Winning the Battle Against Heart Failure Readmissions and Regional Reflections

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• Why is this a problem?
• The cycle of admission-readmission.
• Breaking the cycle:
  - Medications
  - Devices and Remote Monitoring
  - Education
• Regional Reflections
High Hospital readmission rates

Death rates of patients admitted to hospital with Heart Failure

Global HF Awareness program HFA-2014
Courtesy, Hadi Skouri, MD
Clinical Course of HF

Transition to Advanced Heart Failure:
- Oral therapies failing
- A time for many major decisions
- Consider MCS and/or transplantation, if eligible
- Consider inversion of care plan to one dominated by a palliative approach, which may involve formal hospice
Limitations of the Current Model of Care

- Patient
  - Doesn’t recognize early signs and symptoms
  - Symptoms Worsen
  - Private Office
    - Limited time
    - Limited staff
    - Limited diagnostics
    - Limited monitoring
    - Limited intervention
    - Limited pt. Education
  - ER
    - Symptoms Worsen
  - Hospitalization
    - Pressure on LOS shortens time to titrate, test new regimen, or educate
  - Readmission
    - Patient left to self educate
  - Stabilization

Only alternative. ER MD with no patient relationship. Safest route medically and legally is admission.
The highest rate of death & up to 24% of hospital readmissions occur during the first month after discharge

How do we break the cycle?
• HF hospitalization has been acknowledged as an important surrogate of poor outcome for a long time.

• HF hospitalization is an endpoint in all major clinical trials.

• HF hospitalization is reduced by virtually all medications and devices included in practice management guidelines; unfortunately, they don’t improve mortality.

• However, HF hospitalizations are rising!
How do we break the cycle?

Perhaps, we need to customize strategies according to patient backgrounds and clinical profiles!
Recommendation 8.8 (1 of 2)

• It is recommended that HF disease management programs include the following components based on patient characteristics and needs.
  – Comprehensive education and counseling individualized to patient needs
  – Promotion of self care, including self-adjustment of diuretic therapy in appropriate patients (or with family member/caregiver assistance)
  – Emphasis on behavioral strategies to increase adherence

Strength of Evidence = B
Recommendation 8.8 (2of 2)

- **It is recommended** that HF disease management programs include the following components based on patient characteristics and needs.
  - Vigilant follow-up after hospital discharge or after periods of instability
  - Optimization of medical therapy
  - Increased access to providers
  - Early attention to signs and symptoms of fluid overload
  - Assistance with social and financial concerns

*Strength of Evidence = B*
Recommendation 8.9

• It is recommended that HF disease management include integration and coordination of care between the primary care physician and HF care specialists and with other agencies, such as home health and cardiac rehabilitation.

  *Strength of Evidence = C*
Contemporary Evidence about Hospital Strategies for Reducing 30-Day Readmissions: A National Study

Elizabeth H. Bradley; PhD, Leslie Curry, MPH, PhD; Leora I. Horwitz, MD; Heather Sipsma, PhD; Jennifer W. Thompson, MPP; Mary Anne Elma, MPH; Mary Norine Walsh, MD; Harlan M. Krumholz, MD
Results

• Nearly 90% of hospitals agreed or strongly agreed that they had a written objective of reducing preventable readmission for patients with heart failure or AMI.

• More hospitals reported having quality improvement teams to reduce preventable readmissions for patients with heart failure (87%) than for patients with AMI (54%).

• On average, hospitals used 4.8 of 10 key practices; fewer than 3% of hospitals utilized all 10 practices.
Percentage of hospitals implementing 10 key practices

Summary scores indicating the frequency with which hospitals are implementing key practices in quality improvement and performance monitoring, medication management, and discharge and follow-up.

J Am Coll Cardiol 2012;60:607-14
Patients are not adequately managed during hospitalizations. Should they stay longer?
Improvement in LVEF is associated with lower risk of readmission for HF

HR 1.77 (0.95, 3.29) for improved versus no improvement group

Murphy NF et al. Eur J Heart Fail. 2007;9(12):1196-204.
Lower proportion of HFrEF patients on LCZ696 were treated in the emergency department for worsening of HF (discharge without hospitalization)

- CI = confidence interval; HF = heart failure; HR = hazard ratio

**Packer et al. Circulation 2015;131:54–61**
Treatment with LCZ696 resulted in a lower likelihood of multiple hospitalizations for HF

LCZ696 (N=4,187)
Enalapril (N=4,212)

HR 0.79
(95% CI: 0.71–0.89)
p<0.001

29% fewer HFrEF patients were hospitalized more than once for HF with LCZ696 than with enalapril (n=170 and n=240, respectively; p=0.001)

CI=confidence interval; HF=heart failure; HFrEF=heart failure with reduced ejection fraction; HR=hazard ratio

Packer et al. Circulation 2015;131:54–61
Influence of Sacubitril/Valsartan (LCZ696) on 30-Day Readmission After Heart Failure Hospitalization

