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Karen M. Williams, M.S., holds a master’s degree in exercise science from Brigham Young University. She is an independent fitness consultant specializing in sports medicine research and exercise program development. She has developed training programs for the military as well as the individual and has contributed to several research publications.
Physical activity plays an important role in improving the health of individuals who face health challenges such as type 2 diabetes, obesity, hypertension, cancer, AIDS, neurological disorders, low-back pain and selected psychological disorders (USDHHS, 1996). Similarly, individuals engage in physical activity as a part of rehabilitation for orthopedic problems, cardiovascular diseases, pulmonary disorders, neurological conditions and immune dysfunction.

You have the opportunity to establish a needed link between the health-challenged client who wants to participate in physical activity and their healthcare professional. The value you offer is the ability to provide safe and effective exercise programming for your client, and skill in motivating and supporting him as he strives to reach his goals. This chapter will provide you with the tools necessary for conducting proper screening and assessment, as well as designing...
effective programs, for clients with metabolic, cardiovascular, neurological and psychological disorders.

The first step for ensuring your clients perform safe and effective physical activity is to thoroughly screen and assess them. Screening is the initial process by which you separate individuals who may be appropriate for your services from those who clearly are not. Assessment is the process of determining the significance or importance of various factors that contribute to, or complicate, your client’s exercise programming. A thorough screening and assessment process protects both you and your client by ensuring that the needs of a potential client can be met by the services you can legitimately and ethically provide. To do this, you must understand your client’s health disorder and its impact on the ability to perform physical activity. Moreover, a comprehensive screening and assessment process helps instill client confidence in your abilities as a competent trainer who offers quality services.

The knowledge you use in screening and assessment will come, in part, from your training, experience and knowledge of the current scientific literature. It may also be necessary to consult established exercise guidelines from professional groups such as the American College of Obstetricians and Gynecologists (ACOG), the American College of Sports Medicine (ACSM) or the American Heart Association (AHA).

It is also crucial that you be effective in communicating with your client’s healthcare providers. This communication is a two-way street where you obtain guidance from your client’s healthcare provider and, in return, report to the provider on your client’s progress. Chapter 3 provides guidelines for communicating effectively with healthcare professionals.

Tools for Screening, Evaluation and Assessment

Screening and assessment require that you collect both subjective and objective data from your client that will allow you to build an individualized training program. Proper tools and the information they generate will allow you to:

- Determine how the client’s perceived problem relates to all levels of physical activity.
- Ask about old and new musculoskeletal injuries and use the information obtained to accurately develop a plan for testing and programming.
- Choose exercise tests that relate to functional outcomes and meet the special needs of the disorder or condition.
- Select exercise tests that can be modified to fit each client’s needs.
- Identify and learn about any other conditions (e.g., hypertension may coexist with rheumatoid arthritis) that may influence exercise performance.
- Obtain a list of any medications the client is currently taking and know how each drug may affect exercise performance results, particularly the cardiovascular response to physical exertion.

The identification of goals is an important part of the health screening process. Interviews and surveys are useful tools in determining the goals of your client. You must also determine the goals of your client’s healthcare team. Obtain this information by adding a “goals” section to the physician release form. These tools will offer you invaluable information about the needs of your client and will assist the client in setting realistic goals.

The Health History

The pre-activity health history not only allows you to gain valuable insight into your client’s condition and history, but also provides you with the opportunity to educate your client on the benefits of physical activity and therefore motivate them to participate.

The screening assists you in identifying clients with:

- medical contraindications to exercise
- risk factors for coronary heart disease (CHD) that require medical clearance prior to participation in physical activity
- clinically significant disease that requires a medically supervised activity program (e.g., CHD, pulmonary disease, orthopedic concerns, neurological issues, metabolic disease, immune disorders)
• multiple, coexisting health conditions that require increased and/or special attention
In addition, administering a health screening allows you to:
• become more familiar with the client's health condition and abilities
• gain your client's confidence in you as a thorough, concerned fitness professional
• reduce the likelihood of legal problems by acknowledging the client's health condition and adhering to recommended activity guidelines specific to the health challenge
• increase communication between you, the client and their healthcare professionals

Because CHD may either be present as a single condition or may coexist with other health disorders (e.g., physical, neuromuscular and psychological conditions), it is essential that you screen all clients for cardiovascular risk factors before initiating an exercise program (ACSM, 2002; CSEP, 1998). Research has shown that physical activity precipitates an increased risk for cardiovascular incidents, especially in clients with medically significant risk factors. It also is recommended that you screen your clients for risk factors related to their specific disorder, as each health condition produces unique responses.

