

Common Medical Conditions and Exercise Modifications

As stated previously in this course, most of your active older clients will have at least one chronic health condition. Many of these increase the likelihood of developing additional chronic conditions, termed co-morbidities (e.g., hypertension increases the risk for stroke and coronary artery disease). Despite the desire to construct challenging exercise programs to condition your active agers, many of these conditions require modifications to exercises to ensure safe and effective programs. This section briefly describes several of the common chronic health conditions and provides advice on how to modify exercises to keep the program safe but challenging. Exercise modification recommendations for each condition are listed in a bulleted list.

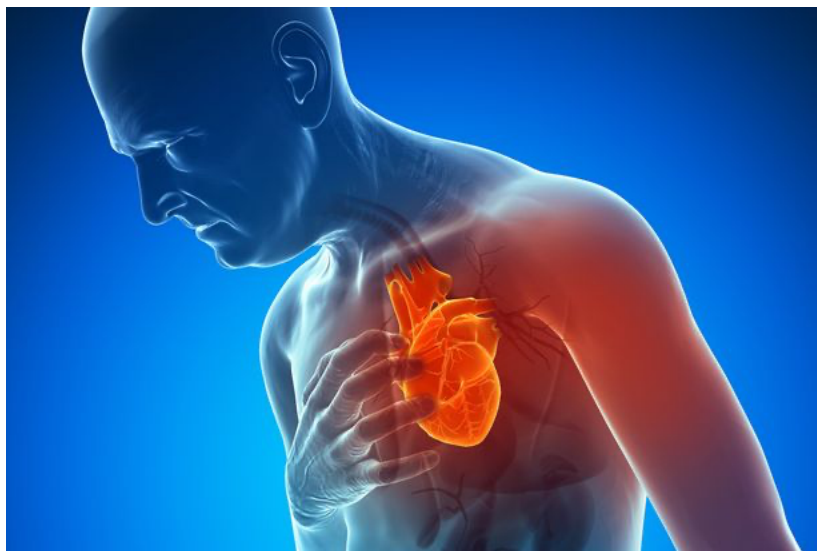
Cardiovascular Disease

Cardiovascular disease (CVD) continues to be the number one killer of both male and female adults and older adults in the United States (53). There are over 20 different conditions that are collectively referred to as CVD, but the majority of cases of CVD are due to coronary artery disease (CAD) and stroke. CAD the end result of accumulated damage to the walls of the blood vessels that serve to provide the heart muscle (myocardium) with blood and oxygen.

Coronary atherosclerosis is caused by a variety of different risk factors including age, ethnicity, family history, gender, and many lifestyle

behaviors, such as smoking, poor diet and hypertension (53). Most of your active agers are likely to choose lifestyle behaviors that are preventative rather than problematic, but the unmodifiable factors are still a concern.

CAD becomes problematic in times of physical and/or emotional stress when the metabolic demand on the heart increases. The increased need for oxygen by the myocardium cannot be supplied due to the narrowing of the coronary arteries and restricted blood flow (myocardial ischemia). People experiencing myocardial ischemia may have a number of symptoms including chest pain (angina pectoris), difficulty breathing (dyspnea), dizziness or lightheadedness (syncope), or other uncomfortable sensations. You need to recognize these symptoms and take immediate action if any client shows these signs. It could be a sign that the client is experiencing a heart attack (myocardial infarction) which can damage or kill portions of the heart muscle and may cause sudden cardiac death (53).



Stroke results from a rupture or blockage of blood vessels in the brain. Ruptures are typically due to elevated blood pressure and blockage is caused by atherosclerosis in the cerebral arteries. Stroke is the third leading cause of death in older adults and can occur at any time.

Exercise Recommendations for Cardiovascular Disease & Stroke:

- Always have an automated external defibrillator (AED) on hand in case of cardiac arrest. CPR with AED certification must always be kept current.
- Check blood pressure before a training session if your client has been diagnosed with hypertension. Do not train if the client has a blood pressure of either 250 mmHg systolic or 115 mmHg diastolic or greater.
- Your clients with CAD may be on medication to control their condition. If your active older client is on a beta blocker (e.g., Metoprolol, Atenolol), heart rate response to exercise will likely be blunted and may reduce exercise tolerance. During HIIT and MIT training, use the Rating of Perceived Exertion to gauge exercise intensity.

Rating	Descriptor
6	No exertion at all
7	Extremely light
8	
9	Very light
10	
11	Light
12	
13	Somewhat hard
14	
15	Hard (heavy)
16	
17	Very hard
18	
19	Extremely hard
20	Maximal exertion

- If your active older client has a sudden loss or change in speech, muscle weakness on one side of the body, or difficulty walking, it may be a stroke. This is AN IMMEDIATE MEDICAL EMERGENCY. If you see any of these symptoms, call 911 immediately!

