

# Advanced running tests & optimising performance

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## How do we assess performance?

One way to assess performance is via blood lactate testing. This is a test that can be performed on a treadmill in a clinic setting. It provides objective information about training zones and guides the clinician when structuring a training programme. This test is not necessary for all runners however it may be useful for runners have recurrent injuries.

### **Blood lactate testing**

A resting blood lactate score is taken via a finger pin prick and repeated every 3 minutes whilst running on a treadmill. The speed of the treadmill is increased by 1km/h every 3 minutes. Along with blood lactate, heart rate and rating of perceived excursion (RPE) can also be measured. RPE correlates with blood lactate making it an effective low-tech way of monitoring training intensity.

Blood lactate testing provides a profile of the training zones (aerobic, steady state, threshold and interval) and the speeds/RPE needed to achieve these zones. This can then be used to design a structured training programme that enhances performance and reduces injury risk.

### **What are we looking for?**

- Lactate threshold – where the lactate increases above resting levels which shows the transition between aerobic to steady state training
- Lactate turn point – where the blood lactate increases again indicating the move from threshold to interval training

## **BLAGA test**

Whilst performing blood lactate testing, video gait analysis and measurement of step rate can be performed at each running speed. This allows assessment of how a runner's gait changes at different running speeds. A runner may only experience pain when running at high intensities which may be caused by overstriding at high speeds. Providing the runner with specific cues to increase their step rate when running at high speed would help to address this problem.

## **What about injured runners?**

Start thinking about performance from day 1 instead of at the end of rehabilitation. It is important to maintain fitness from the start as there is evidence suggesting that cardiovascular fitness is protective against injury. The use of cross training (cycling, swimming or aqua jogging) can be an effective way of maintaining fitness and avoiding excessive load on the injured tissues. For traumatic injuries upper body cross training (hand cycling or rowing using only the arms) may be appropriate.

Cross training should aim to mirror the type of training the runner would be performing if they were injury free. The runner could perform an interval session in the pool instead of on the track or perform a long slow bike ride instead of a long slow run. Aim to get the same volume and training intensity during rehabilitation.

## **Reducing injury risk and improving performance**

Strength and conditioning will help to reduce injury risk whilst simultaneously improving performance. Other ways to achieve this would be to spend time on improving technique. A sprinter who cannot tolerate high speed running may instead work on their starting technique which may lead to an improvement in performance. Consider input from other members of the multidisciplinary team such as a sport psychologist to help improve performance.

## Balancing performance gains and injury risk

When implementing any changes into a runners training programme only change 1 parameter at a time. This might involve increasing the runners total training volume by adding an extra run during the week. The tolerance to this change should be monitored over the proceeding weeks. If this is tolerated, then it might be appropriate to change another parameter such as training intensity based on the blood lactate test results.

## Structuring Training

A training programme should comprise of 80% low intensity and 20% high intensity running. The majority of training should be performed at a low intensity as distance running is a low intensity event. The 20% of high intensity training is comprised of 12% tempo and steady state runs and 8% high intensity speed work. To ensure each individual run is performed in the optimal training zone aim to achieve a specific pace or RPE. The preference would be to use RPE instead of pace as external factors such as wind or elevation can influence pace.

## Links associated with this episode:

[The running physio – Optimising performance for injured runners](#)

[Twitter @Tomgoom](#)

## Optimising performance in injured athletes

1. Consider performance from initial assessment
2. Set clear goals
3. Cross-train as soon as possible and try to mirror usual training in terms of volume and intensity
4. Include strength and conditioning for performance as well as rehab needs
5. Focus on optimising technique to improve performance
  - Consider non-painful or low load options for improving technique e.g. work on running gait, drills or starts
6. Consider other potential performance enhancers
  - Sleep
  - Diet
  - Lifestyle
  - Psychosocial factors
7. Enhance motivation
  - Set inspiring goals
  - Keep rehab enjoyable where possible
  - Give lots of positive feedback
8. Ensure good social support
  - Consider athlete working with a role model e.g. Higher level runner at their club
  - Maintain social side of sport despite injury
  - Identify a 'support team' around them
9. Be positive about return to sport to improve confidence and reduce fear
10. Review performance tests approximately every 2-3 months to monitor progress.

***An injury can be an opportunity. It gives an athlete time to work on other areas and come back stronger, wiser and faster!***

