Building An Outpatient Heart Failure Effort: Focused on Quality

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Karol Harshaw-Ellis, DNP, GNP, A/ACNP-BC
Objectives

• Identify quality indicators to monitor in patients with heart failure in the outpatient setting.
• Identify key aspects that are important to building a quality outpatient heart failure program.
• Discuss care coordination across the continuum of care including opportunities to improve quality of care.
Margaret Bowers

No conflicts of interest to disclose.
Karol Harshaw-Ellis

No conflicts of interest to disclose.
Background and Significance

- 6.5 Million Americans have Heart Failure (HF)
- 550,000 Americans diagnosed with HF annually
- 287,000 Americans die annually with HF

Background and Significance

**Age-specific Prevalence of Hospitalizations per 1000 Population**

- **0-44**
- **45-64**
- **65-84**
- **85+**

**HF most common reason for hospitalization among Medicare recipients**

Source: Age-specific prevalence of hospitalizations per 1000 population/National Hospital Discharge survey. CDC Heart Failure Fact Sheet
Direct and indirect costs to treat heart failure could more than double from $31 billion in 2012 to $70 billion in 2030.

By 2030, you -- and every U.S. taxpayer -- could be paying $244 a year to care for heart failure patients, according to an American Heart Association policy statement.

Paul A. Heidenreich et al. *Forecasting the Impact of Heart Failure in the United States A Policy Statement From the American Heart Association*. *Circulation: Heart Failure*, 2013 DOI: 10.1161/HHF.0b013e318291329a
Heart Failure Readmissions

- Annually, more than 1 million persons in the U.S. are admitted

- 34% readmitted within 90 days after discharge

- Approximately, 20% of Medicare recipients are readmitted within 30 day

CDC, Centers for Disease Control and Prevention. Heart Failure Fact Sheet, 2006; Heidenriech et al. 2011, Circulation 123(8), 933-944; Jencks et al. NEJM, 360(14), 1418-1428
Heart Failure Readmissions

Most research suggests that a higher proportion of short term (7 day, 15 day, 30 day) readmissions fall into the “potentially preventable” category.

What does readmissions mean?

Possible Indicator of poor quality during discharge process

– Inappropriate handoffs
  • Lack of appropriate knowledge to care for the patient such as discharge summary

– Inaccurate medication reconciliation
  • Not receiving appropriate med or dosing. Inappropriate formulary substitutes.

What does readmissions mean?

• Possible Indicator of poor quality during the discharge process
  – Inadequate knowledge of self-care
    • Specifically for heart failure (sodium, medications, disease process, and weight monitoring)
  – Lack of appropriate follow-up
    • Primary care or specialty provider
  – Inconsistent patient monitoring and duplication of test
    • Repeat labs and diagnostics by different providers

Penalties of Readmissions

– $280 million in penalties comprise about 0.3 percent of the total amount hospitals are paid by Medicare in 2012
– 2% penalty of regular payments starting in October 2013
– 3% penalty in 2014

Multiple Models and Mechanism to Reduce HF Readmissions

- Community Education and Outreach
- Risk Assessment in Clinic
- Disease Management
- Case Management
- Telephonic Follow-Up
- Home Care
- Self Management Tools
- HF Triage Protocols
  - Coordination with HF Clinic
  - PRM in ER
- Transition Checklist
  - Readmission Risk Assessment
  - Risk-Based Mitigation Plans
  - Hand-Off Key Barriers to Post-dc Caller
- Early Clinic Follow-Up
  - Care Plans for Complex Patients
  - Coordination with Home Health and Community Care
  - ICD Data/telemonitoring?

Duke Heart Center
Strategies To Reduce 30 day HF Readmissions

Number of Selected Strategies Implemented and Risk-Standardized Readmission Rates

Same Day Access and Success

• “Thanks to the broader efforts of Heart@Home, which includes SDA, that readmission rates at DUH have gone down 15% year over year. As a result, HF is the one condition currently for which DUH will not receive financial penalties due to excess readmissions.”

