

# Care Guide for Cardiovascular Disorders

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| OPPORTUNITY   | PROCESS   | MEASUREMENT/VALUE  | COMMON APPROPRIATE INTERVENTIONS   | SUGGESTED FOLLOW-UP   |
|---|---|--|--|---|
| <b>Blood Pressure Monitoring</b> <sup>1,2</sup>   | <ul style="list-style-type: none"> <li>Measure, manage and adjust, as necessary, at each visit</li> </ul>   | <p><b>Blood pressure goal</b></p> <ul style="list-style-type: none"> <li>&lt;130/85 mm Hg and lower if tolerated for patients with CHD and HF</li> <li>&lt;130/80 mm Hg for patients with diabetes</li> <li>&lt;125/75 mm Hg for patients with renal insufficiency and proteinuria &gt;1gm/24 hours</li> </ul>   | <p><b>If BP elevated over goal</b></p> <ul style="list-style-type: none"> <li>Lifestyle modification</li> <li>Pharmacology                             <ul style="list-style-type: none"> <li>For most patients, start with a low dose of a once-daily drug</li> <li>Combination therapy as appropriate, and titrate dose based on age, need and response to achieve blood pressure targets</li> </ul> </li> </ul>   | <ul style="list-style-type: none"> <li>Measure and evaluate management at each visit</li> </ul>   |
| <p><b>Lipid Evaluation</b><sup>2,3</sup></p> <ul style="list-style-type: none"> <li>Primary Prevention (especially in patients with multiple risk factors)</li> </ul> | <p><b>In all adults 20 years of age and over</b></p> <ul style="list-style-type: none"> <li>Measure fasting lipoprotein profile</li> <li><b>Or if fasting state not available:</b></li> <li>Measure non-fasting TC and HDL</li> <li>Proceed to fasting lipoprotein profile if TC ≥ 200 mg/dL or HDL &lt; 40 mg/dL</li> <li>Assess patient risk status</li> <li>Treatment decisions based on LDL-C and CHD risk</li> </ul> | <p><b>0-1 risk factor</b></p> <ul style="list-style-type: none"> <li>Primary goal – LDL-C &lt;160 mg/dL</li> <li>Secondary goal – if Triglycerides &gt; 200: Non-HDL-C &lt;190 mg/dL</li> </ul> <p><b>2+ risk factors and a 10-year risk ≤ 20%</b></p> <ul style="list-style-type: none"> <li>Primary goal – LDL-C &lt;130 mg/dL</li> <li>Secondary goal – if Triglycerides &gt; 200: Non-HDL-C &lt;160 mg/dL</li> </ul>   | <ul style="list-style-type: none"> <li>Therapeutic lifestyle changes, including:                             <ul style="list-style-type: none"> <li>Reduce intake of saturated fat and cholesterol</li> <li>Increase intake of plant stanols/sterols and soluble fiber</li> <li>Increase physical activity</li> <li>Control weight</li> </ul> </li> <li>Consider starting LDL-lowering drugs if needed to achieve goal</li> </ul>  | <ul style="list-style-type: none"> <li>Obtain once every 5 years if at goal</li> </ul>  |
| <ul style="list-style-type: none"> <li>Secondary Prevention [Patients with CHD, CHD risk equivalents]</li> </ul>  | <ul style="list-style-type: none"> <li>Treatment decisions based on LDL-C in all patients with CHD or CHD risk equivalents, which include:                             <ul style="list-style-type: none"> <li>&gt; 10-year risk &gt; 20%</li> <li>Symptomatic carotid artery disease</li> <li>Peripheral arterial disease</li> <li>Abdominal aortic aneurysm</li> <li>Diabetes Mellitus</li> </ul> </li> </ul>            | <p><b>CHD &amp; CHD risk equivalent</b></p> <ul style="list-style-type: none"> <li>Primary Goal – LDL-C &lt; 100 mg/dL</li> <li>Secondary Goals                             <ul style="list-style-type: none"> <li>If Triglycerides ≥ 200 mg/dL: Non-HDL cholesterol (TC-HDL) &lt; 130 mg/dL</li> <li>If Triglycerides &lt; 200 mg/dL and HDL &lt; 40 (isolated low HDL): Consider pharmaceutical treatment for low HDL</li> </ul> </li> </ul>   | <ul style="list-style-type: none"> <li>LDL-C ≥ 130 mg/dL                             <ul style="list-style-type: none"> <li>Intensive lifestyle therapies</li> <li>Strongly consider concomitant initiation of drug therapy</li> </ul> </li> <li>LDL-C 100-129 mg/dL                             <ul style="list-style-type: none"> <li>Intensive lifestyle therapies</li> <li>Add drug therapy if goal not achieved in 3 to 6 months</li> </ul> </li> <li>Consider drug therapy for other lipid risk factors (TG, low HDL)</li> </ul>   | <ul style="list-style-type: none"> <li>After drug therapy, measure LDL-C at 6 weeks. If goal not achieved, therapy can be intensified. Remeasure LDL-C at 12 weeks and every 4 to 6 months to assess response to therapy.</li> <li>Monitor liver function tests before treatment with statins and periodically thereafter to assess for drug toxicity. Monitor CPK in patients with muscle discomfort.</li> </ul>   |
