Cardiac
Exercise Benefits & Precautions

This book is for educational purposes and should not be substituted for the direction of a physician or other health care provider (*see Disclaimer*). Before starting an exercise program, especially if you have a history of cardiac disease or stroke, you should consult with a physician and/or physical/cardiac therapist. If directed to do so, you should start cardiac rehab and use thisbook with their recommendations.

Please read the 2nd section of this book to learn about precautions, even if you are a healthy individual and are reading this version to learn about preventing heart disease.

Most of the cardiac and stroke research is from the:
CDC – Center for Disease Control and Prevention
NIH – National Heart, Blood and Lung Institute (unless otherwise specified)

Please see *Cardiac References* for links.

It is advised that you always check with your medical doctor or physical therapist before starting an exercise program or change in diet.

Disclaimer: The information in this book is for educational purposes only and has been obtained through research, publications and personal experience, and shall not be liable for incorrect information. Any mentioned publications or websites does not imply endorsement. As this industry is ever changing, I urge readers to confirm the information contained in this book.The author will not be liable for any injuries sustained from practicing techniques taught in this book or for any typographical errors or omissions. *It is advised that you always check with your medical doctor before starting any new exercise program or change in diet*.

LOST TEMPLE FITNESS
Cardiac Disease and Exercise

It is beneficial for people who have a history or are currently undergoing treatment for cardiac disease or stroke to engage in an exercise program. It has also been shown that a healthy diet and exercise program can decrease risk of cardiac issues before they happen, as well as help to decrease the risk of further events. Please read the second section of this book to see how exercise can help with endurance, balance, muscle strengthening and flexibility. Most of the cardiac research is from the *CDC – Center for Disease Control and Prevention* and *NIH – National Heart, Blood and Lung Institute* unless otherwise specified. Please see *Cardiac References* for links.

This book is not meant to substitute an exercise program prescribed by a health care professional but designed to accompany their recommendations. Please consult with your physician before starting any exercise program.

Who is this section recommended for?

- Those with a history of heart disease to be used in conjunction with the cardiologist or other health care provider and/or physical therapist recommendations.
- The average adult looking to reduce their risks of heart disease.
- Patients currently undergoing cardiac rehab to be used in conjunction with the cardiologist or other health care provider and/or physical therapist recommendations.
- Those with a history of stroke or current event to be used in conjunction with the cardiologist / neurologist or other health care provider and/or physical therapist recommendations.
- Physical therapists and other health care providers to be used to prescribe a home exercise program.

Who is this section not for?

- Those who are not able to follow or modify a program without supervision.
- Those who have other medical issues, such as respiratory, cancer, fracture risks or other acute/chronic issues that have not been cleared by an MD.

What is covered in this section?

- Coronary Artery Disease (CAD) aka Coronary Heart Disease (CHD)
    - Causes, Risk Factors and Medications
- Physical Activity and Your Heart
    - Levels of Intensity in Aerobic Activity
    - Types of Aerobic Activity
    - Other Types of Exercise; Risks
    - Benefits, Guidelines for Adults
    - Guidelines for Adults over 65 and Older
    - How to Make Physical Activity Part of your Daily Routine
- Exercise Response to Cardiac Medications:
    - Heart Rate (HR), Blood Pressure (BP) and Clinical Relevance
        - Beta Blockers, Nitrates, Calcium Channel Blockers, Digoxin, Diuretics, ACE inhibitors / ARB
- Cardiac Disease or Symptoms with Possible Exercise and Precaution Information
    - Angina, Arrhythmias, Atherosclerosis, Aortic Aneurysm, Atrial fibrillation, Pacemaker, Cardiomyopathy, Heart Attack, Heart Failure (CHF), Peripheral Arterial Disease (PAD)
- Hypertension/Hypotension
- Cholesterol
- Stroke aka Cerebrovascular accident (CVA)
    - Risk Factors, Signs and Symptoms, Complications, Treating Risk Factors
    - Hemorrhagic Stroke
    - Transient Ischemic Attack (TIA) aka Mini-Stroke
    - Exercise Programs by *National Stroke Association, Hope - A Stroke Recovery Guide* and *NIH – National Heart, Blood and Lung Institute*
- Heart-healthy eating (NIH) Foods to Eat and Nutrients to Limit
    - DASH Diet

Coronary Heart Disease (CHD) aka Coronary Artery Disease (CAD)

Quick Summary

What is CAD/CHD	• CAD is caused by plaque buildup in the walls of the arteries that supply blood to the heart (called coronary arteries) and other parts of the body
Causes	• Coronary heart disease (CHD) starts when certain factors damage the inner layers of the coronary arteries
Major Risk Factors	• Unhealthy cholesterol levels, high blood pressure, smoking, diabetes, insulin resistance, lack of exercise, unhealthy diet, age, obesity, metabolic disease, family history
Emerging and other risk factors related to CAD	• High levels of C-reactive protein, inflammation, high levels of triglycerides, sleep apnea, stress, alcohol, preclamsia (during pregnancy)
Medications	• Sometimes lifestyle changes are not enough to control your blood cholesterol levels. For example, you may need statin medications to control or lower your cholesterol. By lowering your cholesterol level, you can decrease your chance of having a heart attack or stroke.

