
<td>&gt;90%</td>
<td>65</td>
<td>39.4%</td>
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<tr>
<td>&gt;80% to 90%</td>
<td>41</td>
<td>24.8%</td>
</tr>
<tr>
<td>&gt;70% to 80%</td>
<td>26</td>
<td>15.8%</td>
</tr>
<tr>
<td>&gt;60% to 70%</td>
<td>19</td>
<td>11.5%</td>
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<tr>
<td>60% or lower</td>
<td>14</td>
<td>8.5%</td>
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<tr>
<td>Total Scored</td>
<td>165</td>
<td>100%</td>
</tr>
<tr>
<td>&gt;10% Unknown</td>
<td>22</td>
<td>n/a</td>
</tr>
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Linking Results and Rewards

Patient (Clinical) → Healthcare Services → Benefits (Results)

Structure

Payment (Reward) → Costs (Results)

Pricing Fragmented Components of Care

Fragmented Services

- Process A
  - $A

- Process B
  - $B

- Process C
  - $C

Structure

Patient (Clinical)

Payment

Benefits (Results)

Costs (Results)
Components of an Episode of Care

- Precipitating Event (Clinical Risk)
- Care
- Outcome (Benefit)
Reimbursement for Episodes of Care

- Risk of Occurrence
- New Health Event
- Clinical Risk
- Premium
- Payment (Reward)
- Benefits (Results)
- Costs (Results)
- Episode of Care
- Healthcare Services
- Structure

Services Associated with an Episode of Care

- Required Services
- Individualized Services
Costs of Alternative Practice Patterns

- **Inefficient Care**
- **Ineffective Care**
- **Optimum Routine Care**
- **Care of Associated Adverse Outcomes**

Payment in a Value-Driven Market

- **Insurance for Risk of Occurrence:**
  - Capitation: By Beneficiary

- **Evidence-Based Care Required by Population:**
  - Fee-for Service: By Encounter

- **Individualized Health Care Services:**
  - Global Fee: By Episode of Care

- **Care of Potentially-Avoidable Complications:**
  - Warranty: For Episode of Care
Use Fair Empirically-Derived Standards
To Set Global Fees and Warranties

I would be a good boy if only you lowered your standards!
Standardized Hospital Costs and Adverse Outcomes
350 High Performing & 113 Suboptimally Performing Hospitals

% Adverse Outcome Rate

Total Hospital Cost (thousands $)

- Good Performance
- Problematic Performance
- Average Good
- Average Problematic

3.99% $11,192
6.91% $13,259
Aligning Risks, Responsibilities, and Rewards
In a Virtual Partnership

◆ Payer Bears Risk of Occurrence

◆ Managing Organization (e.g., Physician-in-Charge)
  • Receives Standard Negotiated Payment Minus Withhold
  • Overruns in Total Cost of Episode Covered by Withhold
  • Total Savings Shared with Payers

◆ Participating Caregiver
  • Receives Standard Negotiated Payment Minus Withhold
  • Achievement of Intermediate Milestones Determines:
    • Return of Withhold
External and Internal Monitoring

**External Monitoring**
Assesses Performance

- Provider Selection
- Network Formation
- Reimbursement
- Accountability
- Strategic Planning
- Marketing

**Internal Monitoring**
Links Processes to Outcomes

- Quality Control
- Quality Improvement
- Cost Management

Traditional Mortality and Morbidity Review

◆ Analyses of Single Cases with Adverse Outcomes
◆ Peer Review Aided by Medical Literature
◆ Objectives Vary
  • Identify and Correct Substandard Practice
  • Educate Participants
  • Improve Processes of Care
◆ Problems Abound
  • Rarely Affects Individual Practice
  • Divorced from Organizational Decision Making
  • Lacks Scientific Credibility
Fallacy of Generalizing from Single Cases

One Tree

Does Not a Forest Make
Designing Robust Observation Studies

◆ Strengths of Randomized Controlled Clinical Trials
  • Randomization Is Performed Prior to Intervention
  • Treatment and Control Groups Are Similar

◆ Overcoming Weaknesses of Observational Studies
  • Treatments Usually Are Not Randomly Administered
  • Select Controls with Same Likelihood of Treatment
  • Propensity Analyses Match Important Characteristics
Relating Clinical Processes to Outcomes

- Clinical Care Often Is Individualized
- Risk Profiles Affect Outcomes and Routine Care
  - Complications Often Are Related to Higher Initial Risk
  - Treatment May Vary with Initial Risk
  - Differences in Risk Profiles Confound Comparisons
- Matching by Predicted Outcome Reduces Bias
  - Match Cases with and without Complications
  - Compare Potentially Important Elements of Care
  - Differences Suggest Opportunities for Improvement
  - Chart Abstraction Often Required to Assess Processes

A Cycle of Continuous Quality Improvement

- Identify Opportunities to Improve
- Analyze Processes
- Plan for Improvement
- Select Controls
- Matched Controls
  - Reduce Confounding Bias
- Alter Processes
- Adverse Outcomes

Accountability in a Value-Driven Market

- Information about risks and results guides:
  - purchasing decisions and reimbursement
  - performance improvement initiatives

- Evaluation focuses on episodes of care, not on individual cost centers

- Margin and market share accurately reflect:
  - quality of care
  - clinical efficiency
Yes We Can!