

When Strength Training Becomes "Cardio"

By Matt Hedman, President of The Perfect Workout

The term "cardio" is short for cardiovascular, as in the cardiovascular system, which is a closed network of organs and vessels that are responsible for circulating blood. "Cardio" is also similar to "cardiac," which means "related to the heart." When we use the term "cardio" to describe exercise, it usually refers to activities that people often call "aerobic exercise," such as cycling, running, and swimming. Those movements do cause effects that increase blood flow and affect the heart, but they aren't the only way to address the cardiovascular system. Strength training, when applied effectively, is also "cardio."

If you train at the Perfect Workout, you know how the exercise goes: you perform several slow repetitions, your trainer advises you on correct form, the burn in your muscles continues to increase, and eventually you start a repetition that you cannot finish - you still give it your best effort, then place the weight down when it is apparent that you're unable to move the weight any further.

According to a new research article, that last detail is the key cardiovascular aspect in your training [1]. Performing strength training exercises to complete fatigue (the point I call "muscle success") is the key to unlocking several positive "cardio" effects.

The article is a review of 157 studies, most of them pertaining to strength training interventions where "muscle success" was achieved. The article was broken down into acute and chronic effects. Among the short-term findings, the researchers said that the magnitude of blood flow increase from strength training is related to the intensity (with intensity meaning how deeply the muscles were fatigued): the greater the intensity, the greater the resulting increases in blood flow. Therefore, training to complete fatigue is the most effective way to increase blood flow with strength training. For example, one 13-week study of strength training to complete fatigue increased blood flow about 55% in the upper thigh and hip region of seniors.

Another impressive finding that relates to the "cardio" aspect is that training to muscle success converts type IIx muscle fibers to type IIa. If you aren't familiar with the function of specific muscle fiber types, allow me to explain: type IIx are fibers that have a moderate ability to use oxygen and are not very dense with blood vessels. On the other hand, type IIa fibers have a high capacity for oxygen and are denser with blood vessels. Essentially, strength training to complete exhaustion physiologically transforms your muscular system to become more effective at increasing blood flow and using oxygen.

A more significant measure of cardiovascular health is the magnitude that arteries can expand to when blood flow increases. This measurement is called "flow-mediated dilation." Think of this importance in a common situation: if plaque is present in an artery, a heart attack can simply be avoided if the artery can expand enough to let the necessary amount of blood pass through. Therefore, having an artery that can dilate well above its normal size is a significant way to avoid both heart attacks and strokes.

Strength training to "muscle success" improves flow-mediated dilation. This was demonstrated in a 13-week study in which the arterial benefits were seen after six weeks [2]. The subjects in this study were young (average age of 23 years), healthy men who were already physically active. The notable aspect of a young, active, and healthy population is that there isn't as much room for progress as older, less active, or less healthy populations. Therefore, strength training to complete fatigue likely produces even greater arterial benefits for most individuals.

Knowing all of this information is great, but how does it help you? It means your strength training sessions can provide significant cardiovascular benefits...if used correctly. Instead of avoiding complete fatigue due to the required effort and lactic acid "burn," embrace the opportunity! Increasing temporary and long term blood flow, converting your muscles to more vascular and oxidative organs, and allowing your arteries to become more heart attack and stroke-resistant are best achieved by fatiguing all the way down to muscle success. So don't train to complete fatigue because your instructor is recommending you to; train to fatigue because it's in your heart's best interest.

1. Steele J. Resistance Training to Momentary Muscular Fatigue Improves Cardiorespiratory Fitness in Humans: A Review of Acute Physiological Responses and Chronic Physiological Adaptations. 15: 3: 53-80, 2012.

2. Rakobowchuk MM. Endothelial function of young healthy males following whole body resistance training. 98: 6: 2185-2190, 2005.