Improving Quality of Care & Collaboration Across Systems to Reduce Hospital Readmissions:

Heart Failure Population in Skilled Nursing Facilities

Ross B. Edmundson M.D.
Vice President, Medical Director, Health Care Management
Florida Hospital Medical Center
Orlando, Florida
Poor Elwood wasn’t sure if he was coming or going.
Problem & Opportunity
Heart Failure Medicare Population

• Increased public reporting on *all cases* readmissions:
  - Heart Failure, Acute MI, Pneumonia endorsed by NQF
  - Driven by quality, safety, satisfaction, financial issues

• Heart Failure/Benchmarking 30 day readmissions
  – U.S. Rate 24.5%
  – Project Hospital Rate 25.0%
  – Project/pilot SNF Rate 33.0%
  – National Best Practice ~18-20% or better than national average

• Medicare legislation in transition:
  – Calculations are complex, moving target
  – Projected to decline between 2011 and 2013
  – Reimbursements may be based on readmission quartiles
  – Hospitals >75% percentile may be subject to 20% withholding
Unnecessary Re-Hospitalizations

Reducing nursing home hospitalizations is an area of cost savings based on the 2007 study by David Grabowski, et al.:

*Costs and Potential Savings Associated with Nursing Home Hospitalizations*

- In New York State, between 1999-2004, spending increased 29% on nursing home hospitalizations
- During that time period, $972 million in aggregate spending
- Total cost per hospitalization $12,160 (2004)
- 40% deemed avoidable admissions based on diagnosis
- This results in $223 million potential cost savings
- Admissions result in increased iatrogenic disease and delirium
- Conclusion “…policies directed at decreasing nursing home hospitalizations may generate major cost savings for Medicare program”
Index/30 Day Readmission

- An index admission is the admission with a principal diagnosis of a specified condition that meets the inclusion and exclusion criteria for the measure.

- If a patient has one or more additional admissions for the given condition (heart attack, heart failure, or pneumonia) within 30 days of discharge from an index admission. We do not consider the additional admissions as index admissions (they are considered as readmissions). Thus, any admission is either an index admission or a readmission, but not both.

http://www.hospitalcompare.hhs.gov/Hospital/Static/InformationforProfessionals
Framework to Define the Problem
SIX SIGMA / DMAIC

• Definition
  – Business Method for Process Improvement
  – Based on quality management tools
  – Includes statistical methods
  – Infrastructure of people/experts in methods
  – Define, Measure, Analyze, Improve, Control (DMAIC)

• Six Sigma @ Project Hospital
  – Framework for process improvement
  – Improve quality, safety, effectiveness, efficiency
  – Reduce avoidable readmissions

• Project Objectives
  – Identify clinical causes for readmission
  – Identify critical process causes for readmission
  – Map readmission process
  – Identify critical measures (x)
  – Establish standard definition for readmission (Y)
  – Minimize variability in readmission process (model)
  – Pilot interventions on a small scale
# Population: Medicare Heart Failure N=3941
## 30 Day Readmissions Discharge Disposition

