Most patients with CVD have multiple CVD risk factors, which requires a multifactorial approach. Patients with CVD, or who are at risk for CVD, benefit from global CVD risk reduction, with appropriate attention given to all applicable CVD risk factors.¹
### CVD RISK FACTOR: Unhealthy Nutrition

Unhealthy diet is a leading cause of obesity and type 2 diabetes mellitus, which are leading contributors to cardiovascular disease (CVD) morbidity and mortality.²

#### Consume the appropriate calories
(based on age, sex, and activity level) focusing on nutrient dense, whole foods¹

<table>
<thead>
<tr>
<th>LIMIT intake of:</th>
<th>EMPHASIZE intake of:</th>
</tr>
</thead>
<tbody>
<tr>
<td>× Saturated fat (e.g., ultra-processed red meats and tropical oils)</td>
<td>✓ Vegetables, fruits, legumes, nuts, whole grains, seeds, and fish</td>
</tr>
<tr>
<td>× Excessive sodium</td>
<td>✓ Foods rich in monounsaturated and polyunsaturated fatty acids such as fish, nuts, and non-tropical vegetable oils</td>
</tr>
<tr>
<td>× Cholesterol, especially in patients at high risk for CVD with known increases in cholesterol blood levels with increased cholesterol intake</td>
<td>✓ Soluble fiber</td>
</tr>
<tr>
<td>× Ultra-processed carbohydrates and meats</td>
<td></td>
</tr>
<tr>
<td>× Sugar-sweetened beverages</td>
<td></td>
</tr>
<tr>
<td>× Alcoholic beverages</td>
<td></td>
</tr>
<tr>
<td>× Trans fat</td>
<td></td>
</tr>
</tbody>
</table>

#### Time-restricted eating
(limiting caloric consumption to a 6-10-hour period during the active day) may have benefits for weight loss.

In the United States, sugar-sweetened beverages account for approximately HALF of all added sugar intake and are associated with an increased risk for CVD.²

#### Omega-3 fatty acids can be recommended to replace saturated fat²

Saturated fats can raise LDL cholesterol, which may increase the risk for heart disease. The American Heart Association recommends limiting intake of foods containing saturated fats – which are found in butter, cheese, red meat and other animal-based foods.³

In the Diet and Reinfarction Trial, men randomly assigned to increased fish intake had a 29% reduction in total mortality and a 32% reduction in coronary heart disease (CHD) death compared with those randomly assigned to either increased intake of cereal or 30% decreased total fat.⁴

In the Nurses’ Health Study, 2 or more servings of fish per week were associated with 30% lower risk for CHD in women.⁵

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**REFERENCES:**
CVD RISK FACTOR: Overweight & Obesity

Data from 2015-2016 suggests the prevalence of obesity (BMI >30 kg/m²) was ~40% of U.S. adults.¹

Obesity directly and indirectly increases the risk of cardiovascular disease (CVD).²

Weight reduction in patients with obesity attenuates insulin resistance, often improves major CVD risk factors, may have favorable effects on cardiac hemodynamics, and patients with a healthy body weight may have reduced premature all-cause mortality.³-⁵

Overweight and obesity are best managed utilizing a multifactorial approach including nutrition, physical activity, motivational interviewing, behavior modification, pharmacotherapy, and possibly bariatric surgery.²,⁶

Some medications for type 2 diabetes mellitus (e.g., metformin, GLP-1 receptor agonist, SGLT-2 inhibitors) not only improve glucose levels, but reduce the risk of CVD, and are often associated with weight reduction.²

Projections suggest that most of today’s children (~60%) will develop obesity at the age of 35 years, and roughly half of the projected prevalence will occur during childhood.⁷

CVD RISK FACTOR: Physical Inactivity

In the U.S. only 50% of adults get sufficient physical activity to reduce the risk of many chronic diseases such as cardiovascular disease (CVD). ¹

Increased physical activity and routine physical exercise often improve metabolic parameters that otherwise increase CVD risk.²

Blink walking is a moderate intensity activity that most patients can do towards their recommended 150 minutes/week that confers CVD benefits.²

Recommended physical activity for healthy adults includes at least 150 minutes of moderate-intensity or ≥75 minutes of vigorous-intensity physical activity per week.³,⁴

