



Managing Training Load in Athletes: A Coaches' Practical Guide

This guide aims to:

- 1) Define training load and related behaviours;
- 2) Debunk myths linked to training load;
- 3) Share strategies to support adequate training load in athletes.



2026



Chaire de recherche Sécurité
et intégrité en milieu sportif



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TO CITE THIS DOCUMENT :

de Lafontaine, M.-F., Baker, J., Billaut, F., Kaux, J.-F., Radziszewski, S., Belley-Ranger, E., & Parent, S. (2026). Managing Training Load in Athletes: A Coaches' Practical Guide. Research Chair in Safety and Integrity in Sport (Université Laval), University of Toronto, Florida International University, University and University Hospital of Liège.

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What is training load in sports?

Training load generally refers to the **amount, duration, intensity** and **frequency** of sport training. It plays an important role for the athlete's development and performance, whether on their motivation, energy levels, and physical and psychological health.

Characteristics of training load

To measure training load, two key aspects must be considered: **external** load and **internal** load. While external load generally refers to the **objective** physical load, internal load can include the **perceived physical, affective**, and **cognitive load**. The latter can considerably influence an athlete's engagement in training, as well as the quality of their training.

External load: refers to the objectively measured characteristics of the training

Objective physical load: number of repetitions, duration of the training, distance covered, etc.

- *For how long did the athlete train?*
- *How many laps did the athlete perform?*

Internal load: refers to the internal experience of the athlete in reaction to the prescribed / imposed training

Physical internal load: session rating of perceived exertion, soreness or fatigue, heart rate, etc.

- *How did the athlete physically feel during or after the training?*

Affective load: enjoyment, anxiety, stress, feeling pressured, boredom, etc.

- *Is the athlete enjoying the training?*
- *Does the athlete feel nervous about performing a new skill?*

Cognitive load: decision-making, mental fatigue, cognitive processing, etc.

- *Was the training session mentally demanding for the athlete?*

Using both external and internal load measures provides a **more holistic view of an athlete's adaptation to training** than measuring external load only. In fact, it's paramount to evaluate the stress behind the strain; in other words, how the athlete responds and copes to the external training load. **An athlete can respond differently** (i.e., have a different internal load) to a training that they have performed before due to stress or poor sleep, for instance. Relying solely on external load to assess the athletic development or burden **could result in missing important information** on the adaptation of the athlete to various training loads.

Training load can also be characterized in **absolute** or **relative** terms:

Absolute: describes a training, skill or movement to perform, and can be used to evaluate how the training load is perceived or felt by the athlete in the moment.



- *Is the training load adequate (within the athlete's capacity) or challenging (beyond the athlete's capacity)?*
- *Is the training complex (involves new skills) or simple (involves a well-mastered skill)?*

Relative: compares a training, skill or movement to entraînements, skills or movements performed or yet to be performed, and can be used to evaluate the progression of the training; it takes into account the **acute** training load (e.g., in the last week) and the **chronic** training load (e.g., in the last month)



- *Is the training load low, similar or high compared to that of last month?*
- *How does the training compare to the targeted goal (e.g., performing a marathon)?*



See **p.24** for an example of calculation for the acute / chronic workload ratio.

Determinants of training load and performance

It is important to recognize that training load and subsequent performance are influenced by a multitude of factors – therefore, the **athlete's progression may not be linear across time**. The sub-sections below provide some examples of factors and contexts that influence an athlete's capacity to manage training loads and performance, such as lifestyle habits, sport practices, and individual characteristics.



In your coaching role, you have some control over certain sport components, such as giving tailored advice before a competition, planning a training or modelling positive behaviours for the athletes. **Be careful not to intervene in matters that fall outside your professional scope** or within the domain of healthcare professionals. In such matters, it is best to refer the athlete to these professionals (sport psychologist, nutritionist, etc.). Always keep in mind to respect the privacy of your athletes to ensure they do not feel excessively monitored. For instance:

- Make sure the athlete understands the purpose for collecting their performance data and consents to it;
- Respect athletes' boundaries.



