Monitoring training load

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Advanced: for experienced endurance athletes.

Simple training-load tracking, such as session effort times minutes, helps you build gradually and spot overload.

Why it matters: Watches and apps now give everyone readiness scores and load charts. Knowing which numbers are backed by evidence helps you use them without being ruled by them.

The big picture: The popular acute-to-chronic workload ratio didn't prevent injuries in a trial, and heart rate variability guidance helped recovery markers more than performance.

What to do with this

- **Log every session:** duration and how hard it felt on a 0-to-10 scale. Multiply them for a simple load score.
- **Watch for spikes:** especially a single run much longer than anything in the past month (see "Running injuries").
- **Don't rely on the acute-to-chronic ratio** to predict or prevent injuries.
- **Use heart rate variability as one input,** not a verdict. If it's low and you feel bad, go easy.
- **Trust how you feel, too:** persistent fatigue, poor sleep and dropping performance are warning signs (see "Overtraining and burnout").

Go deeper

The terms:

- **Training load:** how much training stress you do. External load is distance or power; internal load is how hard it was for your body.
- **Session effort score (session RPE):** your rating of how hard a session was (0 to 10) multiplied by its minutes.
- **Acute-to-chronic workload ratio (ACWR):** last week's load divided by your average of the past several weeks.
- **Heart rate variability (HRV):** the variation in time between heartbeats, often used as a recovery marker. Higher usually means better recovered, relative to your own normal.

What people believe: Keeping your acute-to-chronic workload ratio in a "sweet spot" prevents injuries, and your watch's readiness score knows better than you do.

Session effort score:

- A simple method rating each session's effort and multiplying by its duration was introduced as a practical way to track training load across all kinds of sessions [1].

The acute-to-chronic workload ratio:

- A 2020 critique concluded the ratio has statistical problems, isn't consistently related to injury, and lacks evidence that changing it reduces injury risk [2].
- In a cluster-randomized trial of elite youth soccer players over a season, coaches who planned training with the acute-to-chronic workload ratio didn't reduce health problems compared with normal training. Coach compliance was low, which limits the conclusion [3].
- In a large study that followed adult runners, the week-to-week change in load wasn't linked to injury, while single runs much longer than the recent longest were [4].

Heart rate variability:

- A 2021 meta-analysis found training guided by heart rate variability improved resting heart rate variability more than pre-planned training. Effects on maximal oxygen uptake and performance were small and not statistically clear [5].

Between the lines: Load tracking is most useful for building gradually and noticing patterns. Precise formulas for predicting injury haven't held up.

Reality check: Most load research is observational, and studies define load in many different ways. Heart rate variability readings vary with how and when they're taken.

How sure are we: Moderate that the acute-to-chronic workload ratio doesn't help prevent injuries. Moderate that sudden single-session spikes in running raise injury risk. Early that training guided by heart rate variability improves performance.

A simple monitoring routine

1. **After each session,** log minutes and effort (0 to 10).
2. **Each week,** total your load and note your longest session.
3. **Each morning (optional),** note resting heart rate or heart rate variability, sleep and mood.
4. **Ease off** when several signs point the same way: low heart rate variability or high resting heart rate, poor sleep, heavy legs, and worse performance.

Sources

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