

## Heart pumping function within enhancement of speed endurance of athletes

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### Abstract

The features of development of the motor qualities of speed, speed endurance ability and heart pumping function in athletes involved in fencing were studied in the paper. Methods of determination of speed and speed endurance ability were designed and a method of calculation of efficiency of speed endurance was offered. A special device was created to measure speed data using a test task. The apparatus is placed on a pedestal of adjustable height with a laptop with the video recording function put in front of it. The video camera captures performance of exercises to calculate in slow-motion replay the quantitative parameters of the test task, which is vertical up and down arm movements at maximal speed for 10 seconds. Every time the hand touches the platform of the apparatus the light on it turns on. The movement performed by the subject is recorded on a camera. The obtained results are processed and systematized for analysis. In the course of speed-strength muscle training the fencers' speed growth rate is reducing. Speed endurance ability indicators are steadily rising. Research of speed and speed endurance ability showed that speed endurance efficiency values increase depending on the sports skill level, masters of sport have the highest indices. Heart pumping function was studied by registering thoracic tetrapolar rheogram. The method is based on recording the electrical resistance of the living tissues, changing during blood filling fluctuations in the cardiac cycle, when subject to high-frequency, but low-power current. Stroke volume was calculated by the formula of W.G. Kubicek (1974). Heart rate fall and increase of stroke volume of fencers were less pronounced than in other sports.

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### Keywords

Athletes, Fencing, Heart pumping function, Speed, Speed endurance efficiency