Re-Admit It! Transitions of Care for Heart Failure

PPA Annual Conference October 2018
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Cardiology Pharmacist

SOCRATIVE ROOM CODE: SOC-36515031
Disclosures:

I have no financial interests or conflicts related to the content of this activity.
Objectives

• Discuss current published literature on the topics of risk factors and interventions for heart failure readmission.
• Review current trends in heart failure prescribing and issues related to medication adherence.
• Identify challenges for heart failure transitions of care and opportunities for further studies.
Background

Adapted from: Arrigo, M. *EHJ Supplements*. Nov 2016
Background

- 500,000 new cases of HF diagnosed annually in America
- Estimated 5.7 million patients living with HF in America
- Most common cause of admission in patients > 65 years of age
- Estimated 20% readmission rate at 30 days, 33% at 60 days, and 40% at 90 days.
- Heart failure costs exceeds $30.7 billion annually
  - One estimates place the annual cost at $39.2 billion
  - Estimated Medicare cost of readmissions alone exceeded $1.7 billion in 2014
Background

- Centers for Medicare & Medicaid 30-Day Readmission Core Measure
- Joint Commission “Advanced Heart Failure” certification in Collaboration with AHA
  - 3 out of 6 mandatory measures relate to TOC:
    - ACHF-02 = Post-Discharge Appointment for Heart Failure
    - ACHF-03 = Care Transition Record Transmitted
    - ACHF-06 = Post-Discharge Evaluation for Heart Failure Patients
    - Requires outpatient heart failure clinic OR collaboration with cardiology practice
What are some preventable causes of readmission in heart failure?
Patient Reported Readmission Factors:

- Distressing symptoms
- Unavoidable progression
- Psychological/social factors
- Self-Care/adherence factors
- Health system factors

❖ Significant heterogeneity in patient reported factors and no single identifiable factor.
Patient Quotes from Retrum et. al study:

- Patient: “I have a problem getting to the pharmacy and paying...am not working, without money, you can’t buy medication.”
- Patient: “Yeah, I was meeting goals for the most part but did go over a few times. I’m not going to lie.”
- Patient: “When I left I thought I was ok, but doc said that in retrospect she should have kept me a few more days.”
Identifying Patients

❖ Risk stratification allows for targeted intervention
  ➢ Finite resources, finite FTEs

Prioritize Patients

Expand Pharmacy Services and Extenders

Align with core measures and enterprise goals
LACE and LACE+ Score

Yale CORE Risk Score

CCF Internal Score
<table>
<thead>
<tr>
<th><strong>LACE+ Score</strong></th>
<th><strong>Yale Risk Score</strong></th>
<th><strong>CCF Internal Scoring</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Age</td>
<td>• Age</td>
<td>• Hemoglobin</td>
</tr>
<tr>
<td>• Gender</td>
<td>• Gender</td>
<td>• Calcium on admission</td>
</tr>
<tr>
<td>• Teaching Status of Hospital</td>
<td>• In-hospital cardiac arrest</td>
<td>• Hx of Drug Abuse</td>
</tr>
<tr>
<td>• Length of Stay</td>
<td>• Diabetes</td>
<td>• active anticoagulant order</td>
</tr>
<tr>
<td>• Acuity of admission</td>
<td>• Heart Failure</td>
<td>• Sodium</td>
</tr>
<tr>
<td>• Previous MI</td>
<td>• CAD</td>
<td>• Insurance</td>
</tr>
<tr>
<td>• CVA</td>
<td>• Prior PCI</td>
<td>• CKD</td>
</tr>
<tr>
<td>• PVD</td>
<td>• Aortic Stenosis</td>
<td>• # of ED Visits (6 months)</td>
</tr>
<tr>
<td>• DM</td>
<td>• COPD</td>
<td>• COPD</td>
</tr>
<tr>
<td>• CHF</td>
<td>• Dementia</td>
<td>• Observation Patient</td>
</tr>
<tr>
<td>• Pulmonary disease</td>
<td>• SBP</td>
<td>• Anemia</td>
</tr>
<tr>
<td>• Liver or renal impairment</td>
<td>• HR</td>
<td>• BUN</td>
</tr>
<tr>
<td>• Any tumor</td>
<td>• RR</td>
<td>• Albumin</td>
</tr>
<tr>
<td>• Dementia</td>
<td>• Sodium</td>
<td>• Health Literacy Barriers</td>
</tr>
<tr>
<td>• Connective tissue disease</td>
<td>• LVEF</td>
<td>• Discharge Disposition</td>
</tr>
<tr>
<td>• AIDS</td>
<td></td>
<td>• # of Active Medications</td>
</tr>
<tr>
<td>• Metastatic solid tumor</td>
<td></td>
<td>• # of Previous Admits (12 months)</td>
</tr>
<tr>
<td>• ED Visits (6 months)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• # of Urgent Admission (1 year)</td>
<td></td>
<td></td>
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<tr>
<td>• # of Elective Admissions (1 year)</td>
<td></td>
<td></td>
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<tr>
<td>• Alternative Level of Care Days</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variable</td>
<td>HR (95% CI)</td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>---------------</td>
<td></td>
</tr>
<tr>
<td>BUN at baseline, per 1 mg/dL increase to 50</td>
<td>1.02 (1.01, 1.04)</td>
<td></td>
</tr>
<tr>
<td>ACEI/ARB (reference = neither at randomization nor discharge/day 7)</td>
<td>0.56 (0.42, 0.75)</td>
<td></td>
</tr>
<tr>
<td>Sodium at baseline, per 1 mEq/L increase</td>
<td>0.95 (0.92, 0.98)</td>
<td></td>
</tr>
<tr>
<td>White race</td>
<td>0.65 (0.49, 0.86)</td>
<td></td>
</tr>
<tr>
<td>Bicarbonate at baseline, per 1mEq/L increase</td>
<td>1.04 (1.01, 1.07)</td>
<td></td>
</tr>
<tr>
<td>SBP at discharge/day 7, per 10 mmHg increase</td>
<td>0.93 (0.86, 0.99)</td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>1.33 (1.02, 1.75)</td>
<td></td>
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<tr>
<td>Length of stay, per 1 day increase</td>
<td>1.06 (1.01, 1.11)</td>
<td></td>
</tr>
<tr>
<td>Male sex</td>
<td>0.74 (0.57, 0.98)</td>
<td></td>
</tr>
</tbody>
</table>
### Cardiovascular Readmission vs. Death

