Canadian Journal of Cardiology 32 (2016) 514–522

Review

Practical Approaches to Prescribing Physical Activity and Monitoring Exercise Intensity

Jennifer L. Reed, PhD, MEd, CS, and Andrew L. Pipe, CM, MD

Division of Prevention and Rehabilitation, University of Ottawa Heart Institute, Ottawa, Ontario, Canada

ABSTRACT

Regular physical activity helps to prevent heart disease, and reduces the risk of first or subsequent cardiovascular events. It is recommended that Canadian adults accumulate at least 150 minutes of moderate- to vigorous-intensity aerobic exercise per week, in bouts of 10 minutes or more, and perform muscle- and bone-strengthening activities at least 2 days per week. Individual exercise prescriptions can be developed using the frequency, intensity, time, and type principles. Increasing evidence suggests that high-intensity interval training is efficacious for a broad spectrum of heart health outcomes. Several practical approaches to prescribing and monitoring exercise intensity exist including: heart rate monitoring, the Borg rating of perceived exertion scale, the Talk Test, and, motion sensors. The Borg rating of perceived exertion scale matches a numerical value to an individual's perception of effort, and can also be used to estimate heart rate. The Talk Test, the level at which simple conversation is possible, can be used to monitor desired levels of moderate- to vigorous-intensity exercise. Motion sensors can provide users with practical and useful exercise training information to aid in meeting current exercise recommendations. These approaches can be used by the public, exercise scientists, and clinicians to easily and effectively guide physical activity in a variety of settings.

RÉSUMÉ

L'activité physique régulière aide à prévenir les maladies du cœur et réduit le risque d'événements cardiovasculaires initiaux ou subséquents. On recommande aux adultes canadiens d'accumuler au moins 150 minutes d'activité physique aérobie d'intensité modérée à vigoureuse par semaine, par périodes de 10 minutes ou plus, et de pratiquer des activités de renforcement musculaire et osseux au moins 2 fois par semaine. Les prescriptions individuelles d'exercices peuvent être élaborées sur la base des principes de fréquence, d'intensité, de durée et de type. Les données probantes de plus en plus nombreuses suggèrent que l'entraînement par intervalles à haute intensité est efficace pour un large éventail de résultats en matière de santé cardiaque. Il existe plusieurs approches pratiques en matière de prescription et de surveillance de l'intensité de l'exercice, dont la surveillance de la fréquence cardiaque, la notation sur l'échelle de perception de l'effort de Borg, le test de la parole et les capteurs de mouvement. La notation sur l'échelle de perception de Borg correspond à une valeur numérique de la perception individuelle de l'effort, qui peut également être utilisé pour estimer la fréquence cardiaque. Le test de la parole, c'est-à-dire la possibilité de tenir une conversation simple, peut être utilisé pour atteindre les niveaux visés d'activité physique d'intensité modérée à vigoureuse. Les capteurs de mouvement peuvent fournir aux utilisateurs des informations pratiques et utiles sur l'entraînement à l'effort pour les aider à se conformer aux recommandations actuelles en matière d'activité physique. Ces approches peuvent être utilisées par le public, et par les scientifiques et les cliniciens de l'activité physique pour guider facilement et efficacement l'activité physique dans des cadres variés.

Heart disease remains one of the leading causes of death in Canada. More than 1.3 million Canadians are living with heart disease, and 9 in 10 have at least 1 modifiable risk factor.[1] There is irrefutable evidence that regular physical activity contributes to the prevention of heart disease, lowering the risk of first or subsequent cardiovascular events.[2,3] The Canadian Society for Exercise Physiology (CSEP) recommends that adults aged 18-64 years accumulate at least 150 minutes of moderate- to vigorous-intensity aerobic exercise per week, in bouts of 10 minutes or more.[4] Muscle- and bone-strengthening activities using major muscle groups are also advised on at least 2 days per week.[4] Adherence to CSEP guidelines increases the likelihood that improvements in health and fitness will be achieved.[2,5,6] It is important that physical activity, ordinarily a fundamental element of human behaviour, be viewed from a practical perspective. There is a danger that we can 'overmedicalize' this important health behaviour and in so doing, intimidate, complicate, or otherwise deter adoption of simple, healthy patterns of activity.

Received for publication August 13, 2015. Accepted December 16, 2015.

Corresponding author: Dr Jennifer L. Reed, University of Ottawa Heart Institute, 40 Ruskin St, Ottawa, Ontario K1Y 4W7, Canada. Tel.: +1-613-761-5284; fax: +1-613-761-5238.

E-mail: jreed@ottawaheart.ca

See page 520 for disclosure information.

http://dx.doi.org/10.1016/j.cjca.2015.12.024

0828-282X/© 2016 Canadian Cardiovascular Society. Published by Elsevier Inc. All rights reserved.

Individual exercise prescriptions can be developed using the frequency, intensity, time, and type (FITT) principles.[7] The most difficult of these principles to prescribe is intensity, particularly when exercise testing with ergospirometry, the gold standard for determining peak aerobic power ($\dot{V}O_{2peak}$), is not available. Peak aerobic exercise testing is often impractical because of the cost, expertise, and technological resources required. Several alternative and practical approaches to prescribing and monitoring exercise intensity exist, including heart rate monitoring, Borg rating of perceived exertion (RPE) scale,[8] Talk Test,[9] and motion sensors. These methods are used by the general population, exercise physiologists and therapists, and clinicians, but are not without limitations. In this article we examine the role of regular exercise in reducing modifiable risk factors, current exercise training recommendations for Canadian adults, including new approaches such as high-intensity interval training (HIIT), and practical tools for prescribing and monitoring exercise intensity.