<table>
<thead>
<tr>
<th>Discharge Disposition</th>
<th>Patient Count</th>
<th>30 Day Readmits</th>
<th>Readmit Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psych Facility</td>
<td>6</td>
<td>6</td>
<td>100%</td>
</tr>
<tr>
<td>Rehabilitation Facility</td>
<td>6</td>
<td>6</td>
<td>100%</td>
</tr>
<tr>
<td>Another institution</td>
<td>5</td>
<td>4</td>
<td>80%</td>
</tr>
<tr>
<td>Left AMA</td>
<td>40</td>
<td>14</td>
<td>35%</td>
</tr>
<tr>
<td><strong>Skilled Nursing Facility</strong></td>
<td><strong>853</strong></td>
<td><strong>284</strong></td>
<td><strong>33%</strong></td>
</tr>
<tr>
<td>Home Health</td>
<td>842</td>
<td>250</td>
<td>30%</td>
</tr>
<tr>
<td>Intermediate Care</td>
<td>39</td>
<td>11</td>
<td>28%</td>
</tr>
<tr>
<td>Home</td>
<td>1879</td>
<td>431</td>
<td>23%</td>
</tr>
<tr>
<td>Another Hospital</td>
<td>5</td>
<td>1</td>
<td>20%</td>
</tr>
<tr>
<td>Long Term Care</td>
<td>16</td>
<td>3</td>
<td>19%</td>
</tr>
<tr>
<td>Hospice (HM)</td>
<td>111</td>
<td>12</td>
<td>11%</td>
</tr>
<tr>
<td>Hospice (HC)</td>
<td>56</td>
<td>3</td>
<td>5%</td>
</tr>
<tr>
<td>Patient Expired</td>
<td>83</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td><strong>N=3941</strong></td>
<td><strong>N= 1025</strong></td>
<td><strong>26%</strong></td>
</tr>
</tbody>
</table>

Total Population ALOS = 5.23
30 Day Readmit ALOS = 5.81

*Project years 01/2007-09/2009*
*Based on Medicare patients with DRG 291,292,293 and 127/2007*
## 30 Day Readmissions Variability by Facility (All SNFs)

<table>
<thead>
<tr>
<th>Facility</th>
<th>N=23 Count</th>
<th>30 Day Readmits</th>
<th>Readmit Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facility A</td>
<td>2</td>
<td>2</td>
<td>100%</td>
</tr>
<tr>
<td>Facility B</td>
<td>1</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>Facility C</td>
<td>1</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>Facility D</td>
<td>11</td>
<td>9</td>
<td>82%</td>
</tr>
<tr>
<td>Facility E</td>
<td>5</td>
<td>4</td>
<td>80%</td>
</tr>
<tr>
<td>Facility F</td>
<td>3</td>
<td>2</td>
<td>67%</td>
</tr>
<tr>
<td>Facility G</td>
<td>82</td>
<td>43</td>
<td>52%</td>
</tr>
<tr>
<td>Facility H</td>
<td>6</td>
<td>3</td>
<td>50%</td>
</tr>
<tr>
<td>Facility I</td>
<td>22</td>
<td>11</td>
<td>50%</td>
</tr>
<tr>
<td>Facility J</td>
<td>38</td>
<td>19</td>
<td>50%</td>
</tr>
<tr>
<td>Facility K</td>
<td>2</td>
<td>1</td>
<td>50%</td>
</tr>
<tr>
<td>Facility L</td>
<td>4</td>
<td>2</td>
<td>50%</td>
</tr>
<tr>
<td>Facility M</td>
<td>4</td>
<td>2</td>
<td>50%</td>
</tr>
<tr>
<td>Facility N</td>
<td>16</td>
<td>7</td>
<td>44%</td>
</tr>
<tr>
<td>Facility O</td>
<td>7</td>
<td>3</td>
<td>43%</td>
</tr>
<tr>
<td>Facility P</td>
<td>24</td>
<td>10</td>
<td>42%</td>
</tr>
<tr>
<td>Facility Q</td>
<td>12</td>
<td>5</td>
<td>42%</td>
</tr>
<tr>
<td>Facility R</td>
<td>27</td>
<td>11</td>
<td>41%</td>
</tr>
<tr>
<td>Facility S</td>
<td>10</td>
<td>4</td>
<td>40%</td>
</tr>
<tr>
<td>Facility T</td>
<td>20</td>
<td>8</td>
<td>40%</td>
</tr>
<tr>
<td>Facility U</td>
<td>20</td>
<td>8</td>
<td>40%</td>
</tr>
<tr>
<td>Facility V</td>
<td>48</td>
<td>19</td>
<td>40%</td>
</tr>
<tr>
<td>Facility W</td>
<td>488</td>
<td>109</td>
<td>22%</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td><strong>853</strong></td>
<td><strong>284</strong></td>
<td><strong>33%</strong></td>
</tr>
</tbody>
</table>