Currently, both the American Heart Association and American College of Sports Medicine have identified several positive CHD risk factors that directly contribute to the progression and/or presence of the disease. A single negative CHD risk factor also has been identified and actually lessens the progression and/or aids in the regression of the disease. Table 2.1 presents a list of those CHD risk factors that you should screen for in all prospective clients.

Use these objective CHD risk factors (ACSM, 2006; Howley & Franks, 2003) to determine the cardiovascular health status (i.e., apparently healthy, increased risk, known disease) of clients with specific disorders. Once you determine your client's cardiovascular health status, follow the recommended guidelines (ACSM, 2006) regarding the necessity of an exercise stress test, and referral for physician-supervised submaximal or maximal exercise testing (see Table 2.2).

The PAR-Q, PARmed-X and HHQ
A number of screening tools may be used to gather information about your client. A comprehensive health history questionnaire (Figure 2.1) is a good tool to use along with the PAR-Q (Figure 2.2), which is a particularly useful questionnaire and is easy to administer, but may be inadequate as a sole means of assessing relative cardiovascular health and other physical, neuromuscular and psychological conditions. Use of additional questionnaires, such as the PARmed-X (Figure 2.3) may also assist in gathering information.

The PARmed-X identifies any existing contraindications to exercise (CSEP, 1998). Administer this questionnaire by having the client complete the PAR-Q, as well as sections A through D on the PARmed-X questionnaire. The client then should take the form to their physician to gain medical approval. The PARmed-X also allows the physician to offer specific recommendations for programming and progression.

Psychological Factors
Although the health screening process typically covers a client's physiological condition, you should also address the psychological health of

<table>
<thead>
<tr>
<th>Table 2.1 Coronary Heart Disease Risk Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Positive Risk Factors</strong></td>
</tr>
<tr>
<td>• Age (men &gt;45 yrs; women &gt;55 yrs) When age exceeds these ranges, the client should undergo a GXT test</td>
</tr>
<tr>
<td>• Family history (premature disease or heart attack in an immediate relative: male &lt;55 yrs; female &lt;65 yrs)</td>
</tr>
<tr>
<td>• Hypertension (SBP &gt;140 mmHg and or DBP &gt;90 mmHg) Confirmed on at least two separate occasions or on antihypertensive medication</td>
</tr>
<tr>
<td>• High cholesterol (LDL &gt;130 mg/dl; HDL &lt;40 mg/dl; if LDL is not available, then cholesterol &gt;200) Or on lipid-lowering medications</td>
</tr>
<tr>
<td><strong>Negative Risk Factor</strong></td>
</tr>
<tr>
<td>• HDL &gt;60 mg/dl</td>
</tr>
</tbody>
</table>

your client. While most trainers are not qualified to evaluate a client’s psychological status, you can use your professional experience, observations and intuition to determine your client’s stage of readiness for adopting and maintaining an active lifestyle. These same skills can help you identify the most appropriate strategy for working with a specific client. If the client is currently under a mental health professional’s or physician’s care for a psychological disorder, it may be advisable to contact the professional for any guidance they may wish to provide.

**Know a Client’s Medications**

In the health history, obtain a list of all medications that the client is taking, and understand their effects on all of the major organ systems of the body (ACSM, 2002). Determine if prescribed medications adversely affect the body’s response to physical exertion. Clients who take heart-rate-altering medications (HRAM) are not candidates for a submaximal assessment to determine aerobic capacity; however, you may need to assess the amount of work that a client can perform at a specific heart rate without estimating aerobic capacity. This will determine the client’s ability to perform work at a predetermined heart rate identified by their physician. Lists of questions you may want to ask physicians regarding medications for specific conditions are provided in each chapter of this manual.

Once your client has obtained physician approval to exercise, and you feel you have a solid understanding of the effects of your client’s health condition and the medications they are taking on their physical activity performance, you must prepare for emergency situations. Research potential emergencies associated with your client’s condition/s and be prepared to manage any adverse events associated with increasing physical effort. Each chapter will identify risks associated with a specific disorder and recommend emergency procedures.

**Informed Consent and Liability Waivers**

It is recommended that you review an informed consent form with your client and have them sign it. Though a signed informed consent form does not prevent litigation, it does improve the client’s understanding of the nature of assessment tests by ensuring they are given both verbal and written instructions. Most informed consent forms include the following information in an effort to prepare the client for the exercise evaluation:

- objectives of the intended test battery or assessments
- explanation of all tests to be administered
- description of all risks related to each assessment
- instruction that the client is free to withdraw from the tests at any time
- explanation that the client may abstain from completing a questionnaire
- indication that all client information is confidential
- encouragement to ask questions about any of the tests at any time

The laws pertaining to consents and waivers vary from state to state and country to country, so it is inappropriate and in fact exposes you to legal risk if you copy samples printed in various sources.