<table>
<thead>
<tr>
<th>Variable</th>
<th>HR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUN at baseline, per 1 mg/dL increase to 50</td>
<td>1.03 (1.01, 1.04)</td>
</tr>
<tr>
<td>ACEI/ARB (reference = neither at randomization nor discharge/day 7)</td>
<td>0.66 (0.47, 0.92)</td>
</tr>
<tr>
<td>Sodium at baseline, per 1 mEq/L increase</td>
<td>0.96 (0.93, 0.99)</td>
</tr>
<tr>
<td>White race</td>
<td>0.67 (0.49, 0.93)</td>
</tr>
<tr>
<td>Bicarbonate at baseline, per 1 mEq/L increase</td>
<td>1.04 (1.01, 1.07)</td>
</tr>
<tr>
<td>SBP at discharge/day 7, per 10 mmHg increase</td>
<td>0.88 (0.81, 0.95)</td>
</tr>
<tr>
<td>Depression</td>
<td>1.43 (1.04, 1.96)</td>
</tr>
<tr>
<td>Length of stay, per 1 day increase</td>
<td>1.08 (1.02, 1.14)</td>
</tr>
<tr>
<td>Male sex</td>
<td>0.74 (0.57, 0.98)</td>
</tr>
<tr>
<td>Potassium at baseline, per 0.1 mEq/L increase to 3.7</td>
<td>0.93 (0.87, 0.99)</td>
</tr>
<tr>
<td>Hospitalization for heart failure in last year</td>
<td>1.48 (1.04, 2.11)</td>
</tr>
</tbody>
</table>

LACE+ Risk Score

<table>
<thead>
<tr>
<th>LACE+ Risk Score</th>
<th>Score Stratification</th>
</tr>
</thead>
<tbody>
<tr>
<td>79-90</td>
<td>Highest Risk</td>
</tr>
<tr>
<td>59-78</td>
<td>High Risk</td>
</tr>
<tr>
<td>29-58</td>
<td>Moderate Risk</td>
</tr>
<tr>
<td>0-28</td>
<td>Minimal Risk</td>
</tr>
</tbody>
</table>


Figure 3
Distribution and calibration of the LACE+ index by 10-point strata. The bars present the number of people in the validation cohort (left vertical axis) with each CMG score (horizontal axis). The red line presents the expected risk of 30-day death or urgent readmission (right vertical axis). The black line presents the observed event rate (right vertical axis) with 95% confidence intervals calculated using exact methods. The star symbols indicate CMG strata where the expected rate excludes the 95% confidence interval of the observed rate.
Yale CORE Risk Score

- Scored from 0-100% based on multiple variables

Adapted from: Keenan, P.  *Circulation: CV Quality and Outcomes*. 2008;1:29-37

Figure 3. Observed 30-day readmission rate within predicted deciles, by patient age, sex, race, and non-rural/rural hospital.
CCF Internal Score