Duke Heart Center

Duke Translational Medicine Institute, (2013, September, 7) https://www.dtmi.duke.edu/
Heart Failure Same Day Access Clinic Model

- Improve disease specific and population health
- Increase patient and provide access
- Decrease cost through the reduction of hospitalizations and ER visits
- Utilize advanced practice nurses to improve patient outcomes
- Improve evidence based therapies (Medications and Devices)
Adapted from the 2013 ACCF/AHA Guideline for the Management of Heart Failure
Pharmacologic Treatment for Stage C HFrEF

**HFrEF Stage C**
**NYHA Class I – IV**

*Treatment:*

- **Class I, LOE A**
  - ACEI or ARB AND Beta Blocker

For persistently symptomatic African Americans, NYHA class III-IV:
- **Class I, LOE A**
  - Hydral-Nitrates
- **Add**
  - **Class I, LOE C**
  - Loop Diuretics

For all volume overload, NYHA class II-IV patients:
- **Add**

For NYHA class II-IV patients. Provided estimated creatinine >30 mL/min and K+ <5.0 mEq/dL:
- **Add**
  - **Class I, LOE A**
  - Aldosterone Antagonist
Pharmacological Therapy for Management of Stage C HFrEF

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>COR</th>
<th>LOE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diuretics</strong></td>
<td></td>
<td></td>
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<tr>
<td>Diuretics are recommended in patients with HFrEF with fluid retention</td>
<td>I</td>
<td>C</td>
</tr>
<tr>
<td><strong>ACE Inhibitors</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACE inhibitors are recommended for all patients with HFrEF</td>
<td>I</td>
<td>A</td>
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<tr>
<td><strong>ARBs</strong></td>
<td></td>
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<tr>
<td>ARBs are recommended in patients with HFrEF who are ACE inhibitor intolerant</td>
<td>I</td>
<td>A</td>
</tr>
<tr>
<td>ARBs are reasonable as alternatives to ACE inhibitor as first line therapy in HFrEF</td>
<td>IIa</td>
<td>A</td>
</tr>
<tr>
<td>The addition of an ARB may be considered in persistently symptomatic patients with HFrEF on GDMT</td>
<td>IIb</td>
<td>A</td>
</tr>
<tr>
<td>Routine <em>combined</em> use of an ACE inhibitor, ARB, and aldosterone antagonist is potentially harmful</td>
<td>III: Harm</td>
<td>C</td>
</tr>
</tbody>
</table>
**Pharmacological Therapy for Management of Stage C HFrEF (cont.)**

<table>
<thead>
<tr>
<th>Recommendations</th>
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<th>LOE</th>
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<tbody>
<tr>
<td><strong>Beta Blockers</strong></td>
<td></td>
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<tr>
<td>Use of 1 of the 3 beta blockers proven to reduce mortality is recommended for all stable patients</td>
<td>I</td>
<td>A</td>
</tr>
<tr>
<td><strong>Aldosterone Antagonists</strong></td>
<td></td>
<td></td>
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<tr>
<td>Aldosterone receptor antagonists are recommended in patients with NYHA class II-IV HF who have LVEF ≤35%</td>
<td>I</td>
<td>A</td>
</tr>
<tr>
<td>Aldosterone receptor antagonists are recommended in patients following an acute MI who have LVEF ≤40% with symptoms of HF or DM</td>
<td>I</td>
<td>B</td>
</tr>
<tr>
<td>Inappropriate use of aldosterone receptor antagonists may be harmful</td>
<td>III: Harm</td>
<td>B</td>
</tr>
<tr>
<td><strong>Hydralazine and Isosorbide Dinitrate</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The combination of hydralazine and isosorbide dinitrate is recommended for African-Americans, with NYHA class III–IV HFrEF on GDMT</td>
<td>I</td>
<td>A</td>
</tr>
<tr>
<td>A combination of hydralazine and isosorbide dinitrate can be useful in patients with HFrEF who cannot be given ACE inhibitors or ARBs</td>
<td>IIa</td>
<td>B</td>
</tr>
</tbody>
</table>
Pharmacologic Therapy for Management of Stage C HFrEF (cont.)