### Table 2.2

**Recommended Clinical Exercise Test and Physician Supervision Prior to Participating in Physical Activity**

<table>
<thead>
<tr>
<th>Medical Exam and Clinical Stress Test Recommendations for:</th>
<th>Low-risk</th>
<th>Moderate-risk</th>
<th>High-risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate activity</td>
<td>Younger No</td>
<td>Older No</td>
<td>No Symptoms</td>
</tr>
<tr>
<td>Vigorous exercise</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physician Supervision Recommended During Exercise Testing:</th>
<th>Low-risk</th>
<th>Moderate-risk</th>
<th>High-risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submaximal testing</td>
<td>Younger No</td>
<td>Older No</td>
<td>No Symptoms</td>
</tr>
<tr>
<td>Maximal testing</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

texts. A more in-depth discussion of these forms (and examples) can be found in the ACE Personal Trainer Manual and the ACE Lifestyle and Weight Management Consultant Manual and in publications by the Professional Reports Corporation. You should develop your consent and waiver forms with the assistance of an attorney with a specialty in such a process and licensed to practice in your state.

In rare instances, you may work with a client who does not want to obtain physician approval for participation in physical activity. It is important that you have the client sign a legally prepared document that releases you, and the facility in which you work, from any liability related to injury that results from exercise testing and/or programming. From both a medical and legal perspective, it is probably best to obtain physician clearance for all clients with an identified health condition even if a clearance is not explicitly recommended in any of the established guidelines.

You must protect yourself and your client from any untoward outcomes of physical activity. Limit the likelihood of litigation by using informed consent and liability waiver forms when working with clients with health challenges, particularly those with cardiovascular, neuromuscular, metabolic and hematological disorders.

Choosing Assessment Tests

Take care when selecting tests for client evaluation. Assessments must be known to be accurate, reliable and easy to administer (consider equipment cost, difficulty of assessment and adaptability to special needs). In general, test types include resting cardiovascular function, anthropometry, submaximal aerobic fitness capacity, muscular fitness measures, joint range of motion (flexibility) measures for both upper- and lower-body extremities, and neuromuscular assessments (Table 2.3).

The client’s health condition dictates the type of fitness tests needed and the order in which these tests are administered. For example, a cardiac client may undergo an entirely different battery of tests than those administered to a client with a neurological disorder. Some disorders require that clients improve their functional fitness. Therefore, when working with clients with disorders ranging from cardiovascular, metabolic and pulmonary disease, to orthopedic, immune and neurological disorders, you may need to administer assessments that focus on functional performance (CSEP, 1998; USDHHS, 1996) to measure improvements related to performing activities of daily living.

Once the battery of assessment tests is complete, interpret the results for your client in an accurate and positive manner. Any comparisons that you offer should be made to relative age- and gender-matched persons, particularly for cardiorespiratory and musculoskeletal fitness, and anthropometric assessments.

Client Education

You should include fitness counseling as a routine part of client education. The majority of fitness counseling overviews results from the screening and assessments, and identifies realistic goals for the client to achieve. Additionally, you can use fitness counseling as an educational opportunity to address health and behavioral issues, as well as reiterate the benefits of physical activity specific to a client’s illness. Along these lines, you need to be an effective educator who knows that the barriers to client education include lack of priority setting, lack of time and insufficient knowledge or skill (Hansen & Streff, 1995). To address these barriers and move your client toward a successful physical activity program, you must understand the adult learner. A successful fitness counseling session reveals at least these four phases of adult learning:

- Adult learners need an active and controlling role in deciding what will be learned.
- Learning improves when the material is relevant to a learner’s experience.
- Like children, adults usually have phases of growth with corresponding developmental tasks.
- Adults are most motivated to learn what is immediately applicable in their life setting (Padberg & Padberg, 1990).

