Introduction

This evidence-based guideline summary is based on the 2018 National Heart Failure Guideline. A 2018 review of these recommendations found them to be current. This guideline was developed by the KP National Heart Failure Guideline Development Team (GDT) to assist primary care physicians and other health professionals in the treatment of heart failure in adults.

Definitions

- In this guideline the term heart failure is used to refer to patients who have either heart failure with left ventricular systolic dysfunction (LVSD) or heart failure with preserved ejection fraction, unless otherwise distinguished.

Sleep Apnea

- In heart failure patients, routine screening for sleep apnea (in the absence of suggestive symptoms) is not generally recommended because of the lack of evidence that screening improves outcomes. Consider testing for sleep apnea based on symptoms as in the general population.
- There is no recommendation for or against treating sleep apnea in heart failure patients to improve heart failure-related outcomes.

Use of Statins in Heart Failure Patients without Documented Coronary Artery Disease

- In the heart failure population consider using statins just as they are in the general population according to the KP National Dyslipidemia Guidelines.

Use of Thiazolidinediones (TZDs)

- In heart failure patients consider stopping TZDs in patients who suffer an exacerbation while on them.
- In heart failure patients consider using TZDs only if there are no other alternatives for the treatment of diabetes.

Use of Diuretics
Consider initiating loop diuretics\(^1\) for the management of hypervolemia in heart failure. Consider using the minimal dosage needed to restore normal volume status.

Consider using combination loop\(^1\) and thiazide-type diuretics if the patient is unresponsive to loop diuretics alone.

### TABLE 1. HEART FAILURE DIAGNOSIS

| Initial evaluation for suspected heart failure: | History, physical, ECG, CXR, BNP, labs |
| Findings suggestive of heart failure: | Dy cosnea, orthopnea, PND |
| | Unexplained fatigue, weakness, anorexia or mental disturbances may indicate heart failure in older adults |
| | Neck vein distension, edema |
| | Rales, wheezing (i.e., "cardiac asthma") |
| | Congestion or cardiomegaly on CXR |
| | 10 lbs weight loss over 5 days in response to a diuretic, especially if associated with improved symptoms |
| | Heart failure suggested --> echo |

<table>
<thead>
<tr>
<th>Rule-Out: HF unlikely</th>
<th>Measurement:</th>
<th>Rule-In: HF Likely</th>
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</thead>
<tbody>
<tr>
<td>&lt; 100</td>
<td>BNP (pg/ml)</td>
<td>&gt; 400-500</td>
</tr>
<tr>
<td>&lt; 300</td>
<td>NT-pro BNP (pg/ml)</td>
<td>&gt; 450</td>
</tr>
<tr>
<td>Age &lt; 50 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 300</td>
<td>NT-pro BNP (pg/ml)</td>
<td>&gt; 900</td>
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<tr>
<td>Age &lt; 75 years</td>
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</tr>
<tr>
<td>&lt; 300</td>
<td>NT-pro BNP (pg/ml)</td>
<td>&gt; 1800</td>
</tr>
<tr>
<td>Age &gt; 75 years</td>
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*Table 1 added in August 2016*
Medication Sequencing for Left Ventricular Systolic Disorder

**FIGURE 1: Medication sequencing for left ventricular systolic dysfunction (LVSD)**

- **Diuretics**
  - Lowest dose to manage volume overload.
  - Some patients may not require diuretics.

- **Acute Heart Failure**
  - **ACE Inhibitors**
    - Use if creatinine <2.5 and K <5.5
  - **ARBs**
    - Use if ACEI intolerant due to angioedema, rash or cough.
  - **Hydralazine and Isosorbide Dinitrate**
    - Use if creatinine >2.5 or K >5.5, or if ACEI/ARB is contraindicated.

- **Heart Failure Stabilized**
  - **Beta-blockers**
    - May initially worsen HF, only add when hypervolemia minimal or absent, titrate slowly.
  - **Spironolactone**
    - Add if eligible; see guideline details.
    - May be added earlier during treatment of acute heart failure to potentiate diuretics and reduce hyperkalemia.