For more information on how to **establish healthy boundaries with athletes**, see [this guide](#).

Lifestyle habits

Sleep and rest

Sufficient sleep is fundamental to **facilitate recovery and progressive increase of training load**. Lacking sleep over a long period of time can lead to negative outcomes on training and athletic performance by affecting cognitive abilities (e.g., increase in reaction time, reduced concentration). Late-in-the-day trainings can also be associated with sleep problems.

Conversely, **sleeping more than usual or napping seems to improve athletic performance**. Although it can be associated with a reduction of training load the following day, this can be indicative of adequate recovery rather than a step back in performance.

Nutrition

All training implies a proportional increase in energy expenditure for athletes. Having a healthy and balanced diet, combined with proper hydration, provides the “fuel” necessary for training **by helping the body adapt to the physical changes produced by the training**. Indeed, vitamins and minerals support athletic performance in many ways, by improving recovery, muscle strength, oxygen transportation, energy production, reaction time and concentration, and by reducing fatigue.

On the other hand, training without eating or hydrating sufficiently can promote fatigue, strain, and difficulties to recover, which could increase internal training load. **Coaches should plan sufficient time for athletes to hydrate and possibly eat a snack during training.**



For more information on **positive body image**, see [this guide](#).

Stressful life events

The emotional strain an athlete can feel when experiencing high levels of stress or anxiety outside of their sport can **exacerbate their affective load and impact their athletic performance**. Athletes can go through several changes and life events while involved in their sport, such as academic requirements, difficulties at work or changes in interpersonal relationships. If an athlete is experiencing too much stress or anxiety, they may not be at their best to train. The performance-related anxiety can also **affect an athlete's capacity or tolerance to training load**, which can cause a downward spiral.

A stressful event can negatively impact an athlete's well-being and their athletic performance, **whether the event is related to their sport or not**, and whether it is sudden or chronic. The emotional state of the athlete should therefore be considered at all times, especially in some situations such as challenging competitions, intensive trainings and after performances they may perceive as unsatisfying.

Sport practices

Complementary training / Cross-training

Apart from the specific training required in their sport, some athletes may play other sports or add weight training to increase their fitness. The overall volume resulting from training sessions carried out across different activities throughout the week **can limit an athlete's capacity** to improve their external training load in a specific sport, and their internal load may intensify. However, in the long term, **diversification of training** may be helpful to develop a variety of athletic skills that support overall athletic performance and reduce the risk of injury.

Travelling for competitions / Moving to train

Travelling for competitions or training camps is frequent in sport participation. In some cases, it can involve sitting for long periods of time or changing time zones, which can have a significant impact on the capacity for training and future performance. For instance, travelling can cause fatigue, stress, changes in circadian rhythm, and sleep disturbances, and increase the internal load of the athletes. This can be detrimental to performance by affecting strength, coordination, reaction time, velocity, and decision-making. Therefore, it is important to **consider travelling when scheduling a training or a competition**, and expectations regarding performance outcomes should be adjusted accordingly.

Individual characteristics

Biological maturation and sex

The biological maturation process and biological sex are key elements to consider in line with training and performance. While chronological age refers to the standard age of a person, biological age corresponds to the process of physiological maturity, **which does not necessarily match one's chronological age, and can differ between children**. Therefore, a team may include athletes who have already reached puberty and others who have not. Adaptation to training loads will vary according to athletes' biological and chronological age. In that regard, children are not "small adults" and training should be tailored consequently, based on their biological maturation.

Furthermore, boys and girls do not mature biologically at the same pace nor in the same way. In adolescence, puberty is linked to a spike in hormones that creates physiological differences between them, such as variations in muscle mass, bone density and oxygen utilization, and the menstrual cycle in women. These changes can result in different increases in endurance, strength and speed between men and women, which can partly explain their response to training loads and eventual performance. For female athletes, particular attention should be paid to low energy availability, menstrual cycle and certain injuries (e.g., bone stress injuries).

