Strategies for Preventing Heart Failure Readmissions

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Heart Failure Readmission Reduction
The Holy Grail of Heart Failure?
Disclosures:
Speaker for Novartis Pharmaceuticals
Speaker for Abbot Pharmaceuticals, MCS division

There are no relevant conflicts of interest related to this talk.

The Burden, How many? How much?

- 6.5 million American’s diagnosed with heart failure
  - $21 Billion DIRECT Costs
- Estimated to increase to > 8 million American’s with HF by 2030
  - $53 Billion Costs

- 57.4 MILLION Heart Failure Hospitalizations per year
- Average Cost: $14,631.00 / hospitalization
- 6% In-Hospital MORTALITY
Heart Failure Readmission by the Numbers

- 25% of patients are readmitted within 30-DAYS
- 14,350,000 READMISSIONS / Year
- Median Time to Readmission: 15 DAYS!!
- Direct Cost of Heart Failure readmission = $10,051

- CMS estimated to recover $566,000,000 from Hospitals
  - Many hospitals serve lower socio-economic populations

- 30-Day Readmission increases 6 month mortality for Heart Failure patients
  - 77% vs 11% compared with those NOT readmitted

The Effects of Heart Failure Readmission Programs

- Heart Failure Readmission Reduction Programs (HFRRP) began in 2012
  - Penalties initially were 1% and increased over time

- Heart Failure Readmission Reduction Programs have been successful in reducing readmissions

- 2012 – 2016: reduction in Heart Failure Readmissions
  - 22% → 10%

- WAS THIS A TRUE REDUCTION IN HEART FAILURE READMISSIONS?
  - Hospitals placed patients in “OBSERVATION”
  - ED visits not included, treated with IV lasix
The REAL Cost Heart Failure Readmission Programs

The successful implementation of HFRRP has resulted in a decrease in Heart Failure Readmission rates

Estimated to reduce readmissions by 25%

Actual reduction ~ 9%

HFRRP resulted in INCREASES in 30 day, 90 day and 1 year Mortality


<table>
<thead>
<tr>
<th>Year</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>Average</th>
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</thead>
<tbody>
<tr>
<td>30 Day Risk Adjusted Readmission rate</td>
<td>23.1%</td>
<td>21.5%</td>
<td>23.4%</td>
<td>25.0%</td>
<td>22.5%</td>
<td>21.4%</td>
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<tr>
<td>30 Day Mortality after discharge with HFRRP</td>
<td>7.0%</td>
<td>8.1%</td>
<td>6.6%</td>
<td>8.7%</td>
<td>8.9%</td>
<td>9.3%</td>
<td>9.2%</td>
<td>4.2%</td>
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<tr>
<td>30 Day Mortality after discharge without HFRRP</td>
<td>9.6%</td>
<td>7.8%</td>
<td>7.5%</td>
<td>7.5%</td>
<td>7.0%</td>
<td>6.7%</td>
<td>6.6%</td>
<td>3.3%</td>
<td>6.6%</td>
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</table>

The **REAL** Cost Heart Failure Readmission Programs

Between 2006-2014, > 11,000 Medicare beneficiaries were studied

- 30-day readmissions: 20% → **18.4%**
- 30-day MORTALITY: 7.2% → **8.6%**

- 1-YEAR Readmission Rates: 57.2 % → **56.3%**
- 1-YEAR MORTALITY Rates: 31.3% → **36.3%**

**WHY DO HEART FAILURE READMISSION PROGRAMS RESULT IN INCREASED MORTALITY??**

They do not focus on **IMPROVING** Heart Failure Care
Strategies to Reduce Heart Failure Readmission Rates

Day of Admission

- Ensure proper admission diagnosis
  - Co-morbid conditions may be the actual primary diagnosis
    - COPD
    - Pneumonia
    - Hypertension
    - ACS
- Identify patients at high risk for readmission
  - Frequent admission
  - Low Health Care Literacy
  - Age
  - Multiple Co-morbidities

Strategies to Reduce Heart Failure Readmission Rates

Day of Admission

- Identify Barriers to High Quality Heart Failure Care
  - Social
  - Financial
  - Education

- Engage Multi-disciplinary Care Teams
  - Case Managers
  - Social Workers
  - Nutritionist
  - Physical Therapist
  - Occupational Therapist
  - Pharmacist
  - Nurses
Inpatient Strategies to Improve Care