Akshay S. Desai, MD, MPH, Brian L. Claggett, PhD, Milton Packer, MD, Michael R. Zile, MD, Jean L. Rouleau, MD, Karl Swedberg, MD, Victor Shi, MD, Martin Lefkowitz, MD, Randall Starling, MD, John Teerlink, MD, John J.V. McMurray, MD, Scott D. Solomon, MD, for the PARADIGM-HF Investigators

CENTRAL ILLUSTRATION Influence of LCZ696 on Readmission: Rates After Investigator-Reported HF Hospitalization According to Treatment Assignment

![Bar chart showing the influence of LCZ696 on readmission rates.](image)

- 30-day All-cause Readmission: Enalapril 21.0%, LCZ696 17.8%
- 30-day Heart Failure Readmission: Enalapril 13.4%, LCZ696 9.7%
- 60-day All-cause Readmission: Enalapril 30.5%, LCZ696 27.8%
- 60-day Heart Failure Readmission: Enalapril 20.3%, LCZ696 17.1%
Subcutaneous Furosemide

- Parenteral therapy removes excess fluid and restores oral absorption.
- Furosemide is alkaline with pH around 9.
- Novel formulation of furosemide at physiologic pH
- A fixed dose of 80 mg infused over 5 hrs (30 mg in first hour followed by 12.5 mg/hr for 4 hrs).
- Dose of 80 mg is equivalent to 120 mg IV
- Goal: Preventing readmission, shortening LOS, others.
CardioMEMS Heart Sensor Allows Monitoring of Pressure to Improve Outcomes in NYHA Class III Heart Failure Patients (CHAMPION) Study

Abraham WT et al., Lancet 2011; 377: 658–66
Patients in NYHA class III HF randomized to a wireless implantable hemodynamic monitoring system or to a control group.

Included patients with HFrEF and HFpEF.

Daily measurement of pulmonary artery pressures + standard of care or standard of care alone.

Protocol defined target filling pressure ranges with titration of diuretic and vasodilators.

Primary efficacy endpoint: Heart failure related hospitalizations at 6 months
CHAMPION Study Primary Endpoint: Cumulative HF Hospitalizations by Randomization Assignment

Abraham WT et al., Lancet 2011; 377: 658–66
Total HF medication changes occurring during the 6-month follow-up period were compared between the active monitoring group (PA pressure-guided HF management added to standard of care management of patient clinical signs and symptoms; red bar) and the blind therapy group (HF management including only standard assessment of weights and patient-reported symptoms; blue bar). In addition, medication changes by HF drug class were compared between groups. ACEI = angiotensin-converting enzyme inhibitors; ARB = angiotensin receptor blockers; HF = heart failure; other abbreviations as in Figure 1.
Reducing readmissions in developing countries

The Education Spectrum

- Patients and families
- Healthcare providers
- Policy makers
- The general public

Outreach

Multidisciplinary Disease Management Programs

Establishment and functionality

HF Readmissions

Quality measures
### Patient Information

**Patient Name:**

**Date of Birth:**

**Doc.**  |  **Male**  |  **Female**

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### Patient Instructions

Nursing heart failure can present as increased shortness of breath, edema, leg swelling, and salt and weight gain.

1. Please weigh yourself daily and record your weight every day.
2. Ensure your weight remains consistent at least 2 lb.
3. Limit salt intake to 2 tsp (10 g) per day.
4. Keep active. Walking is a great form of exercise.
5. Take note of your medication list and review it regularly with your healthcare provider.

Please call 0006 5000 (2222).

### Today's Instructions

**Name:**

**Date:**

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<table>
<thead>
<tr>
<th>Task</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discontinue the following medications:</td>
<td></td>
</tr>
<tr>
<td>Change the dose of the following medications:</td>
<td></td>
</tr>
<tr>
<td>Investigations requested and date:</td>
<td></td>
</tr>
<tr>
<td>Follow-up appointment:</td>
<td></td>
</tr>
</tbody>
</table>
HEART FAILURE

CAUSES AND RISK FACTORS

DIAGNOSIS

1. PHYSICAL ASSESSMENT
   The following factors, along with medical history, heart failure symptoms:
   - Shortness of breath.
   - Increased heart rate.
   - Edema in the legs.
   - Difficulty breathing.
   - Palpitations or heart palpitations.
   - Swelling in the abdomen.

2. BLOOD TESTS
   Blood tests may include kidney function tests, electrolyte levels, and liver function tests.

3. ELECTROCARDIOGRAM (ECG or EKG)
   An ECG records the electrical activity of the heart.

4. ECHOCARDIOGRAM (ECHOCARDIOGRAPHY or ECHO)
   An echocardiogram uses sound waves to examine the heart.

5. Cardiac catheterization
   This procedure involves inserting a tube into an artery in the leg or arm and guiding it to the heart.

6. CATHETERIZATION
   Cardiac catheterization is a procedure that uses a thin tube to examine the heart and its blood vessels.

7. CARDIOPULMONARY RESUSCITATION (CPR)
   Cardiopulmonary resuscitation (CPR) is a technique used to maintain vital signs in the absence of a heartbeat or abnormal breathing.

MANAGEMENT OF HEART FAILURE

HOW IS HEART FAILURE TREATED?