Physical state

The ability to cope with a given training load can also be influenced by the physical state of the athlete. Feeling fatigued, having pain during training, or being in a particular phase of the menstrual cycle and using hormonal contraceptives are few examples of situations that can reduce the capacity and the will to handle a given external training load and perform as usual. Generally, **an athlete's pre-training level of well-being** can be an indicator of how they will respond to training.

In conclusion, these elements can also add up or interact with one another to predict performance, which makes it even more important to consider the athlete's progression in a holistic way, not only through increases in external training load. These factors can partly explain why external training load can lead to **subjectively variable perceptions** of fatigue or exhaustion.

Potential outcomes of inadequate training load management

Gradually increasing training load is necessary for the body to adapt to the physical efforts required by a particular sport. Training overload or **overreaching** indicates that the athlete's capacity to cope with training load or its increase is exceeded.

- **When combined with appropriate rest**, overreaching can lead to fatigue and decrease in performance in the short term, but it generally can promote physical adaptations and better performance in the long term.
- **Without rest or recovery**, overreaching can lead to negative physical and psychological outcomes.

Potential physical outcomes

Overreaching becomes non-functional where there is an inadequate balance between the physical stress caused by the training load and the recovery needed between training sessions. While functional overreaching is linked to short-term declines in performance, **non-functional overreaching / maladaptation** can result in prolonged performance impairments where the body is unable to recuperate effectively.

Overuse injuries (e.g., tendinitis, stress fracture, periostitis) refer to progressive damage to tendons, bones, muscles and joint structures, particularly when training load exceeds the body's capacity for adaptation and recovery. They can stem from the combination of chronic training without appropriate recovery, as well as from large increments ("spikes") in training load (training camps, competitions) and repeated movements that are sport specific. This type of injury is also observed in athletes that specialize early **1**, possibly due to the narrow range of movements and skills that is required in a single sport.



1. Early specialization can be defined by three components that are present before the age of 12:

- Training more than eight months per year,
- In a single sport,
- While ceasing all other sports.

Another potential outcome that can be linked with inadequate training load management is **relative energy deficiency in sport (REDs)**. Energetic availability is the remaining energy that is available for the body to function properly, while taking into account the energy needed for training. REDs is a syndrome that appears due to a chronic or intense state in which the body does not have enough energy available to operate as usual (see *the symptoms of REDs at p.13*). It can impair the psychological, musculoskeletal, cardiovascular and sexual health of the athlete, as well as their performance in sport, and increase their risk of injury.

Training load paradox



Frequent and intense training sessions increase the risk of injury in the short term; however, in the long term, they can support the development of the physical resilience necessary to prevent future injuries. Conversely, giving athletes low training loads can heighten their risk of injury because of a limited development of their physical abilities. **This paradox underlines why carefully tailoring training is important**, by diversifying the type of training and providing incremental, rather than rapid, increases in training load.

Potential psychological outcomes

While functional overreaching does not produce changes in mood, **too much training can lead to negative psychological symptoms**. A state of non-functional overreaching/maladaptation can cause the following symptoms:



- Fatigue;
- Anxiety;
- Stress;
- Sport burnout;
- Decreased well-being;
- Negative mood.



These symptoms can also indicate that the **recovery time is insufficient** or that **the body is unable to recover properly** from the training. Particular attention should be paid to these symptoms if they become chronic.

Why is it important to manage training load?

There are advantages on several levels to tracking and evaluating training load:

Athletic performance

- Assessing the progress and adaptation of the athlete and / or the team to training load;
- Planning the training schedule for the following months or year, in line with competitions or other sport events;
- Understanding variations in performance;
- Prescribing an adequate training load;
- Assessing the readiness of the athlete to train.

