TABLE 2.2. Cardiovascular Disease (CVD) Risk Factors and Defining Criteria

Positive Risk Factors[a]	Defining Criteria
Age	Men ≥45 yr; women ≥55 yr (36)
Family history	Myocardial infarction, coronary revascularization, or sudden death before 55 yr in father or other male first-degree relative or before 65 yr in mother or other female first-degree relative (37)
Cigarette smoking	Current cigarette smoker or those who quit within the previous 6 mo or exposure to environmental tobacco smoke (37,38)
Physical inactivity	Not meeting the minimum threshold of 500–1,000 MET-min of moderate-to-vigorous physical activity or 75–150 min · wk^{-1} of moderate-to-vigorous intensity physical activity (23)
Body mass index/waist circumference	Body mass index ≥30 kg · m^{-2} or waist girth >102 cm (40 in) for men and >88 cm (38 in) for women (39)
Blood pressure	Systolic blood pressure ≥130 mm Hg and/or diastolic ≥80 mm Hg, based on an average of ≥2 readings obtained on ≥2 occasions, or on antihypertensive medication (40)
Lipids	Low-density lipoprotein cholesterol (LDL-C) ≥130 mg · dL^{-1} (3.37 mmol · L^{-1}) or high-density lipoprotein cholesterol (HDL-C) <40 mg · dL^{-1} (1.04 mmol · L^{-1}) in men and <50 mg · dL^{-1} (1.30 mmol · L^{-1}) in women or non-HDL-C <130 (3.37 mmol · L^{-1}) or on lipid-lowering medication. If total serum cholesterol is all that is available, use ≥200 mg · dL^{-1} (5.18 mmol · L^{-1}) (41).
Blood glucose	Fasting plasma glucose ≥100 mg · dL^{-1} (5.5 mmol · L^{-1}); or 2 h plasma glucose values in oral glucose tolerance test (OGTT) ≥140 mg · dL^{-1} (7.77 mmol · L^{-1}); or HbA1C ≥5.7% (42)
Negative Risk Factors	**Defining Criteria**
HDL-C[b]	≥60 mg · dL^{-1} (1.55 mmol · L^{-1}) (41)

[a]If the presence or absence of a CVD risk factor is not disclosed or is not available, that CVD risk factor should be counted as a risk factor.

[b]High HDL-C is considered a negative risk factor. For individuals having high HDL ≥60 mg · dL^{-1} (1.55 mmol · L^{-1}), one positive risk factor is subtracted from the sum of positive risk factors.

HbA1C, glycated hemoglobin; MET, metabolic equivalent; non-HDL-C, total cholesterol minus HDL-C.

TABLE 2.1. Major Signs or Symptoms Suggestive of Cardiovascular, Metabolic, and Renal Disease

Signs or Symptoms	Clarification/Significance
Pain; discomfort (or other anginal equivalent) in the chest, neck, jaw, arms, or other areas that may result from myocardial ischemia; or other recent onset pain of unknown origin	One of the cardinal manifestations of cardiac disease; in particular, coronary artery disease
	Key features *favoring an ischemic origin* include the following: • *Character*: constricting, squeezing, burning, "heaviness," or "heavy feeling" • *Location*: substernal, across midthorax, anteriorly; in one or both arms, shoulders; in neck, cheeks, teeth; in forearms, fingers in interscapular region • *Provoking factors*: exercise or exertion, excitement, other forms of stress, cold weather, occurrence after meals.
	Key features against an ischemic origin include the following: • *Character*: dull ache; "knifelike," sharp, stabbing; "jabs" aggravated by respiration • *Location*: in left submammary area; in left hemithorax • *Provoking factors*: after completion of exercise, provoked by a specific body motion

TABLE 2.1. Major Signs or Symptoms Suggestive of Cardiovascular, Metabolic, and Renal Disease

Signs or Symptoms	Clarification/Significance
Dizziness or syncope	Syncope (defined as a loss of consciousness) is most commonly caused by a reduced perfusion of the brain. Dizziness and, in particular, syncope *during* exercise may result from cardiac disorders that prevent the normal rise (or an actual fall) in cardiac output. Such cardiac disorders are potentially life-threatening and include severe coronary artery disease, hypertrophic cardiomyopathy, aortic stenosis, and malignant ventricular dysrhythmias. Although dizziness or syncope shortly *after* cessation of exercise should not be ignored, these symptoms may occur even in healthy individuals as a result of a reduction in venous return to the heart.