<table>
<thead>
<tr>
<th>Recommendations</th>
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<tbody>
<tr>
<td><strong>Digoxin</strong></td>
<td></td>
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<tr>
<td>Digoxin can be beneficial in patients with HFrEF</td>
<td>IIa</td>
<td>B</td>
</tr>
<tr>
<td><strong>Anticoagulation</strong></td>
<td></td>
<td></td>
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<tr>
<td>Patients with chronic HF with permanent/persistent/paroxysmal AF and an</td>
<td>I</td>
<td>A</td>
</tr>
<tr>
<td>additional risk factor for cardioembolic stroke should receive chronic</td>
<td></td>
<td></td>
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<tr>
<td>anticoagulant therapy*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The selection of an anticoagulant agent should be individualized</td>
<td>I</td>
<td>C</td>
</tr>
<tr>
<td>Chronic anticoagulation is reasonable for patients with chronic HF who have</td>
<td>IIa</td>
<td>B</td>
</tr>
<tr>
<td>permanent/persistent/paroxysmal AF but without an additional risk factor for</td>
<td></td>
<td></td>
</tr>
<tr>
<td>cardioembolic stroke*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anticoagulation is not recommended in patients with chronic HFrEF without</td>
<td>III: No Benefit</td>
<td>B</td>
</tr>
<tr>
<td>AF, prior thromboembolic event, or a cardioembolic source</td>
<td></td>
<td></td>
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<tr>
<td><strong>Statins</strong></td>
<td></td>
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<tr>
<td>Statins are not beneficial as adjunctive therapy when prescribed solely for HF</td>
<td>III: No Benefit</td>
<td>A</td>
</tr>
<tr>
<td><strong>Omega-3 Fatty Acids</strong></td>
<td></td>
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<tr>
<td>Omega-3 PUFA supplementation is reasonable to use as adjunctive therapy in</td>
<td>IIa</td>
<td>B</td>
</tr>
<tr>
<td>HFrEF or HFpEF patients</td>
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</table>
### Pharmacological Therapy for Management of Stage C HFrEF (cont.)

<table>
<thead>
<tr>
<th>Recommendations</th>
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<th>LOE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Other Drugs</strong></td>
<td></td>
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</tr>
<tr>
<td>Nutritional supplements as treatment for HF are not recommended in HFrEF</td>
<td>III: No Benefit</td>
<td>B</td>
</tr>
<tr>
<td>Hormonal therapies other than to replete deficiencies are not recommended in HFrEF</td>
<td>III: No Benefit</td>
<td>C</td>
</tr>
<tr>
<td>Drugs known to adversely affect the clinical status of patients with HFrEF are potentially harmful and should be avoided or withdrawn</td>
<td>III: Harm</td>
<td>B</td>
</tr>
<tr>
<td>Long-term use of an infusion of a positive inotropic drug is not recommended and may be harmful except as palliation</td>
<td>III: Harm</td>
<td>C</td>
</tr>
<tr>
<td><strong>Calcium Channel Blockers</strong></td>
<td></td>
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</tr>
<tr>
<td>Calcium channel blocking drugs are not recommended as routine in HFrEF</td>
<td>III: No Benefit</td>
<td>A</td>
</tr>
</tbody>
</table>
## Treatment of HFpEF