- Based on data from large clinical trials
- Integrated into EHR to calculate in real time
- Individualize thresholds
- No correlation with medication history discrepancies
- Prospectively evaluating…
  - stay tuned!
What are perceived barriers to expanding transitions of care services in your organization?
<table>
<thead>
<tr>
<th>Medication Reconciliation</th>
<th>Patient Counseling</th>
<th>Post Discharge Follow-up</th>
<th>Barriers</th>
<th>Barrier Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inpatient RPh</td>
<td>In person</td>
<td>No</td>
<td></td>
<td>Met with nurse managers and charge nurses on each floor to advertise and address any concern.</td>
</tr>
<tr>
<td>Med to Bed RPh and Provider</td>
<td>In person</td>
<td>No</td>
<td>Payment at the bedside, technician ability to enroll patients, timing of provider sending scripts and allowing appropriate time frame for prep and delivery.</td>
<td>Communicate and educate providers on e-prescribing as early as possible, portable credit card capture device, working with IT to allow technicians the ability to enroll patient and enter consult order.</td>
</tr>
<tr>
<td>Med to Bed RPh and Inpatient RPh</td>
<td>Remote</td>
<td>Not at this time (Day 28)</td>
<td>Getting the prescriptions sent to our pharmacy</td>
<td>We have started calling the floors in the morning to remind the charge nurse that a patient has selected Meds-to-beds. We have also set our pharmacy in the primary position for a physician to pick when writing orders.</td>
</tr>
<tr>
<td>Med to Bed RPh and Inpatient RPh</td>
<td>In person; Remote</td>
<td>No</td>
<td>Working on the follow-up phone call piece to program and expanding technician coverage to better troubleshoot issues</td>
<td>Pending solutions and FTE requests.</td>
</tr>
<tr>
<td>Inpatient RPh</td>
<td>In person; Remote</td>
<td>No</td>
<td>Staff perceptions, politics, logistics of filling/delivering/counseling, how to incorporate new work into already busy day, coordination of correct stakeholders</td>
<td>Town hall meetings with front line staff, daily huddles when new units went live, implementation of support shifts to assist IP pharmacists when they had other patient care needs to address.</td>
</tr>
<tr>
<td>Inpatient Pharmacist and Med to Bed Pharmacist; Other: Not implanted on all floors yet</td>
<td>In person</td>
<td>No</td>
<td>Staffing level (can’t service all patients)</td>
<td>Prioritizing the patients based on the LaCe+ score.</td>
</tr>
</tbody>
</table>
Interventions

Identify High Risk Patient
Admission medication reconciliation
Medication Education
Discharge Interventions
Discharge follow-up

Bedside Delivery
Clinical Pharmacy Services in Heart Failure: An Opinion Paper from the Heart Failure Society of America and American College of Clinical Pharmacy Cardiology Practice and Research Network

Sherry K. Milfred-LaForest, Sheryl L. Chow, Robert J. DiDomenico, Kathleen Dracup, Christopher R. Ensor, Wendy Gattis-Stough, J. Thomas Heywood, JoAnn Lindenfeld, Robert L. Page, II, J. Herbert Patterson, Orly Vardeny, and Barry M. Massie

Heart failure (HF) care takes place in multiple settings, with a variety of providers, and generally involves patients who have multiple comorbidities. This situation is a “perfect storm” of factors that predispose patients to medication errors. The goals of this paper are to outline potential roles for clinical pharmacists in a multidisciplinary HF team, to document outcomes associated with interventions by clinical pharmacists, to recommend minimum training for clinical pharmacists engaged in HF care, and to suggest financial strategies to support clinical pharmacy services within a multidisci-
Admission and Hospitalization
## Table 4: Discrepancy/prescription error

<table>
<thead>
<tr>
<th></th>
<th>Intervention</th>
<th>Control</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of patients <em>with</em> a discrepancy/prescription error</td>
<td>16</td>
<td>30</td>
<td>46</td>
</tr>
<tr>
<td>Number of patients <em>without</em> a discrepancy/prescription error</td>
<td>25</td>
<td>14</td>
<td>39</td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
<td>44</td>
<td>85</td>
</tr>
<tr>
<td>Relative risk (95% CI)</td>
<td>0.57 (0.37–0.88)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of medications <em>with</em> a discrepancy/prescription error</td>
<td>25</td>
<td>62</td>
<td>87</td>
</tr>
<tr>
<td>Number of medications <em>without</em> a discrepancy/prescription error</td>
<td>382</td>
<td>363</td>
<td>745</td>
</tr>
<tr>
<td>Total</td>
<td>407</td>
<td>425</td>
<td>832</td>
</tr>
<tr>
<td>Relative risk (95% CI)</td>
<td>0.42 (0.27–0.66)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Egink, RN. *Pharm World Sci.* 2010 Dec;32(6): 759-66
## Reconciliation

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hvi Card Intervention</td>
<td>—</td>
<td>—</td>
<td>Yes</td>
<td>2d 16h</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Hvi Cts Team A</td>
<td>High</td>
<td>—</td>
<td>Partially</td>
<td>38d 20h</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Hvi Imaging</td>
<td>—</td>
<td>—</td>
<td>Yes</td>
<td>3d 11h</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Hvi Cts Heart Failure Hvi Heart...</td>
<td>—</td>
<td>—</td>
<td>Partially</td>
<td>37d 5h</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Hvi Electrophysil...</td>
<td>—</td>
<td>—</td>
<td>Partially</td>
<td>42d 7h</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Hvi Imaging</td>
<td>—</td>
<td>—</td>
<td>Partially</td>
<td>9d 1h</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Hvi Heart Failure A</td>
<td>High</td>
<td>—</td>
<td>Yes</td>
<td>33d 2h</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Hvi Cts Team B Edward G...</td>
<td>—</td>
<td>—</td>
<td>Yes</td>
<td>23d 1h</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Hvi Cts Team A</td>
<td>—</td>
<td>—</td>
<td>Partially</td>
<td>6d 6h</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

