CM Vitals

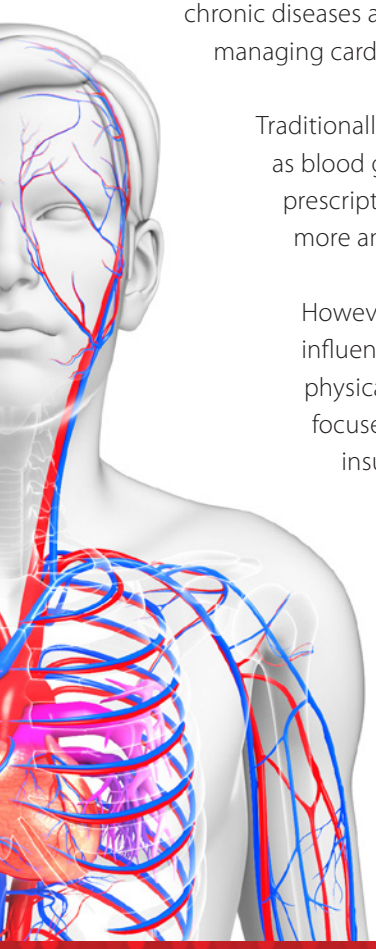
CARDIOMETABOLIC SOLUTIONS

# PATIENT HANDBOOK

# Introduction

**The heart, blood vessels and blood make up one of the most amazing and unique organ systems in the human body: the cardiovascular system.** Often referred to as the body's form of plumbing, the cardiovascular system is responsible for transporting nutrients and oxygen and removing gaseous waste. The cardiovascular system also provides immune protection and regulates body temperature, fluid pH, and water content of cells. [1] These actions are completed with the help of the autonomic nervous system, which regulates the cardiovascular system by monitoring receptors throughout the body on a second-by-second basis.[2] This process allows the heart to respond to stimuli instantaneously and beat over 100,000 times each day, without you having to do anything!

The overwhelming amount of work accomplished by the cardiovascular system each day places stress on both the heart and coronary arteries. Over time, this stress can lead to chronic inflammation, insulin resistance and ultimately cardiometabolic disease.[3] Cardiometabolic disease is comprised of three of the top six most commonly diagnosed chronic diseases among Americans: cardiovascular disease, type 2 diabetes, and stroke.[4] In fact, preventing and managing cardiometabolic risk is the most common conversation patients have with their clinicians.



Traditionally, treating and preventing cardiometabolic disease has focused on managing lab values such as blood glucose, blood pressure, HDL cholesterol, LDL cholesterol, and total cholesterol with the use of prescription drugs. Unfortunately, this strategy has not lowered the rate of cardiometabolic disease. In fact, more and more Americans are diagnosed each year and at increasingly younger ages.

However, we now know the cardiovascular system is highly influenced by lifestyle choices we make every day, such as diet, physical activity, stress response, and the environment. If health-focused choices are not practiced daily, chronic inflammation, insulin resistance and, over time, cardiometabolic disease can damage our overall health.[5, 6]

The CM Vitals Patient Handbook provides a specialized lifestyle plan to help you begin the journey of taking control of your cardiometabolic risk.

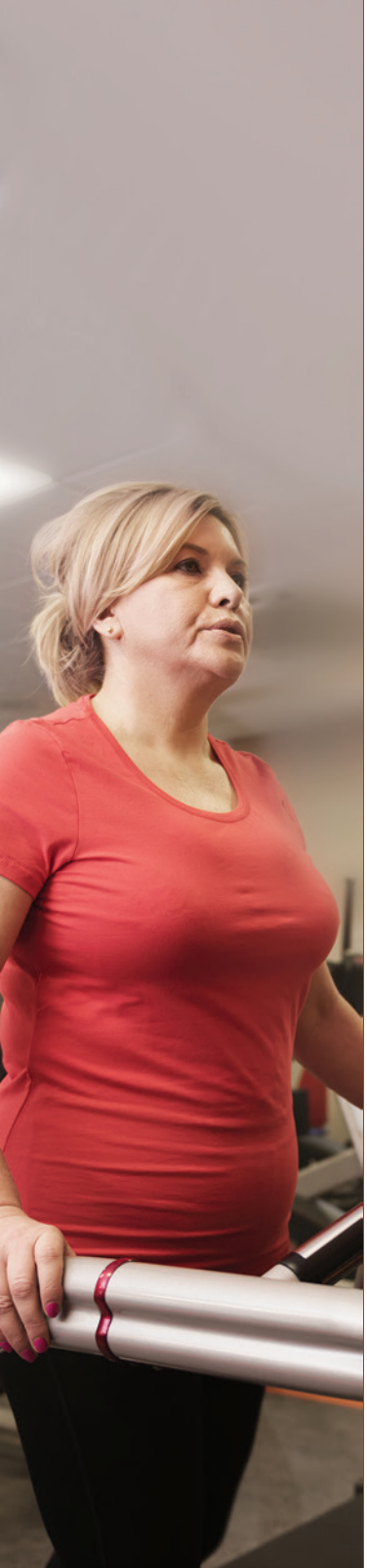
**Cardiometabolic disease** refers to cardiovascular disease, type 2 diabetes and stroke.

# Table of Contents

# Understanding Cardiometabolic Risk

Cardiometabolic risk is a collection of factors that help determine a patient's overall risk for cardiometabolic disease. Based on population data, professional organizations such as the American Diabetics Association (ADA) and the American Heart Association (AHA) have established these guidelines for measuring cardiometabolic risk.[7,8]

| | Pre-Diabetes | Metabolic Syndrome | Type 2 Diabetes | Dyslipidemia |
|---|---|---|---|---|
| **Organization** | ADA | AHA | ADA | AHA |
| | Need 1 to be diagnosed | Need 3 of 5 to be diagnosed | Need 1 to be diagnosed | Need 1 to be diagnosed |
| **FBG (mg/dl)** | 100-125 | >100 | >126 | |
| **HbA1c** | 5.7-6.5 | | >6.5 | |
| **TG (mg/dl)** | | >150 | | |
| **Total Cholesterol (mg/dl)** | | | | >200 |
| **LDL (mg/dl)** | | | | >130 |
| **HDL (mg/dl)** | | <40 males, <50 females | | <40 males, <50 females |
| **BP (mm/Hg)** | | >130 or >85 | | |
| **Waist (IN)** | | >40 males, >35 females | | |
| **OGTT (mg/dl)** | 140-200 | | >200 | |
| **Recommended Therapy** | Lose 7% body weight, 150 min exercise/ week, metformin | Drug therapy, 150 min exercise/week, lose weight | Drug therapy, 150 min exercise/week, lose 10% body weight | Drug therapy, lose weight, 150 min exercise/week |



As you can see, regardless of your risk level, the recommended course of treatment is often focused on drug therapies aimed at reducing an individual lab value (e.g., a statin for high LDL). This type of management is a reactive way of helping you lower your risk, but it clearly does not attack the underlying cause of the problem.

An abnormal lab value is a signal of multiple levels of body functions failing; therefore, simply addressing the lab value will not solve the many layers of dysfunction that continue to persist.