As the fitness counselor, you must individualize the counseling session to your client and offer an opportunity to establish realistic personal goals. Many people with health challenges who are motivated enough to start a
physical activity program have some goal(s) in mind. Thus, an effective fitness counselor listens carefully to their client's needs and reasons for beginning an activity program. Unfortunately, the client who starts out motivated does not always remain motivated. Trainers play a pivotal role in assisting the client with an illness or disorder to understand their current health and fitness status, develop a structured plan of achievable goals at the outset of the program, and help the client to sustain a motivation level whenever it begins to fade. Knowing about the client's past is crucial to understanding the client's present needs and prospective goals. Therefore, you may want to ask such questions as:

| Table 2.3 | Assessment of Clients with a Health Challenge |

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>ASSESSMENT</th>
<th>SPECIAL CONSIDERATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>RESTING CARDIOVASCULAR FUNCTION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Heart rate</td>
<td>30-60 secs measure</td>
<td>Abnormal: HR &gt; 100 bpm</td>
</tr>
<tr>
<td>• Systolic/diastolic blood pressure</td>
<td>two measures 3-5 min apart</td>
<td>Abnormal: SBP &gt; 140 mmHg</td>
</tr>
<tr>
<td>ANTHROPOMETRY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Height and weight</td>
<td>record: in/lb or cm/kg</td>
<td>Abnormal: men &gt; 0.95; women &gt; 0.86</td>
</tr>
<tr>
<td>• Body Mass Index (BMI)</td>
<td>determined via: weight (kg)/height (m²)</td>
<td>When BMI &gt; 30, initiate weight mgmt. strategies: indicates obesity</td>
</tr>
<tr>
<td>• Circumference measures</td>
<td>waist, hip, upper arm, upper thigh</td>
<td>Good measures to confirm loss of inches</td>
</tr>
<tr>
<td>• Skinfold measures</td>
<td>Recommended: waist, iliac, thigh, subscapular, chest, mid-calf, midaxillary</td>
<td>Requires accurate anatomic location of skinfold sites to determine body fat</td>
</tr>
<tr>
<td>SUBMAXIMAL AEROBIC FITNESS ASSESSMENT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Aerobic capacity</td>
<td>In lab setting, use various ergometers: upright bicycle, recumbent bicycle, treadmill, and arm. In field, use walking test. DATA: HR and RPE</td>
<td>Use of standard protocol may require modification for some health challenges</td>
</tr>
<tr>
<td>• Endurance performance</td>
<td>Functional assessment must focus on mode of activity usually performed DATA: TIME to complete known distance</td>
<td>Both are good indicators of effort</td>
</tr>
<tr>
<td>MUSCULAR FITNESS MEASURES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Muscle strength</td>
<td>Repetition-max test; repetition number specific to client's health status and level of muscular strength</td>
<td>Tests are available with norms, but not all persons can perform such tests. Address specific ability of client to perform repeated movements of any muscle group. Use RPE as a guide to fatigue</td>
</tr>
<tr>
<td>• Muscle endurance</td>
<td>Number of repetitions before fatigue using: curl-ups, pull-ups, YMCA bench press, or any muscle group</td>
<td>Not appropriate for all persons: Handgrip dynamometer</td>
</tr>
<tr>
<td>• Joint range of motion (Flexibility)</td>
<td>Upper extremities with goniometer or standardized instrument and lower extremities with goniometer or standardized instrument</td>
<td>Caution in using these tests</td>
</tr>
<tr>
<td>NEUROMUSCULAR ASSESSMENTS</td>
<td>Eye-hand coordination, reaction time, gait analysis, balance</td>
<td>Focus on functional ADL outcomes: related to balance, coordination imbalance</td>
</tr>
</tbody>
</table>

Note: HR = heart rate, SBP = systolic blood pressure, DBP = diastolic blood pressure, BMI = body mass index, RPE = rating of perceived exertion, ADL = activities of daily living
• What do you want from the program?
• What has prevented you from doing this before?
• What is your plan of action?

By engaging in this conversation, you will identify areas of unrealistic expectations, improve your client’s sense of self-direction, and gain important information about the focus of education, knowledge and/or skills for your client. Most importantly, fitness counseling can help to establish, focus on, and achieve realistic goals for clients with specific illnesses or challenges.

Pre-exercise Session Assessment
To ensure safe conduct of each exercise session, it is imperative that you administer a brief pre-exercise session assessment. Take appropriate vital signs and obtain information on symptoms. Additionally, ask your client if there have been any changes in their symptoms or medications since their last exercise session. Review your client’s exercise program and be aware of any signs indicating that your client may be having problems with the exercise program. After you have obtained the necessary information, modify the exercise session to meet your client’s present status (ACSM, 2005).

Physical Activity Programming

Exercise programming for clients with health conditions is similar to that for apparently healthy individuals, and program design should be based on client needs, desires, physical limitations and goals. A thorough understanding of the risks and benefits of exercise associated with your client’s condition will guide you in developing a safe and effective program. Each session should include a warm-up, activity and cool-down phase. It is imperative that aerobic activity is preceded by a warm-up and followed by a recovery period. In general, most clients with health conditions will require an extended warm-up and cool-down period. Exercise progression should be gradual with an emphasis on increasing duration rather than intensity.

