CHF: Tips on Keeping Readmission Rates Down

Keyur B. Shah, M.D.
Division of Cardiology, VCU
Richmond, VA
Disclosures

• Consultant: HeartWare/Medtronic

• I will not discuss off label use of any medications or devices
How did I end up here:

K.S. to K.E., Circa 2011: “Our hospital re-admission rates for HF are bad, you should really do something about that!”

*Within Seemingly Seconds*

“I have tapped you as the Quality Improvement Representative for Heart Failure”
Outline

• The Scope of the Problem
• Interventions to Reduce Readmissions
  • Disease Management/Self Care
  • Close Follow-up
  • Telephone Surveillance
  • Tele-monitoring
  • Surveillance Devices
What is the big deal?
Phenotype of Heart Failure

- With advancing medical therapy, CHF is a disease of the elderly
  - Kidney Disease
  - Hyperlipidemia
  - Obesity
  - Diabetes
  - Hypertension
  - Thyroid disease
  - CVA
  - Coronary disease

Wong CY. Am J Med. 2011
Heart Failure and Readmissions

30 day - Readmission Rate (%)

- CHF: 26.9%
- PNA: 20.1%
- COPD: 22.6%
- Psychosis: 24.6%
- GI Mix Bag: 19.2%

Jencks SF. NEJM. 2009
Dharmarajan K. JAMA 2013
“In 2013, there were 496,502 readmissions following an index stay for AMI, CHF, COPD, or pneumonia, accounting for 13 percent of all readmissions. Aggregate hospital costs for readmissions following an index stay for any of these four conditions totaled $7.0 billion.”
Why the Fuss?

- Hospital Readmission Reduction Program (HRRP)
  - “reductions in all-cause readmissions by aligning payment with outcome”
  - Penalty based on “excess” readmissions beyond expected
  - Capped at 1% in 2012, increases to 2% in 2013 and 3% in 2014%

Distribution of hospitals by penalties

Source: CMS, Modern Healthcare graphic
Medical Interventions?
Medical Therapies (HFrEF)

- Guideline directed medical therapies reduce HOSPITALIZATION
- The endpoint in the major clinical trials is not RE-HOSPITALIZATION: Unclear Immediate Effect of the Drug

Desai AS. Circulation. 2012
Features Suggesting of Medically Advanced Disease

- Severe Symptoms
- Cardiac Cachexia
- Low Sodium
- Recurrent Hospitalizations
- End Organ Damage
- Low Blood Pressure
- Nausea

Palliative Care

Advanced Heart Failure Interventions
High Risk For Readmission

- Recent Admission
- Long Hospitalization
- Poor Health Literacy
- Medical Non-compliance
- Substance abuse
- Depression
- Single / Absent Social Support

- Increased age
- Increasing number of comorbidities
- Poor Access to Clinical Follow-up
Decongestion

DOSE-AHF and CARRESS-HF

60 Day Event Rates Based on Congestion Status at Discharge

- Score 0: 50%, N = 215
- Score 1-2: 52%, N = 141
- Score 3-4: 68%

* 95% upper confidence limit

DOSE-AHF: Weight Loss at 72 Hrs, Volume Loss, NT-BNP reduction

Kociol RD. Circ Heart Fail. 2013

Lala A. Circ Heart Fail. 2015
Hospital Discharge Strategies
<table>
<thead>
<tr>
<th>Rating</th>
<th>Patients with Congestive Heart Failure (N=252,266) readmission rate (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score on HQA discharge instructions</td>
<td></td>
</tr>
<tr>
<td>Lowest quartile</td>
<td>23.5 (23.1–24.0)</td>
</tr>
<tr>
<td>Second quartile</td>
<td>23.2 (22.8–23.7)</td>
</tr>
<tr>
<td>Third quartile</td>
<td>23.6 (23.2–24.0)</td>
</tr>
<tr>
<td>Highest quartile</td>
<td>23.7 (23.2–24.1)</td>
</tr>
<tr>
<td>Score on HCAHPS discharge instructions</td>
<td></td>
</tr>
<tr>
<td>Lowest quartile</td>
<td>24.7 (24.3–25.2)</td>
</tr>
<tr>
<td>Second quartile</td>
<td>23.7 (23.3–24.4)</td>
</tr>
<tr>
<td>Third quartile</td>
<td>23.1 (22.6–23.5)</td>
</tr>
<tr>
<td>Highest quartile</td>
<td>22.4 (21.9–22.8)</td>
</tr>
</tbody>
</table>