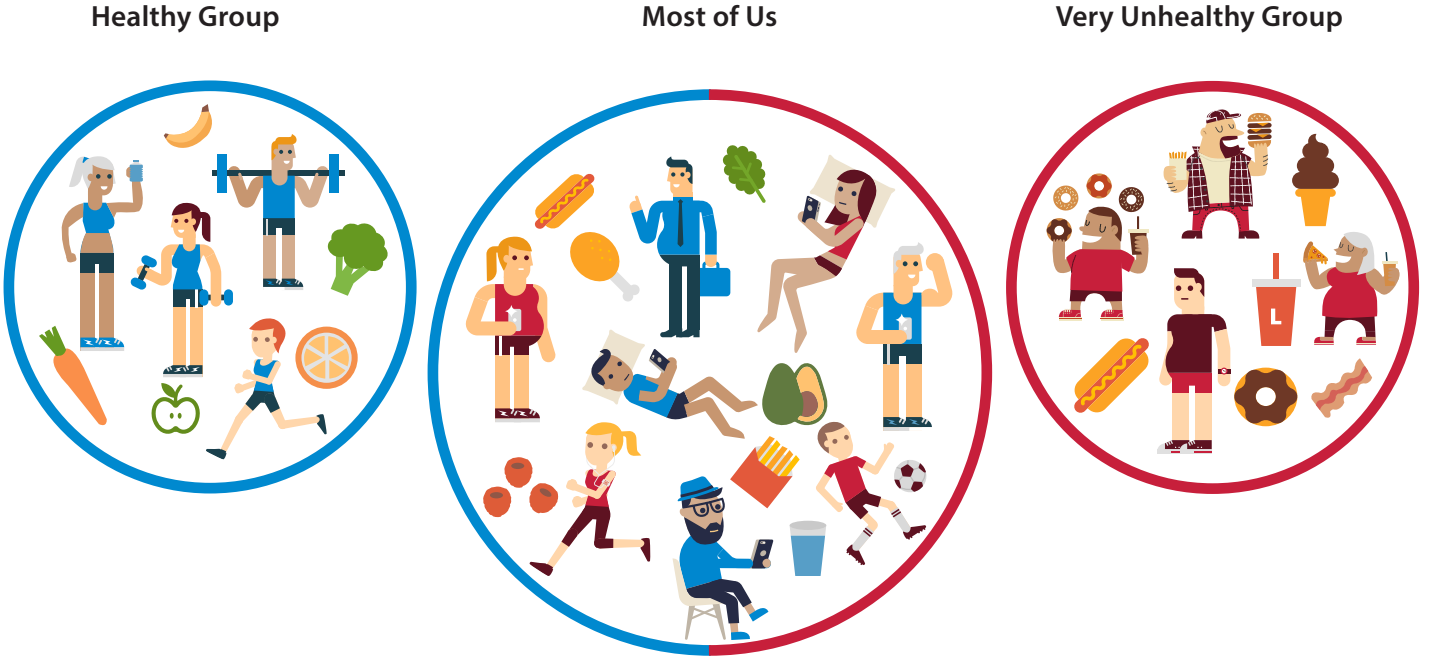
In order to truly improve risk, we must be proactive and attack the underlying cause of the problem. The cause of increased cardiometabolic risk is often a **decreased physiological resilience** and **metabolic reserve** caused by chronic **inflammation** and **insulin resistance** stemming from poor lifestyle choices such as obesity, physical inactivity, stress, environmental factors, and nutrient deficiencies.

**Physiological Resilience:**
Capacity of your body to immediately respond to changes in need

**Metabolic Reserve:**
Long-term capacity of your body to withstand repeated changes in need

## Controlling Your Cardiometabolic Risk

We all have an aunt or uncle who lives a very unhealthy lifestyle and still lived to be 95 years old. On the flip side, we all know someone who practiced a very healthy lifestyle, but unfortunately was diagnosed with cardiometabolic disease before the age of 60. These two groups of people are anomalies, and they represent a very small portion of the general population. Even though your genes play a role in disease progression, they are not the deciding factor for a majority of the population.




Your risk for cardiometabolic disease takes years to develop. The cumulative burden of years of poor choices eventually add up to create your risk or health profile. This is called the metabolic continuum. If you've made some unhealthy choices over your lifetime, you can change your course. However, if you take no action, the risk for disease will snowball as the years progress.

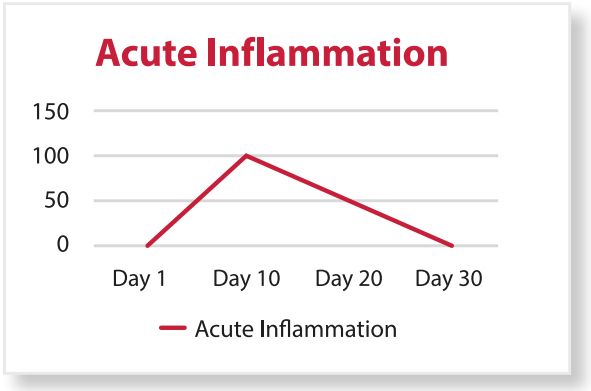
**The Metabolic Continuum**


With your clinician's guidance, the CM Vitals Patient Handbook will help you understand where you fall on the metabolic continuum, and how you can take steps to improve your trajectory as needed.

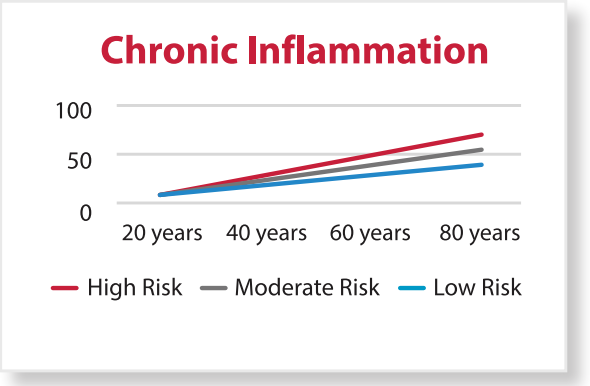
## Chronic Inflammation and Cardiometabolic Risk

The body's immune system responds to unknown, damaged and harmful particles by initiating inflammation. Inflammation is your body's defense and repair system. For example, healthy short-term inflammation ensures you can defend yourself from a virus or repair your skin after getting a cut. Depending on how long the trigger of inflammation lasts, inflammation can be either acute (healthy) or chronic (unhealthy).

Chronic inflammation is commonly the cause of your cardiometabolic risk. If unaddressed and unstopped, your risk can then turn into full cardiometabolic disease. Luckily, your risk setting can be significantly improved by using the power of lifestyle medicine to help lower and control chronic inflammation.