**ULK CHARGE/OVER RIDE**: 2
**IV to PO**: 10
**MAR**: 2
**Heart Failure**: 1
**RX Antimicrobial Stewardship**: 2
**Transitions of Care**: 2
**Vancocin Consult**: 2
Adherence Issues

- Adherence interventions reduce risk of mortality and decrease odds of readmission
  - 50/57 studies utilized medication education
  - 48/57 studies utilized disease state education
  - Comprehensive risk of bias analysis

Ruppar, T. JAHA. 2016;5:e002606
Adherence Issues

- Continuous pharmacist intervention can positively impact adherence, lower emergency department visits and admissions, and lower annual direct healthcare costs.
  - Effect dissipated after intervention withdrawn
Education

- 2013 ACCP Cardiology Network Best Practices Model
  - Principles of discharge counseling
  - Medication specific education
    - Published prior to introduction of valsartan/sacubitril or ivabradine
    - Self-care techniques
- Multidisciplinary approach with written and verbal education
Heart Failure Education Provided:

Brief overview of heart failure and non-pharmacologic therapy options.

Medication Education Provided:
1. Reason for taking medications and treatment goals.
2. Benefits of medication therapy.
3. How medications work.
5. When to take medications and what to do if a dose is missed.
6. Drug interactions (Rx, OTC, herbal) and importance of notifying healthcare provider with any medication changes.
7. Potential duration of therapy.
8. Potential side effects of medications.
9. Use of birth control measures if applicable.
10. Importance of regularly filling prescriptions and taking medications.
11. Proper storage of medications.

Patient was given opportunity to ask questions and receive answers.

Current Inpatient Medications:

<table>
<thead>
<tr>
<th>Current hospital medications:</th>
<th>200 mg</th>
<th>INTRAVENOUS</th>
<th>ONCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ofsplatin (200 mg in NaCl 0.9% 1,150 mL PLATINOL)</td>
<td>200 mg</td>
<td>INTRAVENOUS</td>
<td>ONCE</td>
</tr>
<tr>
<td>PHARMACY COMMUNICATION</td>
<td>1 Each</td>
<td>OTHER</td>
<td>PRN</td>
</tr>
<tr>
<td>PATIENT ASSISTANCE/WHITE BAG SUPPLIED DRUG</td>
<td>1 Each</td>
<td>OTHER</td>
<td>PRN</td>
</tr>
<tr>
<td>MIXTURE FEE - PHARMACY</td>
<td>1 Each</td>
<td>NOT APPLICABLE</td>
<td>PRN</td>
</tr>
<tr>
<td>NaCl 0.9% iv infusion</td>
<td>500-999 mL/hr</td>
<td>INTRAVENOUS</td>
<td>PRN</td>
</tr>
<tr>
<td>acetylcysteine 7.480 mg in D5W 350 mL</td>
<td>100</td>
<td>INTRAVENOUS</td>
<td>CONTINUOUS</td>
</tr>
</tbody>
</table>

READINESS TO LEARN

COGNITIVE ABILITY: [PATIENT EDUCATION: COGNITIVE ABILITY: 5002]

MOTIVATION TO LEARN: [PTED MOTIVATION TO LEARN: 5000]

FAMILY SUPPORT: [PTED FAMILY/SIGNIFICANT OTHER SUPPORT: 5001]

INSTRUCTION PROVIDED TO: [INSTRUCTION PROVIDED TO: 5010]

PATIENT LEARNS BEST BY: [PTED LEARNS BEST: 9569]

FACTORS AFFECTING LEARNING: [PTED INFLUENCING FACTORS: 5574]

PHYSICAL LIMITATIONS AFFECTING LEARNING: [PTED PHYSICAL LIMITATIONS: 5575]
Discharge and Follow Up
Bedside Delivery

- Identifies issues (prior auth, drug interactions, etc) prior to DC
- Strengthens TOC programs
- Expands services of pharmacy extenders
- Improves HCAHP scores
- Delayed medication filling >48 hrs might be associated with heart failure readmission
  - Data lacking on intervention impact

Kovacik, A. JAPhA. 2018; 58(4)S41-S45
Bedside Delivery

- University of Kentucky 2016
  - 40,000 patient encounters captured
  - ¼ patients enrolled in M2B
  - 50% reduction in readmissions
  - ScriptPro review suggests economic benefit of M2B for UK
  - Changed from “opt-in” to “opt-out” based on these data

Adapted from: Pharmacy Practice News. Nov 2017
### Discharge Checklist

- Increased ACE/ARB use
- Increased uptitration
- Reduced 30 day and 6 month readmission rate

**MEDICATIONS prescribed?**

<table>
<thead>
<tr>
<th>Prescribed?</th>
<th>Yes</th>
<th>No</th>
<th>Dose Modified</th>
<th>Reason if not prescribed/titrated up or COMMENTS</th>
<th>Initials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blocker</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>ACE Inhibitor (ACE-I)</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>ARB (ACE 2) (intolerant or in addition)</td>
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<tr>
<td>Diuretics</td>
<td></td>
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<tr>
<td>Digoxin (Arrhythmia or refractory symptoms)</td>
<td></td>
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<tr>
<td>Aldosterone Antagonist</td>
<td></td>
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<tr>
<td>Nitrates (as needed or definitive or both)</td>
<td></td>
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<tr>
<td>Warfarin (if yes last INR in comments)</td>
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<tr>
<td>Aspirin</td>
<td></td>
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<tr>
<td>Lipid lowering agents</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Other (eg. Hydralazine)</td>
<td></td>
<td></td>
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</tbody>
</table>