Physical health

- Reducing the risk of injury, illness and non-functional overreaching;
- Reducing the risk of reinjury.

Psychological well-being

- Maintaining / improving athlete's motivation;
- Promote athlete's well-being.

General guidelines

There is no universal measure for managing external or internal training load. Instead, training load should be accounted for by considering the specificities and the requirements of each sport, as well as the needs and capacity of each athlete. Some general guidelines may inform this management:

- **Using both external and internal load measures** that are fitting and applicable to each sport (regardless of the sport) to understand how the athlete reacts to the physiological stress of training; measuring the progress of the athlete should include assessing their mood, fatigue, level of stress, and signs of exertion;
- **Analyzing subsequent performance** to gauge and adapt the training if necessary;
- **Favoring small increases** in training load rather than spikes;
- **Providing adequate rest** between training sessions;
- **Diversifying training** as much as possible to prevent injuries.



Always keep in mind what information you need when assessing the external or internal training load, or the performance, of an athlete. These data should serve a justified purpose, as detailed in the beginning of this section (**Why is it important to manage training load?**).

Sport-specific guidelines



For precise information on your sport, you can refer to your sport's federation to stay up to date with the latest recommendations specific to your discipline. Below are few indications from the scientific literature that can help support training load management.

Individual sports

Use a wide range of measures to monitor training load (*GPS, heart rate, perceived exertion, well-being questionnaires*)

Acute training load: can be measured over a short period (e.g., one training session)

Personalize training load increases to the athlete's readiness

Collective / Team sports

Use measures that can be applied rapidly to monitor training load (*GPS, perceived exertion*)

Acute training load: can be measured over a long period (e.g., a week)

Provide opportunities for brief high-intensity acceleration training

Preventing non-functional overreaching / maladaptation and injury

Managing external and internal load

Effective training requires an individualized approach that accounts for the factors affecting an athlete's external load capacity and the resulting internal load:

- **Creating an open communication channel** with athletes to learn their motivations, needs and training objectives;
- **Progressively increasing the training load** and avoiding spikes in volume;
- **Adjusting the training** if the athlete is going through stressors that affects their capacity to perform as usual.

As mentioned before, assessing both external and internal training loads is fundamental to determine if the training load is adequate for the athlete.

Promoting recovery

Recovery between training sessions is a crucial tool to promote adequate performance and reduce potential outcomes. Here are few elements to consider:

- **Planning periods of rest** as part of the training program and integrating them to the competitions schedule;
- **Emphasizing the importance of sleep** to athletes while being cautious not to prescribe a fixed number of hours, as the amount of sleep necessary to recover may differ between the athletes.

Detecting early symptoms

Having an open communication with the athletes is a good way to help coaches be aware of how they are feeling and to assess if they are at risk for injury or non-functional overreaching. Some symptoms include:



- Unexplained decrease in performance (ex.: not being able to complete training as usual);
- Chronic fatigue or exhaustion (more than 4 weeks);
- Shifts in emotions or mood changes;
- Flu-like symptoms;
- Respiratory tract infection.

Coaches should also pay attention to the **symptoms of RED-S** in both female and male athletes. Indeed, despite being more frequently studied in women, **REDs can also affect men:**