Each client’s program should be based on their needs and condition. In general, however, the framework for the program should be based on the FITT acronym: F=frequency (e.g., 3 to 5 times per week); I=intensity (e.g., 40 percent to 85 percent of heart-rate reserve); T=time of activity (e.g., 20 to 60 minutes of continuous or intermittent activity); T=type or mode of activity (e.g., use of large muscle groups via walking, running, cycling, swimming, aerobic/step training, etc.). Significant modifications to the FITT variables may be necessary for clients with health challenges. It is important to note that many clients with health challenges are sedentary. Therefore, be conservative in the initial stages of exercise programming and make gradual increases in frequency, intensity and time as appropriate. Once you have developed the exercise program, make sure that all of your recommendations are in accordance with established guidelines and recommendations.

The U.S. Surgeon General’s Report on Physical Activity and Health recommends that all Americans participate in 30 minutes of moderate physical activity at least five, preferably seven, days per week to obtain the health benefits of physical activity (USDHHS, 1996). Address these benefits with your client to encourage compliance.

Pay close attention to your client’s exercise response. The objective data (heart rate, blood pressure, distance completed, time spent exercising) are important; however, the subjective data (RPE, leg pain, work intensity tolerance, shortness of breath, etc.) may be more helpful in appropriately modifying the physical activity to meet your client’s needs.

At the present time, specific exercise guidelines for clients with some health challenges are lacking. A “10-Step Decision-Making Approach” (Appendix E) can provide you with a model for reasoning through the critical steps of exercise programming for clients with health challenges. Remember that it is your responsibility to stay current in the field of exercise science by conducting a regular review of professional scientific literature and applying the knowledge gained to your exercise programming methods.

References

### Suggested Reading


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### Figure 2.1

#### Health History Questionnaire

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Have you ever been told that you have a heart condition?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Have you ever had a heart attack?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Have you ever been told that you have high blood pressure?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Have you ever had a stroke?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Do you have emphysema?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Do you have chronic bronchitis?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Have you ever felt pain in your chest during physical activity?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Have you ever felt pain in your chest when at rest?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Have you ever been told that you have high cholesterol?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Do you currently smoke?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Do you have diabetes?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Are you a male &gt; 45 years of age?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Are you a female &gt; 55 years of age?</td>
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<tr>
<td>14. Has an immediate family member (parent or sibling) had a heart attack, stroke or cardiovascular disease before 55 years of age?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Have you ever lost consciousness or lost your balance due to dizziness?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Are you currently being treated for any bone, orthopedic or joint problems that limit your activity level?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Are you currently taking a medication that your doctor prescribed?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If YES, please list each medication and why you are taking it.
Regular physical activity is fun and healthy, and increasingly more people are starting to become more active every day. Being more active is very safe for most people. However, some people should check with their doctor before they start becoming much more physically active.

If you are planning to become much more physically active than you are now, start by answering the seven questions below. If you are between the ages of 15 and 69, the PAR-Q will tell you if you should check with your doctor before you start. If you are over 69 years of age, and you are not used to being very active, check with your doctor.

Common sense is your best guide when you answer these questions. Please read the questions carefully and answer each one honestly: check YES or NO.

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
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</thead>
<tbody>
<tr>
<td>☐</td>
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<td>☐</td>
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</tr>
</tbody>
</table>

If you answered NO honestly to all PAR-Q questions, you can be reasonably sure that you can:
• Start becoming much more physically active—begin slowly and build up gradually. This is the safest and easiest way to go.
• Take part in a fitness appraisal—this is an excellent way to determine your basic fitness so that you can plan the best way for you to live actively. It is also highly recommended that you have your blood pressure evaluated. If your reading is over 144/94, talk with your doctor before you start becoming much more physically active.

Informed Use of the PAR-Q: The Canadian Society for Exercise Physiology, Health Canada, and their agents assume no liability for persons who undertake physical activity, and if in doubt after completing this questionnaire, consult your doctor prior to physical activity.

No changes permitted. You are encouraged to copy the PAR-Q but only if you use the entire form.

Note: The PAR-Q is being given to a person before he or she participates in a physical activity program or a fitness appraisal, this section may be used for legal or administrative purposes.

I have read, understood, and completed this questionnaire. Any questions I had were answered to my full satisfaction.