Atrial Fibrillation

The electrical rhythm of the heart can be modified beneficially by exercise. The sinoatrial node, known as the pacemaker of the heart, is downregulated by an active lifestyle which can lead to low resting heart rates that are common among athletes. On the other hand, excessive exercise may have a negative effect. Studies have shown that acute bouts of prolonged endurance exercise, such as marathons, can cause wall motion abnormalities in the ventricles and damage to the cardiac muscle

cells due to the strain on the heart muscle and connective tissues. This dysfunction will usually resolve within 48 hours but for some people leads to scarring of the heart muscle and/or chronic atrial fibrillation (AFib) (18). Some of your active agers are likely to be dealing with AFib which increases their risk for stroke. In order to reduce the risk for blood clots that may lead to stroke, many older adults with AFib are prescribed blood thinning medications that may lead to bruising or make bleeding difficult to stop.



Exercise recommendations for Atrial Fibrillation:

- If your active older client is in AFib during the training visit, reduce the exercise intensity and recommend a physician visit to return the heart to normal rhythm.

- Use caution with exercise equipment that may cause cuts or abrasions (e.g., rigid cloth straps of a suspension trainer, metallic edges on benches or selectorized equipment).
- Avoid contact training such as sparring or martial arts in AFib due to potential for brain bleeds.
- Always watch for symptoms of cardiovascular issues or stroke in clients with AFib due to the potential complications of the arrhythmia.

High Blood Pressure (Hypertension)

Blood pressure is defined as the force exerted by blood against the walls of the arteries. According to the updated classification criteria for hypertension the American College of Cardiology, blood pressure values should be less than 120 mmHg for systolic blood pressure (pressure in the arterial system when the heart is ejecting blood into the arteries) and less than 80 mmHg for diastolic blood pressure (pressure in the arterial system when the heart is filling) (53).

Exercise has been shown to be a useful intervention to reduce blood pressure in hypertensive adults. Research studies published in the early 1990s demonstrated that introduction of regular endurance training can decrease both systolic and diastolic blood pressure after a period of 4 months. Furthermore, a longitudinal study of 18 years demonstrated that older adults who engaged in regular endurance training showed no increase in systemic blood pressure from their late forties into their late sixties, whereas a comparison group became, on average, hypertensive during that time frame (54).

From a pharmacological standpoint, there are many prescription medications used to treat hypertension including diuretics (water pills), beta blockers, alpha blockers, ACE inhibitors, and vasodilators.

Exercise Recommendations for Hypertension:

- Take the blood pressure of a hypertensive client prior to the exercise session. Do not allow the client to exercise if resting systolic blood pressure is greater than 180 mmHg or diastolic blood pressure is greater than 100 mmHg.
- Be careful with isometric exercises during core training. Isometrics encourage breath holding and increase thoracic pressure. Cue your client to breathe normally throughout all isometric exercises.
- Encourage forceful exhalations during HIIT training with active agers who are hypertensive. This reduces the likelihood of breath holding.
- Monitor your clients when performing heavy resistance training and power training. Have them count repetitions out loud to keep them from holding their breath.

Diabetes Mellitus

Diabetes is a disease characterized by impaired glucose homeostasis, where glucose levels in the blood are chronically elevated (diagnosis of diabetes is confirmed when fasting blood glucose is ≥ 126 mg/dl or a blood test with Hb A1c levels of 6.5% or higher). This is not a fault of glucose itself, but rather due to issues with the hormone insulin, which many tissues

of the body require to initiate the glucose uptake process. People with diabetes either display impaired insulin production (Type 1) or insensitivity of insulin receptors on the surface of target cell membranes (Type 2) (55).



Most of your diabetic active older clients will have Type 1. It is an autoimmune disease that destroys the body's own insulin-producing beta cells in the pancreas. People with Type 1 require insulin administration typically by subcutaneous injection or an insulin pump (55). Type 2 is characterized by either normal or elevated insulin production in conjunction with reduced insulin sensitivity (known as insulin resistance). Although the pancreas is releasing copious insulin into the blood, the target tissues are not binding the insulin to their membrane receptors which halts glucose uptake. Type 2 is typically associated with inactivity and obesity, issues that are unlikely to be problems with your active older adults.

Exercise helps to manage glucose control. In fact, physical activity is the most important non-dietary factor impacting glucose control in the body.

This is because skeletal muscle is the largest glucose-consuming tissue in the human body and any type of exercise stimulates the uptake and consumption of glucose in muscle (55). Due to this, you must monitor your active older clients very carefully due to the potential of exercise to induce hypoglycemia (<60mg/dl), a low blood glucose condition that can cause slurred speech, mental confusion, dizziness, nausea, muscle tremor and other symptoms (55).