- Establish the etiology / cause of the acute decompensation
  - Dietary Indiscretion
  - Medication non-compliance / misunderstanding
  - Antecedent Illness (COPD, PNA, viral illness)
  - Medical Co-Morbidities (DM, hypothyroidism, hypertension)
  - Acute Coronary Syndrome
  - Arrhythmia

EDUCATION
- Starting Day 1 of admission
- Re-enforce life-style modification
- Medications
  - Type and mechanism of action
  - Reason for use
  - Possible side-effects

Inpatient Strategies to Improve Care

- Aggressive Diuresis
- Initiation OR Titration of Guideline Directed Medical Therapies (GDMT)
  - Do not hold GDMT / RAAS blockade

- Don’t assume just because the creatinine is up that the patient is dry or “low output” and shouldn't be diuresed
  - These patients are often diuretic resistant
  - Need big doses of diuretic
  - They often get worse before they get better

- Worsening renal function is not a reason to decrease diuresis
- Hypotension (relative) is not a reason to decrease diuresis
Inpatient Strategies to Improve Care

- Early and aggressive IV diuresis
  - 2 – 2.5 TIMES oral dose given by IV
  - Start in the ER
- No difference between IV BOLUS or IV INFUSION
- High Dose Diuresis does not result in greater hypokalemia
- High Dose Diuresis is SAFE and EFFECTIVE

Felker GM et al. NEJM, 2011.

Time to Decongestion

**A Bolus vs. Continuous Infusion**
- AUC with bolus infusions, 4236±1440
- AUC with continuous infusion, 4373±1404
  - P=0.47

**B Low-Dose vs. High-Dose Strategy**
- AUC with low-dose strategy, 4171±1436
- AUC with high-dose strategy, 4430±1401
  - P=0.06

Felker GM et al. NEJM, 2011.
Inpatient Strategies to Improve Care

- Aggressive diuresis with **hemoconcentration** improves outcomes
  - Increase in Hgb / HCT (~10% increase)
  - Contraction Alkalosis

Testani et al., Circulation 2010  
Oh et al., IJC 2013

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Inpatient Strategies to Improve Care

**Initiate and/or Titrated Guideline Directed Therapies**

- RAAS Blockade
  - ACEI or ARB
  - Consider switching to ARNI
- Beta-blockers
  - Coreg if plenty of BP room
  - Consider Metoprolol Succinate for improved HR and BP room
- Mineralocorticoids Anagonists
  - If not started during admission, < 50% of patients will have them started as an outpatient
- Hydralazine / Isosorbide
- Consider use of Funny-channel blockade to achieve target HR
ACE - Inhibitor
ARB
AR - Neprilysin Inhibitor
MR Antagonism

Inpatient Strategies to Improve Care

- Initiation and Titration of RAAS blockade with Reduced GFR improves Outcomes

WRF with enalapril (eGFR decrease 29.2%)
WRF with placebo (eGFR decrease 28.9%)

Testani et al, Circ Heart Fail 2011;4:685
Inpatient Strategies to Improve Care

- WRF with Hypotension (GDMT titration) improved prognosis

Testani et al., Eur J Heart Fail 2011;13:877-84.

Inpatient Strategies to Improve Care

- Ensure COMPLETE decongestion

Metra et al., Circ Heart Fail 2012;5:54-62.
Strategies during Transition of Care to Improve Outcomes

- **Education**
  - Simple directions
  - 8th grade vocabulary
  - Medications
    - Which meds
    - Why
    - Possible side-effects
  - Life-Style Modifications
    - Sodium restriction
    - Fluid restriction
    - Risk Factor Modification (tobacco etc)
- **Exercise**
4 STEPS FOR YOUR HEART FAILURE SUCCESS

1. **MEDICATIONS:**
   - Know your medications including recent changes
   - Take them all every day
   - Call immediately if you are missing any of them!

2. **INTAKE:** DAILY SALT AND FLUID RESTRICTIONS
   - Low salt: <2000mg per day max.
   - Salt attracts water!!!
   - Fluids: <64oz (8 cups or 2 quarts) per day maximum!

3. **CHARTING:** EVERY DAY
   - Weight and Blood Pressure
   - Symptoms (worsening breathing, nausea, dizzy, swelling)
   - Sodium and Fluid Intake

4. **EXERCISE!** WALK A LITTLE EVERY DAY (but don’t overdo it!)

