

3

Pre-participation Health Screening



3 Pre-participation Health Screening

For some medical conditions, there may be relatively higher health risks associated with physical activity. Although the risk of acute musculoskeletal injury during exercise is well recognised, the major concern for primary care practitioners remains the increased risk of sudden cardiac death and acute coronary events for high risk individuals. Hence, before prescribing exercise, a pre-participation health screening and a risk stratification process should be carried out to identify high risk individuals on one hand while not creating a significant barrier to exercise participation on the other hand. The identification of risk factors for adverse exercise-related events can be achieved through a two-tier approach including a self-guided screening and/or a professionally guided screening.

Self-guided Screening for Physical Activity

The first line of risk evaluation can be carried out in form of a self-guided screening (by the exercising individual or by allied health professionals). For instance, subjects may follow the recommendation of the Surgeon General's Report on Physical Activity and Health (1996): "previously physically inactive men over age 40 and women over age 50, and people at high risk for cardiovascular disease (CVD) should first consult a physician before embarking on a programme of vigorous physical activity to which they are unaccustomed" (1). Subjects may also use some validated questionnaires such as the American Heart Association (AHA)/ the American College of Sports Medicine (ACSM) Health/ Fitness Facility Pre-participation Questionnaire (Figure 3.1) or the revised Physical Activity Readiness Questionnaire (PAR-Q) (Figure 3.2) before participation. These questionnaires are simple and easy-to-use by the lay person to determine if his or her risk is such that a primary care practitioner should be consulted before initiating physical activity, particularly if the intended exercise intensity is vigorous.



Figure 3.1 American Heart Association/ American College of Sport Medicine Health/ Fitness Facility Pre-participation Screening Questionnaire*

Section I

History

You have had :

- A heart attack
- Heart surgery
- Cardiac catheterization
- Coronary angioplasty (PCI)
- Pacemaker/ implantable cardiac defibrillator/ rhythm disturbance
- Heart valve disease
- Heart failure
- Heart transplantation
- Congenital heart disease

Symptoms

- You experience chest discomfort with exertion
- You experience unreasonable breathlessness
- You experience dizziness, fainting, blackouts
- You take heart medications

Other health issues

- You have musculoskeletal problems
- You have concerns about the safety of exercise
- You take prescription medication(s)
- You are pregnant

If you have marked any of the statements in section I, consult your healthcare provider before engaging in exercise. You may need to use a facility with a medically qualified staff

Section II : cardiovascular risk factors

- You are a man older than 45 years
- You are a woman older than 55 years or you have had a hysterectomy or you are postmenopausal
- You smoke
- Your blood pressure is > 140/90 or you do not know your blood pressure
- You take blood pressure medication
- Your cholesterol level is > 240mg/dl (6.2mmol/L) or you do not know your cholesterol level
- You have a close relative who had a heart attack before the age of 55 (father or brother) or 65 years (mother or sister)
- You are diabetic or take medicine to control your blood sugar
- You are physically inactive (i.e. you get <30min of physical activity at least 3 days/ week)
- You are >20 pound overweight

If you have marked 2 or more of the statements in this section, consult your health care provider before engaging in exercise. You might benefit by using a facility with a professionally qualified exercise staff to guide your exercise program

None of the above (section 1 and 2) is true

You should be able to exercise safely without consulting your healthcare provider in almost any facility that meets your exercise program needs

* Adopted from Balady GJ, Chaitman B, Driscoll D, Foster C, Froelicher E, Gordon N, Pate R, Rippe J, Bazzarre T. Recommendations for cardiovascular screening, staffing, and emergency policies at health/fitness facilities. *Circulation*. 1998 Jun 9;97(22):2283-93.

Figure 3.2 Physical Activity Readiness Questionnaire (PAR-Q)

體能活動適應能力問卷
PAR-Q

體能活動適應能力問卷與你
(一份適用於15至69歲人士的問卷)

經常進行體能活動不但有益身心，而且樂趣無窮，因此，愈來愈多人開始每天多做運動。對大部分人來說，多做運動是很安全的。不過，有些人則應在增加運動量前，先行徵詢醫生的意見。

如果你計劃增加運動量，請先回答下列7條問題。如果你介乎15至69歲之間，這份體能活動適應能力問卷會告訴你應否在開始前諮詢醫生。如果你超過69歲及沒有經常運動，請徵詢醫生的意見。