TABLE 2.1. Major Signs or Symptoms Suggestive of Cardiovascular, Metabolic, and Renal Disease

Signs or Symptoms	Clarification/Significance
Palpitations or tachycardia	Palpitations (defined as an unpleasant awareness of the forceful or rapid beating of the heart) may be induced by various disorders of cardiac rhythm. These include tachycardia, bradycardia of sudden onset, ectopic beats, compensatory pauses, and accentuated stroke volume resulting from valvular regurgitation. Palpitations also often result from anxiety states and high cardiac output (or hyperkinetic) states, such as anemia, fever, thyrotoxicosis, arteriovenous fistula, and the so-called idiopathic hyperkinetic heart syndrome.

TABLE 2.1. Major Signs or Symptoms Suggestive of Cardiovascular, Metabolic, and Renal Disease

Signs or Symptoms	Clarification/Significance
Unusual fatigue or shortness of breath with usual activities	Although there may be benign origins for these symptoms, they also may signal the onset of or change in the status of cardiovascular disease or metabolic disease.

TABLE 2.1. Major Signs or Symptoms Suggestive of Cardiovascular, Metabolic, and Renal Disease

Signs or Symptoms	Clarification/Significance
Shortness of breath at rest or with mild exertion	Dyspnea (defined as an abnormally uncomfortable awareness of breathing) is one of the principal symptoms of cardiac and pulmonary disease. It commonly occurs during strenuous exertion in healthy, well-trained individuals and during moderate exertion in healthy, untrained individuals. However, it should be regarded as abnormal when it occurs at a level of exertion that is not expected to evoke this symptom in a given individual. Abnormal exertional dyspnea suggests the presence of cardiopulmonary disorders; in particular, left ventricular dysfunction or chronic obstructive pulmonary disease.

TABLE 2.1. Major Signs or Symptoms Suggestive of Cardiovascular, Metabolic, and Renal Disease

Signs or Symptoms	Clarification/Significance
Orthopnea or paroxysmal nocturnal dyspnea	Orthopnea refers to dyspnea occurring at rest in the recumbent position that is relieved promptly by sitting upright or standing. Paroxysmal nocturnal dyspnea refers to dyspnea, beginning usually 2–5 h after the onset of sleep, which may be relieved by sitting on the side of the bed or getting out of bed. Both are symptoms of left ventricular dysfunction. Although nocturnal dyspnea may occur in individuals with chronic obstructive pulmonary disease, it differs in that it is usually relieved following a bowel movement rather than specifically by sitting up.

TABLE 2.1. Major Signs or Symptoms Suggestive of Cardiovascular, Metabolic, and Renal Disease