Jha AK. NEJM 2009
An Hour of One on One Teaching

- Nurse Educator
- 1 hr Face to Face
- 223 patients, 180 day follow-up

**TABLE 4. Self-Care Practices at 30-Day Follow-Up**

<table>
<thead>
<tr>
<th>Practice</th>
<th>Control, %</th>
<th>Education, %</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performing daily weigh-in</td>
<td>51</td>
<td>66</td>
<td>0.025</td>
</tr>
<tr>
<td>Following specific sodium restriction</td>
<td>20</td>
<td>32</td>
<td>0.050</td>
</tr>
<tr>
<td>Following specific fluid restriction</td>
<td>39</td>
<td>51</td>
<td>0.094</td>
</tr>
<tr>
<td>Not smoking</td>
<td>90</td>
<td>97</td>
<td>0.031</td>
</tr>
<tr>
<td>Reports plan for worsened symptoms</td>
<td>64</td>
<td>72</td>
<td>0.214</td>
</tr>
<tr>
<td>Performing exercise ≥3 times per week</td>
<td>33</td>
<td>46</td>
<td>0.060</td>
</tr>
<tr>
<td>Self-care practices score (of total of 6)</td>
<td>3.0±1.5</td>
<td>3.6±1.5</td>
<td>0.001</td>
</tr>
</tbody>
</table>

**Figure 3.** Event-free survival defined as time to first hospitalization or death for control (blue) and education (red) subjects. For log-rank comparison, $P=0.012$. 

Koelling T. Circulation 2005
Early Follow-Up

- 30136 pts, 225 hospitals
- < 7 days from hospital discharge

Table 3. Rates of Mortality, Readmission, and Mortality or Readmission at 30 Days by Quartile of Hospital Rate of Early Follow-up

<table>
<thead>
<tr>
<th>Variable</th>
<th>1 (&lt;32.4)</th>
<th>2 (32.4-37.9)</th>
<th>3 (38.3-44.5)</th>
<th>4 (&gt;44.5)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of patients</td>
<td>7081</td>
<td>8662</td>
<td>7812</td>
<td>6581</td>
<td></td>
</tr>
<tr>
<td>Event, 30 d</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mortality&lt;sup&gt;a&lt;/sup&gt;</td>
<td>353 (5.0)</td>
<td>417 (4.8)</td>
<td>352 (4.5)</td>
<td>297 (4.5)</td>
<td>.44</td>
</tr>
<tr>
<td>Readmission&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1658 (23.3)</td>
<td>1787 (20.5)</td>
<td>1606 (20.5)</td>
<td>1377 (20.9)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Mortality or readmission&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1849 (26.1)</td>
<td>2015 (23.3)</td>
<td>1813 (23.2)</td>
<td>1544 (23.5)</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

Hernandez AF. JAMA 2010
Early Follow-up: PCP + Cardiologist

- PCP + Cards vs PCP alone in first 30 days after discharge
- 10599 patients, Ontario
- National Ambulatory Care Reporting System
- Propensity Matched comparison

Improved Survival (0.79 (95% CI, 0.63 to 1.00; P = 0.045))
Improved Combined EP of all-cause hospitalization, ED visit, or death (0.86 (95% CI, 0.78 to 0.94) P = 0.001)
Observations:

• Discharge paperwork alone = joke
• Face to Face education = no joke
• Early follow-up involving PCP + Cards may be most effective
Disease Management Strategies
COACH Trial: Mild or Moderate HF, 18 months

Jaarsma T. Arch Intern Med 2008
DIAL Trial

Telephone calls at 7 days post discharge and every two weeks x 4 vc Standard Care (Cardiologist)
Telephonic (Texas)

Telephone calls Disease Manager by Private Firm, Weekly Phone calls spaced to monthly