What is CAD/CHD *(CDC heart disease)* and *(NIH CHD)*	CAD is caused by plaque buildup in the walls of the arteries that supply blood to the heart (called coronary arteries) and other parts of the body. Plaque is made up of deposits of cholesterol and other substances in the artery. Plaque buildup causes the inside of the arteries to narrow over time, which could partially or totally block the blood flow. This process is called *atherosclerosis.* Too much plaque buildup and narrowed artery walls can make it harder for blood to flow through your body. When your heart muscle doesn't get enough blood, you may have chest pain or discomfort, called *angina*. Angina is the most common symptom of CAD. Over time, CAD can weaken the heart muscle. This may lead to *heart failure*, a serious condition where the heart can't pump blood the way that it should. An irregular heartbeat, or *arrhythmia*, also can develop.

Causes *(NIH CHD)*	Research suggests that coronary heart disease (CHD) starts when certain factors damage the inner layers of the coronary arteries. These factors include: • Smoking • High levels of certain fats and cholesterol in the blood • High blood pressure • High levels of sugar in the blood due to insulin resistance or diabetes • Blood vessel inflammation • Plaque might begin to build up where the arteries are damaged. The buildup of plaque in the coronary arteries may start in childhood. Over time, plaque can harden or rupture (break open). Hardened plaque narrows the coronary arteries and reduces the flow of oxygen-rich blood to the heart. This can cause angina (chest pain or discomfort). If the plaque ruptures, blood cell fragments called platelets (PLATE-lets) stick to the site of the injury. They may clump together to form blood clots. Blood clots can further narrow the coronary arteries and worsen angina. If a clot becomes large enough, it can mostly or completely block a coronary artery and cause a heart attack.
Major Risk Factors	• Unhealthy blood *cholesterol* levels. This includes high LDL cholesterol (sometimes called "bad" cholesterol) and low HDL cholesterol (sometimes called "good" cholesterol). • *High blood pressure.* Blood pressure is considered high if it stays at or above 140/90 mmHg over time. If you have diabetes or chronic kidney disease, high blood pressure is defined as 130/80 mmHg or higher. (The mmHg is millimeters of mercury—the units used to measure blood pressure.) • Smoking. Smoking can damage and tighten blood vessels, lead to unhealthy cholesterol levels, and raise blood pressure. Smoking also can limit how much oxygen reaches the body's tissues. • Insulin resistance. This condition occurs if the body can't use its own insulin properly. Insulin is a hormone that helps move blood sugar into cells where it's used for energy. Insulin resistance may lead to diabetes. • Diabetes. With this disease, the body's blood sugar level is too high because the body doesn't make enough insulin or doesn't use its insulin properly. • Overweight or obesity. The terms "overweight" and "obesity" refer to body weight that's greater than what is considered healthy for a certain height. • Metabolic syndrome. Metabolic syndrome is the name for a group of risk factors that raises your risk for CHD and other health problems, such as diabetes and stroke. • Lack of physical activity. Being physically inactive can worsen other risk factors for CHD, such as unhealthy blood cholesterol levels, high blood pressure, diabetes, and overweight or obesity. • Unhealthy diet. An unhealthy diet can raise your risk for CHD. Foods that are high in saturated and trans fats, cholesterol, sodium, and sugar can worsen other risk factors for CHD. • Older age. Genetic or lifestyle factors cause plaque to build up in your arteries as you age. In men, the risk for coronary heart disease increases starting at age 45. In women, the risk for coronary heart disease increases starting at age 55. • A family history of early coronary heart disease is a risk factor for developing coronary heart disease, specifically if a father or brother is diagnosed before age 55, or a mother or sister is diagnosed before age 65. Although older age and a family history of early heart disease are risk factors, it doesn't mean that you'll develop CHD if you have one or both. Controlling other risk factors often can lessen genetic influences and help prevent CHD, even in older adults.