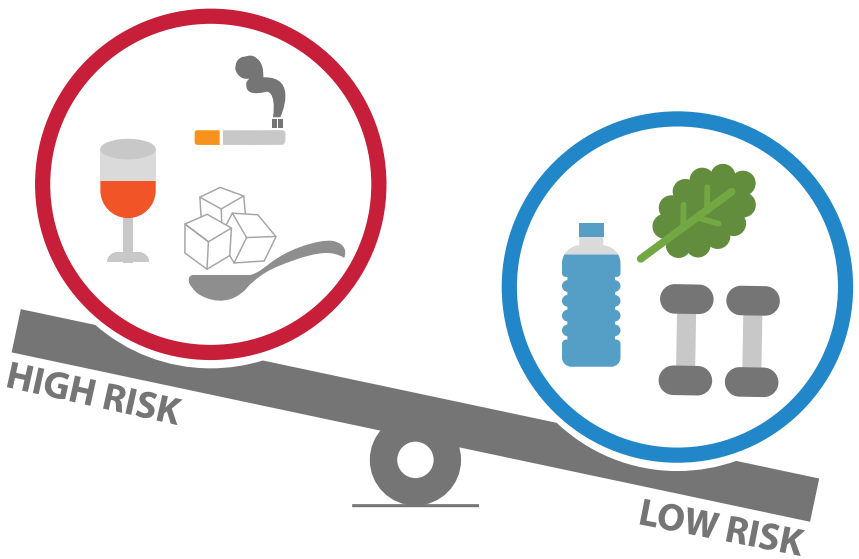

**Acute:** Necessary defense and repair
**Examples:** Cut, broken bone, sick, infection, etc.




**Chronic:** Unregulated cycles of damage and repair
**Examples:** Poor diet, exercise, stress, toxins, etc.

Inflammation is a necessary function of the body, so a certain level is considered protective. But diseases such as **cancer, cardiovascular disease, type 2 diabetes, Alzheimer's,** and **stroke** manifest at early ages when inflammation is chronic and uncontrolled.[9-11] Practicing proactive lifestyle medicine daily will help dampen and control chronic inflammation.[12]

## Chronic Inflammation Risk




### High Risk Factors

- Smoking
- Physical inactivity
- Excessive alcohol
- Added sugar
- Obesity
- Environmental toxins

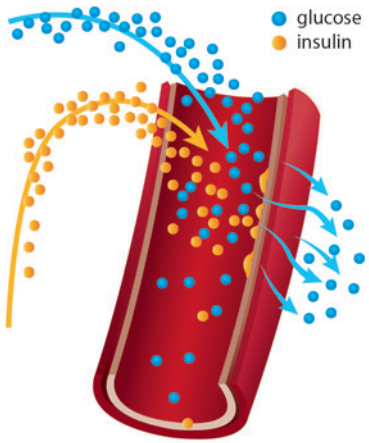
### Low Risk Factors

- Exercise
- No sugar
- No smoking
- Clean water
- Plant-based Mediterranean diet

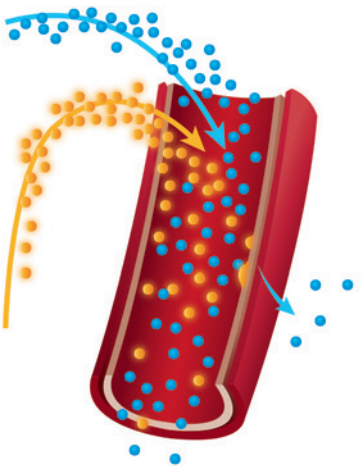
## Prioritizing Insulin Resistance

Daily lifestyle choices have a profound effect on our blood sugar levels. Good choices like making time for a workout or poor choices like skipping breakfast on a busy morning have either a healthy or harmful effect on our blood sugar levels, insulin resistance risks and chronic inflammation levels.

**Insulin Resistance:** Chronic condition in which cells resist insulin, thereby leading to elevations in blood sugar and chronic inflammation




**NORMAL PROCESS**
Glucose absorbed in tissues



**INSULIN RESISTANCE**
Glucose stays in blood

### WHAT CAUSES INSULIN RESISTANCE?

Inactivity, environmental factors, stress, nutrient deficiency, obesity, lack of sleep

### WHAT CAUSES INSULIN RECOVERY?

Physical activity, avoiding toxins, plant-based Mediterranean diet, weight management, meditation

By understanding and prioritizing your drivers of insulin resistance, you can profoundly reverse your overall cardiometabolic risks and disease status.

## Determining Your Place on the Metabolic Continuum

### 1 Understanding Your Lab Values

Lab values are a very important piece of understanding your risk setting. They provide your health care practitioner with a snapshot of how your body is managing various life signals and progressing through the aging process. Lab values are not to be treated in isolation, but are best evaluated in light of the big picture of your risk and/or disease status. Your health care practitioner is trained to understand when a particular lab value is a sign of a deeper problem that must be addressed.

**Blood Lipid Levels**

| | Optimal (mg/dl) | Borderline High (mg/dl) | High (mg/dl) |
|---|---|---|---|
| **Total Cholesterol** | <200 | 200-239 | >240 |
| **HDL** | >60 | 59-40 | <40 |
| **LDL** | <130 | 131-159 | >160 |
| **Triglycerides** | <200 | 200-399 | >400 |
| **ApoB** | <80 | 80-120 | >120 |
| **VLDL** | <30 | 30-40 | >40 |
| **Lp(a)** | <30 | 30-50 | >50 |
| **ApoA-1** | >160 | 120-160 | <120 |
| **LDL-P** | <1,000 | 1,000-1,300 | >1,300 |

Blood Pressure

| | Optimal (mmHg) | Prehypertension (mmHg) | Stage I Hypertension (mmHg) | Stage II Hypertension (mmHg) |
|---|---|---|---|---|
| **Systolic** | <120 | 120-139 | 140-159 | >160 |
| **Diastolic** | <80 | 80-89 | 90-99 | >100 |

Body Mass Index

| | |
|---|---|
| **Underweight** | Below 18.5 |
| **Normal** | 18.5-24.9 |
| **Overweight** | 25-29.9 |
| **Obese Class I** | 30-34.9 |
| **Obese Class II** | 35-40 |
| **Obese Class III** | Above 40 |


**Blood Sugar**

| | Normal | Pre-Diabetes | Diabetes |
|---|---|---|---|
| Blood Sugar (mg/dl) | 70-100 | 101-125 | >126 |
| HbA1c | <5.7 | 5.7-6.5 | >6.5 |
| Fasting Insulin | 7-9 | 10-15 | >15 |

**Inflammation**

| | Optimal | Borderline | High Risk |
|---|---|---|---|
| Fibrinogen | <370 | 370-470 | >470 |
| hs-CRP | <1.0 | 1.0-3.0 | >3.0 |
| Homocysteine | 7-10 | 10-13 | >13 |

*Your health care practitioner may recommend a number of lab tests to help determine your cardiometabolic risk.*

## 2 Identifying Drivers of Insulin Resistance and Inflammation

The CM Vitals Advanced Cardiometabolic Analysis will help you identify the underlying causes of insulin resistance and chronic inflammation.