Survival

Days

GDM: Systolic HF patients

Improve Survival, No decrease in Hospitalization or Health Care Utilization

Systolic HF patients: Showed benefit

Mortality: DM

Event-Free: DM

Mortality: Control

Event-Free: Control

Percent

Months

GDM: Systolic HF patients

Control

DM

Galbreath AD. Circulation 2004
Observations:

• Discharge paperwork alone = joke
• Face to Face education = no joke
• Early follow-up involving PCP + Cards is most effective
• DMS: great outcomes in small studies; variable results larger trials

• DMS: Increase contact may increase likelihood of readmission, but increase
# Telemonitoring RCTs

<table>
<thead>
<tr>
<th>Trial</th>
<th>Patients</th>
<th>Intervention</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>TELE-HF (2010)</td>
<td>1653 pts, All HF</td>
<td>• Not Stated</td>
<td>• No Difference in 180 day readmission rates</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• No Difference in Mortality</td>
</tr>
<tr>
<td>TIM-HF</td>
<td>710 patients, HFrEF;</td>
<td>• Tele: BP, ECG, Weight</td>
<td>• No Difference in Mortality</td>
</tr>
<tr>
<td></td>
<td>Germany</td>
<td></td>
<td>• No Difference in CV death + HF hospitalization</td>
</tr>
<tr>
<td>BEAT-HF (2016)</td>
<td>1437, 6 center ; All HF,</td>
<td>• Predischarge HF edu.</td>
<td>• No Difference in 30d, 180d HF readmission</td>
</tr>
<tr>
<td></td>
<td>California</td>
<td>• Health Coach (telephonic)</td>
<td>• No 180 mortality benefit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Telemonitor weight, BP, HR, Symptoms</td>
<td>• Improved QOL</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Poor Adherence by patients</td>
</tr>
</tbody>
</table>
Observations:

- Discharge paperwork alone = joke
- Face to Face education = no joke
- Early follow-up involving PCP + Cards is most effective
- DMS: great outcomes in small studies; variable results larger trials
- DMS: Increase contact may increase likelihood of readmission, but increase
- Telemonitoring results disappointing
CardioMEMs: What is this thing
A. Control group (254 hospital admissions for heart failure) vs. Treatment group (158 hospital admissions for heart failure).

Hazard ratio 0.63 (95% CI 0.52-0.77); p<0.0001

B. Control group (138 patients with event) vs. Treatment group (107 patients with event).

Hazard ratio 0.73 (95% CI 0.57-0.94); p=0.0146

Number at risk

<table>
<thead>
<tr>
<th></th>
<th>Control group</th>
<th>Treatment group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number at risk</td>
<td>280 267 252 215 179 137 105 67 25 10 0</td>
<td>270 262 244 210 169 131 108 82 29 5 1</td>
</tr>
</tbody>
</table>

Abraham WT. Lancet 2011
30 day readmission rates for >65 y.o. patients

- Control (Standard of Care): 0.67
- Treatment (PA pressure monitoring): 0.34

- HF Hospitalizations: 0.18
- All Cause 30 Day Readmissions: 0.07
- HF 30 Day Readmissions: 0.10

Adamson PB. Circ HF. 2016
Observations:

- Discharge paperwork alone = joke
- Face to Face education = no joke
- Early follow-up involving PCP + Cards is most effective
- DMS: great outcomes in small studies; variable results larger trials

- DMS: Increase contact may increase likelihood of readmission, but increase
- Telemonitoring results disappointing
- Cont. Hemodynamic Monitor works for both diastolic and systolic HF!
  - Need infrastructure
  - $$$$
What we are trying at VCU
- Medications Review
- Appointment Review
- Symptom Review
- Risk Stratification
- Face to Face Education
- Medication Cards
- Binders
- Self Care
- Disposition Planning
- Goal < 7 days after hospital discharge
- Define long term disposition
- Protocols with Home Health
- Communication
Thoughts HF Readmission as a Quality Metric

“The 30-day readmission metric, with its many flaws, and clear direction to reduce utilization and cost, but without focus on patient wellbeing, should serve as an alarm that we are heading in the wrong direction of allowing government policymakers, rather than patients to drive the design of clinical care metrics.”

Konstam MA. JACC:Heart Fail 2016
Thank You!!!