PROBLEMS? CALL!
   - 5 pound overall weight gain
   - Shortness of Breathing
   - Swollen ankles or legs
   - Nausea and vomiting
   - Dizziness
   - Decreased urination
   - Discontinued medications
   - Blood pressure less than 90 (top number)

For the above, call the doctor who is treating your Heart Failure, whether that is your Primary Care Physician or your Cardiologist. Try now, help you turn the situation around before you get sick!

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**SUCCESSION CHART**

<table>
<thead>
<tr>
<th>Week</th>
<th>Month 1</th>
<th>Month 2</th>
<th>Month 3</th>
<th>Month 4</th>
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<td>24</td>
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</tbody>
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**Education on Warning Signs**

**Main Symptoms of Heart Failure**

- Shortness of Breath
- Swollen ankles or legs
- Sudden Weight Gain (2Kg over 2 Days)
- Palpitations
- Poor Appetite
- Tiredness

Supporting Specialist Services and Research in Heart Failure

www.heartbeat-trust.ie
Strategies during Transition of Care to Improve Outcomes

- Multi-disciplinary team
- Bed-to-med program
  - ensure patients has all of their medications
  - understands the medications and the doses
- Home health referral
- Communicate with the Primary Care Physician AND/OR the primary cardiologist
- Management of co-morbid conditions

Outpatient Strategies to Improve HF Care
EARLY FOLLOW UP

- Ideally within 7 – 10 days
- Review medications
  - Clear up confusion about changes made
  - Confirm all prescriptions were filled
- Re-enforce Life-style modifications
  - Sodium restriction
  - Fluid restriction
- Early identification of signs and symptoms
  - Review daily weights
- Continue aggressive titration of GDMT from inpatient stay

“See you in 7” Clinical Trial

- Observation study 10 participating hospital (PH) compared to 82 non-participating hospitals (NPH)
- PH followed a 7-day follow protocol
- Compared:
  - Pre and post intervention readmission rates
  - Unadjusted and risk-standardized 30-day rates
  - Medicare payments
- Pre-intervention time period: May 2011 – April 2012
- Post-intervention time period: May 2012 – April 2013
“See you in 7” Clinical Trial

- Unadjusted HF readmission rates declined in both groups
  29% → 27% (PH) vs 26.4% → 25.8% (NPH)

  - Risk-adjusted HF readmission rates declined more in the PH
    31% → 28.5% (p<0.001) vs 26.7% → 26.1% (p=0.02)

  - Significantly greater reduction in Medicare Payments in the PH
    $451,000 per hospital vs $70,000 per hospital
    $182 per patient vs $63 per patient

  - This benefit was seen with ONLY 30% attendance / participation


Outpatient Strategies to Improve HF Care

- Telemedicine
  - Electronic scale
  - Nursing calls / follow up

- Frequent communication / contact
  - Ensuring all questions are answered
  - Confirming prescriptions are filled

- Identification of high risk patients for frequent follow-up
  - Sometimes every 2-3 weeks for several visits

- Coordinate care between treating physicians (PCP, cardiology, nephrology, endocrinology etc)
Outpatient Strategies to Improve HF Care

- Aggressive titration of GDMT
  - Goal BP -- “walking and talking”
  - BB – target HR < 70 bpm
  - ACEI/ARB/ARNI
  - MRA
  - Hydral/Isordil (if BP allows or intolerant of RAAS blockade)
  - Loop diuretics
    - Can add thiazide diuretics prn

- Outpatient infusion suites
  - Diuretics
  - NOT inotropes

Pulmonary Artery Sensor
CardioMems

Figure 12: (A) Selective left pulmonary angiogram. Dotted white circle shows planned sensor location. Arrows show tapering of the distal pulmonary artery vessels. (B) Dotted white circle shows final position of sensor following release from the delivery catheter.
CHAMPION Trial

Non-randomized controlled trial

Comparing standard heart failure care vs PA sensor guided care

456 patients; Heart Failure with Reduced EF (EF < 40%)

PA sensor guided therapy:

Significant reduction in heart failure readmissions - 28% (p=0.013)

Non-significant reduction in mortality - 32% (p = 0.06)

Shameless Plug
But truly about patient care

Consider referral for evaluation for advanced therapies
- recurrent admission
- unable to tolerate GDMT
- increasing diuretic requirements

Heart Transplant

Mechanical Circulatory Support
LVAD – HeartMate 2 / HeartMate 3
Syncardia Total Artificial Heart

Chronic Inotrope infusions

If we FOCUS on Improving Heart Failure Care
we will ultimately REDUCE Heart Failure Readmission
THANK YOU!

Happy to answer any questions.