



CLINICAL EXERCISE SPECIALIST MANUAL

A Fitness Professional's Guide
to Training People with
CHRONIC DISEASE

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**A FITNESS PROFESSIONAL'S GUIDE TO
EXERCISE AND CHRONIC DISEASE**

BY J. DANIEL MIKESKA, DHSC

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CHAPTER 7

CORONARY HEART DISEASE

By the end of this chapter you will understand:

- Background
- Risk factors
- Pre-participation health screening
- Contraindications
- Exercise recommendations
- Nutrition guidelines

Background

Cardiovascular disease (CVD) accounts for more than 17 million annual deaths worldwide and close to 800,000 in the U.S. (Kachur, et al., 2017). Coronary heart disease (CHD), a subset of CVD, occurs when the small blood vessels leading to the heart narrow, preventing blood and oxygen from passing. In the U.S., 1.5 million people suffer from CHD, and CHD accounts for almost 500,000 deaths annually (Kamil-Rosenberg, & Garber, 2016). Due to the prevalence of CVD, it is important for a CXS to recognize the risk factors and know which clients may be at risk. Table 7.1 details CVD risk factors.

Table 7.1

CVD risk factors

Positive Risk Factor	Criteria
Age	Males -45 or older; Females 55 or older
Family History	Heart attack, coronary revascularization, or sudden death. First degree relative: Male prior to 55 or female prior to 65 years of age
Cigarette Smoking	Within last 6 months, or subjected to second hand smoke
Sedentary Lifestyle	NOT participating in 30 minutes of moderate-intensity activity 3 days/week for the last three months
Obesity	BMI 30 or higher. Waist circumference greater than 40" for males or 35" for females. Waist more than half of height.
Hypertension	BP greater than 139/89, or currently on antihypertension medication.
Dyslipidemia (Cholesterol)	LDL greater than 129, HDL less than 40, total greater than 200, or currently on medication
Pre-Diabetes/Diabetes	Fasting glucose greater than 99
Negative Risk Factor	Criteria
High Serum HDL	HDL greater than 60

CHD is the result of atherosclerosis. Atherosclerosis occurs when the inner walls of blood vessels lose elasticity, and become hard and thick, from accumulated plaque from an excess of lipoproteins in the blood. The most common symptom of CHD is a myocardial infarction (MI), or heart attack (La Forge, 2015), and occurs when the plaque lining the walls of blood vessels breaks free and enters the heart. The most common symptoms of an MI are shortness of breath, syncope, nausea, and diffuse (rather than localized) pain. Another indication of CHD is angina pectoris. Angina pectoris, also associated with narrowing of blood vessel walls, is discomfort in the chest, arms, shoulder, and jaw. Unstable angina requires immediate medical attention however, a CXS can work with clients who have predictable, or stable angina. Stable angina can be categorized into the activity or functional, classifications listed below (La Forge, 2015).

- Class I angina indicates ordinary physical activity does not provoke symptoms, but rapid, prolonged exertion may cause chest pain.
- Class II angina is a slight limitation in physical activity.
- Class III angina is a severe limitation in physical activity.
- Class IV angina is a complete inability to perform physical activity without discomfort.

Heart failure occurs when cardiac output does not meet the metabolic demands of the body, and cardiac dysrhythmia occurs when there is a disruption in the beating rhythm of the heart. Heart failure and cardiac dysrhythmia are often the result of a MI; whereas unstable angina may proceed a MI.

Pre-participation Health Screening

The first line of treatment following a CHD event is cardiac rehabilitation, focused on exercise, lifestyle adaptations, and nutrition counseling. Ideally, a client who has experienced a CHD event will have completed early phase cardiac rehabilitation (24–36 sessions) prior to an exercise program with a CXS

(Kachur, et al., 2017; La Forge 2015). A CXS can work with clients at risk for CHD, but asymptomatic or who have stable CHD and are medically cleared for exercise.

Although discussed in Chapter 2, it is worth repeating, the American College of Sports Medicine (ACSM) has new pre-participation health screening recommendations (Magal & Riebe, 2016). Exercise is safe for most people, and the absolute risk of a cardiovascular event is extremely low (Magal & Riebe, 2016). It is thought previous guidelines were too conservative, requiring up to 95% of clients, age 40 and over to seek medical clearance prior to beginning an exercise program; consequently, discouraging many from ever starting.

Just to reiterate, the objective of the new guidelines are similar to previous guidelines (Magal & Riebe, 2016):

1. To identify individuals who should receive medical clearance before starting a new program or increasing the frequency, intensity, and/or volume of an existing exercise program.
2. To identify individuals who present with CV, metabolic, and/or renal diseases and will benefit from participating in a medically-supervised exercise program.
3. To identify individuals with CV, metabolic, and/or renal diseases who must wait until their medical condition(s) have improved to proceed with an exercise program.

A sample Physical Activity Risk Stratification form can be found in Appendix A.

Contraindications

In addition to the CVD risk factors listed in Table 7.1, the following are common, absolute contraindications to exercise training for clients with CHD (ACSM, 2018; Gielen, Laughlin, O'Conner, & Duncker, 2015; Kachur et al., 2017; La Forge, 2015).