| <b>Screening for Abnormal Glucose Metabolism</b> <sup>1</sup>   | <ul style="list-style-type: none"> <li>All adults over 45 years old</li> <li>Any female with history of gestational diabetes or polycystic ovarian syndrome (PCOS)</li> <li>Screening should be considered at a younger age or more frequently in individuals with one or more risk factors</li> <li>Screen overweight children and adolescents with risk factors</li> </ul>  | <ul style="list-style-type: none"> <li>FPG ≥ 126 mg/dL, or</li> <li>Symptoms of DM and a casual glucose ≥ 200 mg/dL, or</li> <li>Two-hour PG ≥ 200 mg/dL during an OGTT. In the absence of unequivocal hyperglycemia with acute metabolic decompensation, these criteria should be confirmed by retesting on a different day</li> </ul>  | <p>If abnormal,</p> <ul style="list-style-type: none"> <li>Follow diabetes guidelines</li> <li>Reinforce Therapeutic Lifestyle Changes (TLC)</li> </ul>  | <ul style="list-style-type: none"> <li>If normal, repeat at least every 3 years</li> <li>For high-risk patients, repeat annually</li> </ul>   |
| <b>Ischemic Heart Disease Therapy</b> <sup>4,5,6</sup>  | <ul style="list-style-type: none"> <li>All patients with known coronary artery disease, stable angina, unstable angina, post-coronary intervention (PCI), or history or evidence of prior MI</li> </ul>   | <ul style="list-style-type: none"> <li>Document appropriate patients on:                             <ul style="list-style-type: none"> <li>Aspirin</li> <li>Beta-Blocker</li> <li>ACE-I or ARB</li> <li>Statin</li> </ul> </li> <li>Document ejection fraction (EF) in post-MI patients</li> </ul>  | <ul style="list-style-type: none"> <li>Aspirin therapy – at least 81 mg q day, continue indefinitely unless contraindicated</li> <li>If aspirin therapy contraindicated, clopidogrel may be used indefinitely</li> <li>Combination of clopidogrel and aspirin for patients post-MI or post-PCI</li> <li>Beta-blocker – consider in all patients, especially those post-MI or post-PCI</li> <li>ACE inhibitor – treat all patients indefinitely, unless contraindicated, ARB if ACE-I intolerant**</li> <li>Statin – consider in all patients</li> </ul>  | <ul style="list-style-type: none"> <li>Exercise testing based on risk</li> <li>Assess medication compliance and smoking cessation with each visit</li> </ul>  |
| <b>Assess Left Ventricular Function</b> <sup>8</sup>  | <ul style="list-style-type: none"> <li>Measure EF in all patients with signs or symptoms of heart failure</li> </ul>  | <ul style="list-style-type: none"> <li>Ejection fraction measurement to differentiate systolic dysfunction from other forms of heart failure</li> </ul>  | <ul style="list-style-type: none"> <li>Diagnostic testing may include:                             <ul style="list-style-type: none"> <li>Echocardiogram or radionuclide ventriculography</li> <li>Consider stress testing to rule out ischemia</li> <li>B-Type Natriuretic Peptide &gt;100 pg/mL supports a diagnosis of abnormal ventricular function</li> </ul> </li> </ul>   | <ul style="list-style-type: none"> <li>Repeat assessment of EF if significant change in clinical status or if treatment has been received that might have a major effect on cardiac function</li> </ul>   |
| <b>Systolic Heart Failure</b> <sup>8,9</sup>  | <ul style="list-style-type: none"> <li>Identify patients in symptomatic stages of HF</li> <li>Stage B – Heart disease without symptoms of HF</li> <li>Stage C – Heart disease with history or current symptoms of HF</li> <li>Stage D – End-stage HF symptoms despite maximal medical therapy requiring specialized interventions</li> </ul>  | <ul style="list-style-type: none"> <li>Document structural heart disease without symptoms</li> <li>Document ACE inhibitor – All patients should receive an ACE inhibitor unless they have demonstrated intolerance or have a contraindication</li> <li>Document intolerance of ACE inhibitor</li> <li>Document Beta-blocker – All patients with stable NYHA Class I to IV should receive a Beta-blocker unless contraindicated                             <ul style="list-style-type: none"> <li>For patients with stable NYHA Class IV HF, administration of Beta-blockers can be complex, and patients should be monitored by physicians