

MODIFIABLE CARDIOVASCULAR DISEASE (CVD) RISK FACTORS

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: *Unhealthful Nutrition*

Unhealthful 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

LIMIT intake of:

- ✗ Saturated fat (e.g., ultra-processed red meats and tropical oils)
- ✗ Excessive sodium
- ✗ Cholesterol, especially in patients at high risk for CVD with known increases in cholesterol blood levels with increased cholesterol intake
- ✗ Ultra-processed carbohydrates and meats
- ✗ Sugar-sweetened beverages
- ✗ Alcoholic beverages
- ✗ Trans fat

EMPHASIZE intake of:

- ✓ Vegetables, fruits, legumes, nuts, whole grains, seeds, and fish
- ✓ Foods rich in monounsaturated and polyunsaturated fatty acids such as fish, nuts, and non-tropical vegetable oils
- ✓ Soluble fiber



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 a dose-dependent **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



ASPC
The American Society for Preventive Cardiology

REFERENCES: 1. Bays, H.E., et al. Ten things to know about ten cardiovascular disease risk factors ("ASPC Top Ten CVD Risk Factors – 2021"). Am Jm of Prev Card. 2020;1:100003. 2. Pallazola VA, et al. A Clinician's Guide to Healthy Eating for Cardiovascular Disease Prevention. Mayo Clin Proc Innov Qual Outcomes. 2019;3:251-67. 3. <https://www.heart.org/en/healthy-living/healthy-eating/eat-smart/nutrition-basics/aha-diet-and-lifestyle-recommendations>. Accessed Feb. 5, 2020. 4. Dehghan M, et al. Association of dairy intake with cardiovascular disease and mortality in 21 countries from five continents (PURE): a prospective cohort study. Lancet. 2018;392:2288-97. 5. Satija A, et al. Healthful and Unhealthful Plant-Based Diets and the Risk of Coronary Heart Disease in U.S. Adults. Journal of the American College of Cardiology. 2017;70:411-22.




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




RISK

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



RISK

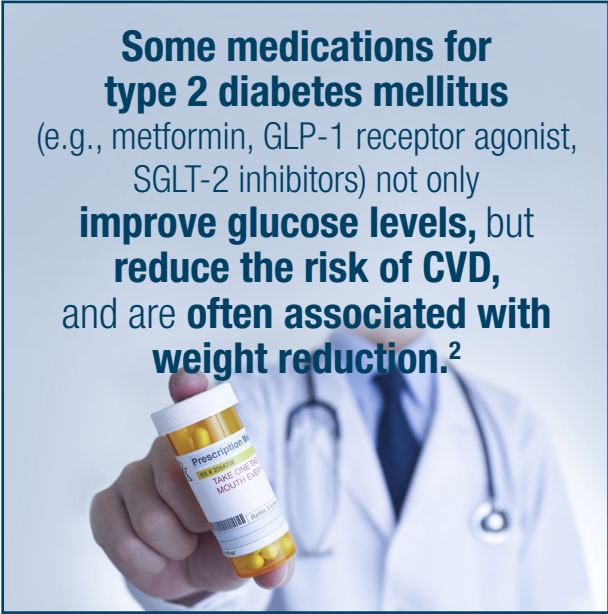
Weight reduction in patients with obesity **attenuates** insulin resistance, often **improves** major CVD risk factors, may have **favorable effects** on cardiac hemodynamics, and patients with a healthy body weight may have **REDUCED** premature all-cause mortality.³⁻⁵



