



400m Testing: how to monitor an athlete's speed, speed endurance and strength

Required resources

- 400-metre track
- Cones to mark 150-metre, 300-metre and 600-metre points
- Stopwatch
- Assistant

How to conduct the test

- The athlete undertakes three separate runs over 150 metres, 300 metres and 600 metres, in this order, from a standing start;
- A recovery of eight minutes is allowed between each test;
- The assistant records the time for the athlete to complete each distance.

Analysis

Analysis of the result is by comparing it with the results of previous tests. It is expected that, with appropriate training between each test, the analysis would indicate an improvement.

400-metre control test calculations

- Speed endurance index = $300\text{m time} - (2 \times 150\text{m time})$
- Target index value

$$= -11.54156 + (1.1226216 \times 150\text{m time}) + (150\text{m time} \times 150\text{m time} \times -0.015101)$$

- Strength and general endurance index = $600\text{m time} - (2 \times 300\text{m time})$
- Target index value

$$= -0.733763 + (0.2408302 \times 300\text{m time}) + (300\text{m time} \times 300\text{m time} \times 0.0008366).$$

Example

- 150m = 15 seconds
- 300m = 32 seconds
- 600m = 71 seconds
- Speed endurance index = 2.0
- Target index value = 1.9
- Strength and general endurance index = 7.0
- Target index value = 7.83.

Speed endurance index

If the athlete's speed endurance index is greater than the target index value, and provided the 150metre time is in line with training targets, then more speed endurance work (lactic anaerobic) is indicated.

Strength and general endurance index

If the athlete's strength and general endurance index is greater than the target index value, and provided the 300metre time is in line with training targets, then more strength and general endurance work (aerobic) is indicated.

Target group

This test is suitable for sprinters but not for individuals where the test would be contraindicated.

Reliability

Reliability would depend upon how strictly the test is conducted and the individual's level of motivation to perform the test.

Validity

There are published tables to relate results to potential performance in competition and the correlation is high with experienced athletes.

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