普通常識是回答這些問題的最佳指引。請仔細閱讀下列問題，然後誠實回答：

請答「是」或「否」

是	否
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

如果
你的
答案
是：

一條或以上答「是」

在開始增加運動量或進行體能評估前，請先致電或親身與醫生商談，告知醫生這份問卷，以及你回答「是」的問題。

- 你可以進行任何活動，但須在開始時慢慢進行，然後逐漸增加活動量；又或你只可進行一些安全的活動。告訴醫生你希望參加的活動及聽從他的意見。
- 找出一些安全及有益健康的社區活動。

<p>全部答「否」</p> <p>如果你對這份問卷的全部問題誠實地答「否」，你有理由確信你可以：</p> <ul style="list-style-type: none">● 開始增加運動量 - 開始時慢慢進行，然後逐漸增加，這是最安全和最容易的方法。● 參加體能評估 - 這是一種確定你基本體能的好方法，以便你擬定最佳的運動計劃。此外，亦主張你量度血壓；如果讀數超過144/94，請先徵詢醫生的意見，然後才逐漸增加運動量。	<p>延遲增加運動量：</p> <ul style="list-style-type: none">● 如果你因傷風或發燒等暫時性疾病而感到不適 - 請在康復後才增加運動量；或● 如果你懷孕或可能懷孕 - 請先徵詢醫生的意見，然後才決定是否增加運動量。 <p>請注意：如因健康狀況轉變，致使你隨後須回答「是」的話，便應告知醫生或健身教練，看看應否更改你的體能活動計劃。</p>
--	---

適當使用體能活動適應能力問卷：

The Canadian Society for Exercise Physiology、Health Canada及其代理人毋須為進行體能活動的人承擔責任。如填妥問卷後有疑問，請先徵詢醫生的意見，然後才進行體能活動。

不得更改問卷內容。歡迎複印整份問卷（必須整份填寫）

註：如一名人士在參加體能活動或進行體能評估前已獲得這份問卷，本部分可作法律或行政用途。

本人已閱悉、明白並填妥本問卷。本人的問題亦已得到圓滿解答。

姓名：_____ 身份證明文年號碼：_____

簽署：_____ 日期：_____

家長或監護人簽署：_____ 見證人：_____

(適用於18歲以下的參加者)

備註： 如果在上述問卷中有一個或以上「是」的答案，即表示你的身體狀況可能不適合參與有關活動。故為安全起見，請你先行諮詢醫生的意見，證明你的身體狀況適宜參與有關活動。