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



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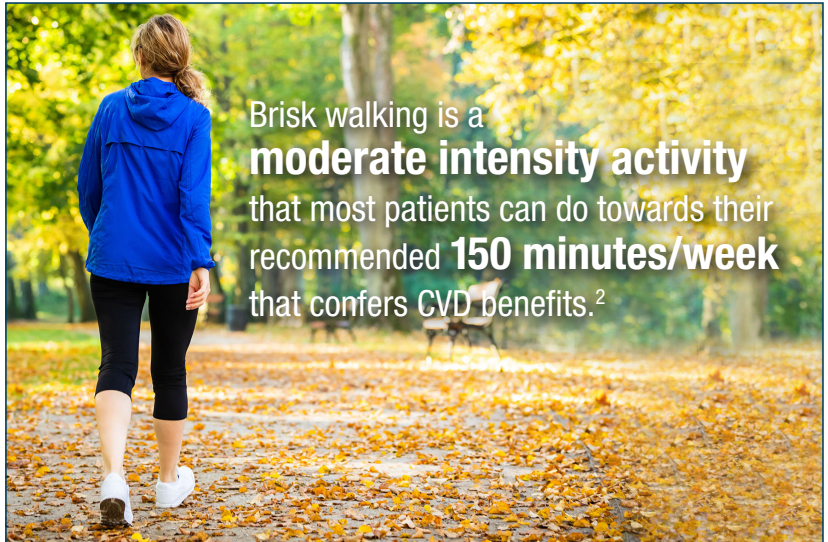
CVD RISK FACTOR: *Physical Inactivity*

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



Brisk 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}



<5,000 steps per day is considered **sedentary**²

5,000-10,000 steps per day is considered **active**²

>10,000 steps per day may be optimal for conferring **CVD benefits**²



Sedentary Behavior <1.5 MET	Light Physical Activity 1.5-3 MET	Moderate Physical Activity 3-6 MET	Vigorous Physical Activity ≥6 MET

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.



REFERENCES: 1. Centers for Disease Control. Physical Activity. <https://www.cdc.gov/physicalactivity/index.html> Accessed October 18, 2020. 2. Bays, H.E., et al. Ten things to know about ten cardiovascular disease risk factors ("ASPC Top Ten CVD Risk Factors – 2021"). Am Jm of Prev Card. 2020;1:100003. 3. Arnett D.K., et al. 2019 ACC/AHA Guideline on the Primary Prevention of Cardiovascular Disease: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. Journal of the American College of Cardiology. 2019;74:e177-e232. 4. Pelliccia A, et al. 2020 ESC Guidelines on sports cardiology and exercise in patients with cardiovascular disease. European heart journal. 2020. 5. Hill K, et al. Physical activity and sedentary behaviour: Applying lessons to chronic obstructive pulmonary disease. Intern Med J. 2015;45(5):474–482.

CVD RISK FACTOR: *High Blood Pressure*

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

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 intake.^{2,3}

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



For a validated listing of home blood pressure devices, please visit www.validatebp.org

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



ACE: angiotensin-converting enzyme

ARB: angiotensin-receptor blockers

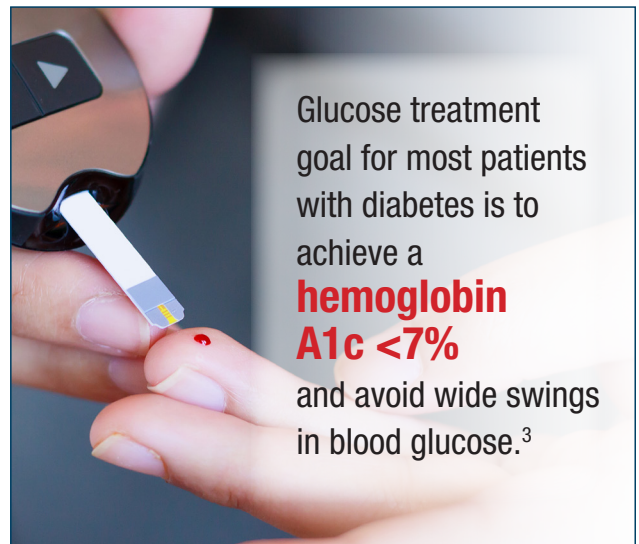
CCB: calcium channel blocker



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

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



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

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



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



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



CVD RISK FACTOR: *Dyslipidemia*

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**.

