



# Sports Medicine Australia (SMA) pre-exercise screening system 2005



## Introduction

Physical activity levels in the general community are low and decreasing (AIHW, 2004). The typical physical working capacity or ability to undertake prolonged moderate or vigorous exercise is poor. This is because in the absence of specific, dedicated exercise time, the majority of people in developed countries such as Australia are becoming increasingly sedentary at work and at home, have low energy expenditure in leisuretime pursuits and have low participation rates in active transport.

It is not uncommon for some people to go for many months or even years without undertaking any planned or structured physical activity. When these people decide to alter lifestyle patterns, join a gym or begin regular physical activity they are often unsure about how to be active. Unfortunately, through inappropriate exercise prescription or knowledge of the principles of progressive overload, **many people do too much too soon**. The result may be extreme muscle soreness or joint problems, or in rare cases they may place themselves at higher risk for acute cardiovascular problems. **For many people this is a demotivator and is related to the high dropout rates typically found for these new programs.**

## Who is it for?

The Sports Medicine Australia (SMA) pre-exercise screening system is a tool for exercise professionals to use when deciding if a person is at a high risk for these problems and is therefore recommended for medical clearance before embarking on an exercise program. Also, the screening system helps to identify those at low or moderate levels of risk during exercise and directs them to begin a tailored physical activity program without the need to seek medical clearance. This is the most common route for the majority of the population. Undertaking regular physical activity is important for the health of everyone.

The SMA screening system is part of the broader effort to encourage physical activity. It is designed to provide a level of guidance so that those who are beginning regular physical activity are directed in an appropriate way to increase their safety and help them enjoy the experience. The SMA pre-exercise screening system is a modification of the American College of Sports Medicine's (ACSM) guidelines for pre-exercise screening and testing (ACSM, 2000). The ACSM guidelines are recognised as an important benchmark for the following reasons (Olds and Norton, 1999):

- The ACSM is an internationally recognised leader in the areas of exercise science and sports medicine
- The ACSM has produced six editions of their guidelines for pre-exercise screening and testing over the past 30 years which have been based on several decades of scientific, clinical and epidemiological research
- Similarities between Australian and North American populations in areas such as physical activity patterns, and morbidity and mortality statistics in lifestyle diseases such as cardiovascular disease, diabetes and cancer, justify their adaptation for use in Australia.

*Disclaimer: The Sports Medicine Australia pre-exercise screening system 2005 ("screening system") has been established by Sports Medicine Australia and is designed to filter out people at high risk for certain exercise related complications. However, the screening system neither purposes nor is intended or implied to be advice on a particular matter or a substitute for advice from an appropriately qualified medical professional, and no express or implied warranty of safety should result from a person using or complying with the screening system. Participants and exercise professionals taking part in, or conducting exercise programs assume all inherent risks of any exercise program and the screening system in no way guarantees against injury or death. No responsibility or liability whatsoever can be accepted by Sports Medicine Australia for any loss, damage or injury that may arise from any person acting on any statement or information contained in these guidelines.*

## SMA pre-exercise screening system

1) The first stage of the screening system is a filter to screen out those people who are at a high risk level for exercise-related complications due to underlying cardiovascular, cerebrovascular, respiratory or metabolic diseases. These are people with known disease or who have signs and/or symptoms of disease. Other serious or potentially serious medical conditions that may be exacerbated during exercise are also important at this stage (see notes at 'Stage 1 - Overview' flow chart). It is recommended that this relatively small group of 'high risk' clients seek medical clearance before beginning an exercise program or undertaking aerobic fitness testing.

The questionnaire shown below is the tool used to identify who is at high risk at this stage.