此問卷由填寫當天計12個月內有效。如因健康狀況轉變，致使你隨後對上述的任何問題答「是」的話，則本問卷即告無效。

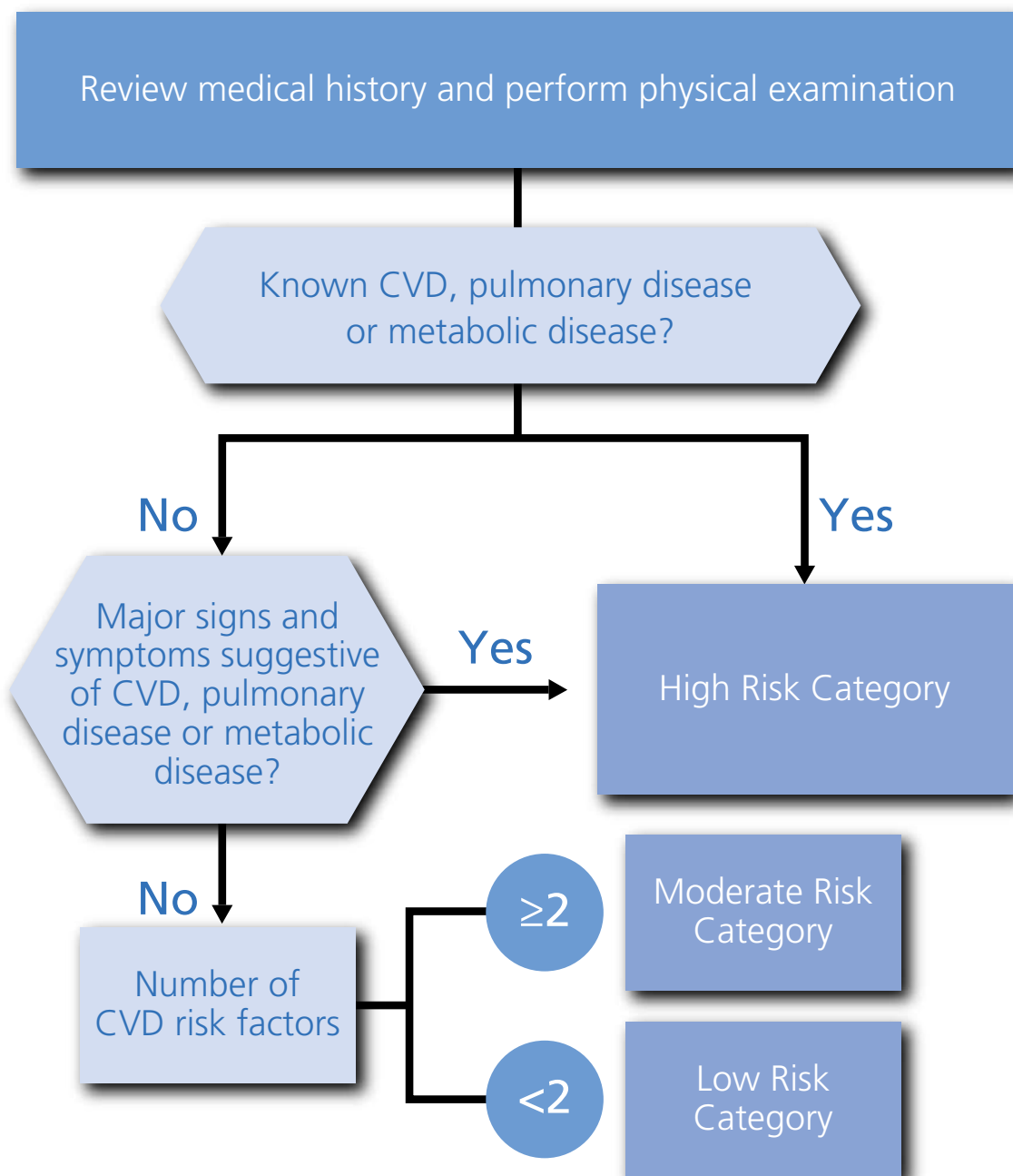
Professionally Guided Screening for Physical Activity

A more advanced and thorough assessment can be carried out by the primary care practitioner into an individual's CVD risk factors, signs and symptoms, and to identify a broader scope of chronic diseases that may need special attention before exercise participation.

ACSM proposed a risk stratification scheme (summarised in Figure 3.3) which assigns participants into one of its three risk categories (Table 3.1) according to specific criteria (Tables 3.2-3.4). Once the risk category has been established, appropriate recommendations before initiating an exercise or substantially progressing the intensity and volume of an existing exercise may be made regarding the necessity for further medical workups and diagnostic exercise testing.

The ACSM recommendations on exercise testing are summarised in Table 3.5. It should be noted that the methodology of pre-participation risk assessment is both complex and controversial, and other organisations such as the European Society of Cardiology, the American Heart Association and the American Association of Cardiovascular and Pulmonary Rehabilitation also published their own guidelines for risk stratification (2-5). Many of them rely on expert consensus in the absence of existing scientific evidence. Primary care practitioners should choose the most applicable tools and instruments for their own settings and populations when making decisions about the level of screening before exercise participation (2,6). Alternatively, primary care practitioners may also ascertain a global coronary and cardiovascular risk score for their patients, such as the Framingham Risk Score or the Systematic Coronary Risk Evaluation (SCORE), for combining the individual's risk factor measurements into a single quantitative estimate of the absolute risk of atherosclerotic cardiovascular death within 10 years (7-8).

Figure 3.3 Logic Model for the ACSM Risk Stratification Scheme*



* Adopted from the Preparticipation Health Screening and Risk Stratification. In Walter R Thompson; Neil F Gordon; Linda S Pescatello. *ACSM's guidelines for exercise testing and prescription*. 8th ed. American College of Sports Medicine; 2010.

Table 3.1 The ACSM Risk Stratification Categories*

Low risk	<ul style="list-style-type: none"> Asymptomatic men and women who have < 2 CVD risk factor from Table 3.2
Moderate risk	<ul style="list-style-type: none"> Asymptomatic men and women who have ≥ 2 CVD risk factors from Table 3.2
High risk	<ul style="list-style-type: none"> Individual who has known CVD, pulmonary disease, or metabolic disease listed in Table 3.3 , OR ≥ 1 signs and symptoms listed in Table 3.4

* Adopted from the Preparticipation Health Screening and Risk Stratification. In Walter R Thompson; Neil F Gordon; Linda S Pescatello. *ACSM's guidelines for exercise testing and prescription*. 8th ed. American College of Sports Medicine; 2010.