Emerging Risk Factors And Other Risks Related to Coronary Heart Disease	Researchers continue to study other possible risk factors for CHD. • High levels of a protein called C-reactive protein (CRP) in the blood may raise the risk of CHD and heart attack. High levels of CRP are a sign of inflammation in the body. • Inflammation is the body's response to injury or infection. Damage to the arteries' inner walls may trigger inflammation and help plaque grow. Research is under way to find out whether reducing inflammation and lowering CRPlevels also can reduce the risk of CHD and heart attack. • High levels of triglycerides in the blood also may raise the risk of CHD, especially in women. Triglycerides are a type of fat. Other conditions and factors also may contribute to CHD, including: • Sleep apnea. Sleep apnea is a common disorder in which you have one or more pauses in breathing or shallow breaths while you sleep. Untreated sleep apnea can increase your risk for high blood pressure, diabetes, and even a heart attack or stroke. • Stress. Research shows that the most commonly reported "trigger" for a heart attack is an emotionally upsetting event, especially one involving anger. • Alcohol. Heavy drinking can damage the heart muscle and worsen other CHD risk factors. Men should have no more than two drinks containing alcohol a day. Women should have no more than one drink containing alcohol a day. • Preeclampsia. This condition can occur during pregnancy. The two main signs of preeclampsia are a rise in blood pressure and excess protein in the urine. Preeclampsia is linked to an increased lifetime risk of heart disease, including CHD, heart attack, heart failure, and high blood pressure.
Medications ***See Exercise Response to Cardiac Medications***	Sometimes lifestyle changes are not enough to control your blood cholesterol levels. For example, you may need statin medications to control or lower your cholesterol. By lowering your cholesterol level, you can decrease your chance of having a heart attack or stroke. Doctors may discuss beginning statin treatment with those who have an elevated risk for developing heart disease or having a stroke Doctors usually prescribe statins for people who have: • Coronary heart disease, peripheral artery disease, or had a prior stroke • Diabetes • High LDL cholesterol levels Your doctor also may prescribe other medications to: • Decrease your chance of having a heart attack or dying suddenly. • Lower your blood pressure. • Prevent blood clots, which can lead to heart attack or stroke. • Prevent or delay the need for a procedure or surgery, such as percutaneous coronary intervention or coronary artery bypass grafting. • Reduce your heart's workload and relieve CHD.

Physical Activity and Your Heart (NIH)

Please read 2nd section in book to learn about Physical Activity and Exercise

Quick Summary

What is Physical Activity?	• Physical activity is any body movement that works your muscles and requires more energy than resting. Walking, running, dancing, swimming, yoga, and gardening are a few examples of physical activity
Aerobic Activity	• Aerobic activity moves your large muscles, such as those in your arms and legs. Running, swimming, walking, bicycling, dancing, and doing jumping jacks are examples of aerobic activity.
Levels of Intensity in Aerobic Activity	• You can do aerobic activity with light, moderate, or vigorous intensity.
Examples of Aerobic Activities	• Pushing a cart, gardening, water aerobics, tennis, hockey, walking, jogging, running
Other Types of Physical Activity	• Muscle-strengthening, bone strengthening, and stretching
Exercise Risks	• Rarely, heart problems occur as a result of physical activity. Examples of these problems include arrhythmias, sudden cardiac arrest, and heart attack. These events generally happen to people who already have heart conditions.

LOST TEMPLE FITNESS

What is Physical Activity *(**NIH – National Institutes of Health** – all sections unless otherwise specified)*	Physical activity is any body movement that works your muscles and requires more energy than resting. Walking, running, dancing, swimming, yoga, and gardening are a few examples of physical activity. Exercise is a type of physical activity that's planned and structured. Lifting weights, taking an aerobics class, and playing on a sports team are examples of exercise. Physical activity is good for many parts of your body. *This article focuses on the benefits of physical activity for your heart and lungs.* A heart-healthy lifestyle also involves following a heart-healthy eating, aiming for a healthy weight, managing stress, and quitting smoking. (NIH)
Aerobic Activity	Aerobic activity moves your large muscles, such as those in your arms and legs. Running, swimming, walking, bicycling, dancing, and doing jumping jacks are examples of aerobic activity. Aerobic activity also is called endurance activity. Aerobic activity makes your heart beat faster than usual. You also breathe harder during this type of activity. Over time, regular aerobic activity makes your heart and lungs stronger and able to work better.
Levels of Intensity in Aerobic Activity *(NIH & Harvard Medical Publishing)*	You can do aerobic activity with light, moderate, or vigorous intensity. Moderate- and vigorous-intensity aerobic activities are better for your heart than light-intensity activities. However, even light-intensity activities are better than no activity at all. The level of intensity depends on how hard you must work to do the activity. To do the same activity, people who are less fit usually must work harder than people who are more fit. So, for example, what is light-intensity activity for one person may be moderate-intensity for another. LIGHT- AND MODERATE-INTENSITY ACTIVITIES Light-intensity activities are common daily activities that do not require much effort. Moderate-intensity activities make your heart, lungs, and muscles work harder than light-intensity activities do. On a scale of 0 to 10, moderate-intensity activity is a 5 or 6 and produces noticeable increases in breathing and heart rate. A person doing moderate-intensity activity can talk but not sing. VIGOROUS-INTENSITY ACTIVITIES Vigorous-intensity activities make your heart, lungs, and muscles work hard. On a scale of 0 to 10, vigorous-intensity activity is a 7 or 8. A person doing vigorous-intensity activity can't say more than a few words without stopping for a breath.