**INTERVENTIONS And COUNSELING measures addressed?**

<table>
<thead>
<tr>
<th>Addressed?</th>
<th>Yes</th>
<th>No</th>
<th>COMMENTS</th>
<th>Initials</th>
</tr>
</thead>
<tbody>
<tr>
<td>General risk modification education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment and adherence education</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Heart Failure Monitoring (including low salt diet fluid restriction if needed, daily weight, activity)</td>
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<tr>
<td>Blood pressure control</td>
<td></td>
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</tr>
<tr>
<td>Smoking Cessation Counseling</td>
<td></td>
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<tr>
<td>Dyslipidemia control</td>
<td></td>
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<tr>
<td>Diabetes control</td>
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<tr>
<td>Dietitian/nutritionist interview</td>
<td></td>
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<tr>
<td>Cardiac rehabilitation interview and enrollment</td>
<td></td>
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</tr>
</tbody>
</table>

**FOLLOW-UP services scheduled?**

<table>
<thead>
<tr>
<th>Scheduled?</th>
<th>Yes</th>
<th>No</th>
<th>COMMENTS</th>
<th>Initials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiologist follow-up</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary care follow-up</td>
<td></td>
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<tr>
<td>Cardiac rehabilitation</td>
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<tr>
<td>Anticoagulation service follow-up</td>
<td></td>
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<tr>
<td>Visiting Nurse/Home Care if needed</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Patient record release form signed if needed</td>
<td></td>
<td></td>
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<tr>
<td>Other (eg. Electro-Physiology follow up)</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**M.D./P.A./N.P. Signature** ___________ **Date:** _______ **Time:** _______
**Congestive Heart Failure Discharge Checklist**

**Patient Info**
- **Patient Name:** [Redacted]
- **Nursing Patient Education %:** [Redacted]

**Nursing Nutrition Assessment**
- **Heart Failure:** Done

**Nutrition Consult Screening**
- **Most Recent Value Education for a Therapeutic Diet [heart failure]**

**Nutrition Consult Order**
- **04/26/14 1505**
  - **NUTRITION CONSULT [864174642] ONCE**
  - **Comments:** Heart failure
  - **Question:** Consult Type Answer: DIET EDUCATION
- **04/24/14 1301**
  - **NUTRITION CONSULT [853225902] ONCE**
  - **Question:** Consult Type Answer: ASSESSMENT

**Nutrition Education Note Completed?**
- Signed

**Pharmacy Consult Order**
- **04/26/14 1615**
  - **PHARMACY HEART FAILURE EDUCATION [864174742] ONCE**

**Pharmacy Education Note Completed?**
- [Redacted]

**Heart Failure D/C Checklist Form - Provider**
- **Recent optimal pharmacologic therapy initiated or achieved and any intolerances documented?**
  - *** MISSING REQUIRED FIELD ***
- **No symptomatic change or standing hypotension (Orthostatic ECGs require order)?**
  - *** MISSING REQUIRED FIELD ***
- **Vital Signs established and patient/caregiver informed of this goal?**
  - *** MISSING REQUIRED FIELD ***
- **Recent optimal volume status achieved?**
  - *** MISSING REQUIRED FIELD ***
- **Stable renal function and acceptable electrolyte panel?**
  - *** MISSING REQUIRED FIELD ***
- **Patient to have Follow Up Appointment with?**
  - *** MISSING REQUIRED FIELD ***

**Heart Failure D/C Checklist Form - Care Coordination**
- **Post Discharge Arrangements Finalized?**
  - [Redacted]

**Med Reconciliation Status**
- **Med Rec complete:** No

**Quality Metrics**
- **ACE ARB?**
  - [Redacted]
- **ASA Extended?**
  - [Redacted]
- **ASA Within 24 hours?**
  - Yes
- **Beta Blocker Extended?**
  - [Redacted]
- **Statin Extended?**
  - [Redacted]

**Discharge Follow up Order**
- **04/09/14 1000**
  - **FOLLOW UP APPOINTMENT - HM [86727313] ONCE**
  - **Comments:** Please cancel appts with EKG, ...
- **04/18/14 1515**
  - **FOLLOW UP APPOINTMENT - HM [86174014] ONCE**
  - **Status:** Cancelled
# Congestive Heart Failure Discharge Checklist

## Patient Info
- **Discharge Date:** [__]__
- **Discharge Location:** [__]

## Nursing Patient Education
- **Heart Failure:** [__]

## Nursing Nutrition Assessment
- **Nutrition Consult Screening:** [__]
- **Education for a Therapeutic Diet:** [__]

## Nutrition Consult Order
- **05/06/14 1402**
  - **NUTRITION CONSULT [666404401] ONCE**
  - **Question:** Consult Type Answer: DIET EDUCATION

