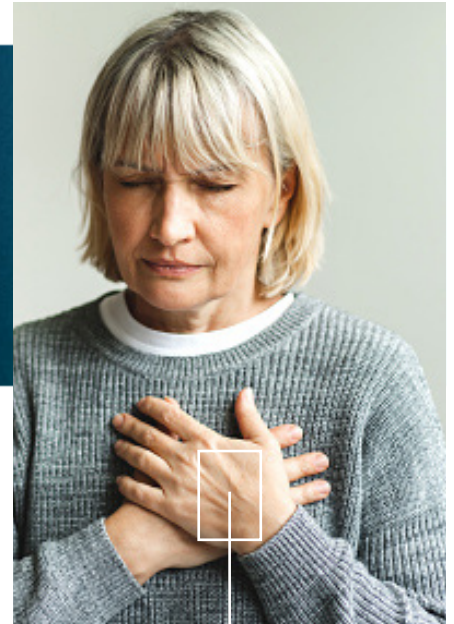


WHAT IS CARDIOVASCULAR DISEASE

Cardiovascular disease (CVD) encompasses a range of conditions affecting the heart and blood vessels. The most prevalent form is atherosclerotic cardiovascular disease (ASCVD) which results from the accumulation of plaque in the walls of arteries, encompassing various conditions, including:



Coronary Heart Disease (CHD)

This includes heart issues like heart attacks, chest pain (angina), and narrowed coronary arteries.



Cerebrovascular Disease

Involves problems like mini-strokes (transient ischemic attack), strokes, and blockages in the carotid artery.



Peripheral Artery Disease

Shows up as leg pain during movement (claudication).



Aortic Atherosclerotic Disease

Encompasses issues like a bulging abdominal aorta (abdominal aortic aneurysm) and a weakened descending thoracic aorta.



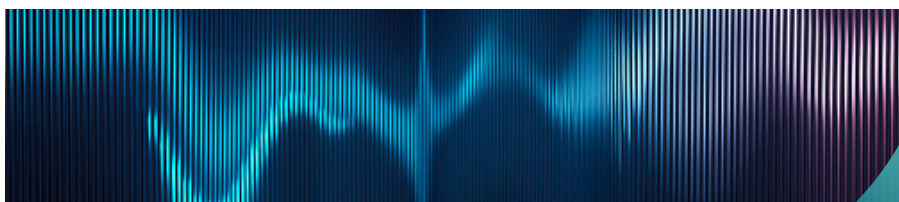
Heart Failure

Happens when the heart can't pump enough blood, leading to fatigue, breathlessness, and leg swelling. It often results from underlying cardiovascular problems like coronary artery disease, past heart attacks, high blood pressure, and heart-straining conditions.



Heart Arrhythmias

Refers to abnormal heartbeats, whether too fast, too slow, or irregular. These irregularities often arise from disruptions in the heart's electrical signals. Causes include heart conditions, high blood pressure, diabetes, smoking, excessive alcohol, and certain medications.



STATISTICS ON CARDIOVASCULAR DISEASE

WHAT IS
CARDIOVASCULAR
DISEASE

CVD ACCOUNTS FOR

1 / 5 IN DEATHS

APPROX. EVERY

34 SECONDS

ANNUAL DEATH TOLL OF OVER

17 MILLION GLOBALLY

IMPOSING AN
ECONOMIC BURDEN OF

\$229 * BILLION

* IN THE U.S. IN 2018

RISK FACTORS OF CARDIOVASCULAR DISEASE

Recognizing a heightened risk for cardiovascular disease (CVD) is crucial for minimizing its impact. Timely identification of CVD risk factors, such as hypertension, high cholesterol, diabetes, smoking, obesity, and physical inactivity, is key to preventing or delaying the disease.

NON-MODIFIABLE RISK FACTORS

Non-modifiable risk factors for cardiovascular disease (CVD) are characteristics or conditions that cannot be changed or controlled. These factors play a significant role in influencing an individual's susceptibility to cardiovascular problems. Common non-modifiable risk factors include:

Family History

A family history of cardiovascular disease can increase an individual's risk. If a close relative (parent or sibling) has experienced heart disease or a cardiovascular event at an early age, the risk may be elevated.

Ethnicity/Race

Certain ethnic groups may have a higher predisposition to cardiovascular disease. For example, African Americans are at an increased risk of hypertension and related complications.

Age

The risk of cardiovascular disease increases with age. Aging is associated with changes in blood vessels and the heart, making older individuals more susceptible to CVD.

Gender

Men generally face a higher risk of cardiovascular disease than premenopausal women. However, the risk for women increases after menopause, and by the age of 65, the risk is similar for both genders.

Genetic Factors

Inherited genetic conditions, such as familial hypercholesterolemia, can contribute to higher levels of cholesterol and an increased risk of cardiovascular problems.