Example of Walking Intensity *(Harvard Medical Publishing)*

Type of walking	***Pace***	***How it feels***	***Intensity***
Easy	Leisurely stroll	Light effort, breathing easily. You can sing	Light
Moderate	Purposeful, like you havesome place to get to	Some effort, breathing morenoticeable. You can talk in full sentences	Light to moderate
Brisk	In a bit of a hurry	Moderate effort, breathing harder. You can talk in full sentences, but need to take more breaths	Moderate
Fast	Late for an appointment	Hard effort, slightly breathless. You can talk in phrases	Moderate to vigorous

Examples of Aerobic Activities	Below are examples of aerobic activities. Depending on your level of fitness, they can be light, moderate, or vigorous in intensity: • Pushing a grocery cart around a store • Gardening, such as digging or hoeing that causes your heart rate to go up • Walking, hiking, jogging, running • Water aerobics or swimming laps • Bicycling, skateboarding, rollerblading, and jumping rope • Ballroom dancing and aerobic dancing • Tennis, soccer, hockey, and basketball
Other Types of Physical Activity	The other types of physical activity—***muscle-strengthening, bone strengthening,*** **and** ***stretching***—benefit your body in other ways. Muscle-strengthening activities improve the strength, power, and endurance of your muscles. Doing pushups and sit-ups, lifting weights, climbing stairs, and digging in the garden are examples of muscle-strengthening activities. With bone-strengthening activities, your feet, legs, or arms support your body's weight, and your muscles push against your bones. This helps make your bones strong. Running, walking, jumping rope, and lifting weights are examples of bone-strengthening activities. Muscle-strengthening and bone-strengthening activities also can be aerobic, depending on whether they make your heart and lungs work harder than usual. For example, running is both an aerobic activity and a bone-strengthening activity. Stretching helps improve your flexibility and your ability to fully move your joints. Touching your toes, doing side stretches, and doing yoga exercises are examples of stretching.
Exercise Risks	In general, the benefits of regular physical activity far outweigh risks to the heart and lungs. • Rarely, heart problems occur as a result of physical activity. Examples of these problems include arrhythmias, sudden cardiac arrest, and heart attack. These events generally happen to people who already have heart conditions. • The risk of heart problems due to physical activity is higher for youth and young adults who have congenital heart problems. The term “congenital” means the heart problem has been present since birth. Congenital heart problems include hypertrophic cardiomyopathy, congenital heart defects, and myocarditis. People who have these conditions should ask their doctors what types of physical activity are safe for them. • For middle-aged and older adults, the risk of heart problems due to physical activity is related to coronary heart disease (CHD). People who have CHD are more likely to have a heart attack when they are exercising vigorously than when they are not. • The risk of heart problems due to physical activity is related to your fitness level and the intensity of the activity you are doing. For example, someone who is not physically fit is at higher risk for a heart attack during vigorous activity than a person who is physically fit. • ***If you have a heart problem or chronic (ongoing) disease—such as heart disease, diabetes, or high blood pressure—ask your doctor what types of physical activity are safefor you. You also should talk with your doctor about safe physical activities if you have symptoms such as chest pain or dizziness.*** • Discuss ways that you can slowly and safely build physical activity into your daily routine.

