

Infographic. Running myth: strength training should be high repetition low load to improve running performance

James L N Alexander ¹, Christian J Barton,^{1,2} Richard W Willy³

The important performance benefits of strength training, including heavy resistance, explosive resistance and plyometric training for endurance runners have been well documented in recent systematic reviews.¹⁻⁵ As such, strength training should be considered an important addition to a well-planned

training programme for middle and long distance runners of all levels.

The key benefits runners can obtain from a strength training programme include:

1. Improved running economy.
2. Faster time trial performance.
3. Faster maximal sprint speed.

Strength training interventions lasting 6–20 weeks, added to the training programme of a distance runner with >6 months running experience, have been reported to enhance running economy by 2%–8%.⁵ Running economy improvements will theoretically enhance endurance running performance by allowing the runner to run at a lower oxygen or energy cost during training and racing.⁵ These benefits have been reported in runners from a recreational level through to highly trained elite athletes.⁵

Faster time trial performances over middle (1500–3000 m) and long distance (5–10 km) events, with improvements ranging from 2% to 5%, have also been reported in groups of runners who undertake strength training.⁵ For a recreational runner with a personal best 10 km time of 50 min, this equates to an improvement of between one to two and a half minutes. Faster maximal sprint speed following strength training may be another benefit for distance runners.⁵

If strength training is removed from a training programme, loss of performance benefits occur within 6 weeks.⁶ Therefore, staying consistent with appropriately periodised strength training leading into goal events may be needed to maximise performance.

While there is evidence that consistent strength training, when combined with other exercise interventions, may assist in reducing the risk of overuse injuries in other sporting populations,⁷ the effect on injury risk in runners remains unclear.⁸ Further high-quality research is required to establish if the important physiological adaptations that occur in response to strength training result in increased tissue capacity and reduced injury risk in running populations.

There is a belief among some health professionals, running coaches and runners that to maximise the benefits to running performance, strength training should be high repetition, low resistance to mimic the endurance demands of running.

This is incorrect (see figure 1).⁵

Improvements in muscular endurance are achieved specifically by running and should not be the goal of a strength training programme. Completing



Figure 1 Infographic.

endurance type exercises (eg, 3 sets of 20 reps or more with light resistance) has been reported to be less effective than heavy resistance and explosive resistance training in achieving benefits to running performance.⁵ Examples of heavy resistance exercises commonly utilised include barbell squats, deadlifts, steps-ups, lunges and calf raise variations.⁵ Completing exercises with moderate resistance, for example, 60%–80% of 1 repetition maximum for 3–6 sets of 5–15 repetitions has been reported to benefit performance.⁵ For distance runners, training to repetition failure is not recommended.⁵

There is no one size fits all approach when it comes to strength training for endurance runners. While the addition of two to three supervised strength sessions per week, initially focussing on a periodised heavy resistance training programme is recommended.⁵ Exercise selection, weight, sets, reps and recovery all depend on the individuals' needs, injury history, goals, ability and training experience. For runners without strength training experience, it is of particular importance to gradually progress training loads to reduce the risk of injury and overtraining.⁵ A well-planned programme should not negatively impact other running sessions. Careful programming should allow at least 3 hours recovery after high-intensity running before completing strength training, and at least 24 hours recovery after strength training before a high-intensity running session is scheduled.⁵

It is recommended that runners seek the assistance of an experienced health professional or strength and conditioning coach to ensure they start out safely and get the most out of their strength training program.

¹Sports and Exercise Medicine Research Centre, La Trobe University, Melbourne, Victoria, Australia

²Department of Surgery, St Vincent's Hospital, University of Melbourne, Melbourne, Victoria, Australia

³Physical Therapy and Movement Science, University of Montana, Missoula, Montana, USA

Correspondence to James L N Alexander, Sports and Exercise Medicine Research Centre, La Trobe University, Melbourne, VIC 3086, Australia; j.alexander@latrobe.edu.au

Collaborators Katherine Parker.

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ORCID iD

James L N Alexander <http://orcid.org/0000-0001-9474-6652>

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