Heart Failure
Clinician Guide

Introduction
This evidence-based guideline summary is based on the 2016 National Heart Failure Guideline. A 2016 review of these recommendations found them to be current. However, the recommendation pertaining to erythropoietin was removed after it was determined that it was no longer relevant. 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 either heart failure with left ventricular systolic dysfunction (LVSD) or heart failure with preserved ejection fraction, unless otherwise specified.

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. (Weak recommendation)
- There is no recommendation for or against treating sleep apnea in heart failure patients to improve heart failure-related outcomes. (No recommendation for or against)

Use of Statins in Heart Failure Patients without Documented Coronary Artery Disease
- In the heart failure population, consider using statins just as they are used in the general population according to the KP National Dyslipidemia Guidelines. (Weak recommendation)

Use of Thiazolidinediones (TZDs)
- In heart failure patients, consider stopping TZDs in patients who suffer an exacerbation while on them. (Weak recommendation)
- In heart failure patients, consider using TZDs only if there are no other alternatives for the treatment of diabetes. (Weak recommendation)
Use of Diuretics

- Consider initiating loop diuretics\(^1\) for the management of hypervolemia in heart failure. Consider using the minimum dosage needed to restore normal volume status. (Weak recommendation)
- Consider using combination loop\(^2\) and thiazide-type diuretics in patients who are unresponsive to loop diuretics alone. (Weak recommendation)

**TABLE 1. HEART FAILURE DIAGNOSIS**

| Initial evaluation for suspected heart failure: | History, physical, ECG, CXR, BNP, labs |
| Findings suggestive of heart failure: | Dyspnea, 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-pound 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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<tbody>
<tr>
<td>&lt; 100 BNP (pg/ml)</td>
<td>&gt; 400-500</td>
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<tr>
<td>&lt; 300 NT-pro BNP (pg/ml) Age &lt; 50 years</td>
<td>&gt; 450</td>
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<tr>
<td>&lt; 300 NT-pro BNP (pg/ml) Age &lt; 75 years</td>
<td>&gt; 900</td>
<td></td>
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<tr>
<td>&lt; 300 NT-pro BNP (pg/ml) Age &gt; 75 years</td>
<td>&gt; 1800</td>
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</table>

*Table 1 added in August 2016*

BNP, B-type natriuretic peptide; CXR, chest X-ray; ECG, electrocardiogram; NT, N-terminal; PND, paroxysmal nocturnal dyspnea
Vasodilators in Left Ventricular Systolic Dysfunction

**Use of Renin-Angiotensin System Inhibitor/Blockers and/or Vasodilators**

- In patients with LVSD, prescribe ACE inhibitors (ACEIs). (Strong recommendation)
- In patients who are intolerant to ACEIs due to cough, allergy, or angioedema, consider angiotensin-receptor blockers (ARBs) as an alternative. However, if ACEI-induced angioedema is severe, use ARBs with caution. (Weak recommendation)
- If both ACEIs and ARBs are contraindicated, consider the combination of hydralazine and isosorbide dinitrate. (Weak recommendation)
- The routine simultaneous use of ARBs and ACE inhibitors is not generally recommended. (Weak recommendation)
Target Dose of ACEIs

- Consider making the target dose of ACEIs at least the dose used in major clinical trials in patients with LVSD. (Weak recommendation)
  - Lisinopril 20 mg daily
  - Captopril 50 mg three times daily
  - Enalapril 10 mg twice daily

Appropriate Renal Function for Prescribing ACEIs

- In patients with serum creatinine levels ≤ 2.5 mg/dl or eGFR ≥ 30 ml/min/1.73 m², consider using ACEIs. (Weak Recommendation)
- In patients with serum creatinine levels > 2.5 mg/dl or eGFR < 30 ml/min/1.73 m², consider using ACE inhibitors on a case-by-case basis. (Weak Recommendation)

Combination Aspirin and ACEIs

- In patients taking ACE inhibitors for LVSD who have concomitant atherosclerotic vascular disease (CVD), consider prescribing aspirin (ASA) (81 mg). (Weak Recommendation)

Beta-Blockers in LVSD

Use of Beta-Blockers in Addition to Standard Treatment

- For patients with LVSD NYHA class II-IV, or with asymptomatic LVSD (NYHA class I) and concomitant CAD, prescribe beta-blockers. (Strong recommendation)
- For patients with asymptomatic (NYHA class I) LVSD without concomitant CAD, consider prescribing beta-blockers. (Weak recommendation)

Which Beta-Blockers to Use

- For patients with LVSD, consider prescribing carvedilol, metoprolol succinate, or bisoprolol as the beta-blockers of choice. (Weak recommendation)

Beta-Blockers with Concomitant Asthma or COPD

- For patients with LVSD and concomitant well-controlled asthma or COPD, consider prescribing carvedilol or the cardioselective beta-blockers metoprolol or bisoprolol. Consider discussing the risks and benefits of treatment and instruct patients to report any increase in airway symptoms. If airway symptoms worsen on a non-cardioselective agent, consider a cardioselective agent. (Weak recommendation)
- Carvedilol is an acceptable but less well-established option for patients with LVSD and well-controlled asthma or COPD.