- If a person answers 'Yes' to any of these questions then they are considered to be in the 'high risk' group. There is, however, scope for the exercise specialist to use a level of professional judgement when interpreting these responses. For example, swelling or fluid accumulation about the ankles may be related to local joint problems or recent air travel rather than, for example, due to underlying cardiovascular pathology. For those with well controlled diabetes or stable cardiovascular conditions (coronary heart disease (CHD), cardiac failure, stroke and peripheral vascular disease (PVD)) there is generally no need to seek medical clearance before beginning a low - moderate physical activity program such as regular walking (NHF 2005). Also, 'other' medical conditions that may be mentioned are essentially endless so there requires a level of interpretation in deciding if the risk of adverse effects outweighs the known benefits of individually-tailored regular physical activity.

**Those who are NOT at high risk can begin low or moderate level physical activity without the need for medical clearance** (see details below for specific guidelines and rare exceptions). These people may also proceed to stage 2 of the screening system if there is a desire to exercise at vigorous intensity levels or if there is an intention to undergo exercise testing to maximal levels.

2) The second stage of the screening system is used to determine those people who are categorised as moderate or low risk for exercise-related complications due to underlying cardiovascular, cerebrovascular,

respiratory or metabolic diseases (or other medical conditions referred to below).

Stage 2 identifies those at moderate risk who are either 'older' and/or who have 2 or more risk factors for heart disease. For these clients they are classified as moderate risk and can undertake physical activity up to moderate intensity levels (for example, walking for the majority of people), without medical clearance. Stage 2 procedures and measures can also be used as a valuable adjunct in the general health appraisal of clients and to monitor changes in risk factor status over time and with lifestyle changes.

Those who are 'younger' and who have less than 2 risk factors are considered low risk for exercise-related complications. They can also be tested to maximal levels without medical clearance or supervision.

The general process for administering the pre-exercise screening system is illustrated below. Specific flow charts [decision-making trees] are then presented for each of the two stages.

### Acknowledgment

This screening system was produced by Professor Kevin Norton of the University of South Australia in consultation with Sports Medicine Australia members.

### References

American College of Sports Medicine (ACSM) (2000). *ACSM's guidelines for exercise testing and prescription* (6th ed). New York, Lippincott Williams & Wilkins.

Australian Institute of Health and Welfare (AIHW) (2004). *Heart, stroke and vascular diseases Australian facts 2004*. Canberra, AIHW and National Heart Foundation of Australia.

National Heart Foundation (NHF) (2005). *Physical activity recommendations for people with cardiovascular disease*. Sydney, National Heart Foundation of Australia.

Olds, T. and Norton, K. (1999). *Pre-exercise health screening guide*. Champaign, Ill, Human Kinetics.

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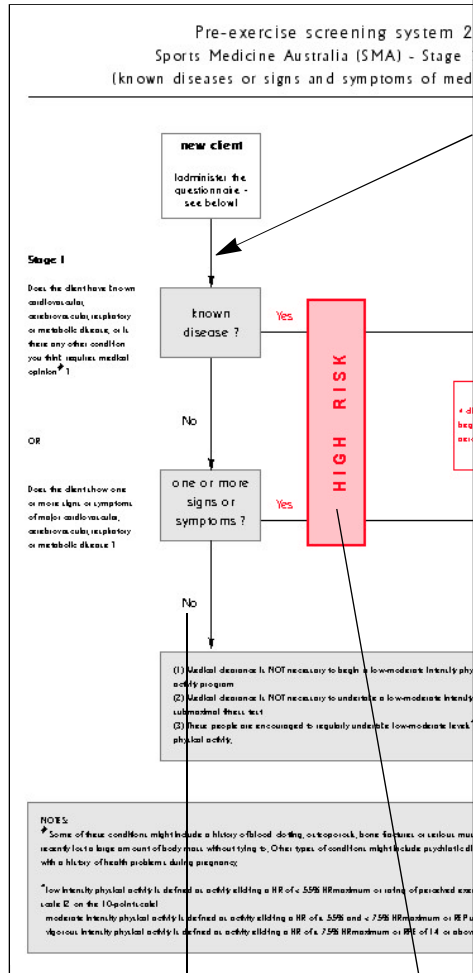
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**State Branches: see Website for details**

**STAGE 1** Administer the SMA pre-exercise screening questionnaire to new clients or those significantly upgrading their exercise activity to determine who is at a **high risk**

