Hospital Readmission: A Measure of Hospital Quality?

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Objectives

1. Describe rates of hospital readmissions, association with LOS, and factors associated with higher rates.
2. Discuss role of readmissions as a “quality” metric.
3. Outline proven strategies for improvement.
4. Implications of “bundled” payments and future of readmissions in VA.
5. Research opportunities.
In the past 14 years, hospital LOS has steadily declined in VA. Over the same time, what happened to 30-day hospital readmission rates?

1. Increased
2. Decreased
3. Remained unchanged
Associations Between Reduced Hospital Length of Stay and 30-Day Readmission Rate and Mortality: 14-Year Experience in 129 Veterans Affairs Hospitals

Peter J. Kaboli, MD, MS; Jorge T. Go, MD, MS; Jason Hockenberry, PhD; Justin M. Glasgow, BS, MS; Skyler R. Johnson, BS, MS; Gary E. Rosenthal, MD; Michael P. Jones, PhD; and Mary Vaughan-Sarrazin, PhD

Figure. Study flow diagram.

Total index medical admissions, from 1997 to 2010 (n = 4360541)

Excluded (n = 235634)
- Transfer to another acute care facility: 33475 (0.8%)
- >30-d LOS: 64579 (1.5%)
- In-hospital deaths: 135732 (3.1%)
- Missing income level: 1848 (0.04%)

Final sample, from 1997 to 2010 (n = 4124907)
- HF: 207296 (5.0%)
- CAP: 199020 (4.8%)
- COPD: 186272 (4.5%)
- AMI: 92519 (2.2%)
- GIH: 82254 (2.0%)
Reduction of LOS Significant for All Conditions
## Adjusted LOS (Mean, days)

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>All Med Dx</th>
<th>CHF</th>
<th>COPD</th>
<th>AMI</th>
<th>CAP</th>
<th>GIH</th>
</tr>
</thead>
<tbody>
<tr>
<td>97–98</td>
<td>5.44</td>
<td>6.33</td>
<td>5.68</td>
<td>6.63</td>
<td>7.18</td>
<td>5.08</td>
</tr>
<tr>
<td>03–04</td>
<td>4.54</td>
<td>5.31</td>
<td>4.53</td>
<td>4.90</td>
<td>5.74</td>
<td>4.17</td>
</tr>
<tr>
<td>09–10</td>
<td>3.98</td>
<td>4.40</td>
<td>3.89</td>
<td>3.78</td>
<td>4.96</td>
<td>3.68</td>
</tr>
<tr>
<td>Change</td>
<td>-1.46</td>
<td>-1.93</td>
<td>-1.79</td>
<td>-2.85</td>
<td>-2.22</td>
<td>-1.40</td>
</tr>
</tbody>
</table>

Reduction of LOS Significant for All Conditions
Reduction in 30-Day Readmission Rates
## Significant Reductions in 30-Day Readmissions

### Adjusted Readmission Rates

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>All Med Dx</th>
<th>CHF</th>
<th>COPD</th>
<th>AMI</th>
<th>CAP</th>
<th>GIH</th>
</tr>
</thead>
<tbody>
<tr>
<td>97-98</td>
<td>16.5%</td>
<td>20.4%</td>
<td>17.9%</td>
<td>22.6%</td>
<td>14.7%</td>
<td>14.1%</td>
</tr>
<tr>
<td>03–04</td>
<td>15.0%</td>
<td>19.3%</td>
<td>15.5%</td>
<td>20.2%</td>
<td>13.7%</td>
<td>13.1%</td>
</tr>
<tr>
<td>09–10</td>
<td>13.8%</td>
<td>19.0%</td>
<td>14.6%</td>
<td>19.8%</td>
<td>13.8%</td>
<td>12.2%</td>
</tr>
<tr>
<td>Change</td>
<td>-2.7%</td>
<td>-1.4%</td>
<td>-3.3%</td>
<td>-2.8%</td>
<td>-0.9%</td>
<td>-1.9%</td>
</tr>
</tbody>
</table>
Advanced statistics