with expertise in this area</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>ACE inhibitors and Beta-blockers in appropriate patients; ARB only if ACE-I intolerant</li> <li>ACE inhibitors/ARB – titrate to target doses used in clinical trials</li> <li>Angiotensin Receptor Blocker (ARB) if allergy, cough or angioedema with ACE inhibitors**</li> <li>Consider Hydralazine/Nitrate combination if ACE-I and ARB intolerant due to hypotension or renal insufficiency</li> <li>Beta-blocker therapy should be initiated at low dose once patient is clinically stable and euvolemic and up-titrated slowly</li> <li>Diuretics to control the fluid retention of heart failure</li> <li>Spironolactone at low dose for patients with NYHA class IV HF (consider in class III). Contraindicated if K<sup>+</sup> &gt; 5.0 mmol/L and serum creatinine &gt; 2.5 mg/dL.</li> <li>Consider Digoxin if symptomatic (class II to IV)</li> <li>Daily weights/dietary instruction</li> <li>Consider cardiology referral for patients who remain symptomatic despite basic medical therapy or who have EF &lt; 35%.</li> <li>All above interventions and consider cardiology referral for potential specialized interventions (cardiac transplantation, LV assist device, etc.)</li> </ul> | <ul style="list-style-type: none"> <li>Measure K<sup>+</sup> and serum creatinine levels at least 7 and 30 days after starting Spironolactone and monthly thereafter</li> <li>Check renal function and serum K<sup>+</sup> levels 1 to 2 weeks after starting ACE inhibitors and periodically thereafter</li> <li>Measure K<sup>+</sup> after change in dose of any drug that may affect potassium balance</li> <li>Consider serum digoxin measurement in 2 to 3 weeks after starting new drug in elderly or in those with impaired renal function</li> </ul> |

\* Cardiovascular disorders (CVD) included in this guide relate to hypertension, coronary heart disease (CHD), heart failure (HF) and atrial fibrillation. \*\* There are some reports of angioedema with ARB

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|--|---|--|--|---|
| <b>Diastolic Heart Failure (Preserved Systolic Function)<sup>8</sup></b> | <ul style="list-style-type: none"> <li>Measure EF in all patients and assess for significant impairment of diastolic function</li> </ul>  | <ul style="list-style-type: none"> <li>Exclude other possible causes that present in similar manner</li> </ul>   | <ul style="list-style-type: none"> <li>No definitive treatment; in the absence of evidence-based guidelines, generally treat similarly to systolic HF</li> <li>Control                             <ul style="list-style-type: none"> <li>Blood Pressure, usually with ACE-I or ARB</li> <li>Ventricular rate in patients with atrial fibrillation present</li> <li>Volume overload with diuretics</li> </ul> </li> </ul>  | <ul style="list-style-type: none"> <li>Based on pharmacologic agents of choice</li> </ul>   |
| <b>Atrial Fibrillation/Flutter Management<sup>10,11,12</sup></b>         | <ul style="list-style-type: none"> <li>Oral anticoagulation</li> <li>Rate control</li> <li>Rhythm control</li> </ul>  | <ul style="list-style-type: none"> <li>Document all patients with chronic or paroxysmal Atrial Fibrillation (AF)</li> <li>Document high-risk patients with AF at high risk for ischemic stroke                             <ul style="list-style-type: none"> <li>Prior TIA</li> <li>Systemic embolus or stroke</li> <li>Hypertension</li> <li>Poor LV function (EF ≤ 35%)</li> <li>Rheumatic MV disease</li> <li>Rate control or sinus rhythm</li> <li>Prosthetic heart valve</li> <li>Diabetes</li> <li>CHD</li> <li>Thyrotoxicosis</li> </ul> </li> </ul>   | <ul style="list-style-type: none"> <li><b>Warfarin is the preferred agent for the prevention of ischemic/embolic stroke, except in very low-risk patients</b></li> <li>Age ≥ 60, with risk factors for ischemic stroke or age ≥ 75, warfarin</li> <li>Age 60-74, no risk factors for ischemic stroke, warfarin or aspirin</li> <li>Age &lt; 60, no risk factors for ischemic stroke, aspirin</li> <li>Antiarrhythmic drugs and/or cardioversion</li> </ul>   | <p>For anticoagulated patients:</p> <ul style="list-style-type: none"> <li>Target INR 2.5 (range 2-3)</li> <li>At least weekly INR until stable</li> <li>Monthly INR once stable</li> </ul>   |