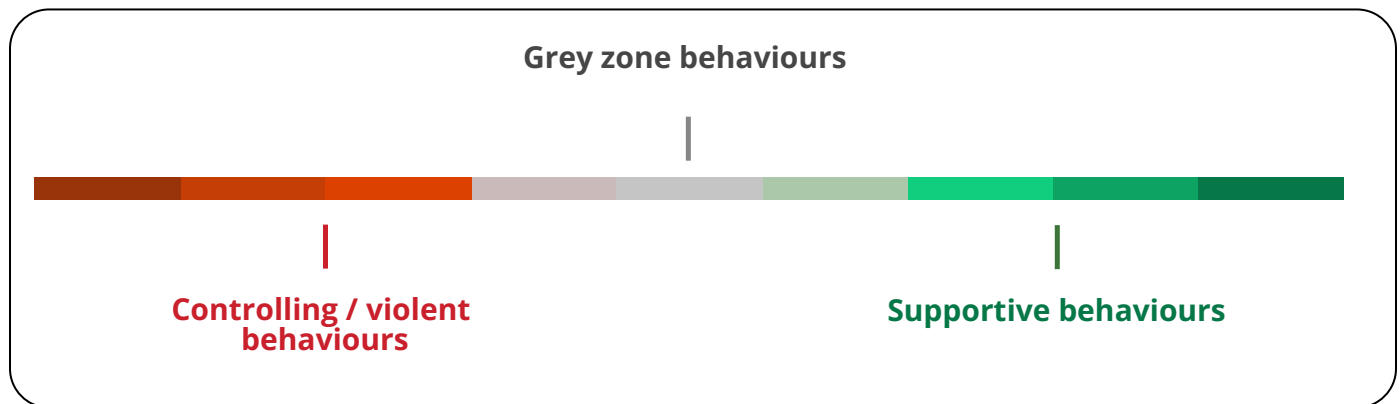
- Use of weight loss methods;
- Rapid and significant weight loss;
- Injuries (ex.: stress fractures);
- Decrease or incapacity to improve the performance;
- Depressive mood;
- Chronic fatigue.

To keep track of how the athlete is feeling, short questionnaires could be used on a daily basis to assess how the athlete feels. **Regular screening of fatigue, mood and pain could help detect overtraining rapidly and prevent negative outcomes for the athlete.** If symptoms are detected, then an adjustment of training load should be planned in combination with recovery. In the case such symptoms become chronic or interfere with the athlete's normal functioning, the coach should refer them to a health professional that can thoroughly evaluate the situation (physician, nutritionist or psychologist).

*For detailed information of the methods to assess athlete well-being, readiness and training load capacity, please refer to the **Tools relevant to training load management (p.23)** section of this guide.*

Approaches to training load

Coaches can adopt a variety of behaviours regarding training load – these behaviours can be situated on a continuum, ranging from controlling or violent to supportive and adaptative. Depending on the sport and the athlete, these behaviours can also fall into a “grey zone”, in the middle of this **continuum**, where the context will inform on if they are acceptable and under which circumstances.



Sometimes, controlling or violent behaviours can be used as means to improve athlete performance. This is considered **instrumental violence** and can have harmful impacts on athletes even though that is not the objective.

Controlling / violent behaviours

- **Not allowing (enough) rest** between training sessions;
- **Forcing an athlete to train** despite injuries or medical contraindications;
- **Ignoring or not paying attention to an athlete** who performs less than usual or less than other athletes;
- **Making comments on an athlete's weight** to justify higher training loads;
- **Displaying uncritical conformity** regarding the training program (“This is the way we do things here”, “We have always done this that way”), or refusing to individualize training for the athlete's needs;
- **Limiting access to water or food** as an incentive to complete the training;
- **Punishing an athlete with additional exercise** (push-ups, “suicides”, laps, etc.).



Many beliefs can lead to the use of controlling or violent behaviours, such as a desire to increase performance or motivation, or to punish inadequate behaviors from the athletes. **Having been exposed to these behaviours as an athlete** can also lead someone to adopt them as a coach.

Grey zone behaviours

- **Increasing training volume or intensity** to perform better for a competition;
- **Encouraging the athlete to push themselves** when they show signs of fatigue.

“Grey zone” behaviours should be **used with caution**. Reflecting on the context and the athlete’s disposition is necessary to determine if the behavior is appropriate. **Training is a collaborative process** with the athlete – expectations for training should be determined and adapted through communications with them.