# Advanced Cardiometabolic Analysis

## Stress

- Do you frequently feel worried, anxious, or on edge? Y N
- Do you feel overly stressed? Y N
- Do you experience mental fogginess or have trouble concentrating? Y N
- Do you have trouble falling or staying asleep? Y N
- In the last six months, have you unintentionally lost or gained ten or more pounds? Y N

## Diet

- Do you typically snack on chips, cookies, crackers or granola bars? Y N
- Do you regularly consume soft drinks or fruit juices? Y N
- Do you have frequent sugar cravings? Y N
- Do you eat within three hours of bedtime? Y N
- Do you regularly eat at restaurants or consume prepared foods from the grocery store? Y N

## Environmental Factors

- Are you sensitive to smells or fragrances? Y N
- Do you regularly have less than one or more than three bowel movements per day? Y N
- Do you take a laxative more than twice a month? Y N
- Do you regularly have headaches or migraines? Y N
- Do you have regular exposure to exhaust fumes, tobacco smoke, pesticides, commercial chemicals, paint, cleaning chemicals, or volatile fumes? Y N

## Exercise and Physical Activity

- Generally speaking, do you enjoy exercising? Y N
- Do you exercise regularly? Y N
- In the last month, how many exercise sessions did you complete? _____
- What is the average length of time of your exercise sessions? _____
- Please rate the intensity of your exercise sessions:

# Stress and Cardiometabolic Disease

## Stress Factors

### Sleep Cycle Disturbances
- Not sleeping enough hours
- Unable to fall into a deep sleep
- Difficulty falling asleep
- Inconsistent sleep schedule
- Shift work issues

### Inflammation
- Musculoskeletal: back, joint pain
- GI: dysbiosis, Crohn's disease, diverticulitis
- Dermatological: eczema, psoriasis
- Autoimmune: MS, lupus, rheumatoid arthritis
- Immunological: food allergies, chronic infections


### Mental/Emotional
- Anxiety
- Depression
- PTSD
- Fear, worry
- Restless mind

### Blood Sugar Imbalances
- Elevated blood sugar
- Hypoglycemia
- Increased oxidative stress (decreased antioxidant reserve)
- Abdominal obesity
- Metabolic syndrome
- Hyperlipedmia
- Hypertension

Chronic stress can significantly increase inflammation in the body, leading to cell damage, insulin resistance and increased risks for cardiometabolic disease.[13]

Stress indirectly causes additional risks. During stressful periods, we often engage in unhealthy coping strategies such as overindulging in junk food, smoking or drinking excessive amounts of alcohol. Additionally, stress can interfere with our routine healthy habits such as exercise, sleep and healthy meal preparation. It is unreasonable to reduce all types of stress. Often, the goal of stress management is to view the stress trigger differently or change the situation and reduce the impact of stress on you. Stress is a contributor to almost 90% of all diseases, so reducing your stress level is a powerful step in improving your overall health.

If you need additional support for reducing stress and its impact on your body, talk with your health care practitioner about using the ARK Stress Recovery Program, a comprehensive program for personalized stress support.

## Blood Sugar and Stress

We've all heard of, and perhaps fallen victim to, the term "stress-eating," which refers to either overconsuming highly processed and refined calories or making a poor food choice after a difficult situation. We turn to this eating pattern because we believe it will comfort us and relieve our stress.

Even though these food choices are temporarily comforting, this pattern of coping can lead to erratic blood sugar levels, a common problem for patients with chronic stress. When you stress-eat, blood sugar levels skyrocket well above normal ranges, forcing the pancreas to produce unhealthy amounts of insulin. This rush of insulin causes blood sugar levels to quickly drop below normal levels, leading to fatigue and drowsiness.

As a response to the rapidly dropping blood sugar levels, your body will tell the adrenal glands to produce high amounts of cortisol to stimulate glucose production from stored energy and raise blood sugar back to safer, normal levels.

If this becomes a regular pattern, this dramatic rise and fall in blood sugar levels will place a constant burden on many hormone systems. This can initiate a vicious cycle of chronic inflammation, the root cause of many diseases.

If you struggle with stress-eating, talk to your health care practitioner about protein-filled, meal replacement options.

## Take Control of Blood Sugar-Induced Stress

### 1 Be conscious of the food choices you make.

The immediate aftermath of a stressful situation might be the most important time to eat a well-balanced, healthy meal. High levels of stress deplete your body's nutrient stores, and they must be replenished. In these situations, be strategic about what you choose to eat!

### 2 Eat a balanced breakfast every morning to help stabilize blood sugar levels.

### 3 Engage in daily physical activity.

Start with getting up from your chair after more than one hour of sitting, as this can trigger insulin resistance. Then, set a physical activity goal of engaging in a minimum of 20 minutes of aerobic exercise daily, while continuing to avoid prolonged sitting throughout the day.

**TIME**
**20 MIN**

**PACE**
**MOVE THROUGHOUT THE DAY**

4. Avoid refined carbohydrates and simple sugars that can spike blood sugar.

5. Eat foods high in fiber to help slow down the absorption of glucose into the bloodstream.

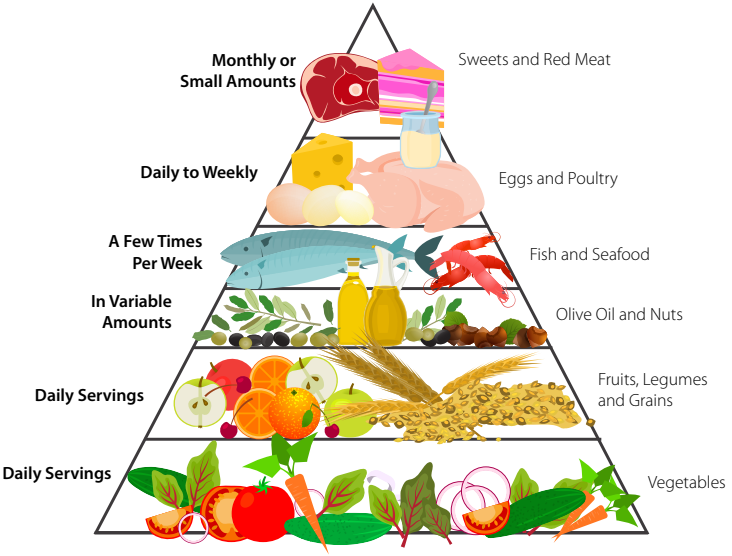
6. Make sure each meal is balanced with healthy protein, carbohydrates and fat. Eating well-balanced meals will help ensure blood sugar levels remain consistent throughout the day.

# Diet and Cardiometabolic Disease

## Creating a Heart-Healthy Meal

A healthy diet can significantly reduce and reverse cardiometabolic risk and disease. Smart food choices help control your body weight, cholesterol levels, blood sugar levels, and blood pressure. In addition to these important factors, a healthy diet can further reduce your risk of many other chronic diseases by lowering inflammation, controlling insulin resistance, erasing nutrient deficiencies, and even turning on health-promoting genes![14]

You may be wondering, "What does a heart-healthy diet look like?"




One of the most studied and healthiest dietary patterns comes from the Mediterranean region. The Mediterranean diet consists of a high intake of olive oil, nuts, seeds, fish, plant proteins (legumes and lentils), fruits, vegetables, herbs and spices with a moderate consumption of wine and dairy (mostly in the form of yogurt and cheese).

The Mediterranean diet also consists of minimal meat consumption, particularly red meat, refined carbohydrates, sugars and processed foods—all of these dietary choices have repeatedly shown to have harmful effects on the body.

## How Macronutrients Affect Cardiometabolic Health

### Carbohydrates

Carbohydrates are an essential source of energy for your body. Carbohydrates are considered simple or complex depending on their chemical structure. Simple carbohydrates include sugars found naturally in food, as well as sugars added during food processing. As a general rule, these should be avoided. Complex carbohydrates include whole grains, vegetables and legumes, all of which are good sources of fiber. Both complex and simple carbohydrates are processed in the body and turn into glucose, which is used as energy.



### Dietary Fiber

Fiber is a substance found in plants and when it is consumed by humans, it cannot be broken down during digestion. Fiber is passed, intact, through the gastrointestinal (GI) tract and makes up part of the stool. The two types of fiber, soluble and insoluble, are both important to a healthy diet.