Aldosterone Antagonism

- For patients with LVSD, EF ≤ 35%, NYHA Class III or IV, and no contraindications, consider prescribing spironolactone in addition to standard treatment. (Weak recommendation)
- For patients with LVEF ≤ 40%, recent MI, either diabetes or signs of heart failure, and no contraindications, consider prescribing spironolactone. (Weak recommendation)
- For patients with EF < 40%, any symptom of heart failure, and no contraindications, consider prescribing spironolactone as an acceptable but less well-established option. (Weak recommendation)
For most patients, consider prescribing a dose of spironolactone of ≤ 25 mg daily. High doses may increase the risk of serious hyperkalemia. (Weak recommendation)

Consider prescribing eplerenone as an alternative to spironolactone if gynecomastia is problematic. (Weak recommendation)

**Digoxin**

Consider adding digoxin to standard therapy of ACEIs, diuretics, and beta-blockers for heart failure, to improve symptoms and reduce hospitalization only if symptoms remain poorly controlled after optimizing other medicines. (Weak recommendation)

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. (Strong recommendation)

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. (Weak recommendation)

**Oral Anticoagulation - Warfarin**

For patients with LVSD and atrial fibrillation, consider prescribing warfarin unless contraindicated. (Weak recommendation)

For LVSD patients in normal sinus rhythm and with left ventricular thrombus on echocardiography or a history of thromboembolism, consider prescribing warfarin. (Weak recommendation)

**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). 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). (Weak recommendation)

In patients with LVSD, do not prescribe calcium channel blockers other than amlodipine³ and felodipine³.³ (Strong recommendation)
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. (Weak recommendation)

### Lifestyle Factors

<table>
<thead>
<tr>
<th>Sodium-Restricted Diet</th>
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<tbody>
<tr>
<td>For patients with heart failure, consider initiating a moderate sodium restriction to assist in volume management: ≤ 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. (Weak recommendation)</td>
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<th>Physical Activity</th>
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<td>For patients with stable heart failure, consider recommending light to moderate aerobic activity and resistance training unless contraindicated.</td>
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<th>Pharmacological Management of LVSD Based on Patients Race/Ethnicity or Sex</th>
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<td>For women≥ 4 and nonwhite populations, consider management with ACEIs, beta-blockers, and spironolactone similar to that for men and white populations. (Weak recommendation)</td>
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<tr>
<td>For blacks/African Americans and patients who require additional vasodilation for uncontrolled hypertension or symptoms, consider adding hydralazine and isosorbide dinitrate to standard heart failure therapy (including ACEIs and beta-blockers). (Weak recommendation)</td>
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<th>Target Blood Pressure</th>
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<td>For patients aged &lt; 60 years with congestive heart failure (CHF), initiate pharmacologic treatment to lower BP when SBP ≥ 140 mmHg or DBP ≥ 90 mmHg. Treat to a goal SBP &lt; 140 mmHg and goal DBP &lt; 90 mmHg. (Strong recommendation)</td>
</tr>
<tr>
<td>For patients, aged ≥ 60 years with CHF, consider initiating pharmacologic treatment at SBP ≥ 140 mmHg or DBP ≥ 90 mmHg and treat to goal SBP &lt; 140 mmHg and goal DBP &lt; 90 mmHg. (Weak recommendation)</td>
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<th>Medications to Achieve Target Blood Pressure</th>
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<td>In patients with heart failure with preserved ejection fraction, consider the following medications to control hypertension:</td>
</tr>
<tr>
<td>• Diuretics</td>
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<tr>
<td>• ACEIs</td>
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<tr>
<td>• ARBs</td>
</tr>
<tr>
<td>• Beta-blockers</td>
</tr>
<tr>
<td>• Dihydropyridine calcium channel blockers (Weak recommendation)</td>
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</table>
In patients with systolic heart failure, consider prescribing the following medications to control hypertension:

- Diuretics
- Beta-blockers
- ACEIs or ARBs if patient is intolerant of ACEIs
- Hydralazine/isosorbide dinitrate
- Amlodipine or felodipine (Weak recommendation)

**Reassessment of Systolic Performance**

After patients have received optimal medical therapy or revascularization, if a change in cardiac function would impact candidacy for implantable cardioverter defibrillator (ICD) therapy, consider offering a follow-up measurement of LVEF. (Weak recommendation)

Consider not initiating routine repeat measurement of LVEF (after initial confirmation of LVSD) when the results will not alter management. (Weak recommendation)

**Omega-3 Supplementation**

For heart failure patients with an ejection fraction < 40% and after consideration of benefits, risks, and costs to the patient, consider prescribing omega-3 fatty acids supplementation (1 g per day). (Weak recommendation)

### TERMINOLOGY

<table>
<thead>
<tr>
<th>Recommendation Language</th>
<th>Strength*</th>
<th>Action</th>
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<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>Weak 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>Weak 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>
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</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 strong clinical benefits.