Meal and Rest Period Issues

LEADING THE QUEST FOR HEALTH™

Cedars-Sinai
Hospital Readmission After Orthopedic Procedure: Opportunities and Implications

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October 29, 2009
Objectives

- Participants will be able to:
  - identify general predictors for hospital readmission after hip or knee replacement
  - discuss proposed policy implications around hospital readmissions

Readmissions as a Measure of Quality

- Hospital readmissions are sometimes indicators of poor care or missed opportunities to better coordinate care
- Nearly one in five patients who is discharged from the hospital will be readmitted within the month (30 days) and more than three-quarters of these readmissions are preventable (according to Centers for Medicare and Medicaid Services, 2009)
- Readmission rates have varied according to demographic, social and disease-related characteristics
**Readmissions as a Measure of Quality**

- Patients often experience difficulties during the transition to home or post-acute care
- While in the hospital, patients tend to rely on professional caregivers
- Upon discharge, patients are expected to assume a self-management role in recovery with little support and preparation (Coleman and Berenson, 2004)
- Despite the needs and opportunities associated with transition, hospitals and other providers have not invested in their role in managing the transition

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**Quality of Care Transitions and Readmissions**

- MedPAC report to Congress in June 2007 reported 17.6% of admissions result in readmission at 30 days after discharge with cost estimate of 15 billion dollars
- According to MedPAC, 75% of all 30-day hospital readmissions were potentially preventable or 13% of total admissions
- CMS has added 30-day readmission rates for Medicare patients hospitalized for heart attack, heart failure and pneumonia to the measures published on its Hospital Compare website
- Challenges to improving the quality of care transitions are impacted by collaboration between health care settings
- Initiatives to improve communication, coordination of care after discharge, and improve the quality of care during the initial admission may prevent readmissions
Hospital Readmissions

- Hospital readmissions following joint replacements at the hip or knee may be caused by a variety of reasons
  - Complications related to the procedure
  - Problems from multiple comorbid conditions
  - Thromboembolic disease most common reason for emergency readmission
  - Medical complications
  - Joint dislocation
  - Infection
  - Inflammation

- Hospital readmissions following hip fractures may be caused by a variety of reasons
  - Cardiac diseases including congestive heart failure
  - Multiple chronic conditions
  - Non-compliance with medication regimen
  - Inappropriate or poor post-operative care
  - Premature discharge
  - Medical complications

- Readmissions are good indicators to examine the postoperative course of similar groups
- Readmissions usually occur within one month of hospital discharge
Uniform Data for Medical Rehabilitation

- UDSMR Database for orthopedic patients that were targeted for the RAC audits averaged for all orthopedic patients from all IRFs

% Orthopedic Patients from all IRFs

<table>
<thead>
<tr>
<th>Year</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total n</td>
<td>477,769</td>
<td>443,983</td>
<td>425,052</td>
</tr>
<tr>
<td>All Orthopedic</td>
<td>195,429 (40.9%)</td>
<td>174,086 (39.2%)</td>
<td>155,873 (36.7%)</td>
</tr>
<tr>
<td>Hip Fracture</td>
<td>42,788 (9.0%)</td>
<td>46,385 (10.4%)</td>
<td>47,371 (11.1%)</td>
</tr>
<tr>
<td>Hip Replacement</td>
<td>37,003 (7.7%)</td>
<td>28,136 (6.3%)</td>
<td>22,505 (5.3%)</td>
</tr>
<tr>
<td>Knee Replacement</td>
<td>75,214 (15.7%)</td>
<td>61,740 (13.9%)</td>
<td>48,814 (11.5%)</td>
</tr>
</tbody>
</table>

Number of Orthopedic Cases 2004-2006

Data from the Uniform Data System for Medical Rehabilitation Annual Reports for 2004, 2005, and 2006
Study Objective

- To determine if discharge destination after hospitalization for hip or knee replacement influences the hospital readmission rate

Design

- Design:
  - Retrospective cohort study including consecutive patients with primary diagnosis of hip or knee replacement discharged from the acute hospital in a three year period
- Setting:
  - Urban academic non-profit hospital
- Population:
  - Study analyzed the discharge destination of 606 orthopedic patients discharged alive from the acute hospital between January 2004-September 2006) and unplanned readmission rate to the study site hospital within 180 days after discharge following hip or knee replacement
  - Data abstracted from the University HealthSystem Consortium (UHC) clinical database
Design

- UHC is an alliance of academic medical centers and affiliated hospitals representing approximately 90% of the nation’s non-profit academic medical centers.
- Information regarding hip or knee replacement patients was first extracted from the database on an individual basis.
- Statistical analyses of patients who had unplanned readmission to the hospital within 180 days was carried out.
- Outcome variables included:
  - Discharge destination
  - Patient characteristics (age, gender, race, comorbid conditions)
  - Variables from the surgical admission that were significantly associated with risk of readmission included admission severity, burden of comorbidities, any days in the ICU, long length of stay and cost.