CAN BEER
1 – $2.50
or
2- $5.00

ALL BOTTLE
Association between LOS reduction and Readmissions

Risk adjusted decrease in readmission rates for hospital with 0%, 10%, 25% and 40% reduction in LOS

- 40% LOS Reduction
- 25% LOS Reduction
- 10% LOS Reduction
- No Change in LOS
A patient discharged from a hospital with LOS that was 1 full day lower than expected:
- given the year and patient characteristics
- was 6% more likely to be readmitted (OR = 0.94; 95% CI, 0.93-0.95; p < .001), compared to a patient discharged from a hospital with mean LOS equal to the expected LOS for the year

Within hospitals, each additional day of stay was associated with a 3% relative increase in the likelihood of readmission.
Stated another way...

- Reducing LOS to much below expected will result in a small trade off for higher readmission rate.
- Patients with longer LOS have higher readmission rates.
  - Duh, these people are sicker and need to return to hospital more frequently
Okay, so VA shortened LOS (has become more efficient) AND at the same time reduced hospital readmissions. However, we have improved palliative care services (i.e., the dead don’t get readmitted), thus 30 day mortality has:

1. Increased
2. Decreased
3. Remained unchanged
Mortality Trends over 14 years

- 30-day mortality decreased by 25%
  - (6.4% to 4.8%)
- 90-day mortality decreased by 18%
  - (11.46% to 9.4%)

- Logistic regression analyses, adjusting for patient demographics and comorbidity and hospital random effects, found similar reductions (P<0.0001).
SUMMARY

- Unadjusted LOS decreased from 1997 to 2010 with concomitant decrease in unadjusted readmissions
- In multivariable analyses: similar results
  - Greater reductions in LOS resulted in less reduction in 30-day readmissions
- Considerable variation suggests fixable solutions
- Reassuring to show increased inpatient efficiency has not resulted in increased hospital readmission
Eugene Oddone and Morris Weinberger, Durham VAMC

“The authors acknowledge that a limitation of the study is that it was conducted in a single health care system (VA). That statement is included in all articles from VA investigators. Perhaps it is time to embrace the VA as the largest US ACO. Let the VA serve as an example of how to enhance both efficiency (reduced LOS) and quality (reduced readmissions and mortality).”
Break #1 for Questions

Your host, Dr. Todd Wagner
Palo Alto VAMC
Do you believe 30-day hospital readmission rate is a measure of healthcare quality?

1. Yes
2. No
3. I’m not sure, but I will have a more informed opinion at the end of the hour.
Is 30-day Readmission a Quality Metric?

- **Quality**: a degree of excellence; superiority in kind
- **Metric**: a standard of measurement to capture performance
  - *Readmits*: Easy to measure, but not necessarily quality

- **Donabedian Model of Quality**
  - **Structure**: presence of hospitalists/intensivists
  - **Process**: ASA for AMI
  - **Outcomes**: a health state like death
    - No external validity for readmission rates

Thehealthcareblog.com/blog/2013/02/14 (Ashish Jha, MD)
Is Readmission an Error or Adverse Event?

- **Error**: includes terms such as mistakes, close calls, near misses, active errors, and latent errors

- **Adverse event**: includes terms that usually imply patient harm (i.e., medical and iatrogenic injury)
  - Readmission **may result from** an error or adverse event
    - e.g., wrong dose of diuretic for HF patient
    - e.g., fall resulting from re-conditioning
  - More frequently from the disease process or uncontrollable factors.
    - e.g., homeless man with O2 dependent COPD

Thomas, EJ, Peterson, LA, Measuring Errors and Adverse Events in Health Care. *JGIM*. 2003 Jan; 18(1) [Houston VA]
So, if readmissions are not an Adverse Event or great Quality Metric, are they preventable? Assuming yes, what % are preventable?