<table>
<thead>
<tr>
<th>Sedentary Behavior</th>
<th>Light Physical Activity</th>
<th>Moderate Physical Activity</th>
<th>Vigorous Physical Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1.5 MET</td>
<td>1.5-3 MET</td>
<td>3-6 MET</td>
<td>≥6 MET</td>
</tr>
<tr>
<td>Sedentary Behavior</td>
<td>Light Physical Activity</td>
<td>Moderate Physical Activity</td>
<td>Vigorous Physical Activity</td>
</tr>
<tr>
<td>&lt;5,000 steps per day is considered sedentary²</td>
<td>5,000-10,000 steps per day is considered active²</td>
<td>&gt;10,000 steps per day may be optimal for conferring CVD benefits²</td>
<td></td>
</tr>
</tbody>
</table>

MET = metabolic equivalent of task; a unit that estimates the amount of energy used by the body during physical activity, as compared to resting metabolism.

Lowering high blood pressure reduces cardiovascular disease (CVD) risk, reduces the progression of kidney disease, and reduces overall mortality among a range of patients otherwise at risk for CVD.¹

**CVD RISK FACTOR: High Blood Pressure**

Non-pharmacologic treatment of high blood pressure includes:

- Low-sodium diet (<2300 mg per day)
- Adequate potassium
- Routine physical activity
- Attaining a healthy body weight
- No more than low to moderate alcohol intake²,³

The **American Heart Association** defines hypertension (HTN) as blood pressure persistently ≥130/80 mmHg.⁴

**Thiazide diuretics** are often a first line therapy for HTN. Based on the results of CVD outcomes trials, the American College of Cardiology has recommended chlorthalidone as the preferred thiazide or thiazide-type diuretic.

**Loop diuretics** may be preferred in patients with heart failure and when estimated glomerular filtration rate is <30 ml/min.

In addition to lowering blood pressure, **ACE inhibitors and ARBs** are beneficial in treating heart failure and coronary artery disease.

**CCBs** lower blood pressure and are first line hypertensive agents.

**Beta blockers** reduce CVD in patients with reduced ejection fraction, treat angina pectoris and cardiac dysrhythmias, and may reduce the risk of recurrent myocardial infarction after an acute myocardial infarction.¹

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**REFERENCES:**


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ACE: angiotensin-converting enzyme  
ARB: angiotensin-receptor blockers  
CCB: calcium channel blocker

For a validated listing of home blood pressure devices, please visit [www.validatebp.org](http://www.validatebp.org)
**CVD RISK FACTOR: Hyperglycemia**

Diabetes mellitus is a major risk factor for cardiovascular disease (CVD), which warrants more aggressive treatment of other common CVD risk factors (e.g., overweight or obesity, high blood pressure, dyslipidemia, cigarette smoking).¹

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**Type 2 diabetes** mellitus (T2DM) is associated with **double** the risk for death and a **10-fold increase** in **hospitalizations** for **coronary heart disease**.²

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**Metformin** has favorable effects on CVD risk factors and when combined with weight management and physical activity, often remains a **first-line therapy** for patients with T2DM.¹

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In patients with T2DM, **SGLT2 inhibitors** reduce glucose levels, reduce CVD Risk, and contribute to **modest weight loss**.⁵

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In patients with T2DM, **GLP-1 receptor agonists** have the potential to reduce CVD via glycemic control, improvement in lipid levels, and reduction in body weight and blood pressure.⁶

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Glucose treatment goal for most patients with diabetes is to achieve a **hemoglobin A1c <7%** and avoid wide swings in blood glucose.³

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A general principle of lipid management is that the most aggressive lipid management is best directed at patients with the highest cardiovascular disease (CVD) risk.\(^1\)

**STATINS** are the most recommended drug treatment for hypercholesterolemia due to their cholesterol-lowering efficacy, safety, and CVD benefits supported by numerous CVD outcomes trials.\(^2\) In high risk individuals, the objective of lipid-altering therapy with statins is to achieve at least a 50% reduction in LDL-C and achieve an LDL-C <70 mg/dL.\(^3,4\)

Elevated LDL cholesterol and elevated triglycerides may be improved with regular physical activity and healthful nutrition.

PCSK9 inhibitors can lower LDL-C ≥50% and reduce CVD risk when added to high intensity or maximally tolerated statins.\(^5,6\)

Because apo B and non-HDL cholesterol levels better reflect atherosclerotic CVD risk (compared to LDL-C alone), measurement of these biomarkers may provide additional useful information regarding risk for CVD events and are sometimes included in lipid management guidelines and societal recommendations.\(^10,11\)

**REFERENCES:**