ADULT PRE-EXERCISE SCREENING SYSTEM (APSS)

USER GUIDE

This user guide is part of the Adult Pre-Exercise Screening System (APSS). No warranty of safety should result from its use. The screening system in no way guarantees against injury or death. No responsibility or liability whatsoever can be accepted by Exercise & Sports Science Australia, Fitness Australia, Sports Medicine Australia and Exercise is Medicine for any loss, damage or injury that may arise from any person acting on any statement or information contained in the screening tool or this user guide.

STAGE 1 (COMPULSORY)

AIM: To identify those individuals with a known disease, and/or signs or symptoms of disease, who may be at a higher risk of an adverse event due to physical activity/exercise. An adverse event refers to an unexpected event that occurs as a consequence of a physical activity/exercise session, resulting in ill health, physical harm or death to an individual.

Stage 1 may be self-administered and evaluated by the client.

The screening tool can be administered to both regular and casual users of exercise services. Once completed, the form should be filed appropriately with the client's records for future reference.

Further information regarding Stage 1 questions:

1. **Has your medical practitioner ever told you that you have a heart condition or have you ever suffered a stroke?**
   Heart conditions include, but are not limited to: post myocardial infarction (heart attack), angina, coronary artery bypass, coronary angioplasty, heart failure, cardiomyopathy, heart transplant, pacemaker insertion, congenital heart disease, heart valve disease, and peripheral arterial disease.

2. **Do you ever experience unexplained pains or discomfort in your chest at rest or during physical activity/exercise?**
   Any unexplained chest pains, characterised by: constriction, burning, knifelike pains, and/or dull ache.

3. **Do you ever feel faint, dizzy or lose balance during physical activity/exercise?**
   There are many causes of feeling faint or dizzy. Examples of dizziness may include, but are not limited to: light-headedness or the feeling of nearly fainting, loss of balance or other sensations such as floating or swimming. This question is attempting to identify individuals with conditions such as blood pressure regulation problems (e.g. orthostatic hypotension) or cardiac arrhythmias. Although dizziness after exercise should not always be ignored, this may occur even in healthy individuals. Dizziness after exercise may not always indicate a serious medical issue.

4. **Have you had an asthma attack requiring immediate medical attention at any time over the last 12 months?**
   Medical attention refers to a medical practitioner or hospital visit following an asthma attack. It does not include the self-administration of medications prescribed for asthma.

5. **If you have diabetes (type 1 or 2) have you had trouble controlling your blood sugar (glucose) in the last 3 months?**
   Trouble controlling blood sugar refers to suffering from hyperglycaemia (high) or hypoglycaemia (low).
   Abnormal blood sugar levels may impede the individual's ability to exercise. In addition, participants with diabetes have an increased risk for coronary artery disease and can have a reduced ability to feel chest pain (silent angina). It is important to consider blood sugar levels and risk for coronary artery disease in patients with diabetes.

6. **Do you have any other conditions that may require special consideration for you to exercise?**
   Examples include: acute injury, pregnancy, epilepsy, transplants, and cancer.

7. **Describe your current physical activity/exercise levels in a typical week by stating the frequency and duration at the different intensities. For intensity guidelines consult Figure 2 in the screening tool.**
   From the information collected, calculate the total number of minutes of exercise per week.
   If weighted physical activity level <150 min/week, the client has a higher risk of chronic disease.

The information provided above should be used to help in the design of the client's exercise prescription in conjunction with ***Figure 1: Exercise screening, referral and assessment pathways for exercise*** on page 5.

STAGE 2 (RECOMMENDED)

AIM: This stage is to be completed with the exercise professional to determine an appropriate exercise prescription based on established risk factors. The aim is to identify those individuals with risk factors or other conditions that may result in them being at a higher risk of an adverse event due to exercise.

Further information regarding Stage 2 questions are included below. Further information regarding risk factors can be found at www.exercisesciencetoolkit.com (pre-exercise screening and blood biomarker modules).

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8. Demographics

≥ 45 yr for males and ≥ 55 yr for females have a higher risk of chronic disease.

9. Family history of heart disease

If the client has a family member (including parents, grandparents, uncles, aunts) with history of premature cardiovascular disease (CVD) before the age of 55 years, the client has a higher risk of heart disease.

(National Vascular Disease Prevention Alliance, 2012)

10. Do you smoke cigarettes on a daily or weekly basis or have you quit smoking in the last 6 months?

This is a YES/NO question. Smoking is to include tobacco cigarettes and pipe.
If the client is reliant on having a weekly smoke or has given up within the past 6 months, the client has a higher risk of heart conditions.