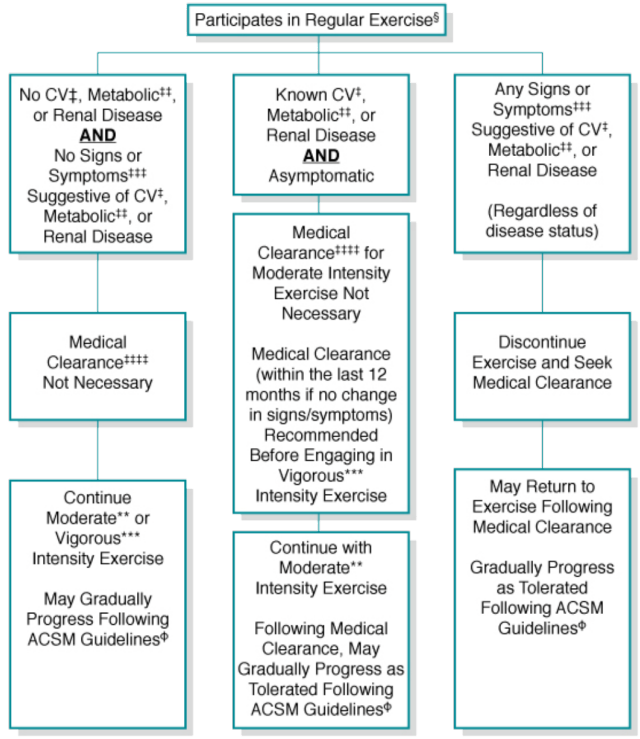
Signs or Symptoms	Clarification/Significance
Ankle edema	Bilateral ankle edema that is most evident at night is a characteristic sign of heart failure or bilateral chronic venous insufficiency. Unilateral edema of a limb often results from venous thrombosis or lymphatic blockage in the limb. Generalized edema (known as anasarca) occurs in individuals with the nephrotic syndrome, severe heart failure, or hepatic cirrhosis.

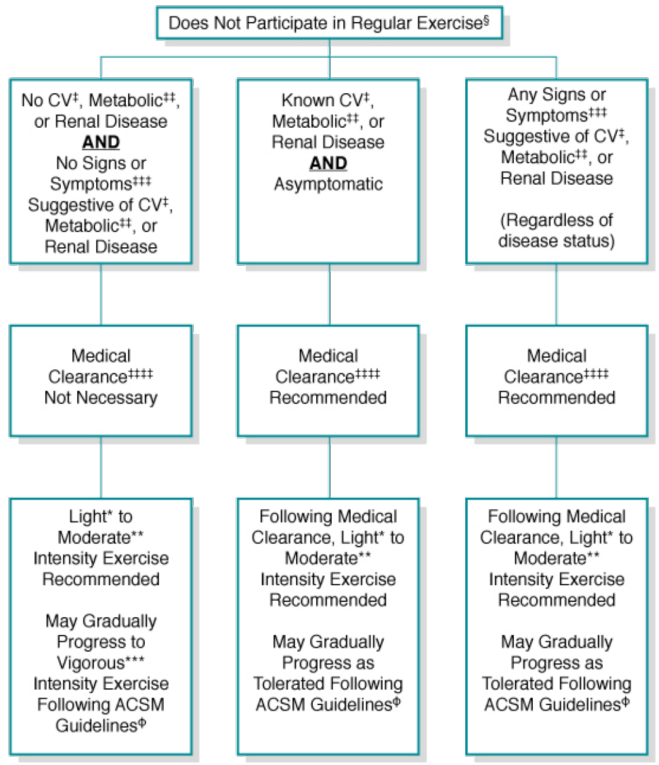
TABLE 2.1. Major Signs or Symptoms Suggestive of Cardiovascular, Metabolic, and Renal Disease

Signs or Symptoms	Clarification/Significance
Intermittent claudication	Intermittent claudication refers to the pain that occurs in the lower extremities with an inadequate blood supply (usually as a result of atherosclerosis) that is brought on by exercise. The pain does not occur with standing or sitting, is reproducible from day to day, is more severe when walking upstairs or up a hill, and is often described as a cramp, which disappears within 1–2 min after stopping exercise. Coronary artery disease is more prevalent in individuals with intermittent claudication. Patients with diabetes are at increased risk for this condition.

TABLE 2.1. Major Signs or Symptoms Suggestive of Cardiovascular, Metabolic, and Renal Disease

Signs or Symptoms	Clarification/Significance
Known heart murmur	Although some may be innocent, heart murmurs may indicate valvular or other cardiovascular disease. From an exercise safety standpoint, it is especially important to exclude hypertrophic cardiomyopathy and aortic stenosis as underlying causes because these are among the more common causes of exertion-related sudden cardiac death.


