Managing Cost and Outcome of Post Hospital Care

Reg Warren, PhD

The National Predictive Modeling Summit
September 22-23, 2008
The dilemma for post hospital care?

- 2008 Medicare Advantage enrollment: 8.5 million*
- 2.2 million hospital admissions in 2008 (260 admits/k)
- 750,000 of hospitalized seniors will receive post acute care
- 250,000 of those will not go to the most appropriate setting
- MCO’s will spend $12.4B on SNF and Home Health in 2008*

Challenges

- Misalignment of incentives: per diem
- High degree of practice variation
- Lack of common measurement across care settings
- Over-utilization unnecessarily exposes members to institutional risks and over-burdens taxpayers

*Kaiser Foundation 2008
Managing Cost and Outcome of Post Hospital Care

- Diagnosis vs. Function
- A Predictive Model
  - Regression
  - Severity adjustment
- Application
  - Real-time decision support
  - Retrospective comparison
- Influence on cost and outcome
People go to the Hospital because they are Sick: *Disease Driven*

People get postacute care because they are frail and Care Dependent: *Function Driven*
Functional Independence Measure (FIM) (18 – 126)

- Eating
- Grooming
- Bathing
- Dressing Upper Body
- Dressing Lower Body
- Toileting
- Bladder Management
- Bowel Management
- Bed, Chair, WC Transfer
- Toilet Transfer
- Tub/Shower Transfer
- Walk/WC
- Stairs

- Expression
- Comprehension
- Social Interaction
- Problem Solving
- Memory
Function → Burden of Care

- Functional needs
  - Drives >90% of skilled utilization
  - Admit function- predict outcome
  - 5 points FIM equate to one hour caregiver burden/day
  - SNF admission: FIM 65 (6 hrs care/day)
  - HH admission: FIM 85 (2 hrs care /day)
20% of SNF patients would get the same result at home.

SNF LOS can be reduced by 30% without impacting functional result.

HH Cost can remain stable even with increased referrals.

Many Acute Rehab cases would get the same result in SNF.

Acute Discharges
Sr. Population
## Discharge Site and Functional Level (FIM 18-126)

<table>
<thead>
<tr>
<th>Discharge Site Considerations</th>
<th>FIM Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home Alone</td>
<td>&gt;108</td>
</tr>
<tr>
<td>OP Therapy/Home Safety</td>
<td></td>
</tr>
<tr>
<td>Home with Assist</td>
<td>&gt;90</td>
</tr>
<tr>
<td>OP (Outpatient) Therapy</td>
<td></td>
</tr>
<tr>
<td><strong>Home w/Assist or ALF</strong></td>
<td>&gt;80</td>
</tr>
<tr>
<td><strong>Home Health Services</strong></td>
<td></td>
</tr>
<tr>
<td>Home, SNF, Custodial, B&amp;C w/</td>
<td>&lt;79</td>
</tr>
<tr>
<td><strong>24-hour Assistance</strong></td>
<td></td>
</tr>
</tbody>
</table>

*Diagnosis, medical complexity or other social, caregiver or medical issues may influence the functional level at which the patient is discharged.*
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Leader in post-acute outcome measurement since 1995

Manage over 900,000 Senior lives in SNF, Acute Discharge, Acute Rehab, Home Health

Database of 250,000+ post-acute cases
  - Over 50,000 new records added each year

California, Colorado, Washington, Maryland, District of Columbia, Virginia and Tennessee

Kaiser Permanente, PacifiCare, Health Net, Group Health Coop, and AmeriGroup

MHS Participant
“Not everything that counts can be counted, and not everything that can be counted counts”

Albert Einstein
Improvement in Function in SNF: Predictable

80 yr old female with CHF, cellulitis, UTI and prior stroke

Correlations

<table>
<thead>
<tr>
<th></th>
<th>ADMFIM</th>
<th>DISFIM</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADMFIM</td>
<td>1.000</td>
<td>.818*</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>N</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>DISFIM</td>
<td>.818**</td>
<td>1.000</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.</td>
</tr>
<tr>
<td>N</td>
<td>500</td>
<td>500</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level
Length of SNF Stay: Less Predictable

Correlations

<table>
<thead>
<tr>
<th></th>
<th>ADMFIM</th>
<th>EPISODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation</td>
<td>Pearson</td>
<td>-265**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td>500</td>
<td>500</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).
Specific Relevant Conditions (Groupers)

- Feeding tube (Peg/J vs. NG)
- Restricted Weight Bearing
- Pressure Wound: II, III or IV
- Vascular/ surgical wound
- IV
- Vent
- Severe Obesity (BMI>50)
- Hemodialysis
**Regression: Length of Skilled Stay**

<table>
<thead>
<tr>
<th>Independent Variable*</th>
<th>Coefficient</th>
<th>Patient’s Actual Value</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random Error (constant)</td>
<td></td>
<td></td>
<td>24.08</td>
</tr>
<tr>
<td>Admission FIM</td>
<td>-.196</td>
<td>65</td>
<td>-12.74</td>
</tr>
<tr>
<td>Age</td>
<td>.034</td>
<td>82</td>
<td>2.78</td>
</tr>
<tr>
<td>Days Post Onset</td>
<td>.074</td>
<td>6</td>
<td>.444</td>
</tr>
<tr>
<td>Condition (IV/Stage II)</td>
<td>10.87</td>
<td>1</td>
<td>10.87</td>
</tr>
</tbody>
</table>

Predicted Episode LOS = 25.43

82 y/o female Hip fracture Acute: 6 days

*sig p < .05
How powerful is the model?