Variability = 22-100%

* Project years 01/2007-09/2009
* Based on Medicare patients with DRG 291,292,293 and 127/2007
## Medicare HF 30 Day Readmissions

### Hospital Related Facilities

<table>
<thead>
<tr>
<th>Facility</th>
<th>Count</th>
<th>30 Day Readmits</th>
<th>Readmit Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNF A</td>
<td>48</td>
<td>19</td>
<td>40%</td>
</tr>
<tr>
<td>SNF B</td>
<td>38</td>
<td>12</td>
<td>32%</td>
</tr>
<tr>
<td>SNF C</td>
<td>35</td>
<td>14</td>
<td>40%</td>
</tr>
<tr>
<td>SNF D</td>
<td>38</td>
<td>10</td>
<td>26%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>159</strong></td>
<td><strong>55</strong>*</td>
<td><strong>35%</strong></td>
</tr>
</tbody>
</table>

Preliminary data sample=48*

4 charts did not meet criteria for inclusion

3 patients had multiple, complex readmissions, 1 patient readmitted 6 x in 4 months

* Project years 01/2007-09/2009
* Based on Medicare patients with DRG 291,292,293 and 127/2007
# Data Sources & Stakeholders*

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Stakeholders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute care organization</td>
<td>Administration, Case Management, Nursing, Home Care, Information Systems,</td>
</tr>
<tr>
<td></td>
<td>Clinical Process Improvement, Regulatory Affairs, Government Affairs, Finance/Revenue Management, Strategic Planning, electronic medical records</td>
</tr>
<tr>
<td>Skilled Nursing Facility</td>
<td>Database reports from Administration, Finance, Case Management, Nursing, Risk Management, Strategic Planning, and paper medical records</td>
</tr>
</tbody>
</table>

*Serves to identify report capability and mobilize commitment to Improvement Process*
Process Mapping

Patient comes to hospital
Patient admitted & receives treatment
Patient Discharge Ordered
CM coordinates & obtains SNF approval
CM report called to SNF
Chart copied, faxed, sent with patient
Patient moves to SNF
Patient admitted to SNF
Care delivered at SNF
Patient change in status
Hospital admission obtained
Admission called to hospital or sent to ED
Patient transported to hospital
Patient is readmitted

Clinical Staff
Admit To Acute Care
Nursing Unit Clinical Providers
Plan of Care
Counsel Patient & Family
Discharge Packet Complete

CM Triggered
Discharge Plan Initiated
Facility Selected

Case Management

Skilled Nursing Facility
Interventions
Clinical Providers RN, ARNP, MD
Change in Patient Status
Arrival & Plan of Care

Patient Arrives

Yes

Readmit ≤ 30 Days?

No

Yes

Transition to Acute Care?

No
Barriers to Data Collection

- **Hospital**
  - Multiple data sources
  - Conflicting definitions and software
  - Electronic Medical Records
    - ER / admit/ discharge diagnosis
    - Duplicate, conflicting documentation
    - Capability to produce electronic reports

- **SNF**
  - Retrieving achieved charts
  - Volume of paper charts
  - Integrity of documentation

- **Overall**
  - Hospital & SNF IT systems not linked across systems
  - Data not harmonious across providers, locations, systems
  - Extensive use of personnel
  - No central repository for data
  - Six Sigma project is limited in scope
  - Alignment with organization/community initiatives
Medicare Heart Failure Readmission

Respiratory/Pulmonary
- Shortness of breath
- O2 Saturation issues
- Pneumonia
- Pulmonary infiltrates
- CHF
- Chest Pain/irregular heart rate

Diarrhea/dehydration
- Changes in mental status
- Abnormal labs
- Nausea/vomiting
- UTI