*Figure 1 added in August 2016*

**Vasodilators in Left Ventricular Systolic Disorder (LVSD)**

- **Use of Renin-Angiotensin System Inhibitor/Blockers and/or Vasodilators**
  - In patients with LVSD, prescribe ACE inhibitors.
  - In patients who are intolerant to ACE inhibitors due to cough, allergy, or angioedema, consider angiotensin-receptor blockers as an alternative. However, if ACEI-induced angioedema is severe, use caution when ARBs are used.
  - If both ACE inhibitors and ARBs are contraindicated, consider the combination of hydralazine and isosorbide dinitrate.
  - The routine simultaneous use of ARBs and ACE inhibitors is not generally recommended.
Consider making the target dose of ACEIs to be at least that used in major clinical trials in patients with LVSD.

- Lisinopril 20 mg daily
- Captopril 50 mg three times daily
- Enalapril 10 mg twice daily

In patients with serum creatinine levels up to 2.5 mg/dl or eGFR > 30 ml/min/1.73 m², consider using ACE inhibitors.

In patients with serum creatinine levels higher than 2.5 mg/dl or eGFR < 30 ml/min/1.73 m², consider using ACE inhibitors on a case-by-case basis.

In patients taking ACE inhibitors for LVSD if they have concomitant atherosclerotic vascular disease (CVD), consider prescribing Aspirin (ASA) (81 mg).

For patients with LVSD NYHA class II-IV, or with asymptomatic LVSD (NYHA class I) and concomitant CAD, prescribe Beta-blockers.

For patients with asymptomatic (NYHA class I) LVSD without concomitant CAD, consider prescribing Beta-blockers.

For patients with LVSD, consider prescribing carvedilol, metoprolol succinate or bisoprolol³ as the choices of beta-blockers.

For patients with LVSD and concomitant well-controlled asthma or COPD, consider prescribing carvediolol or the cardioselective beta-blockers metoprolol or bisoprolol³. Consider discussing the risks and benefits of treatment, and instruct the patient to report any increase in airway symptoms. If airways symptoms are worsened on a non cardioselective agent, consider a cardioselective agent.

Carvedilol is an acceptable but less well-established option for patients with LVSD and well-controlled asthma or COPD.

For patients with LVSD, EF <= 35%, NYHA Class III or IV, and no contraindications, consider prescribing spironolactone, in addition to standard treatment.

For patients with LVEF <= 40%, recent MI, either diabetes or signs of heart failure, and no contraindications, consider prescribing spironolactone.

For patients with EF < 40%, any symptom of heart failure, and no contraindications, consider prescribing spironolactone as an acceptable but less well-established option.

For most patients, consider prescribing a dose of spironolactone of 25 mg daily or less. High doses may increase risk of serious hyperkalemia.
Consider prescribing eplerenone as an alternative to spironolactone if gynecomastia is problematic.

**Digoxin**

- Consider adding digoxin to standard therapy of ACE inhibitors, diuretics, and beta-blockers for heart failure, to improve symptoms and reduce hospitalization, only if symptoms remain poorly controlled after optimizing other medicines.
- For patients with few or no symptoms of heart failure who are in normal sinus rhythm, do not prescribe digoxin because it does not reduce mortality.
- Consider using lower doses of digoxin, and consider maintaining serum digoxin levels at ≤ 0.8 ng/ml, because of possible toxicity, which may be more common in women, and for maximum benefit.

**Oral Anticoagulation - Warfarin**

- For patients with LVSD and atrial fibrillation, consider prescribing warfarin unless contraindicated.
- For LVSD patients in normal sinus rhythm, and with left ventricular thrombus on echocardiography or a history of thromboembolism, consider prescribing warfarin.

**Calcium Channel Blockers**

- In patients with LVSD with uncontrolled hypertension despite beta blocker, ACEI/ARB, spironolactone, hydralazine and long-acting nitrate, consider prescribing Amlodipine³ and felodipine³ (second generation dihydropyridine calcium channel blockers). For the treatment of angina pectoris in patients with LVSD with angina pectoris despite beta blocker and long-acting nitrate, consider prescribing Amlodipine³ and felodipine³ (second generation dihydropyridine calcium channel blockers).
- In patients with LVSD, do not prescribe calcium channel blockers (CCBs) other than amlodipine³ and felodipine³.
Heart Failure with Preserved Ejection Fraction

- In patients with heart failure with preserved ejection fraction, consider treating the following concomitant conditions according to local and national guidelines: hypertension, rhythm abnormalities, ischemia, and edema.