- **05/06/14 1403**
  - **NUTRITION CONSULT [666404571] ONCE**
  - **Question:** Consult Type Answer: ASSESSMENT

- **06/02/14 1549**
  - **NUTRITION CONSULT [666862097] ONCE**
  - **Comments:** HF education
  - **Question:** Consult Type Answer: DIET EDUCATION

## Nutrition Education Note Completed?
- **Signed:** [__]

## Pharmacy Consult Order
- **05/07/14 0830**
  - **PHARMACY HEART FAILURE EDUCATION [666596182] ONCE**

## Pharmacy Education Note Completed?
- **Signed:** [__]

## Heart Failure D/C Checklist Form - Provider
- **Near optimal pharmacologic therapy initiated or achieved and any intolerances documented?** Yes
- **No symptomatic spine or standing hypotension (Orthostatic BPs require order)?** Yes
- **Dry Weight established and patient/caregiver informed of this goal?** Yes
- **Near optimal volume status achieved?** Yes
- **Stable renal function and acceptable electrolyte panel?** Yes
- **Patient to have Follow Up Appointment with?** COHS Physician

## Heart Failure D/C Checklist Form - Care Coordination
- **Post Discharge Arrangements Finalized?** SNF

## Med Reconciliation Status
- **Med Rec complete:** [__]

## Quality Metrics
- **ACE ARB:** [__]
- **ASA Extended?** [__]
- **ASA Within 24 hours?** [__]
- **Beta Blocker Extended?** [__]
- **Statin Extended?** [__]

## Discharge Follow up Order
- **Cardiologist Order Only**
  - *as needed* [__]
Follow Up

- **Telephone Intervention**
  - Impact on all-cause readmission rate greatest ≤ 7 days from discharge.
    - Apprx 23% reduction
    - 8-30 days after discharge favorable to trend but not statistically significant.
  - Intervention has greater impact earlier in post-discharge period
  - Reduced ER visits but increased physician office visits
  - Cost-savings
Follow Up

- Cochrane Review of telemonitoring and structured telephone intervention.
  - Telemonitoring impacted mortality, telephone favored but nonsignificant.
  - Reduction in CHF hospitalization
    - (RR 0.77; 95% CI 0.68-0.87)
  - Six trials identified improvements in QoL metrics (adherence, NYHA functional class, self-care, etc)
  - Conclusion: may reduce CHF hospitalization by one-fifth, all-cause hospitalization by 8-9%

Inglis, SC. Cochrane Database. 2010; Aug 4(8):CD00728
Follow Up

• Telephone Intervention
  - Pharmacist Evidence:
    • Trend towards odds of reduced readmission for non-physician providers (OR 0.85, 95 CI 0.69-1.06)
    • Wide CI reflects lower study population receiving this intervention
  - Pharmacist call within 72 hours improves HCAHPs for medication and discharge preparation domains

Lee, K. *Med Care.* 2016: 54(4) 365-372
• Office Visits
  - Multidisciplinary approach:
    • Evaluated 90-day readmission for 6 clinic visits after discharge
    • 7.6% clinic readmissions versus 23.3% control group (aHR 0.17; 95% CI 0.07-0.41)
    • ARR=15.7%
    • NNT=7
Table 2. Overview of HF-Post-Discharge Management Program Schedule.\textsuperscript{a}

<table>
<thead>
<tr>
<th>Week</th>
<th>Visit Number</th>
<th>Duration of Visit</th>
<th>Purpose of Visit</th>
<th>Intended Provider\textsuperscript{b}</th>
</tr>
</thead>
</table>
| 0    | 1            | 60 minutes        | • Initial consultation  
• Determination of HF etiology/precipitating factors  
• Order tests to identify etiology  
• Initial patient education/counseling  
• Adjustment of diuretics as needed  
• Medication titration of ACEI and BB, as suitable  
• Referral to telehealth as needed | Physician assistant |
| 2    | 2            | 30 minutes        | • Evaluation of HF labs (ordered at visit no. 1)  
• Adjustment of diuretics  
• Medication titration of ACEI and BB, as suitable  
• Add additional therapy (eg, spironolactone) as suitable  
• Patient medication education | Clinical pharmacist specialist |
| 2    | 3            | 30 minutes        | • Focused patient education on lifestyle/dietary modification and counseling for medication adherence | Case manager |
| 4-6  | 4\textsuperscript{c}  | 30 minutes        | • Medication titration, additional therapy, and diuretic adjustment, as suitable  
• Patient medication education | Clinical pharmacist specialist |
| 8-12 | 5            | 30 minutes        | • Final patient assessment and consultation  
• Medication titration, as suitable | Physician assistant |
| 8-12 | 6            | 30 minutes        | • Referral for follow-up of echocardiogram and ICD referral based on echocardiogram results  
• Follow-up patient education on lifestyle modification and medications  
• Disposition of patient/referral to other clinics  
• Order echocardiogram to follow-up LV function and potential referral for ICD by primary provider | Case manager |

Abbreviations: ACEI, angiotensin-converting enzyme inhibitor; BB, \( \beta \)-blocker; HF, heart failure; LV, left ventricular.

\textsuperscript{a}Patients' visit no. 1 appointment is to be scheduled 1 to 2 weeks post-HF hospital discharge.