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>COR</th>
<th>LOE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systolic and diastolic blood pressure should be controlled according to published clinical practice guidelines</td>
<td>I</td>
<td>B</td>
</tr>
<tr>
<td>Diuretics should be used for relief of symptoms due to volume overload</td>
<td>I</td>
<td>C</td>
</tr>
<tr>
<td>Coronary revascularization for patients with CAD in whom angina or demonstrable myocardial ischemia is present despite GDMT</td>
<td>IIa</td>
<td>C</td>
</tr>
<tr>
<td>Management of AF according to published clinical practice guidelines for HFpEF to improve symptomatic HF</td>
<td>IIa</td>
<td>C</td>
</tr>
<tr>
<td>Use of beta-blocking agents, ACE inhibitors, and ARBs for hypertension in HFpEF</td>
<td>IIa</td>
<td>C</td>
</tr>
<tr>
<td>ARBs might be considered to decrease hospitalizations in HFpEF</td>
<td>IIb</td>
<td>B</td>
</tr>
<tr>
<td>Nutritional supplementation is not recommended in HFpEF</td>
<td>III: No Benefit</td>
<td>C</td>
</tr>
</tbody>
</table>
## ACCF/AHA/AMA-PCPI 2011 HF Performance Measurement Set

<table>
<thead>
<tr>
<th>Measure</th>
<th>Description*</th>
<th>Care Setting</th>
<th>Level of Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. LVEF assessment</td>
<td>Percentage of patients aged ≥18 y with a diagnosis of HF for whom the quantitative or qualitative results of a recent or prior (any time in the past) LVEF assessment is documented within a 12 mo period</td>
<td>Outpatient</td>
<td>Individual practitioner</td>
</tr>
<tr>
<td>2. LVEF assessment</td>
<td>Percentage of patients aged ≥18 y with a principal discharge diagnosis of HF with documentation in the hospital record of the results of an LVEF assessment that was performed either before arrival or during hospitalization, OR documentation in the hospital record that LVEF assessment is planned for after discharge</td>
<td>Inpatient</td>
<td>Individual practitioner • Facility</td>
</tr>
<tr>
<td>3. Symptom and activity assessment</td>
<td>Percentage of patient visits for those patients aged ≥18 y with a diagnosis of HF with quantitative results of an evaluation of both current level of activity and clinical symptoms documented</td>
<td>Outpatient</td>
<td>Individual practitioner</td>
</tr>
</tbody>
</table>

*Please refer to the complete measures for comprehensive information, including measure exception.

<table>
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<th>Care Setting</th>
<th>Level of Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.   Symptom management†</td>
<td>Percentage of patient visits for those patients aged ≥18 y with a diagnosis of HF and with quantitative results of an evaluation of both level of activity AND clinical symptoms documented in which patient symptoms have improved or remained consistent with treatment goals since last assessment OR patient symptoms have demonstrated clinically important deterioration since last assessment with a documented plan of care</td>
<td>Outpatient</td>
<td>Individual practitioner</td>
</tr>
<tr>
<td>5.   Patient self-care education†‡</td>
<td>Percentage of patients aged ≥18 y with a diagnosis of HF who were provided with self-care education on ≥3 elements of education during ≥1 visits within a 12 mo period</td>
<td>Outpatient</td>
<td>Individual practitioner</td>
</tr>
<tr>
<td>6. Beta-blocker therapy for LVSD (outpatient and inpatient setting)</td>
<td>Percentage of patients aged ≥18 y with a diagnosis of HF with a current or prior LVEF &lt;40% who were prescribed beta-blocker therapy with bisoprolol, carvedilol, or sustained release metoprolol succinate either within a 12 mo period when seen in the outpatient setting or at hospital discharge</td>
<td>Inpatient and Outpatient</td>
<td>Individual practitioner Facility</td>
</tr>
</tbody>
</table>

*Please refer to the complete measures for comprehensive information, including measure exception.
†Test measure designated for use in internal quality improvement programs only. These measures are not appropriate for any other purpose, e.g., pay for performance, physician ranking or public reporting programs.
‡New measure.