The goal of treatment is to help you feel better and live longer. Treatment may include the following:

- Medications to control your blood pressure and reduce the workload on your heart.
- Devices to help your heart pump more efficiently.
- Lifestyle changes to improve your overall health.
- Hospitalization for heart failure.
- Implantable cardioverter-defibrillators (ICDs) to prevent life-threatening arrhythmias.
- Cardiac resynchronization therapy (CRT) if you have heart failure.

COMMON MEDICATIONS USED TO TREAT HEART FAILURE

- ACE inhibitors
- Beta-blockers
- Diuretics
- Angiotensin receptor blockers (ARBs)
- Aldosterone antagonists
- Digoxin
- Statins

LOW SODIUM DIET

- Avoid salty foods like bacon, ham, and processed meats.
- Use herbs, spices, and seasonings to add flavor to your food.
- Read labels carefully to avoid hidden sources of salt.
- Drink water instead of salty soups or broths.
Most patients are willing to take the advice, and follow it, simply because it’s rare!
**MY FLUID DIARY**

مذكرة تسجيل السوائل

<table>
<thead>
<tr>
<th>TIME (الوقت)</th>
<th>FLUID INTAKE (السوائل المتناولة)</th>
<th>MEASURED URINE OUTPUT (قياس كمية البول)</th>
<th>REMARKS (ملاحظات)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:00 MN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1:00 AM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2:00 AM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:00 AM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4:00 AM</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Today, you are just expected to consume _________ milliliters (ml) of fluids.

اليوم، يتوقع فقط أن تستهلك _________ ملليлитر (مل) من السوائل.
- 26% did not know how much salt HF patients can have.
- 24% thought that bed rest is the best advice on physical activity.

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shortness of breath</td>
<td>129 (98)</td>
</tr>
<tr>
<td>Light headedness</td>
<td>27 (21)</td>
</tr>
<tr>
<td>Leg swelling</td>
<td>115 (88)</td>
</tr>
<tr>
<td>Abdominal Swelling</td>
<td>61 (47)</td>
</tr>
<tr>
<td>Weight gain</td>
<td>112 (85)</td>
</tr>
<tr>
<td>Weakness, fatigue</td>
<td>116 (89)</td>
</tr>
<tr>
<td>Chest pain</td>
<td>71 (54)</td>
</tr>
<tr>
<td>Poor appetite</td>
<td>51 (39)</td>
</tr>
<tr>
<td>Poor sleep</td>
<td>82 (63)</td>
</tr>
<tr>
<td>Inability to lie flat</td>
<td>119 (91)</td>
</tr>
<tr>
<td>Question</td>
<td>Choices</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>----------------------------------------------</td>
</tr>
<tr>
<td>How much salt should you approximately take per day?</td>
<td>2 grams or less</td>
</tr>
<tr>
<td></td>
<td>5 grams</td>
</tr>
<tr>
<td></td>
<td>Any amount of salt</td>
</tr>
<tr>
<td></td>
<td>Don’t Know</td>
</tr>
<tr>
<td>How many liters of fluid you can consume per day?</td>
<td>Up to 2 Liters or 2000ml</td>
</tr>
<tr>
<td></td>
<td>2to 3 Liters (2000-3000ml)</td>
</tr>
<tr>
<td></td>
<td>More than 3 Liters(3000ml)</td>
</tr>
<tr>
<td></td>
<td>Don’t Know</td>
</tr>
<tr>
<td>How often do you check your weight?</td>
<td>Every day early morning after passing urine and before breakfast</td>
</tr>
<tr>
<td></td>
<td>Several times per week</td>
</tr>
<tr>
<td></td>
<td>Once every week</td>
</tr>
<tr>
<td></td>
<td>Whenever they find weighing scale</td>
</tr>
<tr>
<td></td>
<td>Never</td>
</tr>
<tr>
<td>If your weight increases by 2 Kg or more over 2 days, what should you do?</td>
<td>Take extra water pill</td>
</tr>
<tr>
<td></td>
<td>Call the heart failure nurse within 24 hours</td>
</tr>
<tr>
<td></td>
<td>Wait until the next visit to tell the doctor</td>
</tr>
<tr>
<td></td>
<td>Don’t Know</td>
</tr>
<tr>
<td>Do you know who to contact if your heart failure symptoms (e.g. shortness of breath, weight gain, chest pain, palpitations) worsen?</td>
<td>Physician</td>
</tr>
<tr>
<td></td>
<td>Nurse</td>
</tr>
<tr>
<td></td>
<td>Dietician</td>
</tr>
<tr>
<td></td>
<td>I don't know</td>
</tr>
</tbody>
</table>
Technology vs. self-care behaviors

Value of Contribution

Academic/ Socioeconomic Background

- Basic Education
- Technology
Summary

• HF hospitalizations remain high and represent a significant burden on healthcare systems worldwide.

• Most medications and devices improve hospitalization rates individually, but overall rates do not reflect that.

• Measures to prevent HF readmissions should be tailored to patients’ backgrounds and level of education.

• Markers of readmissions may need to be broadened in light of current epidemiology (ER visits?, urgent clinic visits?, days at home instead of days at the hospital?)
Thank you