Demographics

- Age: 18-101 with median age 70.1 years old
- Gender: 64.2% female and 35.8% male
- Ethnicity:
  - Caucasian: 74.8%
  - Hispanic: 11.1%
  - African American: 8.1%
  - Asian: 3.8%
  - Other: 2.3%
- Length of Stay for Index Admission: 1-39 days with average LOS in the acute hospital=7.8 days
Joint Replacement Readmission Rates:  Impact on Discharge Destination

Overall unplanned readmission within 180 days was 8.3%  
(n=50 patients had one or more unplanned readmissions within 180 days)

\( n=606, \text{Chi-Square}=15.294, \text{df}=4, \ p=0.004 \)

Chi-Square Test of Relationship of Bivariate Patient Characteristics, Comorbid Conditions, and Hospital Care Factors to Rate of Unplanned Readmission (Overall Rate = 8.3%)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Sample Size</th>
<th>Readmission Rate</th>
<th>Chi-Square</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender Male (n = 217, 35.8%)</td>
<td>9.2%</td>
<td>0.417</td>
<td>0.516</td>
<td></td>
</tr>
<tr>
<td>Age 60 or Under (n = 164, 27.1%)</td>
<td>5.5%</td>
<td>2.268</td>
<td>0.132</td>
<td></td>
</tr>
<tr>
<td>Age 85 or Older (n = 166, 27.4%)</td>
<td>9.0%</td>
<td>0.046</td>
<td>0.832</td>
<td></td>
</tr>
<tr>
<td>Race Non-White (n = 153, 25.2%)</td>
<td>7.8%</td>
<td>0.045</td>
<td>0.832</td>
<td></td>
</tr>
<tr>
<td>Admission Severity Major or Extreme (n = 198, 33.0%)</td>
<td>14.7%</td>
<td>14.400</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>Admitted through Physician’s Office (n = 126, 20.8%)</td>
<td>4.8%</td>
<td>2.565</td>
<td>0.110</td>
<td></td>
</tr>
<tr>
<td>Sustained Comorbidity (n = 18, 2.8%)</td>
<td>14.7%</td>
<td>1.856</td>
<td>0.162</td>
<td></td>
</tr>
<tr>
<td>COPD Comorbidity (n = 18, 2.8%)</td>
<td>12.0%</td>
<td>0.755</td>
<td>0.387</td>
<td></td>
</tr>
<tr>
<td>Admitted to Home - Routine Self Care (n = 136, 22.4%)</td>
<td>5.1%</td>
<td>2.231</td>
<td>0.136</td>
<td></td>
</tr>
<tr>
<td>Discharged to Home with Home Health (n = 95, 15.7%)</td>
<td>10.5%</td>
<td>0.755</td>
<td>0.387</td>
<td></td>
</tr>
<tr>
<td>Discharged to Skilled Nursing Facility (n = 179, 29.5%)</td>
<td>12.3%</td>
<td>5.476</td>
<td>0.019</td>
<td></td>
</tr>
<tr>
<td>Discharge to Acute Rehabilitation (n = 189, 31.2%)</td>
<td>4.2%</td>
<td>5.868</td>
<td>0.016</td>
<td></td>
</tr>
<tr>
<td>Discharge to Home - Routine Self Care (n = 136, 22.4%)</td>
<td>5.1%</td>
<td>2.231</td>
<td>0.136</td>
<td></td>
</tr>
</tbody>
</table>

Discharge Destination from Acute Hospital

- Discharged to Home - Routine Self Care: 22.4%
- Discharged to Home with Home Health: 15.7%
- Inpatient Rehabilitation: 31.2%
- Skilled Nursing Facility: 20.7%
- Acute Rehabilitation: 4.2%
- Other: 2.0%

Overall unplanned readmission within 180 days was 8.3%
### Means for Continuous Covariates Associated with Unplanned Readmission to Hospital within 180 Days