### ACCF/AHA/AMA-PCPI 2011 HF Performance Measurement Set (cont.)

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<tr>
<th>Measure</th>
<th>Description*</th>
<th>Care Setting</th>
<th>Level of Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. ACE Inhibitor or ARB Therapy for LVSD (outpatient and inpatient setting)</td>
<td>Percentage of patients aged ≥18 y with a diagnosis of HF with a current or prior LVEF &lt;40% who were prescribed ACE inhibitor or ARB therapy either within a 12 mo period when seen in the outpatient setting or at hospital discharge</td>
<td>Inpatient and Outpatient</td>
<td>Individual practitioner Facility</td>
</tr>
<tr>
<td>8. Counseling regarding ICD implantation for patients with LVSD on combination medical therapy†‡</td>
<td>Percentage of patients aged ≥18 y with a diagnosis of HF with current LVEF ≤35% despite ACE inhibitor/ARB and beta-blocker therapy for at least 3 mo who were counseled regarding ICD implantation as a treatment option for the prophylaxis of sudden death</td>
<td>Outpatient</td>
<td>Individual practitioner</td>
</tr>
<tr>
<td>9. Post-discharge appointment for heart failure patients</td>
<td>Percentage of patients, regardless of age, discharged from an inpatient facility to ambulatory care or home health care with a principal discharge diagnosis of HF for whom a follow-up appointment was scheduled and documented including location, date and time for a follow-up office visit, or home health visit (as specified)</td>
<td>Inpatient</td>
<td>Facility</td>
</tr>
</tbody>
</table>

*Please refer to the complete measures for comprehensive information, including measure exception.
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‡New measure.

### Post discharge Process

<table>
<thead>
<tr>
<th>Recommendation or Indication</th>
<th>COR</th>
<th>LOE</th>
</tr>
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<tbody>
<tr>
<td>Performance improvement systems in the hospital and early post discharge outpatient setting to identify HF for GDMT</td>
<td>I</td>
<td>B</td>
</tr>
</tbody>
</table>
| Before hospital discharge, at the first post discharge visit, and in subsequent follow-up visits, the following should be addressed:  
  a) initiation of GDMT if not done or contraindicated;  
  b) causes of HF, barriers to care, and limitations in support;  
  c) assessment of volume status and blood pressure with adjustment of HF therapy;  
  d) optimization of chronic oral HF therapy;  
  e) renal function and electrolytes;  
  f) management of comorbid conditions;  
  g) HF education, self-care, emergency plans, and adherence; and  
  h) palliative or hospice care. | I   | B   |
| Multidisciplinary HF disease-management programs for patients at high risk for hospital readmission are recommended | I   | B   |
| A follow-up visit within 7 to 14 days and/or a telephone follow-up within 3 days of hospital discharge is reasonable | IIa | B   |
| Use of clinical risk-prediction tools and/or biomarkers to identify higher-risk patients is reasonable | IIa | B   |
Effective systems of care coordination with special attention to care transitions should be deployed for every patient with chronic HF that facilitate and ensure effective care that is designed to achieve GDMT and prevent hospitalization.

Every patient with HF should have a clear, detailed and evidence-based plan of care that ensures the achievement of GDMT goals, effective management of comorbid conditions, timely follow-up with the healthcare team, appropriate dietary and physical activities, and compliance with Secondary Prevention Guidelines for cardiovascular disease. This plan of care should be updated regularly and made readily available to all members of each patient’s healthcare team.

Palliative and supportive care is effective for patients with symptomatic advanced HF to improve quality of life.

