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## Sprint interval training effects on aerobic capacity: a systematic review and meta-analysis.

### Review article

Gist NH, et al. Sports Med. 2014.

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### Abstract

**BACKGROUND:** Sprint interval training (SIT) involving repeated 30-s "all out" efforts have resulted in significantly improved skeletal muscle oxidative capacity, maximal oxygen uptake, and endurance performance. The positive impact of SIT on cardiorespiratory fitness has far-reaching health implications.

**OBJECTIVE:** The objective of this study was to perform a systematic review of the literature and meta-analysis to determine the effects of SIT on aerobic capacity.

**METHODS:** A search of the literature was conducted using the key words 'sprint interval training', 'high intensity intermittent training/exercise', 'aerobic capacity', and 'maximal oxygen uptake'. Seventeen effects were analyzed from 16 randomized controlled trials of 318 participants. The mean  $\pm$  standard deviation number of participants was  $18.7 \pm 5.1$ . Participant age was  $23.5 \pm 4.3$  years.

**RESULTS:** The effect size calculated for all studies indicates that supramaximal-intensity SIT has a small-to-moderate effect (Cohen's  $d = 0.32$ , 95 % CI 0.10-0.55;  $z = 2.79$ ,  $P < 0.01$ ) on aerobic capacity with an aggregate improvement of  $\sim 3.6 \text{ mL}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$  ( $\sim 8$  % increase). The effect is moderate to large in comparison with no-exercise control groups (Cohen's  $d = 0.69$ , 95 % CI 0.46-0.93;  $z = 5.84$ ,  $P < 0.01$ ) and not different when compared with endurance training control groups (Cohen's  $d = 0.04$ , 95 % CI -0.17 to 0.24;  $z = 0.36$ ,  $P = 0.72$ ).

**CONCLUSION:** SIT improves aerobic capacity in healthy,

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young people. Relative to continuous endurance training of moderate intensity, SIT presents an equally effective alternative with a reduced volume of activity. This evaluation of effects and analysis of moderating variables consolidates the findings of small-sample studies and contributes to the practical application of SIT to improve cardiorespiratory fitness and health.

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