- Unstable angina
- Severe or symptomatic aortic stenosis
- Decompensated heart failure—new or worsening signs and symptoms of HF
- Severe obstructive cardiomyopathy
- Acute cardiac mural thrombus—ventricle wall clot
- Acute deep venous thrombus
- Recent embolism
- Recent myocardial infarction
- Uncontrolled cardiac arrhythmia
- Uncompensated symptomatic CHF
- Acute myocarditis or pericarditis
- Uncontrolled HTN (resting SBP >180 mm Hg and/or resting DBP >110 mm Hg)
- Orthostatic BP drop of >20 mm Hg

- Uncontrolled sinus tachycardia
- Thrombophlebitis
- Illness or fever

Exercise Recommendations

For a client with CHD, the clearance for exercise can only be made by a physician and is outside the scope of practice of a CXS. However, it should be noted some contraindications can be considered relative; meaning the benefits of exercise can outweigh the risks, and a client should be allowed to proceed with caution (ACSM, 2018; Gielen et al., 2015). Accordingly, a training session should end at the first sign of symptoms, and resume only after the symptoms have been resolved. Some relative contraindications to exercise for clients with CHD are stable angina, controlled hypertension, asymptomatic tachyarrhythmia and bradyarrhythmia, and uncorrected anemia (Gielen et al., 2015). FITT Guidelines for clients with stable CHD are in Table 7.2.

Table 7.2

FITT Guidelines for clients with stable coronary heart disease

	Frequency	Intensity	Time	Type	Caution
Aerobic	3-7 days/ week 3 days if all bouts are vigorous	Initial Stage: 30-55% HRR Deconditioned or at-risk: 30-39% HRR Stable CHD: Moderate—40-60% HRR or RPE <11-14 Vigorous—60-90% HRR	Deconditioned or at-risk: 1-10 min bouts, 3x/ day Stable CHD: 20-60 min/session or 2000 kcal expenditure/week	Rhythmic motion using large muscle groups	Start slow, and warm up gradually. Limit heavy weights to avoid breath holding, isometric exercise, muscular contraction failure, and Valsalva maneuver.
Resistance Training	2-3 days/ week	General: 60-80% 1RM (low-moderate) Deconditioned or at-risk: <40% 1RM	General: 8-12 exercises 1-4 sets Deconditioned or at-risk: 10-15 reps 1 set	Bands, light hand weights, machines.	Avoid rapid changes in body position Monitor the client for a few minutes after the exercise has ended

ACSM, 2018; Kamil-Rosenberg & Garber, 2016; La Forge, 2015

Nutrition Basics

Although a CXS is not qualified to provide nutrition guidance to a client (unless a CXS has formal training in nutrition such as a registered dietitian), there are recommendations that can be discussed. The primary cause for CHD is atherosclerosis, a hardening and narrowing of blood vessels due to fatty plaque build-up. Low-density lipoproteins (LDL) contribute to atherosclerosis; therefore, a main goal of any diet should be to reduce LDL cholesterol. Omega-3 fatty acids have been associated with a reduction

of arrhythmias and the progression of atherosclerosis. Plant sterols and stanols mimic cholesterol and may reduce cholesterol uptake. Conservative alcohol consumption (1-2 drinks/day) can reduce blood pressure by relaxing the endothelial cells that line blood vessel walls, and 25-30 grams of fiber daily can aid in the reduction of total and LDL cholesterol.

Discussion and application

1. Describe the differences between angina pectoris, myocardial infarction, and heart failure.
2. Describe some contraindications to exercise training for client experiencing CHD.

References

- American College of Sports Medicine. (2018). *ACSM's resources for the exercise physiologist: A practical guide for the health fitness professional* (P. Magyari, R. Lite, M. W. Kilpatrick, & J. E. Schoffstall Eds. 2 ed.). Philadelphia, PA: Wolters Kluwer.
- Gielen, S., Laughlin, M. H., O'Conner, C., & Duncker, D. J. (2015). Exercise training in patients with heart disease: Review of beneficial effects and clinical recommendations. *Progress in Cardiovascular Disease*, 57(4), 347-355. <https://doi.org/10.1016/j.pcad.2014.10.001>
- Kachur, S., Chongthammakun, V., Lavie, C. J., De Schutter, A., Arena, R., Milani, R. V., & Franklin, B. A. (2017). Impact of cardiac rehabilitation and exercise training programs in coronary heart disease. *Progress in Cardiovascular Disease*, 60(1), 103-114. <https://doi.org/10.1016/j.pcad.2017.07.002>
- Kamil-Rosenberg, S., & Garber, C. E. (2016). Cardiac conditioning for healthy individuals: Primary prevention of heart disease. *Current Physical Medicine and Rehabilitation Reports*, 4(3), 223-232. <https://doi.org/10.1007/s40141-016-0130-9>
- La Forge, R. (2015). Coronary heart disease in J.S. Skinner, C.X. Bryant, S. Merrill, & D.J. Green (Eds), *American Council on Exercise medical exercise specialist manual*. San Diego, CA: American Council on Exercise.
- Magal, M., & Riebe, D. (2016). New preparticipation health screening: What exercise professionals need to know. *ACSM's Health & Fitness Journal*, 20(3), 22-27. <https://doi.org/10.1249/FIT.0000000000000202>