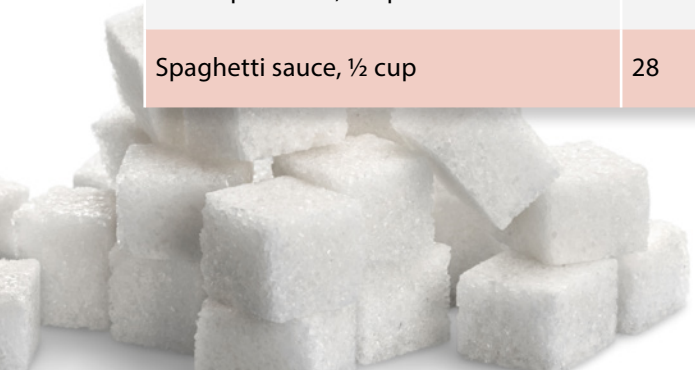
Soluble fiber retains water and creates a gelatinous substance that slows digestion and allows for better absorption of the nutrients in our diet. Soluble fiber can be found in foods such as oat bran, barley, nuts, seeds, beans, lentils, fruits, fruit skins, and many vegetables. Soluble fiber also helps slow down the absorption of sugars, thereby helping you to maintain healthy blood sugar levels.

Insoluble fiber, on the other hand, speeds the passage of foods through the stomach and intestines and adds bulk to the stool. Insoluble fiber is usually found in foods like whole wheat, whole grain products, and many vegetables. Insoluble fiber is an effective treatment for either the prevention of constipation or reversing digestive disorders like irritable bowel syndrome.

### Sugar

Sugars are carbohydrates found naturally in many foods including fruits, vegetables, and dairy. The main function of naturally occurring sugar is to provide energy for the human body. Excess and processed sugar, on the other hand, is harmful to your health. According to the AHA, adult men and women can consume up to 9 teaspoons (36 g) and 5 teaspoons (20 g), respectively, of added sugar daily.[15] The average American consumes around 22 teaspoons daily which is over twice the recommended amount. This has become a major public health concern because excess sugar consumption has been associated with obesity, type 2 diabetes, cardiovascular disease, certain cancers, neurodegenerative diseases and non-alcoholic fatty liver disease.[16, 17]

| Table 1: Calories from Added Sugar Per Serving | | |
|---|---|---|
| **Food** | **Calories from added sugars** | **Added sugar (g)** |
| Carbonated soda, 12 oz. can | 132.5 | 33 g |
| Starbucks Caramel Macchiato, Nonfat, 16 oz. | 128 | 32 g |
| Granola, 1 cup | 80 | 20 g |
| Nonfat flavored yogurt, 6 oz. container | 77.5 | 19 g |
| Milk chocolate, 1 bar (1.55 oz.) | 77.4 | 19 g |
| Cake doughnut (1) | 74.2 | 18.5 g |
| Sweetened condensed milk, 1 fl. oz. | 73.8 | 18.5 g |
| Fruit punch drink, 12 oz. can | 62.1 | 15.5 g |
| Protein bar (50 g) | 60 | 15 g |
| Instant oatmeal (28 g) | 48 | 12 g |
| Barbeque sauce, 2 tsp. | 32 | 8 g |
| Spaghetti sauce, ½ cup | 28 | 7 g |



**Note:** Calories listed are only from added sugars in the food, not the total amount of calories

### Protein

Lean proteins are vital to a healthy diet, improve feelings of fullness, help regulate blood sugar levels and promote weight loss. Meat, poultry, fish, beans, peas, eggs, nuts and seeds supply our body many nutrients it needs to repair and rebuild damaged tissues. Healthy intake of clean proteins provides B vitamins, vitamin E, iron, zinc, magnesium and critical substances to help create and maintain strong bones, muscles, cartilage, skin, and blood. Proteins also play an important role by helping our bodies build necessary enzymes, hormones and vitamins. Chicken and turkey are both great sources of lean protein and, unlike red meat, contain less inflammatory fats.

Cold-water fish such as salmon, mackerel, tuna, herring and sardines are not only high in protein, but are also rich sources of anti-inflammatory fats known as omega-3 fatty acids (e.g., EPA and DHA).

Legumes (e.g., beans and lentils) and whole grains (e.g., quinoa) are great sources of plant proteins and provide the added benefit of high fiber content.

Aim to consume 95% of your daily sugar intake from naturally occurring sources such as vegetables and fruits, as these also contain high levels of vitamins, minerals and fiber.

Include colorful vegetables and fruits with every meal to access a broad variety of nutrients for healing functions.

Consume at least two, 3.5-ounce servings of cold-water fish per week to help reduce your risk for cardiometabolic disease.[18]

## How Much Protein Should I Eat?

Protein needs vary based on gender, body size and physical activity level. Generally, 0.8-1.0 g of protein per kilogram (1 kilogram = 2.2 pounds) of body weight is recommended.

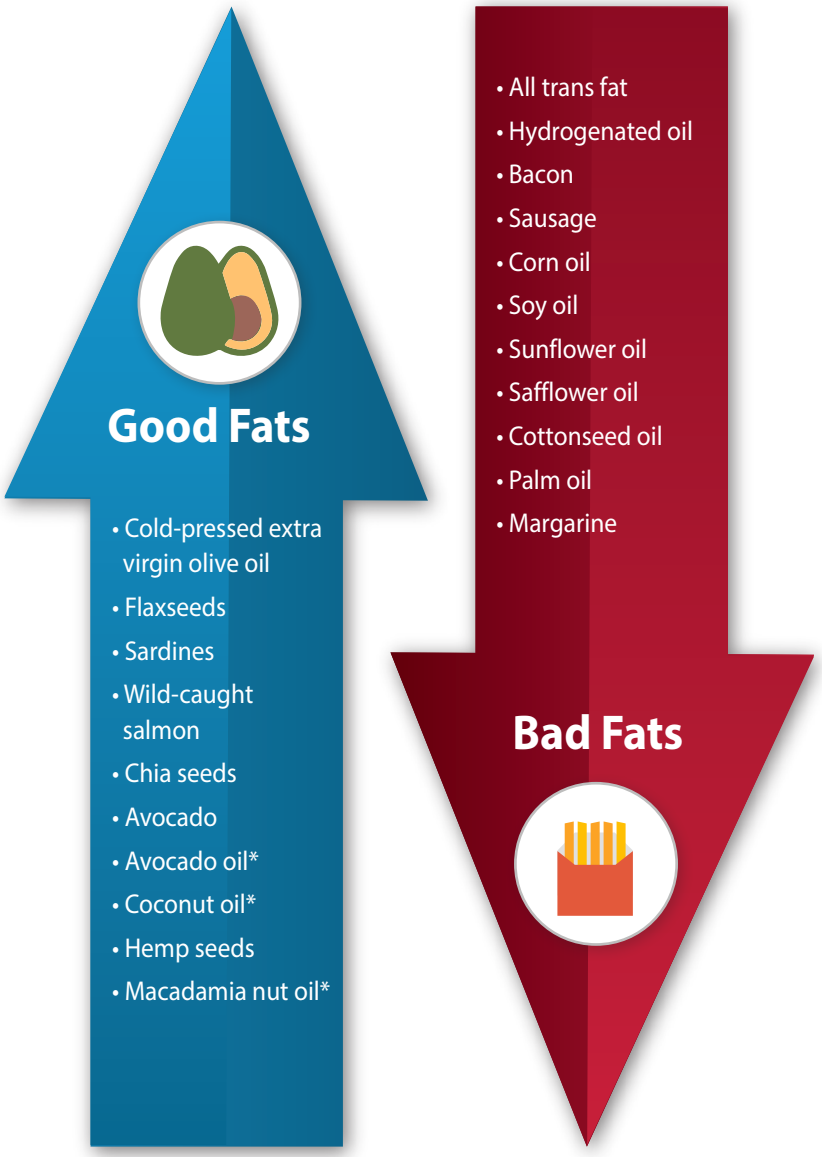
120 lbs. = 44-55 g
150 lbs. = 55-68 g
180 lbs. = 65-82 g