11. Body composition

Height is to be measured in metres (m).
Weight is to be measured in kilograms (kg).
To calculate Body Mass Index (BMI) – divide body weight in kilograms by the height in metres squared (kg/m^2).
BMI = weight (kg)/height^2 (m^2).
If BMI is ≥30 kg/m^2, the client is at a higher risk of heart disease.

Waist circumference is to be measured in centimetres (cm).
A flexible steel tape is recommended for girths. The waist girth is taken at the level of the narrowest point between the lower costal border (rib) and the iliac crest (hip). If there is no obvious narrowing it's taken between the two landmarks. The subject assumes a relaxed standing position with the arms folded across the thorax (chest). The measurer stands in front of the subject to correctly locate the narrowing of the waist. The measurement is taken at the end of a normal expiration (breath out).

If waist circumference is >94 cm male or >80 cm female, the client is at a higher risk of chronic disease.

(Australian National guidelines (NHMRC, NHF, Dept Health etc.))

12. Have you been told that you have high blood pressure?

This is a YES/NO question. You are not required to measure the client's blood pressure. If YES, the client has a higher risk of cardiovascular disease.
Appropriately trained exercise professionals may wish to measure their client's blood pressure.
If systolic blood pressure (SBP) is ≥140 mmHg or diastolic blood pressure (DPB) ≥90 mmHg, the client is at a higher risk of cardiovascular disease.

(National Vascular Disease Prevention Alliance. Guidelines for the management of absolute cardiovascular disease risk, 2012)

13. Have you been told that you have high cholesterol?

This is a YES/NO question. You are not required to take the client's blood cholesterol.
If they do not know, then assume NO.
If YES, the client has a higher risk of heart conditions.

These assessments are to be undertaken by a suitably qualified professional.
If the client has any of the below the risk factors for a heart attack increases:
Total cholesterol ≥5.2 mmol/L
HDL cholesterol <1.00 mmol/L
Triglycerides ≥1.7 mmol/L
LDL cholesterol ≥3.4 mmol/L

Note: A HDL value > 1.55 mmol/L is considered a negative risk factor.

14. Have you been told that you have high blood sugar?

This is a YES/NO question. You are not required to take the client's blood sugar.
If they do not know, then assume NO.
If YES, the client has a higher risk of diabetes.

If fasting blood sugar ≥5.5 mmol/L, the client has a higher risk of diabetes.

15. Are you currently taking prescribed medication(s) for any condition(s)?

The information should be used to help determine:
1) If further screening is needed.
2) If the client needs to be referred on for further specialised advice refer to flow chart on page 5.
3) A basis for further questioning to help in the design of the client's exercise program.

16. Have you spent time in hospital (including day admission) for any medical condition/ illness/ injury during the last 12 months?

The information should be used to help determine:
1) If further screening is needed.
2) If the client needs to be referred on for further specialised advice refer to flow chart on page 5.
3) A basis for further questioning to help in the design of the client's exercise program.

17. Are you pregnant or have you given birth within the last 12 months?

The information should be used to help determine:
1) If further screening is needed.
2) A basis for further questioning to help in the design of the client's exercise program.

18. Do you have any diagnosed muscle, bone or joint problems that you have been told could be made worse by participating in physical activity/exercise?

The information should be used to help determine:
1) If further screening is needed.
2) If the client needs to be referred on for further specialised advice refer to flow chart on page 5.
3) A basis for further questioning to help in the design of the client's exercise program.

The responses provided to the questions above can be used to tailor appropriate exercise types and intensities. Exercise professionals can also help to modify behaviours and lifestyle factors to help reduce most risk factors or the likelihood of developing them. Figure 1: Exercise screening, referral and assessment pathways for exercise professionals on page 5 should be used in conjunction with the answers provided in Stage 2.

WHEN DO WE UNDERTAKE PRE-EXERCISE SCREENING?

Pre-exercise screening is part of exercise professionals' duty of care. It should be completed whenever any one or more of the following conditions are met:

Beginning an exercise program from a sedentary or low baseline. Examples may include a client who has been relatively inactive for an extended period of time and decides to join a walking-for-fitness group, a circuit class or a community sports club.

Significantly upgrading an exercise program especially when the intensity is elevated substantially. Examples may include progressing from a walking-based program to a running or High Intensity Interval Training (HIIT)-based program.

When personal health status changes significantly. Examples may include the recent diagnosis of a chronic disease, recovery from a significant injury, or general perception of lack of improvement within an exercise program despite specific attempts to enhance performance.

If an exercise professional has access to his/her client's original/recent screening assessment that was conducted by a different trainer, another assessment should be required regardless if no condition has changed or significantly intensified. Additionally, an exercise professional may operate in various environments (i.e. multiple gyms, beach or parklands), however this shouldn't require his/her client to complete another screening assessment.