1A

administer QUESTIONNAIRE



Pre-exercise screening system 2005  
Sports Medicine Australia (SMA) - Stage 1 procedures

Name Address	Age Phone	Gender Date	M	F
1	Have you ever had a heart attack, coronary revascularisation surgery or a stroke?	No	Yes	
2	Has your doctor ever told you that you have heart trouble or vascular disease?	No	Yes	
3	Has your doctor ever told you that you have a heart murmur?	No	Yes	
4	Do you ever suffer from pains in your chest, especially with exercise?	No	Yes	
5	Do you ever get pains in your calves, buttocks or at the back of your legs during exercise which are not due to soreness or stiffness?	No	Yes	
6	Do you ever feel faint or have spells of severe dizziness, particularly with exercise?	No	Yes	
7	Do you experience swelling or accumulation of fluid about the ankles?	No	Yes	
8	Do you ever get the feeling that your heart is suddenly beating faster, racing or skipping beats, either at rest or during exercise?	No	Yes	
9	Do you have chronic obstructive pulmonary disease, interstitial lung disease, or cystic fibrosis?	No	Yes	
10	Have you ever had an attack of shortness of breath that developed when you were not doing anything strenuous, at any time in the last 12 months?	No	Yes	
11	Have you ever had an attack of shortness of breath that developed after you stopped exercising, at any time in the last 12 months?	No	Yes	
12	Have you ever been woken at night by an attack of shortness of breath, at any time in the last 12 months?	No	Yes	
13	Do you have diabetes (IDDM or NIDDM)? If so, do you have trouble controlling your diabetes?	No	Yes	
14	Do you have any ulcerated wounds or cuts on your feet that do not seem to heal?	No	Yes	
15	Do you have any liver, kidney or thyroid disorders?	No	Yes	
16	Do you experience unusual fatigue or shortness of breath with usual activities?	No	Yes	
17	Is there any other physical reason or medical condition which could prevent you from undertaking an exercise program, or that you are concerned about? *	No	Yes	

**NOTES:**

\* Some of these conditions might include a history of blood clotting, osteoporosis, bone fractures or serious musculoskeletal disorders, or if they have recently lost a large amount of body mass without trying to. Other types of conditions might include psychiatric disorders, later-stage pregnancy or those with a history of health problems during pregnancy.

Also, if any one or more of the risk factors (below) are extreme then the health and fitness professional should use professional judgement as to whether medical clearance may be required.