| Food | Calories | Protein (g) |
|---|---|---|
| Chicken breast (4 oz., boneless, skinless) | 184 | 36 |
| Salmon (3 oz., wild-caught) | 196 | 22 |
| Shrimp (3 oz.) | 84 | 18 |
| Egg (whole, boiled) | 77 | 6 |
| Yogurt (1 cup, plain, whole milk) | 149 | 9 |
| Lentils (1/4 cup) | 57 | 4.5 |
| Almonds (1/4 cup, dry roasted) | 206 | 7.5 |
| Chia seeds (2 Tbsp.) | 137 | 4 |

## Fats

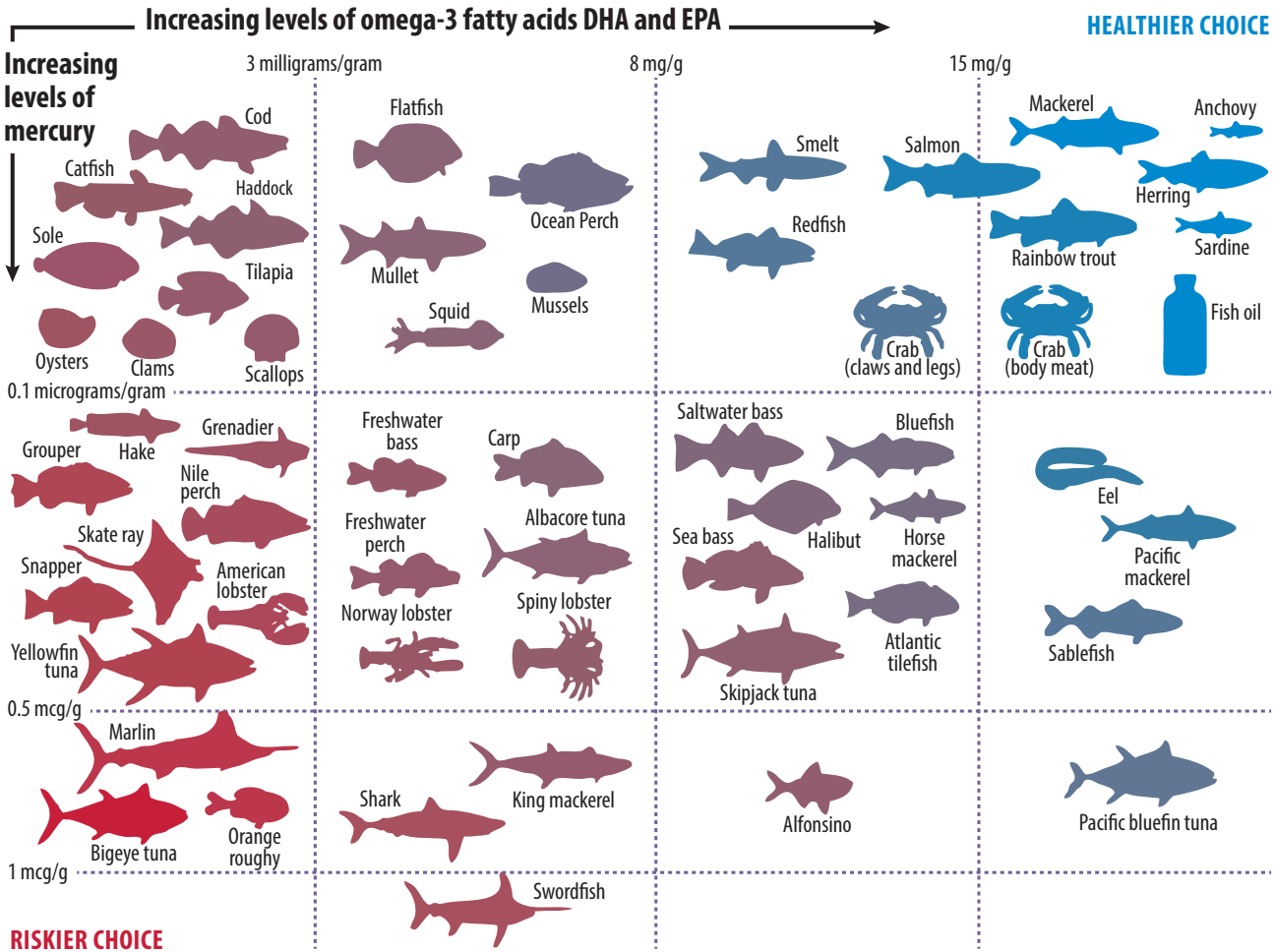
Over the past four decades, fats have been given a bad reputation. Although certain fats, such as trans fats from fried foods, can have very harmful effects on your body, other healthy fats are critical for your body to function at an optimal level. For example, omega-3 fatty acids, such as in salmon, sardines and walnuts, are named "essential" because we cannot make them ourselves. We must consume them through our diet. Omega-3 fatty acids have well-studied health benefits, such as lowering inflammation, triglyceride levels, LDL cholesterol levels, and blood pressure while increasing healthy HDL cholesterol levels. [19, 20]

Instead of eliminating or reducing all fats from your diet, carefully evaluate the types of fats you consume and choose wise amounts of healthy fats while avoiding the more risky fat sources.




*Oils with higher smoke points are more suitable for cooking.

# Choosing Healthy Seafood



## How Do You Eat Healthy?

Regardless of the specific diet you and your health care practitioner have discussed, eating healthy is much easier than you think. Follow these simple steps each day, and your overall diet will improve before you know it!

### 1 Balance, Balance, Balance

Eating well-balanced meals with protein, fats and healthy carbohydrates is essential to stabilizing blood sugar and filling your body with the nutrients it needs. Meal ideas such as a veggie omelet, salmon and broccoli, or mixed nuts and an apple are all great options to ensure balance.

### 2 Fill Your Plate with Colorful Vegetables and Fruits

Choose red, orange, and dark-green vegetables like tomatoes, sweet potatoes, broccoli, peppers and kale to maximize nutrient consumption. Add mixed berries or sliced apples to meals as a side dish or as dessert. The more colorful your plate, the more vitamins, minerals, phytonutrients and fiber you will consume.

### 3 Choose Earth-Food Over Man-Food

If you have the option, always choose food that comes from the earth, not pre-packaged. Man-food is often pre-packaged and contains additives and preservatives. Examples of earth-food include vegetables, fruits, nuts, seeds, legumes, poultry and fish.

### 4 Seasonal, Local and Organic

Choosing locally grown, organic and seasonal options is a great way to ensure peak nutrient amounts in your food as well as avoid any added toxins, such as pesticide residues.