CONFIDENTIALITY

Pre-exercise screening results should be kept as confidential files and shared only among the exercise professionals involved with the client's exercise program and general well-being with client's consent.

STAGE 1

The aim of Stage 1 is to identify individuals who may be at a higher risk of an adverse event due to physical activity:

- If the individual answers YES to any of the first 6 questions, they are advised to seek guidance from an appropriate allied health professional or their medical practitioner prior to undertaking physical activity/exercise (see Figure 1 in the user guide).
- If the individual answered NO, they can proceed to question 7, and if they have no other concerns about their health, they are advised that they may commence activity at a light-moderate intensity or continue with current intensity levels.

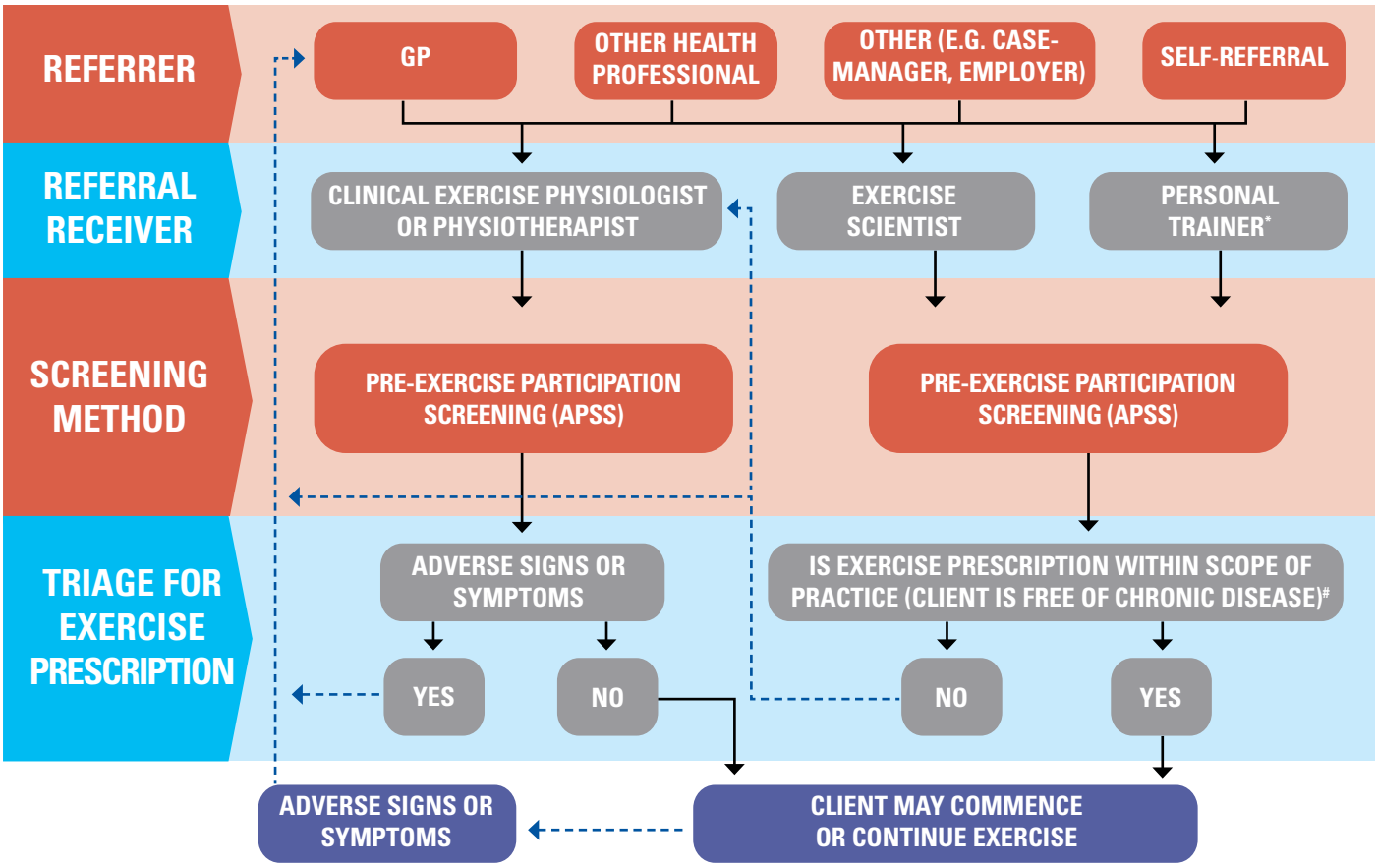
Individuals who participate in less than 150 min of weighted physical activity a week may participate in physical activity/exercise at a light or moderate intensity.