1B

**High risk** clients should get medical clearance before beginning an exercise program or undergoing exercise testing

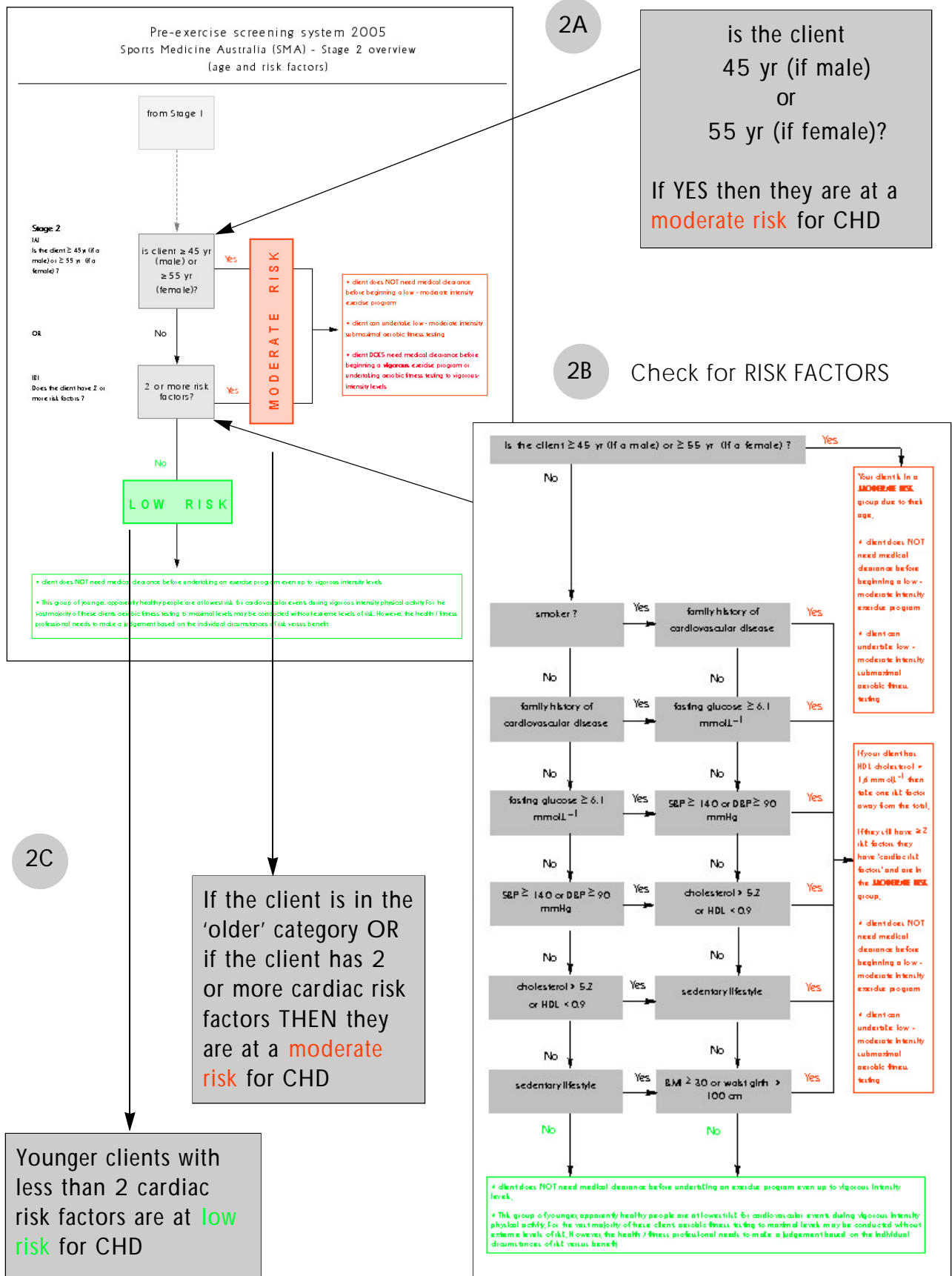
1C

Others can begin a low - moderate intensity physical activity program without the need for medical clearance\*. For those people interested in commencing a vigorous intensity activity program or wanting to undergo exercise testing to maximal levels then proceed to stage 2

\* see details below for specific guidelines and rare exceptions

## STAGE 2

Use the (a) age categories and (b) cardiovascular risk factors to decide who is at a **moderate** or **low** level of risk