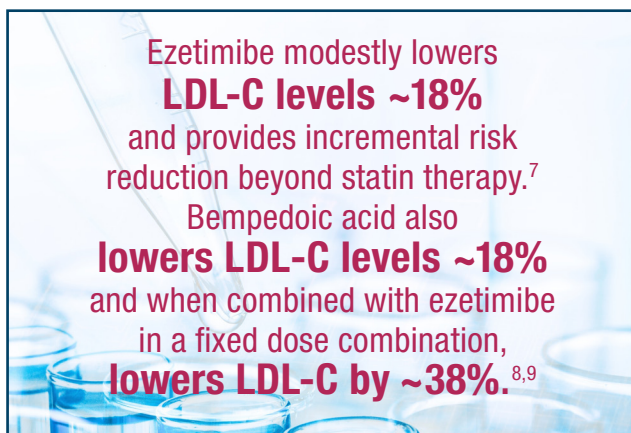


PCSK9 inhibitors can lower LDL-C **≥50%** and **reduce CVD risk** when added to high intensity or maximally tolerated statins.^{5,6}



Ezetimibe modestly lowers **LDL-C levels ~18%** and provides incremental risk reduction beyond statin therapy.⁷

Bempedoic acid also **lowers LDL-C levels ~18%** and when combined with ezetimibe in a fixed dose combination, **lowers LDL-C by ~38%**.^{8,9}



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}

Ten year CVD risk factors can be assessed with the ACC/AHA ASCVD Heart Risk Calculator: <http://cvriskcalculator.com>



REFERENCES: 1. Bays, H.E., et al. Ten things to know about ten cardiovascular disease risk factors ("ASPC Top Ten CVD Risk Factors – 2021"). Am Jm of Prev Card. 2020;1:100003. 2. Arnett DK, et al. 2019 ACC/AHA Guideline on the Primary Prevention of Cardiovascular Disease: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. Journal of the American College of Cardiology. 2019;74:e177-e232. 3. Mach F, et al. 2019 ESC/EAS Guidelines for the management of dyslipidaemias: lipid modification to reduce cardiovascular risk. European heart journal. 2020;41:111-88. 4. Handelsman Y. Consensus statement by the American Association of Clinical Endocrinologists and American College of Endocrinology on the management of dyslipidemia and prevention of cardiovascular disease algorithm – 2020 executive summary. Endocrine practice : official journal of the American College of Endocrinology and the American Association of Clinical Endocrinologists. 2020;(In Press). 5. Grundy SM, et al. 2018 AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APHA/ASPC/NLA/PCNA Guideline on the Management of Blood Cholesterol: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. Journal of the American College of Cardiology. 2018. 6. Mach F, et al. 2019 ESC/EAS Guidelines for the management of dyslipidaemias: lipid modification to reduce cardiovascular risk. European heart journal. 2020;41:111-88. 7. Zhan S, et al. Ezetimibe for the prevention of cardiovascular disease and all-cause mortality events. The Cochrane database of systematic reviews. 2018;11:CD012502. 8. Ray KK, et al. Safety and Efficacy of Bempedoic Acid to Reduce LDL Cholesterol. The New England journal of medicine. 2019;380:1022-32. 9. Ballantyne CM, et al. Bempedoic acid plus ezetimibe fixed-dose combination in patients with hypercholesterolemia and high CVD risk treated with maximally tolerated statin therapy. European journal of preventive cardiology. 2019;2047487319864671. 10. Nordestgaard BG, et al. Quantifying atherogenic lipoproteins for lipid-lowering strategies: Consensus-based recommendations from EAS and EFLM. Atherosclerosis. 2020;294:46-61. 11. Langlois MR, Sniderman AD. Non-HDL Cholesterol or apoB: Which to Prefer as a Target for the Prevention of Atherosclerotic Cardiovascular Disease? Curr Cardiol Rep. 2020;22:67.