\textsuperscript{b}The cardiology fellow and the cardiology nurse practitioners may assist with providing care to these patients in the absence of these primary providers. All visits are overseen by attending cardiologist with expertise in heart failure.

\textsuperscript{c}An additional 1 to 2 medication titration visits scheduled every 2 to 4 weeks apart may be required for some patients.
<table>
<thead>
<tr>
<th>PILL-CVD Study Group</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2012 trial: clinically important medication errors</strong></td>
</tr>
<tr>
<td>- Intervention didn’t alter significant med errors or ADEs</td>
</tr>
<tr>
<td>- Trend favored fewer potential ADEs (IRR=0.80; CI, 0.61-1.04)</td>
</tr>
<tr>
<td><strong>2016 trial: health care utilization</strong></td>
</tr>
<tr>
<td>- No impact on time to first rehospitalization or ER visit</td>
</tr>
<tr>
<td>- Reduced unplanned utilization for low health literate patients (aHR 0.41, 95% CI 0.17-1.00)</td>
</tr>
</tbody>
</table>


Bell, SP. *J Gen Intern Med.* 2016 May;31(5)470-7
AHA Recommendations for Research

• Determine most effective, economical TOC interventions that are broadly applicable to hospitalized patients with HF
• Implement small observational studies and RCTs as proof of concept and evolve into large-scale multicenter RCTs.
• Minimize site contamination by using site-level randomization
• Use pragmatic study designs, minimizing exclusion criteria to best approximate real-world settings
• Include cost-effective or cost-saving analyses in assessments
• Choose outcomes carefully after discussion among multiple key stakeholders, including patients.
Poster at ACCP 2018 Global Conference

Evaluated RN care coordination (over 30 days) and pharmacist medication reconciliation+education (within 7 days of discharge)

- RN care coordination showed 14% reduction in CHF readmissions
- Combined RN+Pharmacist additional 3% reduction
- Pharmacist interventions improved therapy in 13% of patients
- Limitations: lack of randomization, observational study design, small sample size (n=21), lack of readmission risk stratification
• AHA initiative to reduce 30 day readmissions
• Resources such as:
  - readmission checklist
  - discharge checklist
  - telephone follow-up form
  - example order sets
  - patient education materials
• Get With The Guidelines Recognition program
TARGET:HF

THE FIGHT TO REDUCE 30 DAY READMISSIONS STARTS HERE

LEARN MORE AND REGISTER
ANSWER THE CALL. JOIN THE FIGHT. FACE THE CHALLENGE.

MAXIMIZE YOUR PROGRESS
USE GET WITH THE GUIDELINES® HEART FAILURE.

EDUCATION TOOLS
INFORMATION IS POWER.

READ THE LATEST
SEE THE SCIENCE BEHIND THE FIGHT.

SUCCEED AND BE RECOGNIZED
RECOGNITION PROGRAM

LEARN AND SHARE
SEE OUR PRESENTATION MATERIALS
• Quality improvement initiative
  - See You in 7
  - Mind Your Meds
  - Signs and Symptoms
1. Success Metric 1: HF and MI patients are identified prior to discharge and risk of readmission is determined.

2. Success Metric 2: Follow-up visit or cardiac rehab appointment within 7 days is scheduled and documented in the medical record.

3. Success Metric 3: Patient is provided with follow-up documentation which includes: appointment card and educational materials about heart failure or cardiac rehab.

4. Success Metric 4: Possible barriers to keeping the appointment are identified in advance, addressed, and documented in the medical record.

5. Success Metric 5: Patient arrives at appointment within 7 days of discharge from hospital.

6. Success Metric 6: Discharge summary (including summary of hospitalization, updated medication list) available to follow-up clinician.