Table 3.2 Cardiovascular Disease Risk Factors for Use with the ACSM Risk Stratification*

+ve risk factors	Defining Criteria
Age	<ul style="list-style-type: none"> Men ≥ 45 OR Women ≥ 55
Family history	<ul style="list-style-type: none"> Myocardial infarction, coronary revascularisation or sudden death < 55 years old in father or other male first-degree relative OR < 65 years old in mother or other female first-degree relative
Cigarette smoking	<ul style="list-style-type: none"> Current smoker OR Ex-smoker < 6 months OR Exposure to environmental tobacco smoke
Sedentary lifestyle	<ul style="list-style-type: none"> Not participating in at least 30 mins of moderate intensity physical activity on at least 3 days of the week for at least 3 months
Obesity #	<ul style="list-style-type: none"> Body Mass Index ≥ 25kg/m² OR Waist circumference ≥ 90cm (men) OR ≥ 80cm (women)
Hypertension	<ul style="list-style-type: none"> Systolic blood pressure ≥ 140 mmHg OR Diastolic blood pressure ≥ 90 mmHg (confirmed by measurements on at least 2 separate occasions), OR On antihypertensive medication
Dyslipidaemia	<ul style="list-style-type: none"> Total serum cholesterol ≥ 5.2 mmol/L OR HDL cholesterol < 1 mmol/L OR LDL cholesterol ≥ 3.4 mmol/L OR On lipid-lowering medication

Pre-diabetes (confirmed by measurements on at least 2 separate occasions)	<ul style="list-style-type: none"> • Impaired fasting glucose (i.e. fasting blood glucose level is 5.6 - 6.9 mmol/L) OR • Impaired glucose tolerance (i.e. 2-hour post-prandial blood glucose level is 7.8-11 mmol/L)
--	---

-ve risk factors	Defining Criteria
High serum HDL cholesterol ⁺	HDL cholesterol > 1.6 mmol/L

* Modified from the Preparticipation Health Screening and Risk Stratification. In Walter R Thompson; Neil F Gordon; Linda S Pescatello. *ACSM's guidelines for exercise testing and prescription*. 8th ed. American College of Sports Medicine; 2010.

+ If HDL is high, subtract one risk factor from the sum of positive risk factors.

The above BMI classification is promulgated by the World Health Organisation (Western Pacific Region Office) for reference by Asian adults and is not applicable to children under the age of 18 or pregnant women.

Table 3.3 Cardiovascular Disease, Pulmonary Diseases and Metabolic Diseases Suggesting High Risk for Physical Activity*

Cardiovascular Disease	<ul style="list-style-type: none"> • Cardiac diseases • Cerebrovascular disease • Peripheral vascular disease
Pulmonary Disease	<ul style="list-style-type: none"> • Chronic obstructive pulmonary disease • Asthma • Interstitial lung disease
Metabolic Disease	<ul style="list-style-type: none"> • Diabetes mellitus • Significant thyroid disorder • Significant renal disease • Significant liver disease

* Modified from the Preparticipation Health Screening and Risk Stratification. In Walter R Thompson; Neil F Gordon; Linda S Pescatello. *ACSM's guidelines for exercise testing and prescription*. 8th ed. American College of Sports Medicine; 2010.

Table 3.4 Major Signs and Symptoms Suggestive of Cardiovascular Disease, Pulmonary Disease or Metabolic Disease*^

Clinical Features Suggesting High Risk for Physical Activity

- Pain, discomfort in the chest, neck, jaw, arms or other areas that may be due to ischaemia
- Shortness of breath at rest or with mild exertion
- Dizziness or syncope
- Orthopnea or paroxysmal nocturnal dyspnea
- Ankle oedema
- Palpitations or tachycardia
- Intermittent claudication
- Known heart murmur
- Unusual fatigue or shortness of breath with usual activities

* Adopted from the Pre-participation Health Screening and Risk Stratification. In Walter R Thompson; Neil F Gordon; Linda S Pescatello. ACSM's guidelines for exercise testing and prescription. 8th ed. American College of Sports Medicine; 2010.