- SMTX Model: 60%
- Treatment: 38%
- Unknown: 2%

Disability, DPO, Age, Condition Grouper

Therapy Intensity
Each patient is case adjusted:
- Impairment Group
- Age
- DPO
- Adm FIM
- Grouper Condition

SMTX Best Practice
(25% most efficient facilities)

Pt. #30: CVA, 75 yrs, DPO 12, Adm FIM 30, and Med Complex 4
LOS: 15 days
DC FIM: 50

Best Practice Calculation
LOS: 13 days
DC FIM: 62.5

Actual Calculation
LOS: 18 days
DC FIM: 62

VARIANCE
LOS: 28%
DC FIM: 1%

Pt. #1: UTI, 82 yrs, DPO 31, Adm FIM 57, and Med Complex 3
LOS: 11 days
DC FIM: 81

LOS: 14 days
DC FIM: 81

Query

Pts #2-30

Actual Practice

LOS: 21 days
DC FIM: 50

LOS: 14 days
DC FIM: 81
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High Practice Variation

Expectations

Actual

Assessment

Full Recovery

No Recovery

Treatment

Discharge Planning

Discharge

Admission

Postacute Episode

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Real-Time Decision Support

<table>
<thead>
<tr>
<th>Patient First Name:</th>
<th>Peyton</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Last Name:</td>
<td>Manning</td>
</tr>
<tr>
<td>Impairment Group:</td>
<td>Orthopedic Condition</td>
</tr>
<tr>
<td>Diagnosis Category:</td>
<td>Hip Fracture</td>
</tr>
<tr>
<td>Admission FIM:</td>
<td>65</td>
</tr>
<tr>
<td>Medical Complexity:</td>
<td>3</td>
</tr>
<tr>
<td>Skilled Admit Date:</td>
<td>12/13/2007</td>
</tr>
</tbody>
</table>

Results

<table>
<thead>
<tr>
<th># of Records: 1,114</th>
</tr>
</thead>
<tbody>
<tr>
<td>Therapy Cycle</td>
</tr>
<tr>
<td>Low: 11.9 days*</td>
</tr>
<tr>
<td>Avg: 12.1 days</td>
</tr>
<tr>
<td>High: 12.3 days*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Therapy Hours/Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg FIM Gain: 21</td>
</tr>
<tr>
<td>7 Days/Week: 1.38</td>
</tr>
<tr>
<td>6 Days/Week: 1.62</td>
</tr>
<tr>
<td>5 Days/Week: 1.94</td>
</tr>
</tbody>
</table>

Avg D/C FIM: 87
Discharge Setting

<table>
<thead>
<tr>
<th>Community:</th>
<th>75%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home Alone:</td>
<td>8%</td>
</tr>
<tr>
<td>Home w/ Caregiver:</td>
<td>60%</td>
</tr>
<tr>
<td>Assisted Living:</td>
<td>1%</td>
</tr>
<tr>
<td>Board and Care:</td>
<td>5%</td>
</tr>
</tbody>
</table>

Projected Last Paid/Covered Date: 12/25/2007
*95% Confidence Interval (p<.05)
Reduced Practice Variation

Traditional Timeframe

Admission

Discharge

Value Added

Assessment

Most Likely Result

Expectations

Discharge Planning

Treatment

Actual Result

Postacute Episode
## Retrospective Comparison

### Severity-Adjusted Comparison

<table>
<thead>
<tr>
<th>Jan-Mar 2006</th>
<th>Efficiency</th>
<th>Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cases in SMTX</td>
<td>Rehab Start Lag</td>
</tr>
<tr>
<td>Jefferson Av</td>
<td>45</td>
<td>1.4</td>
</tr>
<tr>
<td>Mercy Court</td>
<td>67</td>
<td>1.3</td>
</tr>
<tr>
<td>St Allens</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Garden Ridge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>San Angelo</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pacific Crest</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CareBrook</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total/Average</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**seniormetrix**

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SNF LOS Variance Trend

25% reduction in skilled days

Client Q3, 2006  Source: SMTX
Functional recovery Across Settings: SNF thru HH to Follow-up*
11-01 to 9-07

SNF: all dc home
HH: all admitted from SNF
Follow-up: all records (N=1967)

Source: SMTX
Improving Acute DC Placement

No difference in HH and SNF outcome or acute readmit
Influence on Utilization

- **Average Medicare Plan**
  - LOS: 22 days
  - SNF Admits/k: 50-65
  - SNF Days/k: 900-1100
  - PMPM: $33

- **Predictive Model Results**
  - LOS: 16 days
  - SNF admits/k: 40-50
  - SNF days/k: 600-800
  - PMPM: $22.50
Reducing Practice Variation Using Predictive Models

Pre-Implementation

SNF Days of Treatment

Patient Health Improvement (Functional Improvement Measurement)

Post-Implementation

SNF Days of Treatment

$5,655 average cost per case

23 point average gain in Functional Improvement Measurement (“FIM”), an internationally recognized scale of disability

$4,485 average cost per case (20.7% decrease)

23 point average gain in FIM (unchanged)