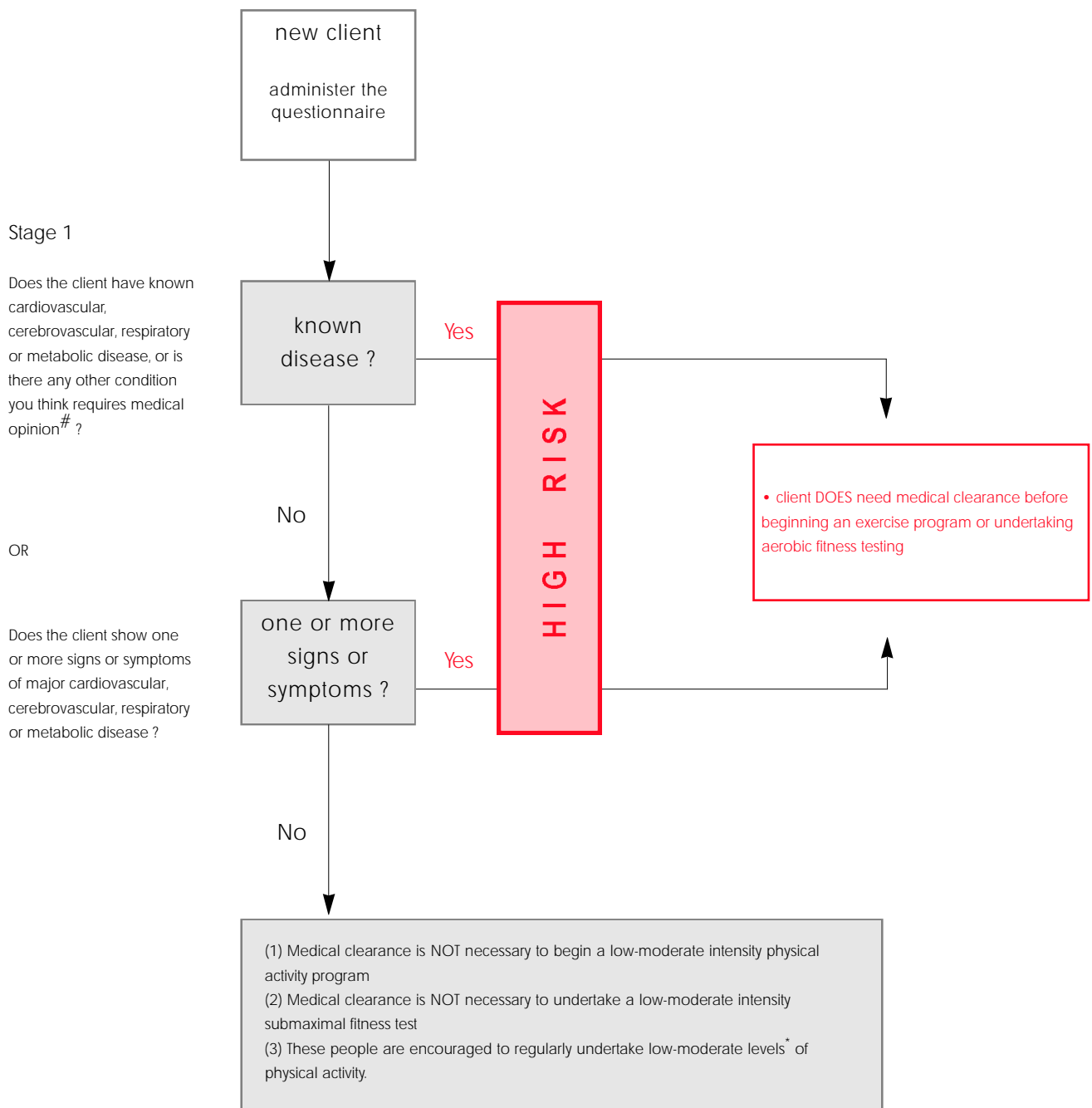


# Pre-exercise screening system 2005

## Sports Medicine Australia (SMA) - Stage 1 overview

(known diseases or signs and symptoms of medical conditions)

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### NOTES:

<sup>#</sup> Some of these conditions might include a history of blood clotting, osteoporosis, bone fractures or serious musculoskeletal disorders, or if they have recently lost a large amount of body mass without trying to. Other types of conditions might include psychiatric disorders, later-stage pregnancy or those with a history of health problems during pregnancy. Those people taking medication(s) for medical conditions listed may also need medical clearance.