### 5 What Does Your Plate Look Like?

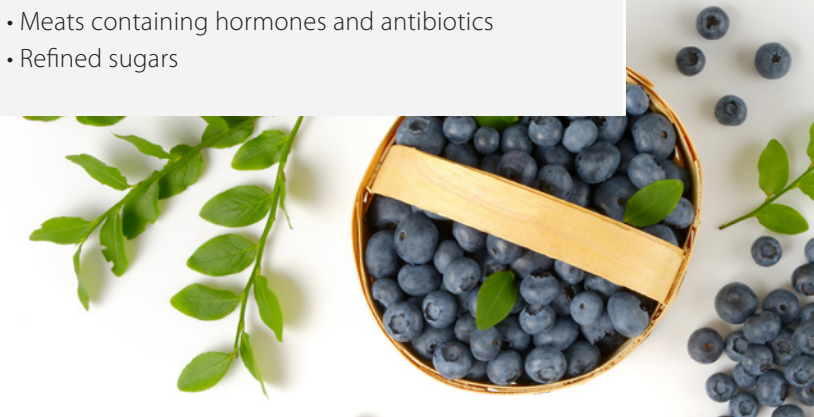
# Environmental Factors and Cardiometabolic Disease

## Environmental Factors and Cardiometabolic Disease

An important, yet often overlooked, modifiable set of risks for cardiometabolic disease is our daily environmental exposures. Whether it is the air we breathe, the personal care products we use on our skin or the food and water we ingest, this burden can significantly increase our risk for many diseases. For example, environmental toxins can add up to over 14 pounds of pesticides, herbicides, food additives, chemicals, and preservatives per year for the average American. The liver, together with the digestive tract, is responsible for removing these toxins through a process called detoxification. Detoxification involves processing and eliminating the unnecessary, and potentially threatening, foreign particles found in our food, water, air, and personal care products. Over time, if toxic burden builds up, a significant demand is placed on the liver to keep up with the constant need to detoxify the body. If exposure levels are not controlled, it can lead to liver stress, chronic inflammation, and systemic insulin resistance. Therefore, we can reduce our total risks by making smart choices when it comes to what we expose our bodies. As a general rule, choose organic, natural, clean products and environments whenever possible.

Poor lifestyle habits such as inadequate dietary fiber, nutrient deficiencies, obesity, and physical inactivity play a fundamental role in the ability of the GI tract to handle toxins and ultimately reduce your risk for cardiometabolic disease. Fortunately, small changes in behavior can make a big difference in your overall health.

| Environmental Exposure | Lifestyle Toxins |
|---|---|
| • Pollution (air, water, ground)<br>• Auto exhaust<br>• Solvents<br>• Occupational hazards<br>• Heavy metals, mercury fillings<br>• Pesticides, herbicides, insecticides<br>• Radiation, UV light | • Fast food/fried food<br>• Processed food/preservatives<br>• Cosmetics<br>• Nicotine<br>• Prescription drugs<br>• Meats containing hormones and antibiotics<br>• Refined sugars |



## Reduce Exposure Risk

### 1 Clean Your Food

Choose organic, locally grown produce whenever possible, especially in those foods high in pesticides. Regardless, always wash fruits and vegetables thoroughly to remove pesticide residues.

### 2 Clean Your Home

Avoid harsh household cleaners and detergents and use products with more natural ingredients. If your house has a history of water damage, be sure to have the house fully inspected for mold.

### 3 Clean Your Skin

Skin and personal care products are often laden with undesirable chemicals and synthetic fragrances. Especially in those with sensitive skin, limit exposure to synthetic fragrances in laundry products, shampoos, body washes and lotions.

### 4 Clean Your Body

Since we all must live, breathe, work and play in our environment, maintaining the ability to detoxify and remove harmful substances is essential. A nutrient-dense diet, ample water intake, and regular exercise are vital steps in detoxifying.

# Exercise and Cardiometabolic Disease

Regular physical activity and daily exercise are one of the most important steps you can take to improve your risk for cardiometabolic disease. Studies indicate risk for cardiometabolic disease are up to **three times higher for inactive persons compared to active**.[21, 22] In fact, inactivity is as useful as high blood sugar, hypertension, and high cholesterol levels in predicting cardiometabolic disease[23]

Research shows that both daily exercise and physical activity are essential for maximum health. For example, exercising one hour a day does not undo the negative effects of sitting for eight hours a day. Movement is a key way our bodies accomplish goals both visible and invisible.

**Exercise:** Structured movement, sustained for >20 minutes at a heart rate above resting levels and completed for the purpose of improving health or fitness

**Physical Activity:** Any movement that uses energy

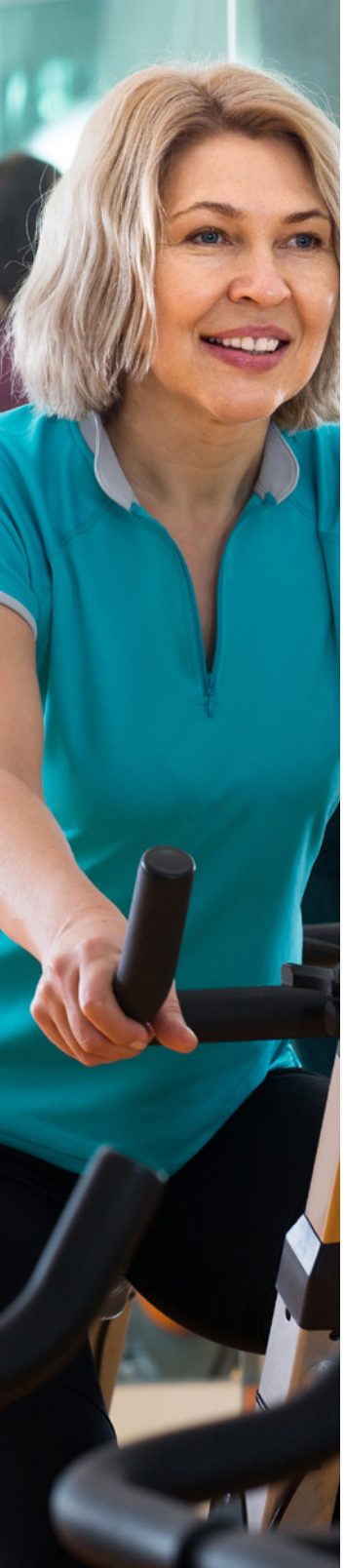
| | Benefits of Daily Exercise | Benefits of Physical Activity |
|---|---|---|
| Anti-inflammatory | ✓ | |
| Insulin sensitivity | ✓ | ✓ |
| Control blood sugar levels | ✓ | ✓ |
| Lower blood pressure | ✓ | |
| Increase energy levels | ✓ | ✓ |
| Control body weight | ✓ | ✓ |
| Optimal health | = ✓ | + ✓ |

## Examples of Exercise

- Brisk walking
- Jogging
- Biking
- Swimming
- Rowing
- Vigorous hiking
- Organized competitive sports (basketball, soccer, etc.)
- Circuit training

## Examples of Physical Activity

- Casual walking
- Stretching
- Standing
- Golf
- Yard work
- Leisurely sports (table tennis, playing catch)



## Intensity Matters

When we think of exercise, we often think of muscular individuals lifting big, heavy weights or marathon runners zooming around a track at top speed. This limited view of exercise can often make people feel incapable of doing enough to get a good result.