Critical thinking skills
- Education specific to diagnosis
- RN vs LPN skills

No Common Identifier
- to track patients across locations or providers

Patient records not electronic

No standard readmission data elements, measures collected, or monitored across system

911 utilization for Transfers
- Lack of coordination
- No Electronic trigger to Case Management

Facility-to-Facility Communication

SNF Interventions
- Interventions limited
  - Labs, CXR, HOB elevated, O2, pain meds, N/V support /meds

Plan of Care limited
- Paper documentation
- Volume of records
- Integrity of documentation

Staff Competence
- Communication, physician notification, change in patient status
- Physician/provider visit patterns
- Physician visits/progress notations

Diabetes
- Diabetic Foot Ulcer
- Hyperglycemia

Secondary Changes in Patient Condition

First Changes in Patient Condition

Database Availability

Primary Changes in Patient Condition
## Critical Xs (Data Elements)*

<table>
<thead>
<tr>
<th>Selected Critical X*</th>
<th>Definition/Assumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographics</td>
<td>Age, gender, etc.</td>
</tr>
<tr>
<td>DRG</td>
<td>Diagnosis Related Group</td>
</tr>
<tr>
<td>ICD9</td>
<td>International Code of Disease, version 9</td>
</tr>
<tr>
<td>Hospital LOS</td>
<td>Hospital length of stay in days</td>
</tr>
<tr>
<td>SNF LOS</td>
<td>Skilled nursing facility length of stay in days</td>
</tr>
<tr>
<td>Physician/provider visit</td>
<td>Resident seen by physician prior to transfer</td>
</tr>
<tr>
<td>Clinical Interventions @ SNF</td>
<td>Medication, laboratory, radiology, other</td>
</tr>
<tr>
<td>Time/Change in Status</td>
<td>Time from change in status to transfer (hours)</td>
</tr>
<tr>
<td>Day/Transfer</td>
<td>Day of week when transferred to acute care</td>
</tr>
<tr>
<td>HFSA/Plan of Care</td>
<td>Heart Failure Society of America Plan of Care on chart</td>
</tr>
</tbody>
</table>

Note: *Critical Xs selected from extensive list of measures designed to provide a foundation to establish a readmission database for continuing process improvement
Results of Measures
# Demographic Characteristics

<table>
<thead>
<tr>
<th>Aged, frail, complex</th>
<th>Range</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>68-98</td>
<td>86</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender, reflects population</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20 (41.6%)</td>
<td>28 (58.3%)</td>
</tr>
</tbody>
</table>

Note: $^a$n=48; preliminary data excludes patients with multiple readmissions.
Note: *Captures co-morbidities associated with CHF ICD9 / 428 as index case

<table>
<thead>
<tr>
<th>ICD-9 Diagnosis</th>
<th>Percent of Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congestive Heart Failure</td>
<td>19.78 %</td>
</tr>
<tr>
<td>Respiratory/Pulmonary</td>
<td>19.78 %</td>
</tr>
<tr>
<td>Septicemia</td>
<td>8.79 %</td>
</tr>
<tr>
<td>Acute Renal Failure NOS</td>
<td>5.49 %</td>
</tr>
<tr>
<td>Urinary Tract Infection NOS</td>
<td>5.49 %</td>
</tr>
<tr>
<td>C. Difficile Enteritis</td>
<td>3.30 %</td>
</tr>
<tr>
<td>All Other Causes</td>
<td>37.37%</td>
</tr>
</tbody>
</table>
### Length of Stay (LOS)

<table>
<thead>
<tr>
<th></th>
<th>Total Sample $^a$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital Index LOS</td>
<td>Range 2-28</td>
</tr>
<tr>
<td></td>
<td>Mean 8</td>
</tr>
<tr>
<td>SNF Admission LOS</td>
<td>Range 1-29</td>
</tr>
<tr>
<td></td>
<td>Mean 13</td>
</tr>
<tr>
<td>Hospital Readmission LOS</td>
<td>Range 1–24</td>
</tr>
<tr>
<td></td>
<td>Mean 8</td>
</tr>
</tbody>
</table>

