LOAD

PRE-SEASON INJURY MANAGEMENT

Pre-season, returning to training after injury or the start of a training program can be an invaluable time to increase fitness, build strength, acquire new skills and improve technical ability. However; the excitement and enthusiasm of returning to sport and exercise can alsom see an increased risk of injury as there is often the perception that more is better, and training hard optimises performance. So how can we train to see physical changes in the body and improve performance without pushing ourselves past the point of productive effort and risking injury?

Training load

Evidence consistently demonstrates that training load has a clear relationship with injury.

Training load is a term used to describe the overall workload of the athlete and it considers both the internal and external loads imposed on an athlete.

External load – quantifies the amount of physical work performed by the athlete. This can be measured by using variables such as distance, pace, training duration, number of balls bowled, number of jumps performed etc.

Internal load – quantifies the athletes physiological and psychological response to the external load. This can be measured using heart rate response, RPE (INSERT LINK TO TABLE) and questionnaires.

Measuring both these variables can provide more meaningful data as an identical external training load could elicit two different internal training loads in two different athletes, or between two different sessions for the same athlete. For example, an overweight 40 year old male running 4km will have a different physiological and perceived effort response to an 18 year old trained male running at the same pace. Although the external load of distance and time is identical, the older unfit individual will have a higher internal training load. Similarly, the younger athlete might consider the 4km run to be “easy” one day, but could find the exact same training sessions harder a week later due to other factors such as fatigue, hydration, time of day etc.

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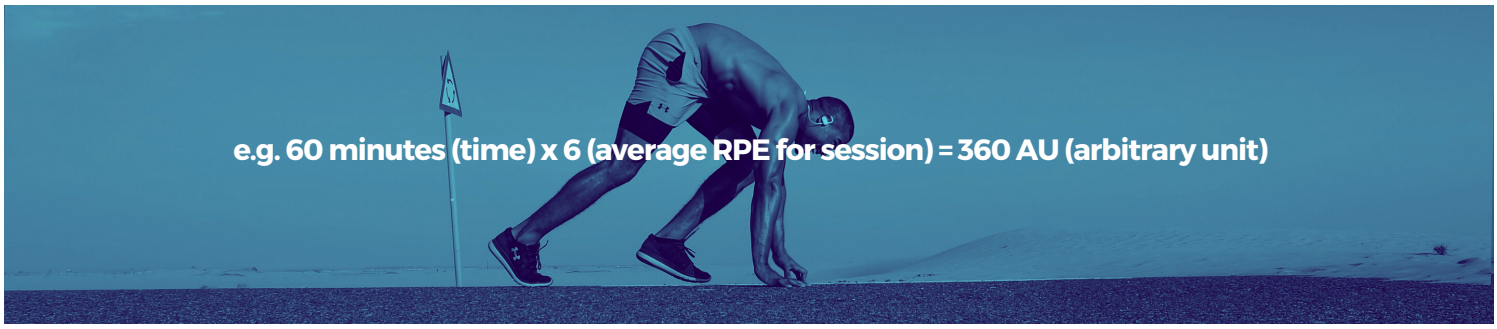
Measuring Training load

Monitoring training volume and intensity together is an effective way of monitoring internal and external loads. A simplistic way to quantify the internal load of an athlete is to use a rating of perceivedmexertion (RPE). At the completion of a training session or any form of exercise, athletes provide a 1-10 'rating' of the intensity of the session. (TABLE OF RPE). Research then suggests multiplying this RPE score for the training session with the training time to give an arbitrary unit (AU). (Gabbett 2016)



Monitoring Training load

Research demonstrates that when training load is fairly constant – ranging from 5% less to 10% more than the previous week, individuals had less then 10% risk of injury. However, the risk of injury rapidly rises if training load is increased by 15% or greater than the previous week's load. This is why "the 10% rule" is commonly used by runners and other athletes to guide training load. (REFERNECE). Research has also shown that the tissues of the body (muscle, tendons, bones etc) can still be reacting to load placed on it 3-4 weeks prior. Therefore, long term training load (28 day period) also needs to be considered.

To help measure and then monitor training load, research suggests calculating the acute to chronic workload ratio (Gabbett).

- **The ACUTE WORKLOAD** is the total training load (arbitrary units) accumulated in the last 7 days.
- **The CHRONIC WORKLOAD** is the average training load (arbitrary units) accumulated over 4 weeks.
- **ACUTE: CHRONIC WORKLOAD RATIO** – is calculated by dividing the chronic load by the acute load.
- Research has found that a ratio between 0.8 and 1.3 (i.e. if the acute load is low and chronic load is high) was the "sweet spot" to reduce injury risk.