Consent from the athlete should also be obtained and reevaluated throughout the trainings to ensure they feel comfortable and that their boundaries are respected. When in doubt, it is important to talk with the athlete, use one own’s judgement, and consider the context to determine if the behaviour is appropriate or not. Healthy resilience should also be addressed with the athlete to make sure they are not overtraining or ignoring pain or injuries to complete the training.



For more information on how to **navigate grey zones and consent with the athletes**, see [this guide](#).



For more information on **athlete resilience**, see [this guide](#).

Supportive behaviours

- **Having frequent and open conversations** with the athlete about how the training load is perceived and felt;
- **Asking the athlete** if something is causing them stress before the training;
- **Giving training load that is appropriate** to the athlete’s development;
- **Adapting the training to the athlete’s current energy level or state**;
- **Provide a rationale** and clear expectations for the training beforehand.



For more information on the **use of positive discipline in sport**, see [this guide](#).

Approaches in terms of training load can have various impacts on the athletes, from injuries, poor performance and disengagement (controlling / violent behaviours) to the progressive development of the athlete’s physical abilities (supportive behaviours). Coaches should **reflect on the effects of their behaviours** on athletes and consider alternative strategies.

Debunking myths on training load

Myth: "Training 10 000 hours in one sport is necessary to become an elite athlete"



The time spent training is only one of many factors influencing an athlete's performance.

It is often heard that the accumulation of training is the most important factor to predict performance in athletes. There is a widespread belief that 10 000 hours of training is necessary for an athlete to become an expert in their sport. However, such an approach is not recommended, because it does not consider the individual and social factors in which they are embedded. Training overload during the adolescence can be damageable for adulthood, as it increases the risk of pain. This can also negatively impact the athlete's physical health for the rest of their life.

The number of hours needed to increase performance is variable according to **each athlete's personal characteristics**, as well as the **specificities of the sport**. A 12-year-old athlete does not have the same training needs or capacities as a 17-year-old athlete, just as a runner will not train the same as a swimmer.

Recent evidence also suggests that **long-term achievement** in sport is linked to both specific-sport and **multisport practice**, indicating that diversifying training may be important to enhance future performance. Rather than focusing on the number of hours, coaches should tailor the training to the athlete and use other indicators to measure their improvement in performance (ex.: increase in endurance, easiness to do a technique).

Myth: "The 10% Rule"



The 10% increase is a guideline, not a rule.

Some coaches refer to the 10% guideline to determine the incremental weekly increases in training load. This means increasing the load by 10% compared to the previous week to allow a gradual progression for the athlete and reduce the risk of injury. **However, every athlete is unique in terms of their capacity for chronic load, level of energy, or events happening in their personal life.** Given this, larger or smaller changes in training load that do not fit the 10% guideline may also be adequate. The 10% increases per week should be seen as a guideline, and not as an inflexible rule, by the coaches who aim to support the progression of their athletes.

Myth: "External training load is the only cause of injury"



Injury can result from a variety of factors.

Some aspects of **external load** can increase the risk of injury in athletes, such as repetition of a specific movement or training for long periods of time. A sudden peak in volume or intensity in training, or insufficient recovery periods, can similarly contribute to higher injury risk in athletes.

Elements related to **internal load** can also contribute to injury. Feeling stressed or distracted by events, both within and outside the context of sport, or not having a regular sleep schedule, are factors that can contribute to injury in athletes. The period of peak of growth in young athletes is also prone to injuries and vigilance is primordial to adjust training load consequently. Therefore, if an injury occurs, external training load should be investigated as a possible precipitating factor, but so should other elements.

Myth: "No pain, no gain: pain is normal when you're an athlete"



Although pain can occur in sport, recurring pain should not be a common experience.

This mindset is common in sport, as pain can be more prevalent in athletes that train at higher volumes. Nevertheless, pain should not be the norm when trying to improve performance.