Exercise Benefits	• Physical activity strengthens your heart and improves lung function. When done regularly, moderate- and vigorous-intensity physical activity strengthens your heart muscle. This improves your heart's ability to pump blood to your lungs and throughout your body. As a result, more blood flows to your muscles, and oxygen levels in your blood rise. • Capillaries, your body's tiny blood vessels, also widen. This allows them to deliver more oxygen to your body and carry away waste products. • Physical activity reduces coronary heart disease risk factors. When done regularly, moderate- and vigorous-intensity aerobic activity can lower your risk for CHD. ○ Plaque narrows the arteries and reduces blood flow to your heart muscle. Eventually, an area of plaque can rupture (break open). This causes a blood clot to form on the surface of the plaque. If the clot becomes large enough, it can mostly or completely block blood flow through a coronary artery. Blocked blood flow to the heart muscle causes a heart attack. Certain traits, conditions, or habits may raise your risk for CHD. Physical activity can help control some of these risk factors because it: • Can lower blood pressure and triglyceride. Triglycerides are a type of fat in the blood. • Can raise HDL cholesterol levels. HDL sometimes is called “good” cholesterol. • Helps your body manage blood sugar and insulin levels, which lowers your risk for type 2 diabetes. • Reduces levels of C-reactive protein (CRP) in your body. This protein is a sign of inflammation. High levels of CRP may suggest an increased risk for CHD. • Helps reduce overweight and obesity when combined with a reduced-calorie diet. Physical activity also helps you maintain a healthy weight over time once you have lost weight. • May help you quit smoking. Smoking is a major risk factor for CHD. • Inactive people are more likely to develop CHD than people who are physically active. Studies suggest that inactivity is a major risk factor for CHD, just like high blood pressure, high blood cholesterol, and smoking. Physical Activity Reduces Heart Attack Risk • For people who have CHD, aerobic activity done regularly helps the heart work better. It also may reduce the risk of a second heart attack in people who already have had heart attacks. *Vigorous aerobic activity may not be safe for people who have CHD. Ask your doctor what types of activity are safe for you.*
Guidelines for Adults	• Some physical activity is better than none. Inactive adults should gradually increase their level of activity. People gain health benefits from as little as 60 minutes of moderate-intensity aerobic activity per week. • For major health benefits, do at least 150 minutes (2 hours and 30 minutes) of moderate-intensity aerobic activity or 75 minutes (1 hour and 15 minutes) of vigorous-intensity aerobic activity each week. Another option is to do a combination of both. A general rule is that 2 minutes of moderate-intensity activity counts the same as 1 minute of vigorous-intensity activity. • For even more health benefits, do 300 minutes (5 hours) of moderate-intensity aerobic activity or 150 minutes (2 hours and 30 minutes) of vigorous-intensity activity each week (or a combination of both). The more active you are, the more you will benefit. • When doing aerobic activity, do it for at least 10 minutes at a time. Spread the activity throughout the week. Muscle-strengthening activities that are moderate or vigorous intensity should be included 2 or more days a week. These activities should work all of the major muscle groups (legs, hips, back, chest, abdomen, shoulders, and arms). Examples include lifting weights, working with resistance bands, and doing situps and pushups, yoga, and heavy gardening.

Guidelines for Adults Aged 65 or Older	The guidelines advise that: • Older adults should be physically active. Older adults who do any amount of physical activity gain some health benefits. If inactive, older adults should gradually increase their activity levels and avoid vigorous activity at first. • Older adults should follow the guidelines for adults, if possible. Do a variety of activities, including walking. Walking has been shown to provide health benefits and a low risk of injury. • If you cannot do 150 minutes (2 hours and 30 minutes) of activity each week, be asphysically active as your abilities and condition allow. • You should do balance exercises if you are at risk for falls. *(See Balance)* • ***If you have a chronic (ongoing) condition—such as heart disease, lung disease, or diabetes—ask your doctor what types and amounts of activity are safe for you.***
Make Physical Activity Part of Your Daily Routine	Do activities that you enjoy and make them part of your daily routine. If you have not been active for a while, start low and build slow. Many people like to start with walkingand slowly increase their time and distance. You also can take other steps to make physical activity part of your routine. PERSONALIZE THE BENEFITS • People value different things. Some people may highly value the health benefits from physical activity. Others want to be active because they enjoy recreational activities, or they want to look better or sleep better. • Some people want to be active because it helps them lose weight or it gives them a chance to spend time with friends. Identify which physical activity benefits you value. This will help you personalize the benefits of physical activity. BE ACTIVE WITH FRIENDS AND FAMILY • Friends and family can help you stay active. For example, go for a hike with a friend. Take dancing lessons with your spouse or play ball with your child. MAKE EVERYDAY ACTIVITIES MORE ACTIVE • You can make your daily routine more active. For example, take the stairs instead of the elevator. Instead of sending e-mails, walk down the hall to a coworker's office. Rake the leaves instead of using a leaf blower. REWARD YOURSELF WITH TIME FOR PHYSICAL ACTIVITY • Sometimes, going for a bike ride or a long walk relieves stress after a long day. Think of physical activity as a special time to refresh your body and mind. KEEP TRACK OF YOUR PROGRESS • Consider keeping a log of your activity. A log can help you track your progress. Many people like to wear a pedometer (a small device that counts your steps) to track how much they walk every day. These tools can help you set goals and stay motivated. BE ACTIVE AND SAFE • Be active on a regular basis to raise your fitness level. • Do activities that fit your health goals and fitness level. Start low and slowly increase your activity level over time. As your fitness improves, you will be able to do physical activities for longer periods and with more intensity. • Spread out your activity over the week and vary the types of activity you do. • Use the right gear and equipment to protect yourself. For example, use bicycle helmets, elbow and knee pads, and goggles. • Be active in safe environments. Pick well-lit and well-maintained places that are clearly separated from car traffic. • Follow safety rules and policies, such as always wearing a helmet when biking. • Make sensible choices about when, where, and how to be active. Consider weather conditions, such as how hot or cold it is, and change your plans as needed.