\* low intensity physical activity is defined as activity eliciting a HR of < 55% HRmaximum or rating of perceived exertion [RPE] up to 11 on Borg's 20-point scale [2 on the 10-point scale]

moderate intensity physical activity is defined as activity eliciting a HR of 55% and < 75% HRmaximum or REP up to 13 [3 on the 10-point scale]

vigorous intensity physical activity is defined as activity eliciting a HR of 75% HRmaximum or RPE of 14 or above [5 on the 10-point scale]



# Pre-exercise screening system 2005

## Sports Medicine Australia (SMA) - Stage 1 questionnaire

	Name Address	Age Phone	Gender Date	M	F
1	Have you ever had a heart attack, coronary revascularisation surgery or a stroke ?		No		Yes
2	Has your doctor ever told you that you have heart trouble or vascular disease ?		No		Yes
3	Has your doctor ever told you that you have a heart murmur ?		No		Yes
4	Do you ever suffer from pains in your chest, especially with exercise ?		No		Yes
5	Do you ever get pains in your calves, buttocks or at the back of your legs during exercise which are not due to soreness or stiffness ?		No		Yes
6	Do you ever feel faint or have spells of severe dizziness, particularly with exercise ?		No		Yes
7	Do you experience swelling or accumulation of fluid about the ankles ?		No		Yes
8	Do you ever get the feeling that your heart is suddenly beating faster, racing or skipping beats, either at rest or during exercise ?		No		Yes
9	Do you have chronic obstructive pulmonary disease, interstitial lung disease, or cystic fibrosis?		No		Yes
10	Have you ever had an attack of shortness of breath that developed when you were not doing anything strenuous, at any time in the last 12 months ?		No		Yes
11	Have you ever had an attack of shortness of breath that developed after you stopped exercising, at any time in the last 12 months ?		No		Yes
12	Have you ever been woken at night by an attack of shortness of breath, at any time in the last 12 months ?		No		Yes
13	Do you have diabetes [IDDM or NIDDM] ? If so, do you have trouble controlling your diabetes?		No		Yes
14	Do you have any ulcerated wounds or cuts on your feet that do not seem to heal?		No		Yes
15	Do you have any liver, kidney or thyroid disorders?		No		Yes
16	Do you experience unusual fatigue or shortness of breath with usual activities?		No		Yes
17	Is there any other physical reason or medical condition, or are you taking any medication(s) which could prevent you from undertaking an exercise program, or that you are concerned about? #		No		Yes