1. 10%
2. 25%
3. 50%
4. 60%
5. 90%
Preventability of Readmissions

- **AJM, Frankl, Breeling, Goldman, 1991**
  - N=2,626 medicine admits over 4 months; 12% 30-day readmissions
    - 9% (or 1% of total) were “preventable”; 89% occur within 10 days
    - 1/3 system failure, 1/3 hope patient would improve, 1/3 sub-optimal judgment in evaluation or treatment

- **Health Care Fin Rev, Goldfield, et al, 2008**
  - N=4,311,652 medicine and surgery admissions; 234 Florida hospitals
  - Medical readmission with: 1) same diagnosis, 2) de-compensation of a chronic condition, or 3) medical complication (3M PPR Software)
    - ~13% overall readmission rate
    - ~60% (or 7.9% of total) met criteria for “potentially preventable”
Proportion of Hospital Readmissions Deemed Avoidable: A Systematic Review

- van Walraven, et al, CMAJ, 2011
  - Systematic review of 34 studies
  - Median proportion of readmissions deemed avoidable: 27.1% [Range 5-79%]

- Answer: ~25% are potentially preventable based on the literature
  - However, likely you can’t prevent all of them
So, readmissions are a poor quality metric, rarely represent an error, and only \( \sim 25\% \) are preventable. Can we at least predict who will be readmitted?

1. No, models are no better than coin flip (\( \text{auc}=0.500 \))
2. Yes, but prediction models aren’t great (\( \text{auc}=0.625 \))
3. Yes, and prediction models are great (\( \text{auc}=0.950 \))
Readmission Prediction Models Stink

### Render IPEC Model: auc = 0.625

- 1 point each
- **Age** > 70
- **Dx**: anemia, DM, RF, HF, COPD
- **Lab**: Cr > 2, Alb > 3.3, Hct > 55 or < 25, glu > 180 or < 60
- **LOS** > 7 days
- Cancer (2pts)
- Prior admit < 6 mo
- 1-5 medications (3pts)
- > 6 medications (4pts)

### Hasan Univ Model auc = 0.650

- Medicare (5pts)
- Medicaid (4pts)
- Self-pay (4pts)
- Charlson Index
- **LOS** > 2 days (3pts)
- Admits in last year
  - 1-3 (4pts)
  - 4 (9pts)
  - ≥ 5 (11pts)
- Have PCP (3pts)
- Married (2pts) and SF-12

Further Proof of Model Stink Factor


- 30 studies (26 unique models)
  - 14 used retrospective admin data for hospital comparisons
    - Auc=.55-.65
  - 7 could identify high-risk patients during hospital stay
    - Auc=.56-.83
  - 5 used at hospital discharge
    - .68-.83
  - 2 models found functional and social variables improved discrimination, but rarely available

[Portland VA]
Now do you believe 30-day hospital readmission rate is a measure of healthcare quality?

1. Yes
2. No
3. I’m still not sure, will have to listen until the end.
Break #2 for Questions

Your host, Dr. Todd Wagner
Palo Alto VAMC
This presentation is a buzz-kill. Is there hope that interventions can improve readmission rates?

1. Yes, studies consistently show readmission rates can be improved.
2. No, evidence is mixed (interventions both increase and decrease readmits).
3. Doesn’t matter, floggings will continue until readmission rates improve.
**SPECIAL ARTICLE**

**DOES INCREASED ACCESS TO PRIMARY CARE REDUCE HOSPITAL READMISSIONS?**

Morris Weinberger, Ph.D., Eugene Z. Oddone, M.D., M.H.Sc., and William G. Henderson, Ph.D., for the Veterans Affairs Cooperative Study Group on Primary Care and Hospital Readmission*

- **NEJM, 1996**
  - N=1,396 randomized to usual care or an intensive MD/RN intervention before discharge and continuing for 6 months.
    - Intervention: higher readmission rates (19% vs. 14%; p=.005)
    - More days of re-hospitalization (10.2 vs. 8.8; p=.04)
    - Intervention patients were more satisfied with care

- **In 2013: Primary Care Medical Home?**
  - No data to suggest it reduces readmission