Exercise Response to Cardiac Medications *(portions adapted from Heart Online)*

Medications	Heart Rate	Blood Pressure	Clinical Relevance to Exercise
β-Blockers Any of a group of drugs (as propranolol) that combine with and block the activity of a beta-receptor to decrease the heart rate and force of contractions and lower high blood pressure and that are used especially to treat hypertension, angina pectoris, and ventricular and supraventricular arrhythmias	↓ at rest and with exercise	↓ at rest and with Exercise	• Monitor for symptoms of hypotension or bradycardia* • Intensity monitoring reliant on HR should be avoided
Nitrates Used in the treatment of angina pectoris and as preservatives in meat products. Some individuals have sensitivity to nitrates and may suffer from headache, diarrhea, or urticaria after ingesting.	↑ at rest ↑ or no change with exercise	↓ at rest ↓ or no change with exercise	• For acute use, hypotension and reflex tachycardia are common. Monitor HR and BP. Exercise should be ceased. • Monitor symptoms of hypotension, tachycardia and Angina
Calcium channel blockers Any of a class of drugs (as verapamil) that prevent or slow the influx of calcium ions into smooth muscle cells especially of the heart and that are used especially to treat some forms of angina pectoris and some cardiac arrhythmias	No change at rest or with exercise (Dihydropyridines) or ↓ at rest and with exercise (Verapamil and Diltiazem)	↓ at rest and with exercise	• Monitor for symptoms of hypotension (+/- bradycardia) • Dihydropyridines (e.g. amlodipine, felodipine, lercanidipine, nifedipine) have greatest effect peripherally and therefore work to lower BP. Tachycardia may occur as an infrequent adverse effect • Verapamil and diltiazem depress sinoatrial and atrioventricular node conduction as well as causing peripheral vasodilation, therefore affect both HR and BP • Intensity monitoring reliant on HR should be avoided
Digoxin A cardiotonic steroid C41H64O14 obtained from a foxglove (Digitalis lanata) and used especially to treat atrial fibrillation	↓ in patients with AF and possibly CHF	No change at rest or with exercise	• Monitor for signs of bradycardia

Medications	Heart Rate	Blood Pressure	Clinical Relevance to Exercise
Diuretics An agent that increases the excretion of urine	No change at rest or with exercise	No change or ↓ at rest or with exercise	• Monitor for symptoms of hypotension and unexpected rapid weight changes • Over diuresis or fluid loss through vomiting or diarrhea in the presence of diuretics, may exacerbate hypotension
ACE inhibitor and ARB Any of a group of antihypertensive drugs (such as captopril) that relax arteries and promote renal excretion of salt and water by inhibiting the activity of angiotensin converting enzyme	No change at rest or with exercise	↓ at rest and exercise	• Monitor for symptoms of hypotension

- Heart rate (HR) and blood pressure (BP) should be assessed prior to undertaking a supervised exercise program.
- Pre exercise values that differ significantly from the individual's norms may require modification of the exercise program or medical review prior to commencing.
- Recent medication changes or up-titration may require modifications to the exercise program.
- Monitor sitting and standing BP for those with suspected postural hypotension and avoid sudden postural changes or exercises that may exacerbate this in these patients

**Blockers with mixed beta and alpha blocking activity (e.g. carvedilol) influence peripheral arterioles as well as reducing HR. Hypotension may be more significant than when using other -Blockers which primarily affect HR alone. -Blockers with intrinsic sympathomimetic activity (pindolol, oxprenolol) lower resting heart rate only slightly, and are not often used in the management of heart failure*

Adapted from American College of Sports Medicine (2013). ACSM's Guidelines for Exercise Testing and Prescription, Ninth Edition. Lippincott, Williams &Wilkins and Australian Medicines Handbook 2014 (online). Adelaide: Australian Medicines Handbook Pty Ltd

Source: Heart Online : *Exercise response to cardiac medications* www.heartonline.org.au/resources Reviewed 11/2014

Cardiac Nutrition – Also see the Nutrition Guide in Chapter 6 of this book

Quick Summary

Heart-healthy eating (NIH)	• Foods to eat in a Heart Healthy Diet
Nutrients to Limit	• Sodium, • Saturated and Trans Fats • Added Sugars • Alcohol
DASH Diet	• Foods to Eat • Foods to Avoid • Questionable or Decrease Consumption • Possible other Names to Avoid

Heart-healthy eating (NIH)