7. Success Metric 7: Reason for referral available to cardiac rehab center and patient brings referral letter or clinician prescription.
<table>
<thead>
<tr>
<th>Success Metric</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>HF and MI patients are prescribed appropriate medications, dose, type, and frequency.</td>
</tr>
<tr>
<td>2</td>
<td>Medication reconciliation is performed accurately as appropriate on admission and discharge for every patient AND is documented in the medical record.</td>
</tr>
<tr>
<td>3</td>
<td>Possible external barriers to obtaining prescribed medications are identified in advance, addressed, and documented in the medical record.</td>
</tr>
<tr>
<td>4</td>
<td>Possible barriers to patients remembering/understanding the need to take medications as prescribed are identified in advance, addressed, and documented in the medical record.</td>
</tr>
<tr>
<td>5</td>
<td>Patient/Caregiver is provided with documented instructions and prescriptions for all their medications, especially when and how they should be taken, during the discharge process.</td>
</tr>
<tr>
<td>6</td>
<td>Patient/Caregiver can demonstrate they understand the importance of taking their medications, adhering to their medications as prescribed, and of adhering to any changes to their prescriptions – especially medications that are added or discontinued.</td>
</tr>
<tr>
<td>7</td>
<td>Patient/Caregiver can demonstrate they understand possible side effects and symptoms that may be related to their medications, and who to call if they have symptoms that may be related to medications.</td>
</tr>
<tr>
<td>8</td>
<td>Patient/Caregiver remembers to take all their medications as prescribed (i.e., dose, type, frequency).</td>
</tr>
<tr>
<td>9</td>
<td>Patient/Caregiver can demonstrate they understand what each medication does, why the medication is important to take as prescribed, and what potential side effects there may be of medicines.</td>
</tr>
<tr>
<td>10</td>
<td>Patient/Caregiver brings his/her medications or a medication list to each and every clinic visit.</td>
</tr>
<tr>
<td>11</td>
<td>Patient/Caregiver can discuss any challenges, problems, issues, side effects, or questions about medications with clinician.</td>
</tr>
<tr>
<td>Success Metric</td>
<td>Description</td>
</tr>
<tr>
<td>----------------</td>
<td>-------------</td>
</tr>
<tr>
<td>1</td>
<td>Clinician assesses the patient’s knowledge of condition, learning style, cognitive level, emotional status, support system, and motivation.</td>
</tr>
<tr>
<td>2</td>
<td>Clinician assesses the patient’s ability to perform self-care (monitoring signs and symptoms, contacting clinicians if deterioration in signs and symptoms occur, and taking medications as prescribed, etc.) and activities of daily living (walking, cooking).</td>
</tr>
<tr>
<td>3</td>
<td>Clinician provides the patient/caregivers with written and verbal information on their condition that includes education on treatment regimen (self-care plan), including warning signs and when to call their healthcare provider.</td>
</tr>
<tr>
<td>4</td>
<td>Clinician communicates in an empathetic, non-judgmental, collaborative manner that establishes and maintains a positive relationship with the patient and caregiver.</td>
</tr>
<tr>
<td>5</td>
<td>Clinician provides the patient/caregiver with community resources for healthcare.</td>
</tr>
<tr>
<td>6</td>
<td>Patients/Caregivers demonstrate their knowledge of condition-related signs and symptoms (i.e., frequency and severity of symptoms) and management.</td>
</tr>
<tr>
<td>7</td>
<td>Patients/Caregivers participate in developing a self-care plan with their clinician to better manage their condition. (Patients keep a daily log and record symptoms, weight, medications, diet and activities when directed by their clinician).</td>
</tr>
<tr>
<td>8</td>
<td>Patients identify contact name and number if they need to contact their clinician (e.g., about signs and symptoms).</td>
</tr>
<tr>
<td>9</td>
<td>Patients/Caregivers bring their daily log and medication list to each and every clinic visit.</td>
</tr>
<tr>
<td>10</td>
<td>Patients/Caregivers discuss challenges or questions about their condition with clinician.</td>
</tr>
<tr>
<td>11</td>
<td>Patients/Caregivers are knowledgeable about and use community resources for health care, as needed.</td>
</tr>
</tbody>
</table>
1. What percentage of heart failure readmissions are considered preventable?
   a. 10-15%
   b. 20-25%
   c. 30-35%
   d. 40-50%
   e. 55-66%
2. Which of the following is a mandatory inpatient measure for JCAHO advanced heart failure certification?
   a. Beta-blocker therapy at discharge
   b. Advanced directive executed
   c. Post-discharge appointment for HF patients
   d. Care transition record transmitted
   e. All of the above
3. Which of the following is an example of a preventable cause of readmission in HF?

a. Uptitration of beta-blocker exacerbated acute CHF, reduced on admission but discharge med rec reflects higher dose
b. Patient’s child borrows the car on the day of discharge follow-up and appointment is missed

c. Patient celebrates their birthday with a high sodium meal and wakes up the next morning with 3 pound weight gain

d. Patient with mild cognitive impairment and CHFrEF discharged to home after optimizing med regimen and volume status
4. Which of the following risk factors is associated with an increased cardiovascular readmission risk?
   a. ACE/ARB prescribed
   b. Male sex
   c. Sodium at baseline, per 1 mEq/L increase
   d. Potassium at baseline, per 0.1 mEq/L increase to 3.7
   e. Depression
Assessment Questions

5. Which of the following statements about adherence interventions is true?
   a. Reduces risk of mortality, increases odds of readmission
   b. Reduces risk of mortality, reduces odds of readmission
   c. Neutral effect on mortality, reduces odds of readmission
   d. Reduces risk of mortality, neutral effect on odds of readmission
Assessment Questions

6. What time from discharge for office visit follow-up interventions showed a statistically significant reduction in odds of readmission?
   a. <7 days
   b. 8-14 days
   c. 15-21 days
   d. 21-28 days
   e. Office visit interventions have not been shown to impact readmission rates.
Assessment Questions

7. Which of the following is a recommended area of research in TOC interventions in HF according to the AHA?
   a. Strict exclusion criteria for targeted HF population
   b. Include cost-benefit and cost-utility analyses
   c. Implement large multicenter RCTs for proof-of-concept
   d. Minimize site contamination by using site-level randomization
Conclusions

- Recruit department leadership
- Define baseline and goal readmission rate
- Identify high risk patients
- Bundle transitions interventions
- Integrate Get With The Guidelines
- Assess cost-effectiveness of the programs
Cleveland Clinic

Every life deserves world class care.