

How to monitor your athletes workloads

- Created as a free resource by Clinical Edge
- [Based on Physio Edge podcast 058 with Tom Goom](#)
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Why monitor athletes?

The goal of monitoring is to reduce the risk of injury and optimise performance by supporting the athlete to identify signs of overtraining.

Training Loads

External loads

The amount of physical work that is completed by the athlete. This can be measured using distance run, pace or training time. The weekly external load can be compared to previous weeks to monitor for any spikes in load which may increase the risk of injury.

Internal loads

The athletes physiological and psychological response to load. This can be measured with rating of perceived exertion (RPE), heart rate variability and questionnaires.

Total load

Monitoring training volume and intensity together is an effective way of monitoring internal and external loads. Gabbett (2016) suggests multiplying training time with the average RPE score for the session to give an arbitrary unit (AU).

$$\underline{100 \text{ minutes (time)} \times 4 \text{ (average RPE for session)} = 400 \text{ AU (Arbitrary unit)}}$$

Injury risk is low when training load is increased by 10% each week but the risk of injury rises if training load increases by 15% or greater each week. The 10% rule which is commonly used by runners can be used to guide training load.

Acute/Chronic Workload Ratio

Research by Tim Gabbett suggests calculating the acute to chronic workload ratio. This can be done by dividing the average load of the last 4 weeks by the load of the current week. This research found a ratio between 0.8 and 1.3 was the sweet spot reducing injury risk, whereas a ratio below 0.8 or above 1.3 increased the risk of injury.

Fatigue

Optimal training load is a balance between increasing fitness whilst limiting fatigue. The higher the training load the greater the improvement in fitness however the greater the risk of fatigue.

A questionnaire that the athlete completes at the same time every week (Sunday evening or Monday morning) can be an effective way of identifying the signs of fatigue. This questionnaire may involve topics such as aches and pains, general well-being, energy levels, sleep, training load over past week and how this compared to previous weeks.

Specific tests

The monitoring used may change depending on the athletes individual needs and the time available to perform monitoring. For athletes with specific pathology we may want to incorporate specific tests relating to their condition.

In a runner with a history of calf problems linked to plantar fasciopathy it may be appropriate to monitor their calf capacity. When this runner is fatigued the calf capacity reduces which increases the risk of developing plantar fascia pain. Therefore, each week this runner would assess the number of single leg calf raises until fatigue. If the calf capacity starts to reduce compared to the other side, then it may be a sign of fatigue and their training programme may need to be altered.

Other tests such as the knee to wall test to assess calf length and symptom tests such as pain on 1st step in the morning may be used to monitor specific pathological response to training.

What next?

Effective monitoring relies on not just listening to the body but also acting when required. It is important that we collect the appropriate data but also use this data to adapt training programmes to ensure optimal performance and reduced injury risk.

Links associated with this episode:

[Gabbett, T.J. The training—injury prevention paradox: should athletes be training smarter and harder? Br J Sports Med 2016;50:273-28](#)

[The running physio – Athlete monitoring](#)

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