NAME ____________________________________________________________

SIGNATURE ____________________________________________________________________________ DATE ______________________________________________________________________

SIGNATURE OF PARENT ________________________________________________________ WITNESS ______________________________

OR GUARDIAN (FOR PARTICIPANTS UNDER THE AGE OF MAJORITY)

Note: This physical activity clearance is valid for a maximum of 12 months from the date it is completed and becomes invalid if your condition changes so that you would answer YES to any of the seven questions.

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Société canadienne de physiologie de l’exercice

Supported by: Health Canada Santé Canada


Clinical Exercise Specialist Manual
The PARmed-X is a physical activity-specific checklist to be used by a physician with patients who have had positive responses to the Physical Activity Readiness Questionnaire (PAR-Q). In addition, the Conveyance/Referral Form in the PARmed-X can be used to convey clearance for physical activity participation, or to make a referral to a medically-supervised exercise program.

Regular physical activity is fun and healthy, and increasingly more people are starting to become more active every day. Being more active is very safe for most people. The PAR-Q by itself provides adequate screening for the majority of people. However, some individuals may require a medical evaluation and specific advice (exercise prescription) due to one or more positive responses to the PAR-Q.

Following the participant's evaluation by a physician, a physical activity plan should be devised in consultation with a physical activity professional (CSEP-Professional Fitness & Lifestyle Consultant or CSEP-Exercise Therapist™). To assist in this, the following instructions are provided:

**PAGE 1:**
- Sections A, B, C, and D should be completed by the participant BEFORE the examination by the physician. The bottom section is to be completed by the examining physician.

**PAGES 2 & 3:**
- A checklist of medical conditions requiring special consideration and management.

**PAGE 4:**
- Physical Activity & Lifestyle Advice for people who do not require specific instructions or prescribed exercise.
- Physical Activity Readiness Conveyance/Referral Form - an optional tear-off tab for the physician to convey clearance for physical activity participation, or to make a referral to a medically-supervised exercise program.

### PARmed-X PHYSICAL ACTIVITY READINESS MEDICAL EXAMINATION

**A** PERSONAL INFORMATION:

NAME _________________________

ADDRESS _________________________

______________________________

TELEPHONE _________________________

BIRTHDATE ___________ GENDER ________

MEDICAL No. _________________________

**B** PAR-Q: Please indicate the PAR-Q questions to which you answered YES

- Q 1 Heart condition
- Q 2 Chest pain during activity
- Q 3 Chest pain at rest
- Q 4 Loss of balance, dizziness
- Q 5 Bone or joint problem
- Q 6 Blood pressure or heart drugs
- Q 7 Other reason:

**C** RISK FACTORS FOR CARDIOVASCULAR DISEASE:

- Less than 30 minutes of moderate physical activity most days of the week.
- Currently smoker (tobacco smoking 1 or more times per week).
- High blood pressure reported by physician after repeated measurements.
- High cholesterol level reported by physician.
- Excessive accumulation of fat around waist.
- Family history of heart disease.

Please note: Many of these risk factors are modifiable. Please refer to page 4 and discuss with your physician.

**D** PHYSICAL ACTIVITY INTENTIONS:

What physical activity do you intend to do?

- _________________________

**This section to be completed by the examining physician**

<table>
<thead>
<tr>
<th>Physical Exam:</th>
<th>Conditions limiting physical activity:</th>
<th>Tests required:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ht</td>
<td>VIt</td>
<td>BP I)</td>
</tr>
<tr>
<td>BP II)</td>
<td>/</td>
<td>Musculoskeletal</td>
</tr>
<tr>
<td>ECG</td>
<td></td>
<td>Exercise Test</td>
</tr>
<tr>
<td>Blood</td>
<td></td>
<td>Urinalysis</td>
</tr>
</tbody>
</table>

Physical Activity Readiness Conveyance/Referral:

Based upon a current review of health status, I recommend:

- No physical activity
- Only a medically supervised exercise program until further medical clearance
- Progressive physical activity:
  - with avoidance of: _________________________
  - with inclusion of: _________________________
- under the supervision of a CSEP-Professional Fitness & Lifestyle Consultant or CSEP-Exercise Therapist™
- Unrestricted physical activity–start slowly and build up gradually

Further information:

- Attached
- To be forwarded
- Available on request

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Clinical Exercise Specialist Manual

18
# PARmed-X PHYSICAL ACTIVITY READINESS MEDICAL EXAMINATION

Following is a checklist of medical conditions for which a degree of precaution and/or special advice should be considered for those who answered “YES” to one or more questions on the PAR-Q, and people over the age of 69. Conditions are grouped by system. Three categories of precautions are provided. Comments under Advice are general, since details and alternatives require clinical judgement in each individual instance.