| <b>Tobacco Use<sup>1,2,10</sup></b>                                      | <ul style="list-style-type: none"> <li>Smoking cessation</li> </ul>   | <ul style="list-style-type: none"> <li>Document/offer treatment options if patient uses tobacco</li> </ul>   | <ul style="list-style-type: none"> <li>Counsel on smoking prevention and cessation                             <ul style="list-style-type: none"> <li>Smoking cessation program</li> <li>Pharmacologic interventions (Coverage may vary by benefit option)</li> </ul> </li> </ul>  | <ul style="list-style-type: none"> <li>Re-evaluate at each visit</li> </ul>   |
| <b>Selective Preventive Health<sup>1,2,13,14,15</sup></b>                | <ul style="list-style-type: none"> <li>Aspirin therapy</li> <li>Weight management</li> <li>Physical activity</li> <li>Substance abuse</li> <li>Post-Menopausal Hormone Replacement Therapy (HRT)</li> <li>Pneumonia – vaccination at least once as adult</li> <li>Influenza – annual vaccination</li> </ul> | <ul style="list-style-type: none"> <li>Document appropriate patient on aspirin</li> <li>Calculate BMI and measure waist                             <ul style="list-style-type: none"> <li>BMI Target: 18.5-24.9 kg/m<sup>2</sup></li> <li>Waist Target: ≤ 35 inches for females    ≤ 40 inches for males</li> </ul> </li> <li>Assess risk to guide prescription</li> <li>Assess for excessive use patterns</li> <li>Document post-menopausal women</li> <li>Document that each patient has a vaccination. If vaccination status is uncertain, vaccination is typically advisable.</li> <li>Document that each patient has a vaccination every year</li> </ul> | <ul style="list-style-type: none"> <li>Administer aspirin (81 mg) daily for patients older than 40 years of age or at high risk for CVD</li> <li>Start weight management and physical activity</li> <li>Encourage a minimum of 30 to 60 minutes of activity at least 3 to 4 times per week, as well as increasing activities of daily living.</li> <li>Advise medically supervised programs for moderate to high-risk patients.</li> <li>Refer to appropriate substance abuse program</li> <li>Recommend lifestyle changes</li> <li>Use of HRT for secondary prevention only is not recommended. Decision to treat should be based upon non-coronary benefits and risks.</li> <li>Primary prevention with daily estrogen/progesterone combination therapy is not recommended.</li> <li>Administer vaccine to all high-risk adults with CVD, unless contraindicated</li> <li>Administer vaccine to all adults with CVD each year</li> </ul> | <ul style="list-style-type: none"> <li>Yearly</li> <li>Monitor progress at each visit</li> <li>Assess activity level at each visit</li> <li>Assess at each visit</li> <li>Document for each patient</li> <li>Yearly</li> </ul>  |
| <b>Depression Screening Opportunity<sup>10,16</sup></b>                  | <ul style="list-style-type: none"> <li>Screen for symptoms of depression</li> </ul>   | <ul style="list-style-type: none"> <li>Document that each patient has been screened for symptoms of major depression over the two weeks preceding the visit</li> <li>Coordinate care with psychiatrist or psychotherapist if involved in your patient's treatment</li> <li>Consider using a patient self-rating depression scale such as the Beck Depression Inventory or Zung Self-Rating Depression Scale<sup>®</sup></li> </ul>   | <ul style="list-style-type: none"> <li>Administer treatment and/or refer patients who meet criteria for depression to a behavioral specialist</li> <li>Administer pharmacologic interventions as indicated                             <ul style="list-style-type: none"> <li>SSRI antidepressants are the preferred first choice since SSRIs do not have the adverse effects commonly seen with tricyclic antidepressants</li> </ul> </li> </ul>  | <ul style="list-style-type: none"> <li>Screening is suggested at subsequent visits</li> <li>Evaluate response to depression treatment with three follow-up contacts in 12 weeks and adjust meds as indicated and/or confer with appropriate treating mental health specialists</li> </ul> |

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\*A committee of Johns Hopkins faculty and professional staff have reviewed these materials and found them to be appropriate for use by primary care physicians, other health professionals and patients. Johns Hopkins acted independently of and received compensation from American Healthways for this review. Johns Hopkins bears no responsibility for clinical outcomes that result from applying these guidelines.