<table>
<thead>
<tr>
<th>Covariate</th>
<th>Unplanned Readmission within 180 Days</th>
<th>t-test</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No (n = 556)</td>
<td>Yes (n = 50)</td>
<td></td>
</tr>
<tr>
<td>Age at Admission</td>
<td>69.8</td>
<td>73.6</td>
<td>1.431</td>
</tr>
<tr>
<td>Number of Comorbid Diagnoses</td>
<td>8.37</td>
<td>9.68</td>
<td>2.139</td>
</tr>
<tr>
<td>Index Length of Stay in ICU</td>
<td>0.14</td>
<td>0.48</td>
<td>3.429</td>
</tr>
<tr>
<td>Index Length of Stay Total</td>
<td>7.50</td>
<td>10.18</td>
<td>3.517</td>
</tr>
<tr>
<td>Estimated Cost of Index Admission</td>
<td>20,837</td>
<td>26,719</td>
<td>3.244</td>
</tr>
</tbody>
</table>

### Multiple Regression Model with Binary Outcome of Readmission to Hospital within 180 days

<table>
<thead>
<tr>
<th>Variable</th>
<th>Standardized Coefficient</th>
<th>95% Confidence Interval</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discharged to Rehabilitation</td>
<td>-0.05</td>
<td>-0.10</td>
<td>0.015</td>
</tr>
<tr>
<td>LOS 75th Quartile &gt;=9 days</td>
<td>0.15</td>
<td>0.04</td>
<td>0.000</td>
</tr>
<tr>
<td>LOS in ICU 0 v1+d</td>
<td>0.16</td>
<td>0.09</td>
<td>0.000</td>
</tr>
</tbody>
</table>

n=606, R=0.271, R²=0.073, Adjusted R²=0.069, df=3/602, F=15.917, p=0.000
### Discharge Destination from Acute Hospital with Associated Readmission Rates

<table>
<thead>
<tr>
<th>Discharge Destination</th>
<th>Number</th>
<th>Percentage</th>
<th>Readmission Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home – Routine Self Care</td>
<td>136</td>
<td>22.4%</td>
<td>5.1%</td>
</tr>
<tr>
<td>Home – with Home Health</td>
<td>95</td>
<td>15.7%</td>
<td>10.5%</td>
</tr>
<tr>
<td>Inpatient Rehabilitation</td>
<td>189</td>
<td>31.2%</td>
<td>4.2%</td>
</tr>
<tr>
<td>Skilled Nursing Facility</td>
<td>174</td>
<td>28.7%</td>
<td>12.6%</td>
</tr>
<tr>
<td>Other (ICF, hospice, AMA, unknown)</td>
<td>12</td>
<td>2.0%</td>
<td>25.0%</td>
</tr>
</tbody>
</table>

n = 606; Chi-Square = 15.294, df=4, p = 0.004

### Joint Replacement Readmission Rates: Impact on Discharge Destination: Discussion

- **Discussion**
  - Study examined readmission rates of hip and knee replacement surgical patients and found a significantly lower readmission rate among patients who were discharged to inpatient rehabilitation.
  - At CSMC, straightforward lower extremity joint replacements are not admitted to inpatient rehabilitation.
  - Additional medical complications post surgery or a neurologic impairment that may complicate the patient’s recovery are required.
  - The patients admitted to inpatient rehabilitation actually had at least one additional health issue which required medical oversight at the hospital level.
Joint Replacement Readmission Rates: Impact on Discharge Destination: **Limitations**

- Limitations
  - All admissions and readmissions were at one institution
  - “Readiness for Rehabilitation” was not a variable collected or for which we controlled

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Joint Replacement and Hip Fracture Readmission Rates: Impact on Discharge Destination: **Conclusion**

- Conclusion
  - Discharge to inpatient rehabilitation was independently associated with a significant reduction in risk of unplanned hospital readmission within 180 days
  - Identification of patients who may benefit from inpatient rehabilitation and further medical management prior to discharge from the acute hospital may be an important strategy in prevention of hospital readmission
  - As readmission rates affect payment and post acute care services move toward a bundled payment system, understanding the implications of discharge destinations as it influences outcomes and payment is imperative
Medical Necessity

Is the Rehabilitation sufficiently complex that a rehabilitation physician is required?

- Yes
- No

Is there a need for three hours of therapy and are there active medical issues requiring management?

- Yes
- No

Admit to IRF

Care cannot be provided in a lower level of care because of medical complexity and case management requiring rehabilitation physician oversight

Admit to Lower Level of Care

Not true

Implications for Further Consideration

- Are there differences in care processes at each discharge destination?
- Are there potential differences between groups discharged to different settings including a “readiness for rehabilitation”?
- Does education of patients and families as well as flow of information to the next level of care aid in decreasing readmission?
Health Policy Implications

- Readmission rates are often markers for quality of care
- Readmission rates vary from between hospitals and between states