Previous Cardiovascular Events

Individuals who have already experienced a heart attack, stroke, or other cardiovascular events are at a higher risk of subsequent events.

While these non-modifiable risk factors cannot be changed, having these risks does not mean you will have disease, and understanding them is crucial for risk assessment. Individuals with high risk factors will benefit from monitoring and managing modifiable risk factors to mitigate overall cardiovascular risk.

MODIFIABLE RISK FACTORS

Several modifiable risk factors can be targeted to prevent or manage cardiovascular disease. Here are key areas to consider:

Nutrition

Focus on an anti-inflammatory diet rich in whole, nutrient-dense foods and minimize processed foods, refined sugars, and trans fats.

Omega-3 Fatty Acids

Include sources of omega-3s, such as fatty fish, flaxseeds, and walnuts, to reduce inflammation.

Physical Activity

Engage in at least 2.5 hours of moderate-vigorous physical activity weekly, including aerobic exercise, strength training, and flexibility exercises.

Stress Management

Incorporate stress-reducing practices such as mindfulness, meditation, yoga, and deep breathing exercises.

Sleep Optimization

Ensure sufficient and quality sleep, aiming for 7-9 hours per night.

Weight Management

Maintain a healthy body weight through a balanced diet and regular physical activity.

Blood Sugar Regulation

Focus on a diet that regulates blood sugar levels by minimizing refined carbohydrates and added sugars.

Smoking Cessation

Quit smoking and avoid secondhand smoke, a major risk factor for cardiovascular disease.

IMPORTANCE OF CVD SCREENING & ADDITIONAL LAB WORK

WHAT IS
CARDIOVASCULAR
DISEASE

Screening for cardiovascular disease (CVD) risk factors involves identifying individuals at a higher risk of developing CVD through routine lab work.

GENERAL ASSESSMENTS

Basic Lipid Panel

A lipid panel is a blood test that measures different types of fats (lipids) in the blood, providing valuable information about a person's cardiovascular health.

Total cholesterol represents the overall amount of cholesterol in the blood, including both low-density lipoprotein cholesterol (LDL-C) and high-density lipoprotein cholesterol (HDL-C) cholesterol.

- Ensure that the total cholesterol remains below 180 mg/dL, but it's essential to consider this value in conjunction with triglyceride and HDL levels for a comprehensive understanding.

LDL-C: Cholesterol carried by low-density lipoprotein, frequently associated with the formation of plaque that contributes to atherosclerosis, and commonly referred to as "bad" cholesterol.

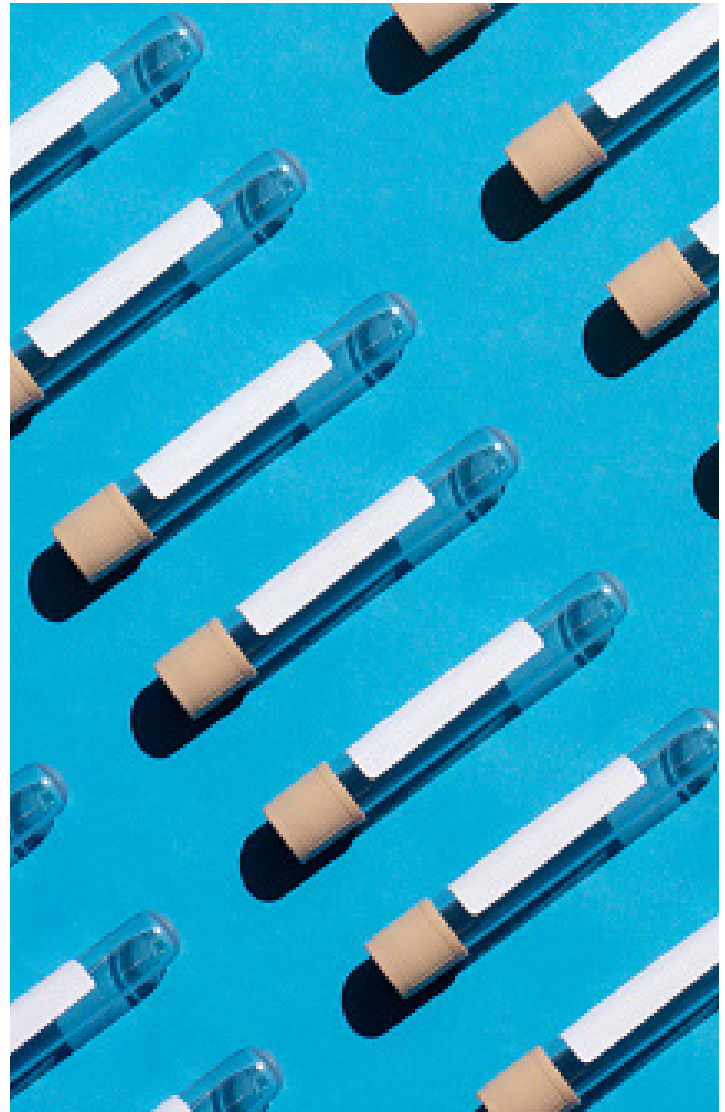
- Optimal range: Maintain an LDL level below 100 mg/dL.
- The precise levels of LDL may be deceptive, as the composition of LDL, especially the quantity of small dense LDL particles and high-density LDL particles, holds greater significance within the overall count. You may consider advanced lipid panels if you are at high risk for CVD.