**Make it a point to go for a short walk every hour throughout your day.**

**Be in the know: Exercise, no matter what age, gender, or body type, helps everyone!**
Find the activity you enjoy and exercise at the intensity level that is right for you. If you have any chronic diseases or have been mostly sedentary, talk with your health care practitioner to be sure you are cleared to exercise.

## Rating of Perceived Exertion

To prevent or reduce your cardiometabolic disease risks, make time for a 20-minute exercise session each day. Of course, if you are new to exercise, this can seem like a daunting and impossible task to accomplish. Follow this plan to help you incorporate daily exercise into your life!

| | M | T | W | T | F |
|---|---|---|---|---|---|
| **Week 1** | 20 minutes *Walk/Jog | | | | |
| **Week 2** | 20 minutes *Walk/Jog | | 20 minutes *Walk/Jog | | |
| **Week 3** | 20 minutes *Walk/Jog | | 20 minutes *Walk/Jog | | 20 minutes *Walk/Jog |
| **Week 4** | 20 minutes *Walk/Jog | 20 minutes *Walk/Jog | 20 minutes *Walk/Jog | | 20 minutes *Walk/Jog |
| **Week 5-6** | 20 minutes *Walk/Jog | 20 minutes *Walk/Jog | 20 minutes *Walk/Jog | 20 minutes *Walk/Jog | 20 minutes *Walk/Jog |

| | |
|---|---|
| **Week 7-12** | Increase the time to 30 minutes following the same 6-week pattern above (Add 10 minutes to one additional day each week). |
| **Week 13-18** | Increase the intensity to more jogging (4-6 RPE) than walking following the same 6-week pattern above (increasing the intensity on one additional day each week). |
| **Week 19-24** | Increase the intensity to jogging only (5-7 RPE), following the same 6-week pattern. |
| **Week 25-30** | Increase the intensity to running only (5-8 RPE), following the same 6-week pattern. |
| **Week 31-36** | Increase the time to 40 minutes, following the same 6-week pattern. |
| **Week 37-42** | Increase the time to 50 minutes, following the same 6-week pattern. |
| **Week 43-48** | Increase the time to 60 minutes, following the same 6-week pattern. |

# Targeted Nutrients for Cardiometabolic Health

## Berberine

*Suggested Dose: 1 g per day*

Berberine is a plant extract that has been used in Chinese and Ayurvedic medicine for over 2,500 years for its broad range of health-promoting properties. It is a potent phytonutrient that has profound effects on multiple markers of cardiometabolic disease. Studies show berberine switches on the master metabolic switch, adenosine mono-phosphate kinase (AMPK).[24]

A recent clinical trial demonstrated that berberine lowered HbA1c, fasting blood glucose and triglycerides in diabetic patients better than traditional therapies.[25] Another clinical trial demonstrated that berberine lowered LDL cholesterol and triglycerides.[26] Berberine has also been shown to promote the uptake of glucose through a mechanism that does not require insulin, promoting better glucose usage within the cell.[27]

## Bergamot

*Suggested Dose: 1 g per day*

Bergamot *(Citrus bergamia)* is a citrus plant that grows almost exclusively in the narrow coastal Calabria region in southern Italy. The local population quickly discovered that bergamot juice could be used as a remedy to help lower cholesterol levels and improve cardiovascular health.[28] Bergamot contains a unique profile of anti-inflammatory polyphenolic flavonoids: neoeriocitrin, neohesperidin, naringin, rutin, neodesmin, rhoifolin and poncirin. In clinical trials, this combination of phenolics has been shown to significantly lower all cholesterol markers through a similar mechanism as statins, but without any of the unnecessary side effects.[29]

If you are on a statin, or have been on a statin previously, talk to your health care practitioner about the benefits of bergamot.

## EPA and DHA

*Suggested Dose: 1 g per day*

Omega-3 fatty acids are essential cornerstones of human nutrition. In nature, omega 3s occur as alpha linolenic acid (ALA), found mostly in plants, and as long-chain EPA and DHA, which primarily originate from cold-water fish. The body is able to slowly convert the shorter-chain ALA to the more active long-chain EPA and DHA. However, many people lack the enzymes delta-5 and delta-6 desaturase necessary to make the conversion, making a higher dietary intake of EPA and DHA necessary. The American Heart Association recommends eating cold-water fish two times per week and talking with your health care practitioner about omega-3 supplementation.[30]

Extensive clinical research has shown that EPA and DHA from fish oil improve cardiovascular health by reducing several markers including blood pressure, triglycerides, cholesterol levels, and insulin sensitivity.[31-33] With over 10,000 published studies in the last three decades, EPA and DHA from fish oil are among the most researched natural ingredients available and have a long history of safety and efficacy. Ask your health care practitioner if you should be on a fish oil supplement.

## CoQ-10

*Suggested Dose: 500 mg-300 mg per day*

CoQ-10 is a lipid-soluble antioxidant found in the mitochondrial membrane of every cell in the body. As a coenzyme, CoQ-10 is required for several enzymatic reactions in metabolism as well as to protect the body against free radicals produced during this process. After the age of 35 to 40 years, endogenous synthesis of CoQ-10 begins to decline causing a decrease in metabolic efficiency. [34]

CoQ-10 supplementation may be necessary to any patient with cardiometabolic risk. Thirteen controlled studies conducted between 1990 and 2004 demonstrated significant CoQ-10 depletion, secondary to use of statin medications used to lower cholesterol levels.[34] These studies demonstrated a range of 19-54% decrease in CoQ-10 levels in patients on statin therapy. In the event of CoQ-10 depletion, supplementation can improve CoQ-10 status and help maintain optimal levels in the body. If you have been on a statin, talk to your health care practitioner about CoQ-10 supplementation.

## Additional Nutrients for Cardiometabolic Wellness

| Nutrient | Function | Dosing |
|---|---|---|
| Chromium | • Improves insulin function and balances blood sugar | 800 mcg per day |
| Vitamin K2 (MK-7 form) | • Improves bone mineral density by removing calcium from blood<br>• Reduces arterial calcium deposits | 45-180 mcg per day |
| Lipoic Acid | • Potent antioxidant that helps regenerate vitamin C and E<br>• Stimulates cell function | 200-600 mg per day |
| Niacin | • Lowers total cholesterol and LDL cholesterol | 500-1,500 mg per day |
| Methyl Folate | • Lowers inflammatory homocysteine<br>• Helps stabilize DNA | 2,000 mcg per day |
| Vanadyl Sulfate | • Mimics the action of insulin<br>• Promotes a healthy blood sugar-insulin relationship | 50 mg per day |

# Conclusion

Cardiometabolic disease or cardiovascular disease, type 2 diabetes and stroke, make up three of the top six diagnosed diseases in the United States. Reducing risk at the root cause for these diseases involves more than just a prescription medication. Identifying and reversing the drivers of chronic inflammation and insulin resistance through lifestyle medicine plays an integral role in reducing overall risk for cardiometabolic disease. The goal is to not only live long, but to add more life to your years!

The human body is remarkably resilient and maintains a metabolic reserve to help protect against disease. Your daily lifestyle choices can greatly enhance or decrease your body's ability to protect you. Ultimately, you hold the keys to your wellness, longevity and vitality. Knowing this is the most powerful medicine you can use!

**"THE GOAL IS TO NOT ONLY LIVE LONG, BUT TO ADD MORE LIFE TO YOUR YEARS!"**

Notes:

## Personalized Recommendations:

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