Foods to Eat	The following foods are the foundation of a heart-healthy diet. Vegetables such as greens (spinach, collard greens, kale), broccoli, cabbage, and carrots Fruits such as apples, bananas, oranges, pears, grapes, and prunes Whole grains such as plain oatmeal, brown rice, and whole-grain bread or tortillas Fat-free or low-fat dairy foods such as milk, cheese, or yogurt Protein-rich foods: • Fish high in omega-3 fatty acids, such as salmon, tuna, and trout, about 8 ounces a week • Lean meats such as 95 percent lean ground beef or pork tenderloin • Poultry such as skinless chicken or turkey • Eggs • Nuts, seeds, and soy products • Legumes such as kidney beans, lentils, chickpeas, black-eyed peas, and lima beans Oils and foods containing high levels of monounsaturated and polyunsaturated fats that can help lower blood cholesterol levels and the risk of cardiovascular disease. Some sources of these oils are: • Canola, corn, olive, safflower, sesame, sunflower, and soybean oils • Nuts such as walnuts, almonds, and pine nuts • Nut and seed butters • Salmon and trout • Seeds such as sesame, sunflower, pumpkin, or flax • Avocados • Tofu
Nutrients to Limit	**A heart-healthy diet limits sodium, saturated and trans fats, added sugars, and alcohol.** **SODIUM** Adults and children over the age of 14 should eat less than 2,300 mg of sodium a day. Children younger than 14 may need to eat even less sodium each day based on their sex and age. If you have high blood pressure, you may need to restrict your sodium intake even more. Talk to your doctor or health care provider about what amount of sodium is right for you or your child. Try these shopping and cooking tips to help you choose and prepare foods that are lower in sodium. • Read food labels and choose products that have less sodium for the same serving size. • Choose low-sodium, reduced sodium, or no-salt added products. • Choose fresh, frozen, or no-salt-added foods instead of pre-seasoned, sauce-marinated, brined, or processed meats, poultry, and vegetables. • Eat at home more often so you can cook food from scratch, which will allow you to control the amount of sodium in your meals. • When cooking, limit your use of premade sauces, mixes, and “instant” products such as rice, noodles, and ready-made pasta. • Flavor foods with herbs and spices instead of salt.

Nutrients to Limit
Continued

SATURATED and TRANS FATS

When you follow a heart-healthy eating plan, you should:

- Eat less than 10 percent of your daily calories from saturated fats found naturally in foods that come from animals and some plants.
- Limit intake of trans fats to as low as possible by limiting foods that contain high amounts of trans fats.

The following are examples of foods that are high in saturated or trans fats.

- Saturated fats are found in high amounts in fatty cuts of meat, poultry with skin, whole-milk dairy foods, butter, lard, and coconut and palm oils.
- Trans fats are found in high amounts in foods made with partially hydrogenated oils, such as some desserts, microwave popcorn, frozen pizza, stick margarines, and coffee creamers.

To help you limit your intake of saturated fats and trans fats:

- Read the nutrition labels and replace foods high in saturated fats with leaner, lower-fat animal products or vegetable oils, such as olive or canola oil instead of butter. Foods that are higher in saturated fats, such as fatty meats and high-fat dairy products, tend to be higher in dietary cholesterol that should also be limited.
- Read the nutrition labels and choose foods that do not contain trans fats. Some trans fats naturally occur in very small amounts in dairy products and meats. Foods containing these very low levels of natural trans fats do not need to be eliminated from your diet because they have other important nutrients.

If you eat:	Try to eat no more than:
1,200 calories a day	8 grams of saturated fat a day
1,500 calories a day	10 grams of saturated fat a day
1,800 calories a day	12 grams of saturated fat a day
2,000 calories a day	13 grams of saturated fat a day
2,500 calories a day	17 grams of saturated fat a day

Not all fats are bad. Monounsaturated and polyunsaturated fats actually help lower blood cholesterol levels. Some sources of monounsaturated and polyunsaturated fats are:

- Avocados
- Corn, sunflower, and soybean oils
- Nuts and seeds, such as walnuts
- Olive, canola, peanut, safflower, and sesame oils
- Peanut butter
- Salmon and trout
- Tofu

Nutrients to Limit
Continued

Added SUGARS

- When you follow a heart-healthy eating plan, you should limit the amount of calories you consume each day from added sugars. Because added sugars do not provide essential nutrients and are extra calories, limiting them can help you choose nutrient-rich foods and stay within your daily calorie limit.
- Some foods, such as fruit, contain natural sugars. Added sugars do not occur naturally in foods, but instead are used to sweeten foods and drinks. Some examples of added sugars include brown sugar, corn syrup, dextrose, fructose, glucose, high-fructose corn syrup, raw sugar, and sucrose.
- In the United States, sweetened drinks, snacks, and sweets are the major sources of added sugars. Sweetened drinks account for about half of all added sugars consumed. The following are examples of foods and drinks with added sugars.
    - Sweetened drinks include soft drinks or sodas, fruit drinks, sweetened coffee and tea, energy drinks, alcoholic drinks, and favored waters.
    - Snacks and sweets include grain-based desserts such as cakes, pies, cookies, brownies, doughnuts; dairy desserts such as ice cream, frozen desserts, and pudding; candies; sugars; jams; syrups; and sweet toppings.

To help you reduce the amount of added sugars in your diet:

- Choose unsweetened or whole fruits for snacks or dessert.
- Choose drinks without added sugar such as water, low-fat or fat-free milk, or 100 percent fruit or vegetable juice.
- Limit intake of sweetened drinks, snacks and desserts by eating them less often and in smaller amounts.