Adapted from the 2013 ACCF/AHA Guideline for the Management of Heart Failure
Same Day Access and Quality Measures

- Electronic Medical Records
  - Track ED and admissions
  - Track patients that receive IV diuretics
  - Track cost of care
  - Identify and flag patients as risk for high admission
  - Evaluate SDA access (Self Schedule)
  - Opportunity to identify NEW quality data points to be analyzed
Heart Failure Same Day Access Team

- Providers
  - Physician Cardiologist (HF Trained)
  - Nurse Practitioners
    - Over 30 years of combined experience
    - Doctorally prepared
    - 2 of 3 Certified HF Nurses (AAHFN)
  - Registered Nurses Clinic 2F/2G
  - Heart Center Nurse Clinician (Martha Anders, RN)
Heart Failure Same Day Access Team Approach

Virtual Multidisciplinary
  – Social Worker
  – Duke Heart Center
  – Home Health
  – Patient Resource Managers
  – Access to HF Clinical Pharmacist
  – HF Rehabilitation
Same Day Access Team Approach

FUTURE Multidisciplinary Team Members

– Data/Outcomes Team
– Mental Health Providers
– Dietician/Nutritional Support
– Bridging Community Services
– Primary Care Network (Self scheduling)
– Maestro and IT care team
Same Day Heart Failure Access Clinic

- 2 patient rooms and a bathroom in 2F/2G available for 12+ clinic sessions per week (outlined in blue)
  - Lasix bolus (<100 mg) therapy administered in 2F/2G
- 2 chairs in 2A
  - Lasix infusions (>100mg), magnesium replacement, potassium replacement administered in Infusion Center
- Staffing
  - Infusion nurse staffing has been increased to meet demand
  - SDA clinic has a dedicated RN and a back-up RN for coverage

- **Location:** Duke Clinic Building, 2F/2G, Hall F
- **Hours:** Monday – Friday, 8:30am-4:00pm (appointment slots)
- **Appointment Availability:** 4 SDA appointments but will accommodate as needed
# Heart Center Communications Protocol

**Semi-Urgent**

- Fever > 101 F for 48 hours or more
- Difficulty taking a deep breath because of severe pain
- Exposure to that which previously caused reaction
- New or Increase edema in legs, arms, face, abdomen
- On diuretics
- History of CHF
- Pink tinge frothy sputum

**Intervention/Advice**

1. Refer to PCP for immediate appointment
2. Acute care Appointment with CAD or ED for further evaluation
3. Refer to physician extender
4. Same day appointment text page extender (970-1243)

**Source:** DUMC, Cardiology Associates, Adult Telephone Triage Protocol. “Shortness of breath”

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**Semi-Urgent**

- Is the area warm, and/or tender
- Area cold and/or bluish
- Rings cutting into skin due to increased swelling
- Vomiting and/or diarrhea
- Recent trauma and unexpected swelling
- History of one kidney
- Swelling and fever with no other symptoms
- Calf of swollen leg is tender
- Pain when flexing ankle
- Persistent fluid retention unresponsive to diuretics
- Weight gain of 2 pounds in 24 hours with respiratory distress/DOE
- Cough that is worse when lying down
- Chronic breathing problem that is worsening
- Ankle swelling and increased difficulty breathing while lying flat.

**Intervention/Advice**

1. Seek medical care within 2-4 hours if history of heart failure with CAD, or PCP or Urgent Care
2. Seek medical care with PCP within 24 hours.
3. Acute care Appointment with CAD or ED for further evaluation
4. Refer to physician extender
5. Same day appointment text page extender (970-1243)

**Source:** DUMC, Cardiology Associates, Adult Telephone Triage Protocol. “Edema/Swelling”
Same Day Access Population

Acute HF symptoms
Warm and wet

Early Follow-up

Chronic Ds Management
Same Day Access Population

- **PALLIATIVE CARE** Mainly managing inotropes and symptom management
- **PSYCO SOCIAL ISSUES** (Homeless, Uninsured)
- **Low Health Literacy**

Duke Heart Center
Same Day Access Clinic

- Follow-up care
  - Phone calls 24-48 hours post-discharge and as needed (i.e. after IV diuretics)
  - Office visit biweekly, weekly, every 4 weeks until stable
  - Hospital follow-up visits
    - Within 3-7 days of discharge but could be sooner
Outpatient- Heart Failure Education