<table>
<thead>
<tr>
<th>Absolute Contraindications</th>
<th>Relative Contraindications</th>
<th>Special Prescriptive Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permanent restriction or temporary restriction until condition is treated, stable, and/or past acute phase.</td>
<td>Highly variable. Value of exercise testing and/or program may exceed risk. Activity may be restricted.</td>
<td>Individualized prescriptive advice generally appropriate:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• limitations imposed, and/or</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• special exercises prescribed.</td>
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<tr>
<td></td>
<td></td>
<td>May require medical monitoring</td>
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<tr>
<td></td>
<td></td>
<td>and/or initial supervision to</td>
</tr>
<tr>
<td></td>
<td></td>
<td>exercise program.</td>
</tr>
</tbody>
</table>

### ADVICE

- **Cardiovascular**
  - aortic aneurysm (dissecting)
  - aortic stenosis (severe)
  - congestive heart failure
  - crescendo angina
  - myocardial infarction (acute)
  - myocarditis (active or recent)
  - pericarditis or systemic embolism—a-acute
  - thromboembolits
  - ventricular tachycardia and other dangerous dysrythmias (e.g., multi-locus ventricular activity)

- **Infections**
  - acute infectious disease (regardless of etiology)
  - subacute/streptococcal infectious diseases (e.g., malaria, others)

- **Metabolic**
  - uncontrolled metabolic disorders (diabetes mellitus, thyrotoxosis, myxedema)

- **Pregnancy**
  - complicated pregnancy (e.g., toxemia, hemorrhage, incompetent cervix, etc.)

- **Other**
  - aortic (or pulmonary) stenosis—mild angina pectoris and other manifestations of coronary insufficiency (e.g., post-angle infarct)
  - cyanotic heart disease
  - shunts (intermittent or fixed)
  - conduction disturbances
    - complete AV block
    - left BBB
    - Wolff-Parkinson-White syndrome
  - diastolic hypertension—controlled
  - fixed rate pacemakers
  - intermittent disqualification
  - hypertension: systolic 160-180; diastolic 105+

- **References:**


The PAR-Q and PARmed-X were developed by the British Columbia Ministry of Health. They have been revised by an Expert Advisory Committee of the Canadian Society for Exercise Physiology chaired by Dr. N. Gledhill (2002).

No changes permitted. You are encouraged to photocopy the PARmed-X, but only if you use the entire form.

Disponible en français sous le titre “Évaluation médicale de l'aptitude à l'activité physique (X-AAP)”