[Durham VA]
Frequently Cited Positive Studies

- **Interventions at the time of discharge:**
  - Project BOOST. Society of Hospital Medicine
  - Transitional Care of Older Adults Hospitalized with Heart Failure. Naylor et al, *JAGS*, 2004
    - N=749; mean age 49.9 yrs
    - Readmissions: 0.21 vs. 0.15 visits/pt/mo (p=.09)
    - ED Visits: 0.25 vs. 0.17 visits/pt/mo (p=.014)
    - Readmissions + ED Visits: 0.45 vs. 0.31 visits/pt/mo (p=.009)
Interventions to Reduce 30-Day Rehospitalization: A Systematic Review


Luke O. Hansen, MD, MHS; Robert S. Young, MD, MS; Kelki Hlnami, MD, MS; Alicia Leung, MD; and Mark V. Williams, MD

Conclusion: No single intervention implemented alone was regularly associated with reduced risk for 30-day rehospitalization.

Taxonomy of interventions:

Pre-Discharge
- Patient Education
- Medication Reconciliation
- Discharge Planning and Schedule Appointment

Post-Discharge
- Timely Follow-up and PCP Communication
- Follow-up Telephone Call
- Patient Hotline and Home Visit

Bridging the Transition
- Transition Coach
- Patient Centered Discharge Instructions
- Provider Continuity

- **Key Components**

![Diagram showing the ideal transition in care process with key components such as discharge planning, complete communication, medication safety, etc.](image)
Interventions: Take Home Points

- Represent a “bundle” of interventions
- Likely represent “good” things that we should be doing anyway; some things for everyone
- Determine local rates, then determine goals for any intervention
CMS is reducing payments for hospitals with higher than expected readmissions rates. This is going to:

1. Decrease readmissions and save money
2. Increase readmissions and cost money
3. Will have no net effect, but will result in gaming the system
Incentives to Reduce Readmissions

- Who wants patients readmitted?
  - Hospitals may have an “incentive” to readmit.
    - DRG-based payment for re-hospitalization are only 4% lower
  - NOT patients, physicians, or payors of health care.

- If nobody is incentivized to readmit, can we be incentivized to NOT readmit them?
    - 2 yrs confidential readmission rate reporting to hospitals/providers
    - Reduce payment for readmission (readmissions cost less)
    - “Bundle” payment for hospitalization and subsequent care
      - Requires hospital and clinic coordination with payment sharing
“Beginning October 1, 2012, the HRRP will lower payment rates for all Medicare discharges if acute care hospitals experience higher-than-average readmission rates for certain "applicable conditions."

- AMI, CHF, CAP

“For the first year of the program, payment reductions will be capped at a maximum of 1% of inpatient payments. The payment reduction rates will subsequently increase by 1% each year before being capped at 3% for fiscal year 2015 and beyond.”
Cost of Implementation and Reducing Readmissions

- Estimate for Project BOOST: $170,000
- Hospital payments may go down if reduce readmissions [$5,000 pneumonia DRG payment]:
  - 400 admits + 25% readmits = 500 admits
    - @$5,000 each = $2.5M
  - 400 admits + 20% readmits = 480 admits
    - @$5,000 each = $2.4M
      - Hospital loss of $100,000 plus $170,000 to implement

Future for Research

- **Prediction Rules:** only if it can change practice

- **Interventions:** enough already; implement them

- **Preventability:** potential for real-time learning
  - van Walraven, *et al.* CMAJ, 2011

- **Rates and Associations for Medicine and Surgery:**
  - Not if it tells us something we already know
5 Summary Bullets: Readmissions

- Not a good quality metric, but has gotten attention for care transitions
- Identifying preventable readmissions is difficult, but good to try to prevent them
- Preventability limited, but may result from an error/adverse event or system failures
- Prediction models stink, but opportunity to figure out how to use them
- Intervention “bundles” are out there, but we need wide-spread implementation.
And a final point...

- Floggings will continue until readmission rates improve (or people lose interest)
Final Break for Questions

Your host, Dr. Todd Wagner
Palo Alto VAMC