- **Exercise-induced pain:** Acute pain during training is not harmful in itself, but it should act as a signal to adapt or stop training, to prevent the situation from worsening. On a scale from 0 to 10, pain should not go above 3 during training – beyond that level, the risk of injury can increase. Mild pain during exercise may be acceptable if symptoms return to baseline within 24 hours and performance remains stable. Persistent or increasing pain should prompt training load adjustment and consultation with a health professional.
- **Delayed onset muscle soreness (DOMS):** DOMS usually appears 12h to 48h hours following an unfamiliar training and can last from 2 to 5 days; it is a normal type of soreness experienced after training and is not harmful.
- **Chronic pain:** Chronic pain is recurrent pain that has lasted for at least 3 months. This type of pain is a cause for concern and should be assessed by a qualified professional.
- **Injury:** Injury is a tissue damage or impairment in physical functioning that occurs through exercise.



Under no circumstances should pain be used as a motivating tool to pursue training or to “push through”. Continuing the same amount of exercise despite pain can lead to overuse injuries and harm one’s physical and mental health. As a coach, it is important to validate an athlete who experiences pain and not shame them if they cannot complete the required training regimen. **Normalizing** the reduction of training load, or stopping the training altogether, may be necessary to preserve the athlete’s physical and mental well-being. It should also be kept in mind that some athletes may minimize pain for various reasons, such as fear of losing playing time or disappointing the team.

Myth: "Any training load should be tolerated, as athletes need to self-sacrifice and show no weakness"



These norms can lead to negative outcomes for athletes and do not improve performance.

A sport culture centered on performance supports beliefs such as athletes should not complain or show weakness (pain, fatigue, anxiety, etc.), and should constantly push themselves beyond their limits. This sport culture could lead an athlete to feel uncomfortable putting their limits when training, to ignore their injuries, to endure pain, to neglect their well-being, or to sacrifice personal relations or interests for the sport. **Coaches should not encourage or tolerate this sport culture** by asking athletes to complete trainings that go too far beyond their capacities or that may not be appropriate due to the presence of injury, fatigue or pain.

Myth: "More training is better than less"



Effective training is not only based on volume.

Moderate, rather than high, training loads are generally better to promote athletic progression in adolescents. Some elements related to training load can affect the health and performance of the athlete:

- Higher training loads or training **without adequate recovery**;
- Training sessions **scheduled close together**;
- **Competition schedule** (e.g., scheduling an intensive training session before a competition may not be optimal, especially if the competition represents a significant increase in the usual training load).

If a technical movement is repeated many times, sometimes incorrectly, only for the sake of training, it may not contribute to improve performance and may instead reinforce poor mechanics. To prevent declines in performance and preserve the athlete’s well-being, adjusting or diminishing training load may be necessary.

How to foster adequate training load in athletes?

Coaches play a central role in supporting athletes in their sport by planning the training load. Below are key strategies for adequate training load planning that fosters the enjoyment, as well as the physical and mental health of athletes.

1 Adjust training load to each athlete

Talk with your athletes

- Although you have technical knowledge and expertise as coach, the athlete remains the person who knows the best how they feel in relation to training load;
- Understand their specific needs within their context.

Take into account elements outside of sport that can impact the performance of the athletes

- Normalize taking breaks or reducing training load if needed;
- Promote open communication so the athletes know they can reach out if they are experiencing difficulties;
- Respect the rhythm of the athletes without pressuring them to pursue training if they are not in the right state;
- Respect the boundaries of the athletes (see [this practical guide](#) for more information).

Adjust the training load to the individual progress and response

- Take into account the progress of each athlete rather than comparing them to one another or to how an “average athlete” should perform;
- Take into account performance based on the athlete's training age;
- Consider other activities or sports that may impact capacity to tolerate training load;
- Consider any recent injury or events (exams, competitions peaks in other sports) that may impede their performance, or cause stress or inadequate sleep, as well as training loads from other sports;
- Remember that adaptation to training load can vary both between and within athletes.