Exercise Recommendations for Diabetes:

- Clients should always have their glucometer on hand so that they can check their glucose readings. Do not let them exercise if their resting blood glucose is above 250 mg/dl or below
- Clients should consume simple sugar (e.g., glucose tablets, orange juice, hard candy...etc.) when there are signs of hypoglycemia during exercise.
- Clients should be educated about the effects of exercise on blood glucose (lowers it) and should be encouraged to monitor how their body reacts to exercise so that they can modify their food intake and/or insulin administration strategies.

Asthma – A Chronic Obstructive Pulmonary Disease (COPD)

Although most pulmonary diseases are not common in active older adults, there is one form of COPD that is: asthma, Greek for the phrase “to pant”, is caused when the smooth muscles that line the smaller airways go into spasm and constrict the airways. Symptoms can be brought on by stimuli such as allergens (e.g., pollen, pet dander, certain foods), irritants (e.g.,

cigarette smoke, chemicals), temperature/humidity, exercise or emotional stress. These changes to the airways of the lung result in wheezing, shortness of breath (dyspnea), and coughing, all characteristic of an asthma attack. If an asthma attack does occur during exercise, these symptoms can greatly limit exercise tolerance in your active older clients.

Medications that are used to treat asthma are classified into short-acting medications and long-acting medications. Short-acting medications, also known as rescue inhalers, are beta-adrenergic agents that are effective bronchodilators. Most clients with asthma will be taking a daily medication for long-acting modulation of the airways and also have a rescue inhaler in case of an emergency.



Exercise Recommendations for Asthma:

- Ensure that your client has taken their daily medication before exercise.
- Always ensure that the client has a rescue inhaler on hand in case of an exercise-induced asthma attack.

- Begin each exercise session with an extended warm-up and end each exercise session with an extended cool-down. Abrupt increases or decreases in exercise intensity may bring about an asthma attack. Monitor the client symptoms during HIIT training
- If training your client outdoors, be cautious when the weather is cold and dry. These conditions increase the likelihood of an asthma attack.
- If an asthma attack does occur, have the client use their rescue inhaler and then sit down with their arms over a chair or table in front of them to open up the chest. Instruct the client on pursed lip breathing where air is inhaled deeply through the nose and slowly exhaled through the mouth while the lips are puckered together as if whistling.
- If symptoms get worse or do not improve in a matter of several minutes, seek medical attention.

Arthritis

There are over 100 different conditions that are collectively referred to as arthritis. It is the most common chronic condition in older adults, affecting nearly 50% of people over the age of 65. Osteoarthritis (OA) is the most common form of arthritis and is characterized by the gradual deterioration of cartilage and bone within a joint (56). OA is most commonly seen in joints that are load-bearing and/or highly mobile such as the fingers, hips, knees, lower back, and feet. Healthy cartilage, the cushioning substance that protects the surfaces of bone at a joint, is able to function much like a sponge as it absorbs and releases the natural fluid (synovial fluid) found in

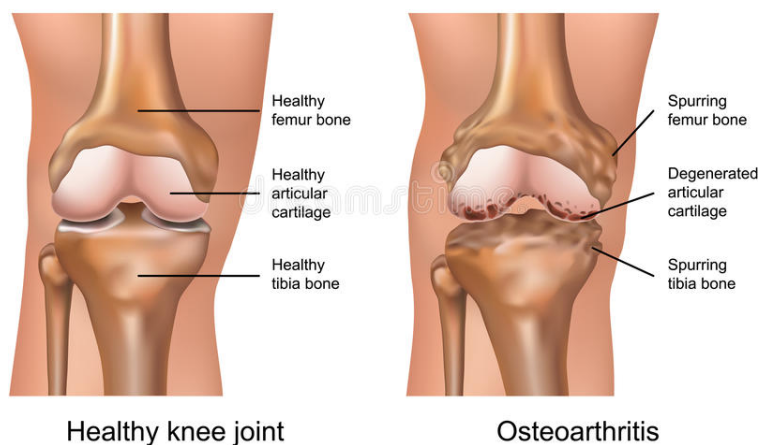
a joint as the joint experiences movement and pressure. However, in some people, cartilage becomes damaged through a variety of different mechanisms and is either broken away from bones or becomes inflamed. This inflammatory process results in a disruption of the normal maintenance of cartilage and causes further breakdown. Eventually, with the loss of more and more cartilage, bone itself becomes exposed in the joint space. Unfortunately, bones do not respond well to direct contact and will form abnormal growths, known as bone spurs (osteophytes) which irritate and further damage the structures of the joint. The most common symptoms in affected joints include pain, inflammation, reduced range of motion, and grinding sensations upon movement.