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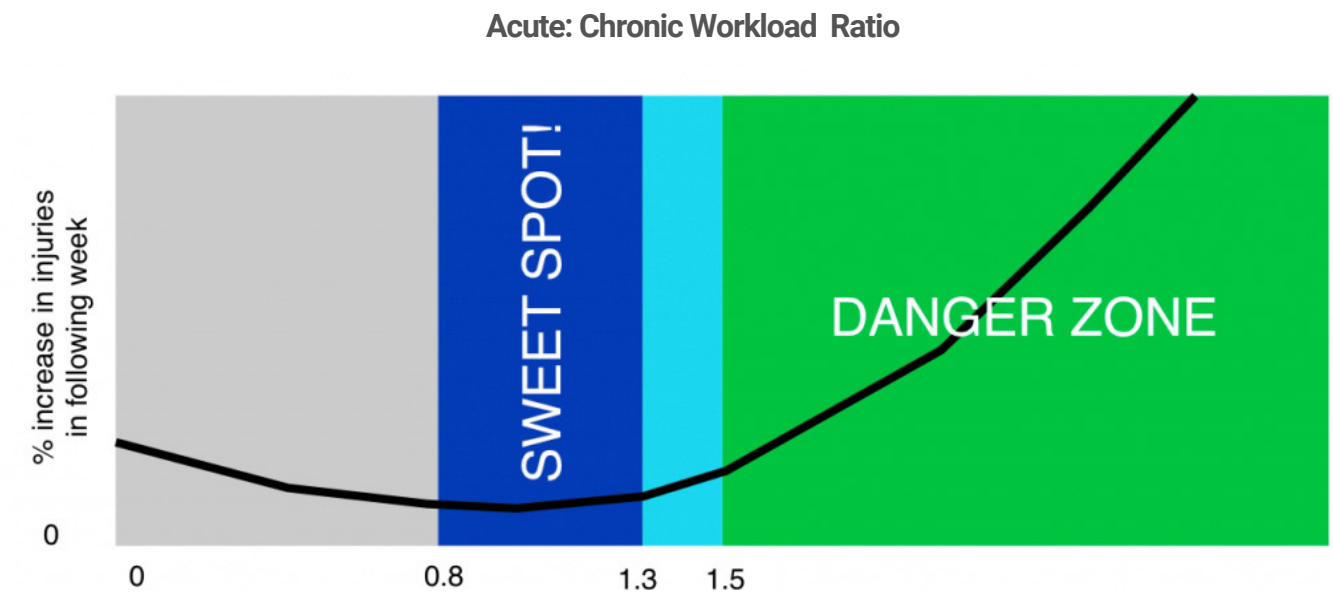
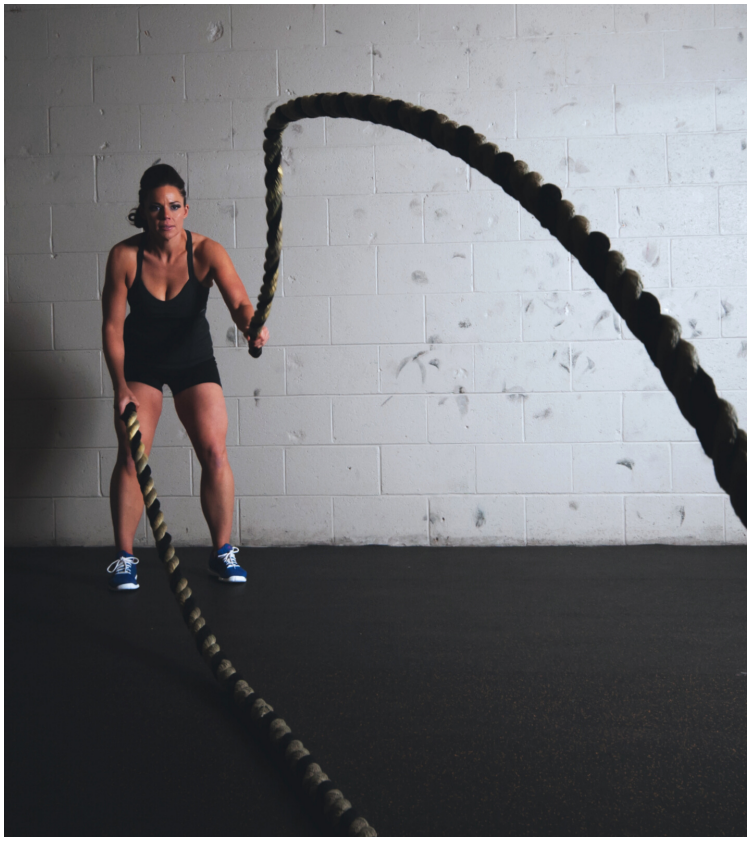


This data provides an overall picture of training load. The optimal training load to improve performance is a balance between increasing fitness whilst limiting fatigue and injury. Data can be used to establish a steadily progressive loading pattern over a period of time that the body can tolerate and adapt to. Large increases in training volume or intensity, will see a sharp increase in load leading to a high acute: chronic workload ratio. Research has found that a ratio above 1.3, where a 'spike' in load has occurred, can increase risk of injury. Similarly, a ratio below 0.8 also has a greater risk of injury (blanch and Gabett 2016).

Whilst this might seem quite complicated; once you have measured and tracked a few weeks of training, you will find plotting your load and calculating workload ratios becomes quite straightforward and can be an invaluable tool to you and your coaches.



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Key points

- Monitoring load can reduce risk of injury and optimise performance by supporting the athlete to identify signs of overtraining.
- Athletes at every level can benefit from monitoring and measuring training load .
- Overtraining and undertraining can increase risk of training.
- Monitor ALL training loads as part of your training schedule.
- Measure training load by recording the amount you exercise and the intensity of your exercise (RPE).
- Establish a moderate, consistent workload which you can then monitor.
- Increases in training need to be gradual to ensure a steady increase in acute: chronic ratio. This will prevent you from going zero-to-hero.
- A ratio below 0.8 or above 1.3 can increase risk of injury.
- Avoid large spikes and drops in load. This often occurs following periods of inactivity e.g. post injury, training for an event.
- Be aware of latent periods following any increase or decrease in training.
    - o Injuries can occur up to 4 weeks later after a spike in training.
- Effective monitoring relies on not just listening to your body, but acting on it and adapting your training program accordingly.

Still lost? (Tips for managing load)

- Consistency is key. Small increases of 10% a week can be a good guide.
- Avoid back-to-back big training days.
- Consider alternating training days into high, moderate, light loads and repeat.
- LISTEN TO YOUR BODY – if you're tired or "flat" – your RPE will change. Need to take this into account when training or planning the next few sessions.