ALCOHOL

If you drink alcohol, you should limit your intake. Men should have no more than two alcoholic drinks per day. Women should have no more than one alcoholic drink per day. One drink is:

- 12 ounces of regular beer (5 percent alcohol)
- 5 ounces of wine (12 percent alcohol)
- 1½ ounces of 80-proof liquor (40 percent alcohol)

Talk to your doctor about how much alcohol you drink. Your doctor may recommend that you reduce the amount of alcohol you drink or that you stop drinking alcohol. Too much alcohol can:

- Raise your blood pressure and levels of triglyceride fats in your blood.
- Add calories to your daily diet and possibly cause you to gain weight.
- Worsen heart failure in some patients.
- Contribute to heart failure in some people with cardiomyopathy.

If you do not drink, you should not start drinking. You should not drink if you are pregnant, under the age of 21, taking certain medicines, or have certain medical conditions including heart failure. It is important for people with heart failure to take in the correct amounts and types of liquids because too much liquid can worsen heart failure.

Remember that alcoholic drinks do contain calories and contribute to your daily calorie limits. The amount of calories will vary by the type of alcoholic drink.

DASH Diet	Foods to Eat	Foods to avoid	Questionable or Decrease Consumption	Possible Other Names to Avoid
DASH stands for Dietary Approaches to Stop Hypertension. The DASH diet is a lifelong approach to healthy eating that's designed to help treat or prevent high blood pressure (hypertension). The DASH diet encourages you to reduce the sodium in your diet and eat a variety of foods rich in nutrients that help lower blood pressure, such as potassium, calcium, and magnesium. ***Mayo Clinic*** ***Chewfo***	***Fruits.*** Choose a variety of fresh fruits, such as apples, oranges and bananas. Add variety by looking beyond the ordinary to apricots, dates and berries. Select fruit canned in its own juice, not in heavy syrup, and frozen fruit without added sugar. ***Vegetables.*** Buy fresh, frozen or canned vegetables, such as tomatoes, carrots, broccoli and spinach. Choose frozen vegetables without added salt or butter or sauces and opt for canned vegetables lowin sodium. ***Low-fat dairy products.*** Look for lower fat dairy options when buying milk, buttermilk, cheeses, yogurt and sour cream. ***Grains.*** Aim for whole-grain and low-fat varieties of bread, bagels, pitas, cereal, rice, pasta, crackers and tortillas. Compare labels and choose the items lower in sodium. ***Nuts, seeds, and legumes.*** Almonds, walnuts, kidney beans, lentils, chickpeas (garbanzos) and sunflower seeds are among the healthy options. But get the unsalted or low-salt varieties. ***Lean meats,*** Poultry and fish. Opt for lean selections, such as fish, skinless chicken and turkey, pork tenderloin, extra-lean ground beef, and round or sirloin beef cuts. Avoid canned, smoked or processed meats, such as deli meats. ***Condiments, seasonings and spreads.*** Herbs, spices, flavored vinegars, salsas and olive oil can add zest to your meals without the salt overload. Choose low- or reduced-sodium versions of condiments. ***Mayo Clinic***	**Standard DASH diet.** You can consume up to 2,300 milligrams (mg) of sodium a day. **Lower sodium DASH diet.** You can consume up to 1,500 mg of sodium a day. ***Fats –*** not heart healthy Saturated fats, including coconut oil, palm oil, and foods containing them. ***Trans fats /*** partially hydrogenated fats and foods containing them – these include many pastries, cookies, and snack crackers, which either contain trans fats or have replaced them with coconut oil or palm oil. Limit fats high in omega-6 fatty acids, such as corn oil, soybean oil (often called vegetable oil), and safflower oil. You can have butter rarely and in small amounts – choose it for special meals for its flavor. ***Sugary foods*** Sugar, honey, agave, molasses, maple syrup, and other sugars Baked goods and pastries. Soda with sugar Candies etc. Energy bars Any other sugary foods ***Chewfo***	**Rinse it off.** Rinse canned foods, such as tuna, beans, and vegetables, before using to wash away some excess salt. **Beware of broth.** Sauté onions, mushrooms or other vegetables in water or a little low-sodium broth. But because even low-sodium broth can add lots of unnecessary sodium, sometimes a healthy oil may be the best option. **Make lower fat substitutions**. Use lower fat dairy products, such as reduced-fat cream cheese and fat-free sour cream, instead of their higher fat counterparts. **Cut back on meat.** Prepare stews and casseroles with only two-thirds of the meat the recipe calls for, adding extra vegetables, brown rice, tofu, bulgur or whole-wheat pasta instead. **Caffeine** ***Mayo Clinic***	Avoid caffeine containing medications such as Anacin

LOST TEMPLE FITNESS

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