- Cardiac Rehabilitation
  - Refer all patients if eligible
  - ICD Codes
    - Difficult walking 719.7
    - Arthralgia 719.4
    - Low back pain 724.2
- Exit care
  - Attempting to include aspects of current materials
- Heart Teaching Manual
- Nurse Practitioners in the Heart Failure Clinic
“Readmissions are reduced when hospitals follow up with patients at home and give care instructions to family members. Duke University Health System created a Same Day Acute Heart Failure Clinic, which provides medical infusions and other treatments outside the hospital so that a return visit is not counted as a readmission.”
What is on the horizon??

- Infusion Clinic 2A extending days and hours
  - Open 8am- 10 pm (Monday – Friday)
  - Open 8 am-4pm (Saturday)
  - Utilize for Evaluation and Treatment
  - Staffed
    - Fellows MD
    - APPs
Case Study

• 64 year old AA male who has been hospitalized 4 times in the last year for acute heart failure.

• Discharged from DUMC 2 days ago. Presents with PND, orthopnea, SOB with minimal exertion, lower leg and scrotal edema, early satiety.

• Unclear of his dry weight (review of chart 198 lbs approximately 1 year ago)
Case Study

<table>
<thead>
<tr>
<th>Past medical history</th>
<th>Medications</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Hypertension</td>
<td>• Lisinopril 40mg po daily</td>
</tr>
<tr>
<td>• NICM</td>
<td>• Lasix 100 mg po twice daily</td>
</tr>
<tr>
<td>• Systolic and Diastolic Heart Failure (EF 25%) with Grade II Diastolic Dysfunction</td>
<td>• Norvasc 10 mg po daily</td>
</tr>
<tr>
<td>• Diabetes Mellitus</td>
<td>• Carvedilol 25 mg every 12 hours</td>
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<tr>
<td>• Obese</td>
<td>• Lantus insulin 10 units at bedtime</td>
</tr>
<tr>
<td>• Renal Insufficiency</td>
<td>• Zocor 20 mg po bedtime</td>
</tr>
<tr>
<td>• Status post AICD</td>
<td>• Aldactone 12.5 mg po daily</td>
</tr>
<tr>
<td></td>
<td>• Digoxin 0.125mg po daily</td>
</tr>
</tbody>
</table>
# Case Study

## Physical Exam
- BP 110/80, HR 98, Afebrile
- Weight 228 lbs
- +JVP and HJR
- Anascara
- Lower leg edema
- Scrotal edema
- +Fluid wave/abdominal edema

## Laboratory and Diagnostic Data
- Echocardiogram 2010: EF 25%, LVH, no focal wall motion abnormalities, Moderate MR,
- Sodium 135, Potassium 4.0, CL 98, BUN 10, Creat 1.0,
- Liver function studies normal
- Pro bnp 20,000
- Thyroid levels normal
- HgbA1C 6.0
- EKG NSR with wide QRS
- LHC normal coronaries 2010
## Case Studies

### Plan of care

- Stop Norvasc
- Start Hydralazine and nitrate
- Stop Lasix and start demedex
- Repeat Echocardiogram
- Consider RHC
- Consider Level I CPX
- Consider Sleep Study
- Treat with IV lasix 100 mg and metolazone 2.5 mg

### Evidence

- AHEFT trial with decrease mortality
- Evaluate for changes in TR and pulmonary pressures
- Demedex with better bioavailability than lasix
- Guide therapy and assess need for advanced HF therapies
- High incidence of OSA in HF patients and contributor to RHF
Key Aspects Same Day Access Clinic

- Important aspects of clinic
  - Utilization of IV diuretics bolus
  - Utilization of Continuous 8 hour IV diuretic infusions (Infusion Center)
  - Monitoring and Titration of evidenced base therapies
  - Treating and evaluating acute and chronic medical illnesses
  - Coordination of care
  - Patient and family education