The importance of medical assessment prior to high-intensity interval training

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Although there is irrefutable evidence that exercise leads to improved health for almost all patients, adherence to physical activity guidelines remains poor. Emerging evidence demonstrates that brief spurts of high-intensity exercise can produce comparable (and possibly greater) health benefits as moderate exercise of longer duration.4 Thus, it has been proposed that high-intensity interval training (HIIT)—brief bursts of vigorous activity interspersed with rest periods—could be recommended as a time-efficient and effective alternative to standard exercise recommendations.5,6 However, prescribing high-intensity exercise presents complex challenges for doctors who must encourage their patients to exercise safely to obtain maximum health benefits. Unaccustomed vigorous physical activity is associated with a small and transient, yet significantly increased, risk of a cardiac event.7 To mitigate this risk, current American College of Sports Medicine (ACSM) guidelines recommend that unless healthy or habitually active, vigorous exercise should not be undertaken without medical assessment.8 Consequently, in an increasingly obese, sedentary population, it is likely that many people will require medical evaluation if choosing to undertake HIIT. In order to ensure participant safety, SWIFT recruited healthy overweight adults, who were self-screened using a modified American Heart Association/American College of Sports Medicine (AHA/ACSM) health/fitness facility pre-participation screening questionnaire.12 This questionnaire excluded participants at high risk of a cardiovascular event, including those with known cardiovascular disease or type 2 diabetes. Of the 705 people who expressed interest, 217 participants (31%) were automatically excluded by the screening questionnaire for pre-existing health conditions, symptoms or unsuitable medications. This proportion of potentially high-risk participants contained within an apparently ‘overweight but healthy’ population reflects the reality of exercise prescription in an increasingly obese demographic.

There were 279 participants who met all study criteria and were considered to be at low or moderate cardiovascular risk. However, physical screening detected five of these participants had hypertension (of stage two or greater), and six had elevated fasting blood glucose in the diabetic range (>7.0mmol/L). Thus, screening by questionnaires alone missed 4% (95% CI: 2–7%) of people with possible chronic disease in a group of apparently healthy overweight individuals.
Out of these 250 participants, 104 (41.6%) opted to try HIIT, and in 11 of these participants, medical evaluation identified issues not detected by the self-screening. Clinical examination revealed signs of possible cardiovascular disease in two participants; a new carotid bruit and an aortic murmur, and another participant was found to have a significant resting tachycardia. Although screening was intended to detect pre-existing conditions, a history taken in person revealed that two more participants had unreported arrhythmias, with another disclosing a significant family history of early cardiac deaths. These six participants were not suitable for HIIT without further assessment. Five other participants required medical attention for unrelated issues; these comprised an atypical pneumonia that required treatment, and issues such as possible hypothyroidism and alcohol misuse disorder.

Thus, of the 104 participants who chose to undertake HIIT, 6/104 (5.8%) had potentially undiagnosed cardiovascular disorders, and in total, 11/104 (10.6%) required medical assessment or management. However, considering that a further 11 of the participants who were excluded by physical screening would have been eligible to choose HIIT, up to 22/115 (19.1%) of potential HIIT participants had medical issues that required evaluation, representing almost one in five overweight but 'apparently healthy' individuals. These results highlight the necessity for medical assessment prior to the commencement of HIIT training in overweight adults.

During the SWIFT trial, nine participants also developed emergent medical issues that required management and influenced HIIT safety. These included a new diagnosis of angina, a brainstem cerebrovascular accident, breast cancer, a head tumour, chronic pain syndrome, hypothyroidism, Bell's Palsy, burns and an unexpected pregnancy. All of these participants required further medical advice, and in most cases needed to cease HIIT. In addition, 11 participants spontaneously reported being unable to complete HIIT due to musculoskeletal issues. While no serious injuries were sustained during HIIT activity, three participants noted that the HIIT exacerbated their musculoskeletal problems. A foot fracture was the only medical issue reported as a direct consequence of HIIT performance.

In summary, while HIIT should be considered a fairly safe and effective intervention for most types of stable patients, experiences from SWIFT support current recommendations that for many, medical evaluation prior to undertaking high-intensity exercise is advisable. It appears that screening questionnaires alone may not be sufficient to identify those requiring further assessment. Doctors are ethically bound to minimise the possibility of harm for individual patients, and for most patients this can be done by excluding the possibility of occult cardiovascular disease or other serious conditions. This initial consultation is also valuable to set up an ongoing relationship for supporting patients to exercise, and to advise them with any change in health status. Given the levels of obesity and physical inactivity in the general population, exercise recommendations are of utmost importance to improve outcomes for almost all patients. Increasing rates of diabetes, cardiovascular and other obesity-related diseases mean that doctors are now invariably involved in exercise risk assessment, especially in relation to vigorous activities such as HIIT. Outcomes from the SWIFT study provide evidence that a brief medical evaluation prior to HIIT participation proved valuable and garnered important information, allowing exercise participation to be undertaken safely.
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Nil.

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