Participates in Regular Exercise§
No CV‡, Metabolic‡‡, or Renal Disease
AND
No Signs or Symptoms‡‡‡ Suggestive of CV‡, Metabolic‡‡, or Renal Disease
Known CV‡, Metabolic‡‡, or Renal Disease
AND
Asymptomatic
Any Signs or Symptoms‡‡‡ Suggestive of CV‡, Metabolic‡‡, or Renal Disease
(Regardless of disease status)
Medical Clearance‡‡‡‡ Not Necessary
Medical Clearance‡‡‡‡ for Moderate Intensity Exercise Not Necessary
Medical Clearance (within the last 12 months if no change in signs/symptoms) Recommended Before Engaging in Vigorous*** Intensity Exercise
Discontinue Exercise and Seek Medical Clearance
Continue Moderate** or Vigorous*** Intensity Exercise
May Gradually Progress Following ACSM GuidelinesΦ
Continue with Moderate** Intensity Exercise
Following Medical Clearance, May Gradually Progress as Tolerated Following ACSM GuidelinesΦ
May Return to Exercise Following Medical Clearance
Gradually Progress as Tolerated Following ACSM GuidelinesΦ


Does Not Participate in Regular Exercise§
No CV‡, Metabolic‡‡, or Renal Disease
AND
No Signs or Symptoms‡‡‡ Suggestive of CV‡, Metabolic‡‡, or Renal Disease
Known CV‡, Metabolic‡‡, or Renal Disease
AND
Asymptomatic
Any Signs or Symptoms‡‡‡ Suggestive of CV‡, Metabolic‡‡, or Renal Disease
(Regardless of disease status)
Medical Clearance‡‡‡‡ Not Necessary
Medical Clearance‡‡‡‡ Recommended
Medical Clearance‡‡‡‡ Recommended
Light* to Moderate** Intensity Exercise Recommended
May Gradually Progress to Vigorous*** Intensity Exercise Following ACSM GuidelinesΦ
Following Medical Clearance, Light* to Moderate** Intensity Exercise Recommended
May Gradually Progress as Tolerated Following ACSM GuidelinesΦ
Following Medical Clearance, Light* to Moderate** Intensity Exercise Recommended
May Gradually Progress as Tolerated Following ACSM GuidelinesΦ

Exercise Preparticipation Health Screening Questionnaire for Exercise Professionals

Assess your client's health needs by marking all *true* statements.

Step 1

SIGNS AND SYMPTOMS

Does your client experience:

____ chest discomfort with exertion
____ unreasonable breathlessness
____ dizziness, fainting, blackouts
____ ankle swelling
____ unpleasant awareness of a forceful, rapid or irregular heart rate
____ burning or cramping sensations in your lower legs when walking short distance
____ known heart murmur

If you **did** mark any of these statements under the symptoms, **STOP**, your client should seek medical clearance before engaging in or resuming exercise. Your client may need to use a facility with a **medically qualified staff**.

If you **did not** mark any symptoms, continue to steps 2 and 3.

Step 2

CURRENT ACTIVITY

Has your client performed planned, structured physical activity for at least 30 min at moderate intensity on at least 3 days per week for at least the last 3 months?

Yes ☐ No ☐

Continue to Step 3.

Step 3

MEDICAL CONDITIONS

Has your client had or do they currently have:

____ a heart attack
____ heart surgery, cardiac catheterization, or coronary angioplasty
____ pacemaker/implantable cardiac defibrillator/rhythm disturbance
____ heart valve disease
____ heart failure
____ heart transplantation
____ congenital heart disease
____ diabetes
____ renal disease

Evaluating Steps 2 and 3:

- If you **did not mark any of the statements in Step 3**, medical clearance is not necessary.
- If you marked Step 2 "**yes**" and **marked any of the statements in Step 3**, your client may continue to exercise at light to moderate intensity without medical clearance. However, medical clearance is recommended before engaging in vigorous exercise.
- If you marked Step 2 "**no**" and **marked any of the statements in Step 3**, medical clearance is recommended. Your client may need to use a facility with a **medically qualified staff**.