Note: $^a$n=48; preliminary data excludes patients with multiple readmissions
### Transfer Day of Week Relative to Access, Staffing, & Resources

<table>
<thead>
<tr>
<th>Day of Week</th>
<th>Total Sample a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>11 (23.0%)</td>
</tr>
<tr>
<td>Tuesday</td>
<td>1 (2.08%)</td>
</tr>
<tr>
<td>Wednesday</td>
<td>4 (8.33%)</td>
</tr>
<tr>
<td>Thursday</td>
<td>10 (21.0%)</td>
</tr>
<tr>
<td>Friday</td>
<td>7 (15.0%)</td>
</tr>
<tr>
<td>Saturday</td>
<td>10 (21.0%)</td>
</tr>
<tr>
<td>Sunday</td>
<td>5 (10.0%)</td>
</tr>
<tr>
<td>Weekends (Fri, Sat, Sun)</td>
<td>22 (46.0%)</td>
</tr>
<tr>
<td>Weekends plus Monday</td>
<td>33 (68.8%)</td>
</tr>
</tbody>
</table>

Note: a\(n=48\); preliminary data excludes patients with multiple readmissions
Transfer Day of Week

Day of the Week

Number of Transfers

Percentage of 48-day Sample

- 23%
- 2.08%
- 8.33%
- 21%
- 15%
- 21%
- 10%
### Physician Visit*

<table>
<thead>
<tr>
<th>*Time lapsed since resident seen by physician (days) prior to acute care transfer</th>
<th>Total Sample a</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not seen by physician in SNF prior to transfer to acute care</td>
<td>25*</td>
<td>52.08</td>
</tr>
<tr>
<td>Seen by physician in SNF prior to transfer to acute care</td>
<td>23*</td>
<td>47.92</td>
</tr>
<tr>
<td>Range in days since last visit</td>
<td>0-27</td>
<td></td>
</tr>
<tr>
<td>Mean days since last visit</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

Note: a\(n=48\), preliminary data excludes patients with multiple readmissions
Note: *Integrity of data to support physician visits difficult to abstract from charts
Limitations in Physician Coverage

There are limitations in current model of physician coverage at Skilled Nursing Facilities

- Limited supply of primary care physicians, especially geriatricians
- Response times to clinical questions can range from hours to days
- Physician consultation over the phone is constrained by:
  - Limited time of the provider
  - Limited knowledge of the patient
  - Lack of visualization of the patient
  - Lack of access to medical records
- Consultation over the phone results in blind diagnosis or unnecessary 911 calls, and transfer to the Emergency Department
- Federal and state guidelines governing physician/non-physician services in SNFs vary across states, government, and regulatory affairs.
Clinical Interventions @ SNF
May be constrained by access, staffing, and resources

<table>
<thead>
<tr>
<th>Service</th>
<th>Total a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medication</td>
<td>9</td>
</tr>
<tr>
<td>Laboratory</td>
<td>8</td>
</tr>
<tr>
<td>Radiology</td>
<td>7</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
</tr>
<tr>
<td>Total Interventions</td>
<td>27 (56%)</td>
</tr>
</tbody>
</table>

Note: a\(n=48\); preliminary data excludes multiple readmissions
### Change in Status*

*Time from change in status to acute care transfer (hours)*

<table>
<thead>
<tr>
<th>Time (hours)</th>
<th>Total Sample</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤1</td>
<td>38</td>
<td>79.17%</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>06.25%</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>04.17%</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>00.00%</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>10.42%</td>
</tr>
</tbody>
</table>

Mean hours ~2

Note: \(^a\text{n}=48\), preliminary data excludes patients with multiple readmissions.
Process Improvement Opportunities

• Early recognition of change in patient status
  – Education of staff

• Communication across caregivers & providers
  – Communication/SBAR
  – Hand off between SNF & hospital
  – Align IT across systems (long term)
  – Reduction of 911 calls from facility & families

• Earlier intervention within SNF facility
  – Interventions prior to transfer to acute care
  – Physician/non-physician coverage

• Documentation of all cause readmissions
  – Data collection on all cause readmission

• Quality of care & safety
  – Reduce avoidable acute care transfers
Intervention Models?