Individuals who participate in 150 min or more of weighted physical activity may continue with light, moderate or vigorous to maximal intensity exercise (based on their current physical activity patterns). Refer to Figure 2: Exercise Intensity Guidelines in the screening tool.

STAGE 2

The information obtained through Stage 2 will identify individuals with risk factors or other conditions. This will assist with appropriate exercise prescription. If there are significant or multiple risk factors, the exercise professional should use professional judgement to decide whether further medical advice is required.

FIGURE 1: Exercise screening, referral and assessment pathways for exercise professionals



Adapted from Maiorana, A. J., Williams, A. D., Askew, C. D., Levinger, I., Coombes, J., Vicenzino, B., Davison, K., Smart, N. & Selig, S. E. (2018). Exercise Professionals with Advanced Clinical Training Should be Afforded Greater Responsibility in Pre-Participation Exercise Screening: A New Collaborative Model between Exercise Professionals and Physicians. Sports Medicine, 48(6), 1293-1302.

*This category also includes group exercise instructors and gym instructors (minimum Certificate III in Fitness qualifications)
Professional judgment should be applied at all stages, in addition to working within the relevant scope of practice

Important Information: This screening tool is part of the Adult Pre-Exercise Screening System ('APSS'). This does not constitute medical advice. This guide, the APSS and any related material (together 'the material') is not intended for use to diagnose, treat, cure or prevent any medical conditions, is not intended to be professional advice and is not a substitute for independent health professional advice. Exercise & Sports Science Australia, Fitness Australia, Sports Medicine Australia and Exercise is Medicine (together 'the organisations') do not accept liability for any claims, howsoever described, for loss, damage and/or injury in connection with the use of any of the material, or any reliance on the information therein. While care has been taken to ensure the information contained in the material is accurate at the date of publication, the organisations do not warrant its accuracy. No warranties (including but not limited to warranties as to safety) and no guarantees against injury or death are given by the organisations in connection with the use or reliance on the material. If you intend to take any action or inaction based on this form, the guidelines and/or the APSS, it is recommended that you obtain your own professional advice based on your specific circumstances.

GLOSSARY OF TERMS

Adverse event: an unexpected event that occurs as a consequence of a physical activity/exercise session, resulting in ill health, physical harm or death to an individual.

Angina: chest pain caused by a decreased blood flow to the heart muscle usually caused by coronary artery disease (CAD).

Cardiac arrhythmias: abnormal heart rhythms that may compromise cardiac output.

Cardiomyopathy: disease of the heart muscle that makes it harder for your heart to pump blood to the rest of your body.

Cardiovascular disease (CVD): an umbrella term that refers to any disease that affects the heart or blood vessels. This includes coronary heart disease (CHD), hypertension, peripheral vascular disease and stroke (cerebrovascular accident).

Congenital heart disease: a problem with the heart's structure and function that is present at birth.

Coronary artery bypass: surgical technique where a healthy artery or vein from the body is connected to a blocked coronary artery to improve blood flow.

Coronary artery disease (CAD): also known as coronary heart disease (CHD) or ischaemic heart disease (IHD), this refers to a narrowing or blockage of the coronary arteries of the heart, usually caused by atherosclerosis. It can lead to angina or an acute myocardial infarction and damage to the heart muscle.

Exercise: planned, structured and repetitive movements carried out to sustain or improve fitness and health.

Exercise professional: a qualified and registered/accredited person who supplies exercise services to the public.

Heart failure: occurs when the heart muscle doesn't pump blood as well as it should. Certain conditions, such as coronary artery disease or high blood pressure lead to heart failure.

Heart murmurs: an extra or unusual sound heard during a heartbeat. Most are harmless but some may be a result of a medical condition (e.g. heart valve disease).

Hyperglycaemia: when blood glucose (sugar) levels remain high.

Hypoglycaemia: when blood glucose (sugar) levels remain low.

Medical practitioner: a professional with a medical degree who practises medicine. In Australia this includes physicians (specialists) such as General Practitioners.

Myocardial infarction: also known as a heart attack, this refers to an interruption of blood flow to the heart muscle causing cells to die. It is commonly caused by coronary artery disease (CAD).

Orthostatic hypotension: sudden fall in blood pressure that occurs when a person changes posture (e.g. stands up).

Peripheral arterial disease: a common circulatory problem in which narrowed arteries reduce blood flow to the limbs, usually legs.

Physical activity: any bodily movement produced by skeletal muscles that require energy expenditure.

Silent angina: decreased blood flow to the heart muscle without pain.

Stroke: rapid loss of brain function due to a lack of blood flow to the brain. It may indicate systemic vascular disease.