Among the risk factors for OA are a history of joint trauma and repetitive joint motions. These are likely issues with your active older adults. Years of exercise training or competitive/recreational sports are likely to cause OA in major joints such as the knees, hips, spine, shoulder and wrist. Poor joint biomechanics are usually to blame and, if not modified, will result in a faster progression of OA. Therefore, a program of corrective exercise is vital for the OA sufferer in order to restore more optimal movement patterns and reduce stress on affected joints.

It must be clearly stated that OA is NOT caused by exercise/sports itself. In fact, a lack of physical activity can accelerate the loss of healthy cartilage by reducing the movement of synovial fluid through the tissue which is a process required to maintain tissue health (56). A review of 14 studies on both aerobic and resistance exercise and knee osteoarthritis, including data from the Fitness Arthritis and Seniors Trial (FAST) found that older adults

who exercised were effectively able to relieve arthritic pain and improve joint function than controls (56). This is good news for your active aging clients who will be glad to know that some focused corrective exercise and effective exercise modifications can help to alleviate their discomfort. There are excellent trainings available to further educate fitness professionals to manage training active agers with OA. Dr. Evan Osar is a chiropractor with many years of experience working with this population (57). His training courses can be found here: <https://iihfe.com>

Osteoarthritis of the Knee



The most common treatments for OA include anti-inflammatory medications such as aspirin, acetaminophen (e.g. Tylenol®), naproxen sodium (e.g. Aleve®), and ibuprofen (e.g. Advil®). However, many older adults do not tolerate these medications well and they may cause serious gastrointestinal issues. Available prescription medications include COX-2 inhibitors but should only be used with caution and physician monitoring due to concerns about gastrointestinal and cardiovascular problems.

Exercise Recommendations for Arthritis:

- Ask if your client has exercise recommendations from a physician or physical therapist.
- Assessment of movement for a client with arthritis should be completed through the pain free range of motion with attention paid to compensatory strategies near the end point.
- Make sure that clients can distinguish between exertion in the muscles and pain in the joints. If any movement causes moderate pain in a joint, stop immediately and consider a modification and/or regression of the exercise.
- Move joints through a slow and controlled range of motion and avoid fast or jerky movements which may increase the sensation of pain.
- Emphasize the development of functional flexibility and eccentric control through simple reactive training exercises (e.g., multiplanar lunges) so that soft tissue structures improve their ability to absorb ground reaction force.
- Warm water aquatic exercise is a good option to integrate into the program for clients with significant OA. Consider cross-training in the pool regularly, especially after heavy training sessions or competition.

Hip and Knee Replacement Surgery

Surgical treatment for arthritis also is available in cases of severe pain and joint dysfunction that does not respond to more conservative treatments. Partial or complete joint replacements have become commonplace for arthritic patients. The American Joint Replacement Registry reported 860,000 hip and knee replacement surgeries in 2017 (58). Knee

replacements tend to have a longer recovery period than hip replacements due to the complexity of the structures that are replaced. However, hip replacements have a greater likelihood of prosthesis dislocation due to the larger range of motion allowed at the hip joint. Exercise is a very important aspect of the long-term integrity of the replaced joint, but several precautions should be taken to ensure the prostheses remain intact:

- Exercise caution with high impact/jarring movements such as jumping or running which may stress the prosthesis.
- For certain types of hip replacements, avoid exercises that involve crossing the leg over the midline of the body (i.e., adduction past midline) and exercises that have excessive hip flexion (i.e., knee rising above the hip) due to the possibility of destabilizing the prosthesis and causing a dislocation. Have your client inform you of any contraindicated movements.
- STOP if the client is feeling pain or any unusual sensation in the area of the prosthesis. This may be indicative of a dislocation. Advise the client to contact their physician immediately for a diagnostic evaluation.

Further guidance on this topic can be found on the Functional Aging Institute's website where Dr. Dan Ritchie has a course specifically on training clients with joint replacements:

<https://fai.securechkout.com/training-clients-with-joint-replacement-course>

Summary

Training active older adults is a great way to maximize your clientele and enjoyment of being a fitness professional. Baby Boomers are wanting to live vibrant and active lives and they will seek out qualified fitness professionals to help them do that. Dispel any preconceived notions you may have about what “older people” cannot do and instead assume that they are “Jacks/Jills Of All Trades” and can do everything you can throw at them, unless screening or assessment results suggest otherwise. Approaching the art of training older adults from this perspective opens up an exciting and almost limitless world to you as an active aging fitness professional. Onward!