Continued on page 3...
<table>
<thead>
<tr>
<th><strong>Special Prescriptive Conditions</strong></th>
<th><strong>ADVICE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lung</strong></td>
<td></td>
</tr>
<tr>
<td>chronic pulmonary disorder</td>
<td>special relaxation and breathing exercises</td>
</tr>
<tr>
<td>obstructive lung disease</td>
<td>breath control during endurance exercises to tolerance; avoid polluted air</td>
</tr>
<tr>
<td>asthma</td>
<td></td>
</tr>
<tr>
<td>exercise-induced bronchoconstriction</td>
<td>avoid hyperventilation during exercise; avoid extremely cold conditions; warm up adequately; utilize appropriate medication.</td>
</tr>
<tr>
<td><strong>Musculoskeletal</strong></td>
<td></td>
</tr>
<tr>
<td>low-back conditions (pathological, functional)</td>
<td>avoid or minimize exercise that precipitates or exacerbates e.g., forced extreme flexion, extension, and violent twisting; correct posture, proper back exercises</td>
</tr>
<tr>
<td>arthritis—acute (infective, rheumatoid, gout)</td>
<td>treatment, plus judicious blend of rest, splinting and gentle movement</td>
</tr>
<tr>
<td>arthritis—subacute</td>
<td>progressive increase of active exercise therapy</td>
</tr>
<tr>
<td>arthritis—chronic (osteoarthritis and above conditions)</td>
<td>maintenance of mobility and strength; non-weightbearing exercises to minimize joint trauma (e.g., cycling, aquatics activity)</td>
</tr>
<tr>
<td>orthopaedic</td>
<td>highly variable and individualized</td>
</tr>
<tr>
<td>hemia</td>
<td>minimize straining andometrics; strengthen abdominal muscles</td>
</tr>
<tr>
<td>osteoporosis or low bone density</td>
<td>avoid exercise with high risk for fracture such as push-ups, curl-ups, vertical jump and trunk forward flexion; engage in low-impact weight-bearing activities and resistance training</td>
</tr>
<tr>
<td><strong>CNS</strong></td>
<td></td>
</tr>
<tr>
<td>convulsive disorder not completely controlled by medication</td>
<td>minimize or avoid exercise in hazardous environments and/or exercising alone (e.g., swimming, mountain climbing)</td>
</tr>
<tr>
<td>recent concussion</td>
<td>thorough examination if history of two concussions; review for discontinuation of contact sport if three concussions, depending on duration of encephalopathies, retrograde amnesia, persistent headaches, and other objective evidence of cerebral damage</td>
</tr>
<tr>
<td><strong>Blood</strong></td>
<td></td>
</tr>
<tr>
<td>anemia—severe (&lt; 10 Gmd/d)</td>
<td>control preferred; exercise as tolerated</td>
</tr>
<tr>
<td>electrolyte disturbances</td>
<td></td>
</tr>
<tr>
<td><strong>Medications</strong></td>
<td></td>
</tr>
<tr>
<td>antihypertensive</td>
<td>antihypertensive</td>
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<tr>
<td>antihypertensive</td>
<td>antihypertensive</td>
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<tr>
<td>anticonvulsant</td>
<td>anticonvulsant</td>
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<tr>
<td>beta-blockers</td>
<td>beta-blockers</td>
</tr>
<tr>
<td>diuretics</td>
<td>diuretics</td>
</tr>
<tr>
<td>ganglionic blockers</td>
<td>ganglionic blockers</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td></td>
</tr>
<tr>
<td>post-exercise syncope</td>
<td>moderate program</td>
</tr>
<tr>
<td>heat intolerance</td>
<td>prolong cool-down with light activities; avoid exercise in extreme heat</td>
</tr>
<tr>
<td>temporary minor illness</td>
<td>postponed until recovered</td>
</tr>
<tr>
<td>cancer</td>
<td>if potential metastases, test by cycle ergometry, consider non-weightbearing exercises; exercise at lower end of prescriptive range (40-65% of heart-rate reserve), depending on condition and recent treatment (radiation, chemotherapy); monitor hemoglobin and lymphocyte counts; add dynamic lifting exercise to strengthen muscles, using machines rather than weights.</td>
</tr>
</tbody>
</table>

*Refer to special publications for elaboration as required*

The following companion forms are available online: [http://www.osep.ca/forms.asp](http://www.osep.ca/forms.asp)

The Physical Activity Readiness Questionnaire (PAR-Q) - a questionnaire for people aged 15-69 to complete before becoming much more physically active.

The Physical Activity Readiness Medical Examination for Pregnancy (PARmed-X for PREGNANCY) - to be used by physicians with pregnant patients who wish to become more physically active.

For more information, please contact the:

Canadian Society for Exercise Physiology
202 - 185 Somerset St. West
Ottawa, ON K2P 0Z2
Tel. 1-877-651-9755 • FAX (613) 234-5555 • Online: www.osep.ca

**Note to physical activity professionals...**

It is a prudent practice to retain the completed Physical Activity Readiness Conveyance/Referral Form in the participant’s file.
Physical activity improves health.

Every little bit counts, but more is even better - everyone can do it!

Get active your way - build physical activity into your daily life:
- at home
- at school
- at work
- at play
- on the way... that's active living!

Starting slowly is very safe for most people. For a free guide, send a self-addressed business reply envelope to:
Canada's Physical Activity Guide
400-708 Bay Street
Toronto, Ontario M5G 1E7
Eating well is also important. Follow Canada's Food Guide to identify getting to make wise food choices.

Benefits of regular activity:
- Better physical and mental health
- Better chance of avoiding heart disease
- Better chance of avoiding cancer
- Stronger immune system
- Better sleep

Health risks of inactivity:
- Premature death
- Heart disease
- High blood pressure
- Kidney disease
- Depression
- Cancer

PARmed-X Physical Activity Readiness Conveyance/Referral Form

Based upon a current review of the health status of ____________________________, I recommend:

☐ No physical activity
☐ Only a medically-supervised exercise program until further medical clearance
☐ Progressive physical activity
☐ with avoidance of:
☐ with inclusion of:
☐ under the supervision of a CSEP-Professional Fitness & Lifestyle Consultant or CSEP-Exercise Therapist
☐ Unrestricted physical activity — start slowly and build up gradually

__________________________  M.D.

__________________________  (date)

Further Information:
☐ Attached
☐ To be forwarded
☐ Available on request

Physician/Healthcare provider stamp: ____________________________

NOTE: This physical activity clearance is valid for a maximum of six months from the date it is completed and becomes invalid if your medical condition becomes worse.