^ These signs or symptoms must be interpreted within the clinical context in which they appear because they are not all specific for significant cardiovascular, pulmonary, or metabolic disease.

Table 3.5 The ACSM recommendations on exercise testing based on the ACSM risk stratification*#

Risk Category	Recommendation for low-moderate intensity physical activity	Recommendation for vigorous intensity physical activity
Low	<ul style="list-style-type: none"> Further medical workup and exercise testing are NOT necessary 	<ul style="list-style-type: none"> Further medical workup and exercise testing are NOT necessary
Moderate ⁺	<ul style="list-style-type: none"> Further medical workup and exercise testing are NOT necessary 	<ul style="list-style-type: none"> Further medical workup and exercise testing are both RECOMMENDED
High [^]	<ul style="list-style-type: none"> Further medical workup and exercise testing are both RECOMMENDED 	<ul style="list-style-type: none"> Further medical workup and exercise testing are both RECOMMENDED

- * Modified from the Preparticipation Health Screening and Risk Stratification. In Walter R Thompson; Neil F Gordon; Linda S Pescatello. *ACSM's guidelines for exercise testing and prescription*. 8th ed. American College of Sports Medicine; 2010.
- # Further medical workups refer to additional medical assessments that may be needed for developing a safe and effective exercise programme. These assessments may include but not limited to ambulatory electrocardiography, Holter monitoring, echocardiography, pulmonary function tests, and serum chemistries.
- + For stable hypertensive patients with presence of target organ damages, medical clearance and exercise testing are also recommended before moderate intensity physical activity. For further details, please refer to Chapter 7 Recommendations for Prescribing Exercise to Patients with Hypertension.
- ^ For diabetic patients with <10% risk of cardiac event over a 10-year period, exercise testing may NOT be necessary before engaging in low to moderate intensity physical activity. Primary care practitioners may use the Framingham Risk Score or the Systematic Coronary Risk Evaluation (SCORE) to ascertain a global coronary and cardiovascular risk score for their diabetic patients to estimate the absolute risk of atherosclerotic cardiovascular death within 10 years (7-8). For further details, please refer to Chapter 6 Recommendations for Prescribing Exercise to Patients with Diabetes.

References

1. U.S. Department of Health and Human Services. *Physical Activity and Health: A Report of the Surgeon General*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion; 1996.
2. Borjesson M, Urhausen A, Kouidi E, Dugmore D, Sharma S, Halle M, Heidbüchel H, Björnstad HH, Gielen S, Mezzani A, Corrado D, Pelliccia A, Vanhees L. Cardiovascular evaluation of middle-aged/senior individuals engaged in leisure-time sport activities: position stand from the sections of exercise physiology and sports cardiology of the European Association of Cardiovascular Prevention and Rehabilitation. *Eur J Cardiovasc Prev Rehabil*. 2010;Jun 19.
3. Balady GJ, Chaitman B, Driscoll D, Foster C, Froelicher E, Gordon N, Pate R, Rippe J, Bazzarre T. Recommendations for cardiovascular screening, staffing, and emergency policies at health/fitness facilities. *Circulation* 1998;Jun 9;97(22):2283-93.
4. Fletcher GF, Balady GJ, Amsterdam EA, Chaitman B, Eckel R, Fleg J, Froelicher VF, Leon AS, Piña IL, Rodney R, Simons-Morton DA, Williams MA, Bazzarre T. Exercise standards for testing and training: a statement for healthcare professionals from the American Heart Association. *Circulation* 2001;Oct 2;104(14):1694-740.
5. American Association of Cardiovascular and Pulmonary Rehabilitation. *Guidelines for Cardiac Rehabilitation and Secondary Prevention Programs*. 4th ed. Champaign, (IL): Human Kinetics Publishers; 2004.
6. Walter R Thompson; Neil F Gordon; Linda S Pescatello. *ACSM's guidelines for exercise testing and prescription*. 8th ed. American College of Sports Medicine; 2010.
7. Wilson PWF, D'Agostino RB, Levy D, Belanger AM, Silbershatz H, Kannel WB. Prediction of coronary heart disease using risk factor categories. *Circulation* 1998;97:1837-47.
8. Conroy RM, Pyörälä K, Fitzgerald AP, Sans S, Menotti A, deBacker G, et al. Estimation of ten-year risk of fatal cardiovascular disease in Europe: the SCORE project. *Eur Heart J* 2003; 24:987–1003.