Risk Factors for Heart Disease

There are several nonmodifiable and modifiable risk factors for heart disease. Nonmodifiable risk factors include age, sex, family history, ethnicity, and history of stroke or transient ischemic attack. Modifiable risk factors include a sedentary lifestyle (not participating in at least 30 minutes of moderate-intensity exercise on at least 3 days of the week for at least 3 months), sedentary behaviour, inadequate consumption of fruits and vegetables, being overweight and obese, high blood pressure, high cholesterol, diabetes, stress, depression, and smoking.[1,7,10,11] Most Canadians (90%) aged 20 years and older have at least 1 modifiable risk factor for heart disease, with many having more than 1 risk factor (Fig. 1).[1] The risk of heart disease increases as the number of risk factors increases.

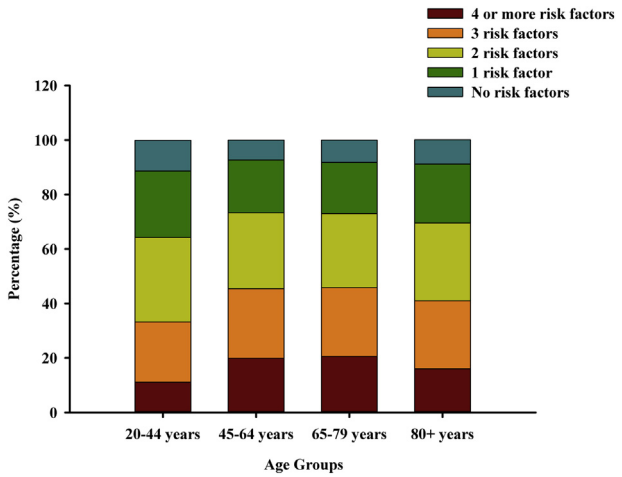

Figure 1. Percentage of the Canadian population aged 20 years and older who reported ≥ 1 modifiable risk factors for heart disease, according to age group. © All Rights Reserved. *Tracking Heart Disease and Stroke in Canada, 2009*. Chronic Disease Surveillance Division, Centre for Chronic Disease Prevention and Control, Public Health Agency of Canada, *using data from Canadian Community Health Survey (Statistics Canada)*. Adapted and reproduced with permission from the Minister of Health, 2015.[1]

The Role of Exercise in Reducing Risk Factors for Heart Disease

Despite the overwhelming evidence supporting regular exercise in the prevention of heart disease, few (15%) Canadian adults accumulate the recommended 150 minutes of moderate- to vigorous-intensity aerobic exercise per week, in bouts of 10 minutes or more.[12] It is estimated that in the United States, 23% of adults participate in strengthening activities at least 2 times per week.[13] Estimates for Canada do not currently exist but are likely similar. Substantial evidence supports the role of moderate- to vigorous-intensity aerobic exercise in reducing the modifiable risk factors for heart disease, including being overweight and obese, hypertension, dyslipidemia, diabetes, stress, and depression. Reducing these risk factors before a first cardiovascular event could prevent or postpone 33% of all cardiovascular-related deaths.[14] Unlike drugs, which are typically specific for single modifiable risk factors (eg, antihypertensives, lipid-lowering agents, antidiabetics), exercise exerts favourable effects on all risk factors simultaneously. In Table 1 the health benefits associated with regular exercise are summarized.[15] The role of physical activity in addressing specific risk factors for heart disease is addressed in more detail below.

Physical activity and overweight and obesity

More than 39% of Canadian men and 27% of Canadian women are overweight (body mass index, 25.0-29.9 kg/m^2), and more than 20% of Canadian adults are obese (body mass index, ≥ 30.0 kg/m^2).[16] Changes in weight are affected by the amount of energy expended vs the amount of calories consumed.[17] If energy expenditure remains low, but caloric consumption is in excess, weight gain will occur. Strong evidence suggests that regular aerobic exercise can attenuate

Table 1. Health benefits associated with regular exercise

Adults and older adults
Strong evidence
• Lower risk of early death
• Lower risk of coronary artery disease
• Lower risk of stroke
• Lower risk of high blood pressure
• Lower risk of adverse blood lipid profile
• Lower risk of type 2 diabetes
• Lower risk of metabolic syndrome
• Lower risk of colon cancer
• Lower risk of breast cancer
• Prevention of weight gain
• Weight loss, particularly when combined with reduced calorie intake
• Improved cardiorespiratory and muscular fitness
• Prevention of falls
• Reduced depression
• Better cognitive function (for older adults)
Moderate to strong evidence
• Better functional health (for older adults)
• Reduced abdominal obesity
Moderate evidence
• Lower risk of hip fracture
• Lower risk of lung cancer
• Lower risk of endometrial cancer
• Weight maintenance after weight loss
• Increased bone density
• Improved sleep quality

Reproduced from U.S. Department of Health and Human Services.[15]

Download English Version:

https://daneshyari.com/en/article/2727142

Download Persian Version:

https://daneshyari.com/article/2727142

Daneshyari.com