HDL-C: A lipid complex consisting of proteins and fats that transport cholesterol in the bloodstream. When cholesterol is within an HDL particle, it is often referred to as "good" cholesterol since HDL transports some cholesterol back to the liver, where it undergoes breakdown and is eliminated from the body through waste.

- Optimal levels for HDL cholesterol are above 60 mg/dL.

Triglycerides: A type of lipid present in the blood that serves as a major source of energy for the body.

- Optimal levels of triglycerides <50 mg/dL.



Recent advancements in individualized testing allow for customized risk assessment, including evaluations of specific biomarkers and imaging techniques, such as:

HgbA1c (Hemoglobin A1c)

Purpose: Reflects the average blood sugar levels over the past 2-3 months by measuring the percentage of hemoglobin that is glycated (bound to glucose).

Cardiovascular Relevance:

Elevated levels indicate poor long-term blood sugar control, which is a significant risk factor for atherosclerosis and cardiovascular disease. Persistent high blood sugar levels can contribute to inflammation and damage to blood vessels.

NMR (Nuclear Magnetic Resonance)

Purpose: NMR provides a more detailed analysis of lipoprotein particles, including their size and concentration. It uses magnetic resonance technology to distinguish between different types of lipoproteins, such as very-low-density lipoproteins (VLDL), low-density lipoproteins (LDL), and high-density lipoproteins (HDL).

Cardiovascular Relevance:

While a basic lipid panel measures total cholesterol, LDL cholesterol, HDL cholesterol, and triglycerides, NMR provides additional insights into lipoprotein particle size. Smaller, denser particles are considered more atherogenic, increasing the risk of atherosclerosis and cardiovascular events. NMR can identify individuals with a higher number of small, dense LDL particles, even if their LDL cholesterol levels appear normal.

Fasting Insulin

Purpose: Measures insulin levels in the blood, reflecting the body's ability to regulate glucose.

Cardiovascular Relevance:

Elevated insulin levels may suggest insulin resistance, a condition where cells become less responsive to insulin. Insulin resistance is associated with metabolic syndrome, which increases the risk of cardiovascular disease, including hypertension and dyslipidemia.

ApoB (Apolipoprotein B)

Purpose: ApoB is a protein found in the outer membrane of LDL and VLDL particles. It reflects the number of atherogenic particles circulating in the bloodstream.

Cardiovascular Relevance:

Measuring ApoB is considered more accurate than assessing LDL cholesterol alone. Each atherogenic particle typically carries one ApoB molecule, so counting ApoB provides a more direct measure of the total number of potentially harmful particles. Elevated ApoB levels indicate an increased risk of atherosclerosis and cardiovascular events.

HOMA-IR (Homeostatic Model Assessment for Insulin Resistance)

Purpose: Calculates insulin resistance using fasting glucose and insulin levels.

Cardiovascular Relevance:

Higher HOMA-IR values indicate increased insulin resistance. Insulin resistance is linked to metabolic abnormalities and is considered an independent risk factor for cardiovascular disease.

Lp(a) (Lipoprotein(a))

Purpose: Calculates insulin resistance using fasting glucose and insulin levels.

Cardiovascular Relevance:

Elevated levels of Lp(a) are associated with an increased risk of atherosclerosis, thrombosis, and cardiovascular disease. Lp(a) has pro-atherogenic and pro-thrombotic properties, making it an independent risk factor. It contributes to the development of atherosclerotic plaques and may interfere with clot dissolution, leading to an increased risk of heart attacks and strokes.

Triglyceride to HDL Ratio

Purpose: Evaluates the balance between triglycerides and high-density lipoprotein (HDL) cholesterol.

Cardiovascular Relevance:

A higher ratio is associated with insulin resistance and an increased risk of cardiovascular disease. It reflects an imbalance in lipid metabolism and is considered a marker of atherogenic dyslipidemia.

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IMAGING ASSESSMENTS

WHAT IS CARDIOVASCULAR DISEASE

Advanced imaging techniques play a pivotal role in assessing cardiovascular disease (CVD) risk by providing detailed insights into the structure and health of blood vessels and the cardiovascular system.