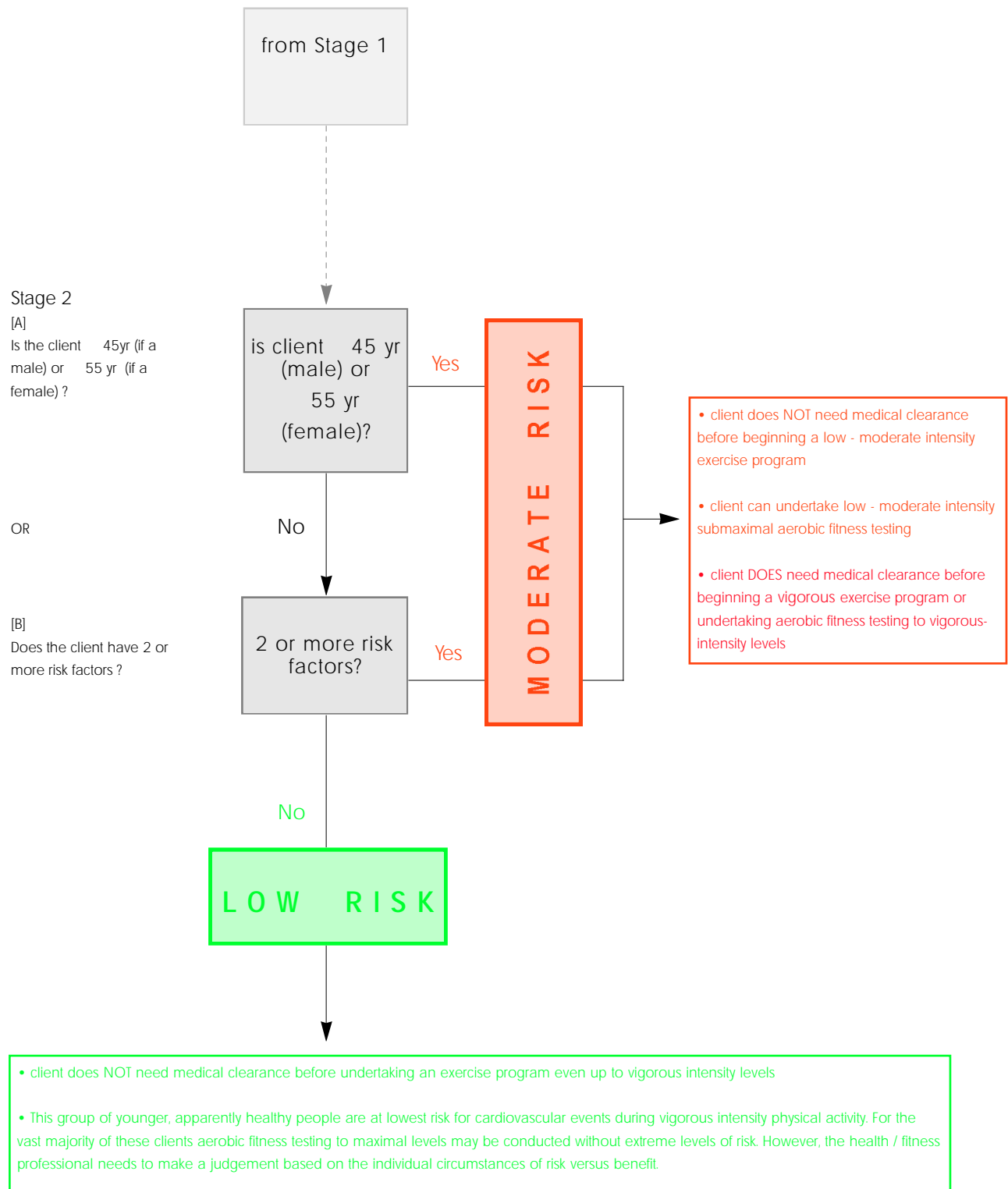
**NOTES:**

# Some of these conditions might include a history of blood clotting, osteoporosis, bone fractures or serious musculoskeletal disorders, or if they have recently lost a large amount of body mass without trying to. Other types of conditions might include psychiatric disorders, later-stage pregnancy or those with a history of health problems during pregnancy. Those people taking medication(s) for medical conditions listed may also need medical clearance.

Also, if any one or more of the risk factors [below] are extreme then the health and fitness professional should use professional judgement as to whether medical clearance may be required.

**Pre-exercise screening system 2005**  
**Sports Medicine Australia (SMA) - Stage 2 overview**  
**(age and risk factors)**

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# Pre-exercise screening system 2005

## Sports Medicine Australia (SMA) - Stage 2 procedures

### Stage 2 [A]

Is your client in the 'older' age category?

### Stage 2 [B]

Does the client smoke cigarettes<sup>†</sup> regularly  
OR  
have they quit smoking in the last 6 months?

Does the client have a 1st ° male relative [father, son, brother] or female relative [mother, sister, daughter] who has had a myocardial infarction, coronary revascularisation, or died suddenly due to a heart attack before the age of 55 yr [males] or 65 yr [females]?

Does the client have impaired fasting glucose?  
[fasting glucose  $6.1 \text{ mmol.L}^{-1}$  on 2 separate occasions].

Does the client have systolic blood pressure measured at  $140 \text{ mmHg}$  on two separate occasions  
OR  
diastolic blood pressure measured at  $90 \text{ mmHg}$  on two separate occasions  
OR  
are they on antihypertensive drugs?

Does the client have a total serum cholesterol concentration of  $> 5.2 \text{ mmol.L}^{-1}$  or HDL  $< 0.9 \text{ mmol.L}^{-1}$  or on lipid-lowering medication

Does the client have an occupation where they are seated for long periods AND they do no regular exercise  
OR  
the client does not meet current PA guidelines of 150 min of moderate PA per week [Use AA questionnaire].

Is the client obese? [BMI  $\geq 30$ ]  
OR  
do they have a waist girth  $> 100 \text{ cm}$ ?

Notes:

<sup>†</sup> includes all forms of smoking such as pipes, roll-your-own and cannabis