**Lifestyle Factors**

**Sodium Restricted Diet**

- For patients with heart failure in order to assist in volume management, consider initiating a moderate sodium restriction, ≤ 2,400 mg per day, unless a low-sodium diet is contraindicated. Consider reinforcing and/or increasing sodium restriction when fluid retention requires increasing doses of diuretics.

**Physical Activity**

- For patients with stable heart failure, unless contraindicated, consider recommending light to moderate aerobic activity and resistance training.

**Pharmacological Management of LVSD Based on Patients Race/Ethnicity or Sex**

- For women and nonwhite populations, for the management of ACE inhibitors, beta-blockers, and spironolactone, consider similar treatment to that in men and white populations.
- In blacks/African Americans and in patients who require additional vasodilation for uncontrolled hypertension or symptoms, consider adding hydralazine and isosorbide dinitrate to standard heart failure therapy (including ACE inhibitors and beta-blockers).

**Target Blood Pressure**

- For patients aged < 60 years with congestive heart failure (CHF), initiate pharmacologic treatment to lower BP when SBP ≥ 140 or DBP ≥ 90 mmHg. Treat to a goal SBP < 140 mmHg and goal DBP < 90 mmHg.
- For patients, aged ≥ 60 years with CHF, consider initiating pharmacologic treatment at SBP ≥ 140 mmHg or DBP ≥ 90 mmHg and treat to goal SBP < 140 mmHg and goal DBP < 90 mmHg.

**Medications to Achieve Target Blood Pressure**

- In patients with heart failure with preserved ejection fraction to control hypertension, consider the following medications:
  - Diuretics
  - ACE inhibitors
  - Angiotensin receptor blockers
  - Beta-blockers
  - Dihydropyridine calcium channel blockers
In patients with systolic heart failure to control hypertension, consider prescribing the following medications:

- Diuretics
- Beta-blockers
- ACE inhibitors or ARBs if intolerant of ACE inhibitors
- Hydralazine/isosorbide dinitrate

Amlodipine or felodipine

Reassessment of Systolic Performance

- After patients have received optimal medical therapy or revascularization if a change in cardiac function would impact candidacy for ICD therapy, consider offering a follow-up measurement of LVEF.
- Consider not initiating a routine repeat measurement of LVEF (after initial confirmation of LVSD) when the results will not alter management.

Omega-3 Supplementation

- For heart failure patients with an ejection fraction less than 40% following consideration of benefits, risks and costs of the supplement to the patient, consider prescribing Omega-3 supplementation\(^5\) (1g per day).

**TERMINOLOGY**

<table>
<thead>
<tr>
<th>Recommendation Language</th>
<th>Strength*</th>
<th>Action</th>
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</thead>
<tbody>
<tr>
<td>Start, initiate, prescribe, treat, etc.</td>
<td>Strong affirmative</td>
<td>Provide the intervention. Most individuals should receive the intervention; only a small proportion will not want the intervention.</td>
</tr>
<tr>
<td>Consider starting, etc.</td>
<td>Conditional affirmative</td>
<td>Assist each patient in making a management decision consistent with personal values and preferences. The majority of individuals in this situation will want the intervention, but many will not. Different choices will be appropriate for different patients.</td>
</tr>
<tr>
<td>Consider stopping, etc.</td>
<td>Conditional negative</td>
<td>Assist each patient in making a management decision consistent with personal values and preferences. The majority of individuals in this situation will not want the intervention, but many will. Different choices will be appropriate for different patients.</td>
</tr>
<tr>
<td>Stop, do not start, etc.</td>
<td>Strong negative</td>
<td>Do not provide the intervention. Most individuals should not receive the intervention; only a small proportion will want the intervention.</td>
</tr>
</tbody>
</table>

*Refers to the extent to which one can be confident that the desirable effects of an intervention outweigh its undesirable effects.
Furosemide, hydrochlorothiazide, and metolazone (Mykrox) are not FDA-approved for heart failure.

Valsartan is FDA-approved for heart failure; losartan and candesartan are not.

Not FDA-approved for heart failure.

Please see the digoxin recommendation for the use of digoxin in women.

Omega-3 supplementation should be not emphasized over drugs with a solid body of evidence demonstrating.