CAROTID INTIMA-MEDIA THICKNESS (CIMT) TEST:

Purpose: The CIMT test measures the thickness of the innermost two layers of the carotid artery wall— the intima and media. Increased thickness is associated with atherosclerosis, the buildup of plaque in arteries.

Procedure: Ultrasound is used to visualize the carotid arteries, and the CIMT is measured from the images.

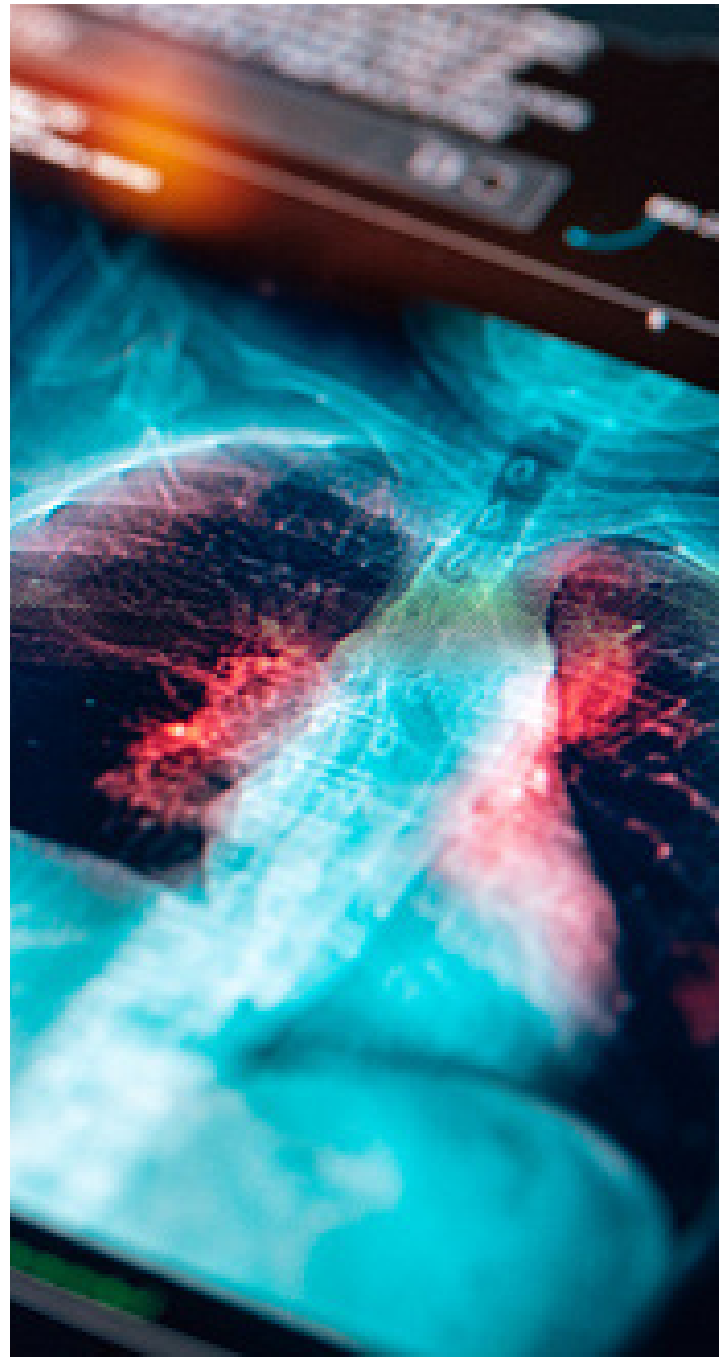
Cardiovascular Relevance: CIMT is used as a marker of subclinical atherosclerosis, providing information about early-stage arterial wall changes before the development of symptoms. Higher CIMT values are associated with an increased risk of cardiovascular events, including stroke and heart attack.

CORONARY ARTERY CALCIUM (CAC) TEST OR CT CALCIUM SCORE:

Purpose: The CAC test measures the amount of calcium deposits in the coronary arteries, providing an indication of coronary artery disease (CAD).

Procedure: A computed tomography (CT) scan is used to create detailed images of the heart, and a calcium score is calculated based on the amount of calcium detected in the coronary arteries.

Cardiovascular Relevance: Calcium deposits in the coronary arteries are a marker of atherosclerosis. A higher calcium score is associated with an increased risk of coronary events. The test is particularly useful for individuals at intermediate risk based on traditional risk factors, helping to further refine their risk assessment.



RESOURCES

Center for Disease Control and Prevention. About heart disease. Retrieved from cdc.gov/heartdisease

heart.org/en/professional/quality-improvement/ascvd

World Health Organization. Cardiovascular diseases. Retrieved from who.int/health-topics/cardiovascular-diseases

These additional labs and imaging assessments contribute to a more complete and personalized approach to cardiovascular risk assessment, allowing for targeted interventions and improved preventive strategies based on individual health profiles.