1. Care Transitions Program (Coleman)
   - Transition coach to support self management skills
   - Supports transition from hospital to home

2. INTERACT Program (CMS)
   - Specific to nursing/skilled nursing facilities
   - Addresses preventable readmissions to acute care

http://www.caretansitions.org/overview.asp
INTERACT Program

• INTERACT
  – Designed to improve the quality of nursing home care
  – Provides tools, resources to staff to reduce avoidable acute care transfers
  – Developed by the Georgia Medical Care Foundation
  – Medicare Quality Improvement Organization for the state of Georgia
  – Support provided by the Center for Medicare and Medicaid Services

• INTERACT II
  – Early identification of a change in resident status
  – Guides nursing home staff when there is a change in patient status
    Provides comprehensive resident assessment when a change is noted
  – Improves documentation
  – Enhances communication
  – Additional development supported by the Commonwealth Fund.
INTERACT
Interventions to Reduce Acute Care Transfers

http://interact.geriu.org/documents/INTERACT_II_Figure%20.pdf
# Acute Care Transfer Process

<table>
<thead>
<tr>
<th><strong>Interventions/Preliminary Y</strong></th>
<th><strong>Definition/Assumption</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>INTERACT/ Education</td>
<td>Early recognition of change in patient status, Stop &amp; Watch Tool</td>
</tr>
<tr>
<td>INTERACT/ Communication</td>
<td>Early warning tools, communication with SBAR</td>
</tr>
<tr>
<td>INTERACT/ Data collection</td>
<td>Transfer checklist, transfer log, integrity of data</td>
</tr>
<tr>
<td>Six Sigma/DMAIC (Y*)</td>
<td>Number of avoidable transfers</td>
</tr>
</tbody>
</table>

Note: Y= Acute care transfer/readmission rates benchmarked against best practice with lower and lower limits reflecting national means at time of final analysis
Framework for Pilot Project

• Select a single hospital related SNF for small scale pilot
• Objective: Test interventions on a small scale
• INTERACT Program as intervention
  – Staff education/ early identification to capture change in status
  – Earlier intervention, comprehensive assessment @ change
  – Enhanced communication process (SBAR)
• Documentation of all cause readmissions
  – Improved integrity of data collection process (checklist, log)
• Preliminary Results for September to December 2009*
  – Suggest acute care transfers can be avoided with interventions

Note: *Final analysis is pending at the time of this presentation
Lessons Learned

- **Align** administrative leadership, medical staff, stakeholders, readmission team for continuous process analysis & improvement
- Identify **subject matter experts**, personnel resources, & stakeholders
- Identify **data sources**, owners, & program experts
- Establish **collaboration, communication** across providers & locations
- **Standardize measures, definitions** across systems & state assumptions when definitions are not matched (critical)
- Have **critical conversations** to ensure information technology programs have capability to link hospitals to skilled nursing facilities
- Ensure harmonious **IT system definitions across software programs**
- Verify care path / **process improvement capability**
- **Test** interventions on a **small scale** to establish financial targets
- Identify **optional responses to potential changing regulations**
Legislative Issues

- What is under hospital control?
- What is responsibility of SNFs?
- Alignment of incentives?
- Who controls readmissions?
- Who controls...which barriers?

Certainly....in transition
Acknowledgement

Six Sigma Team

Dianne Ross PhD, RN, Research Scientist
Mary Alford RN, Chief Nursing Officer
Duncan Grodack, Senior Analyst, MIS
Karen Marcarelli JD, MSN, RN, VP Patient Care Services