Although it is important to consider elements within and outside of sport in training load, **controlling behaviours towards the athlete should be avoided**, such as monitoring their diet, imposing a sleep schedule, or asking questions that are invasive. As coach, make sure that you give advice only on the technical aspects of the training and refer the athlete to the appropriate professional if needed.



Calibrate the training load to prevent injury

Train smarter, not harder

- Favor progressive increases in training load, rather than sudden peaks in volume or intensity;
- Make sure the warm-up is appropriate for the sport practiced.

Combine training sessions with appropriate, mandatory resting periods so that the athletes do not experience non-functional overreaching / maladaptation, or increase their injury risk

- Plan additional resting periods if the athlete is traveling for a competition or another sport event.

Encourage a multisport approach

- Consider including other sports as complementary training to reduce the risk of injury and the movement redundancy;
- If possible, specialization in only one sport should only occur in late adolescence to reduce injury risk.

Resume and increase training load gradually after periods of inactivity (e.g., following an injury, at the beginning of the season)

Keep an eye out for signs of injury

- Chronic pain;
- Excessive fatigue;
- Functional limitations;
- Lack of motivation;
- “Heavy legs”;
- Decrease in performance.

3

Focus on the well-being of the athlete

Make sure training is fun for the athletes

- Vary the activities throughout the training;
- Plan challenging activities;
- Put new skills into practice.

Address athletes' physical and emotional well-being

- Understand how you can help athletes with stress management;
- Diminish training load if they exhibit lack of motivation or difficulties to concentrate;
- Discuss the potential impact of the menstrual cycle on training load (without forcing female athletes to disclose information on that matter).

Create a space that fosters open communication

- Communicate clearly the objectives of each exercise;
- Encourage the athlete to give their opinion on the training and be receptive to their feedback;
- Express your emotions in a healthy manner at all times, even if the training does not go as planned (see [this practical guide](#) for more information on emotional regulation);
- Develop and implement strategies to prevent and resolve conflicts (see [this practical guide](#) for more information).

Pay attention to the state of the athlete before, during and after the training:

- By directly asking the athlete how they're doing and talking with them;
- By observing the athlete during practice;
- By asking the athlete about their mental or physical state (ex.: rate pain or perceived exertion on a scale from 1 to 10; see the **Tools relevant to training load management** section at p.23).

Signs of decrease in motivation and / or mental health



- Regularly missing practices;
- Lack of engagement in training;
- Social withdrawal;
- Anxiety or depression symptoms;
- Chronic fatigue.

Want to learn more?

**Practical guides for
coaches**



[Click here](#)

**Information on
REDs
(in French only)**

[Click here](#)

**Clinical evaluation
tool for REDs
(in French only)**

[Click here](#)

Tools relevant to training load management



Remember that questionnaires and scales can be helpful when they **complement open communication with athletes**. The best way to manage training load remains to get to know athletes and discuss training load with them.

Rating of perceived exertion scale

The Borg rating of perceived exertion scale (RPE) is a self-rated tool that assesses the perceived intensity of physical effort. This scale ranges from 0 (very, very light effort) to 10 (maximal effort). For the coaches, using the RPE scale can help determine how intense training is for the athlete and give an indication of their internal load. The RPE scale can also be used in the context of a return to training after injury to make sure that the effort is tolerated by the athlete.

Pain scale

Assessing pain regularly is important to gauge if the training is adequate or not. For instance, a scale ranging from 0 to 10 (with a higher score indicating higher severe pain) could be useful to assess pain rapidly. As detailed in this guide, pain should not go beyond a rating of 3 out of 10 during training to avoid increasing the risk of injury.

Hooper index

This tool has four questions that assess sleep quality, fatigue, stress and muscle soreness. Athletes rate each component on a scale ranging from 1 to 7. The sum of these items yields a score that helps determine the readiness of the athlete for the training session, with a higher score indicating a worse state for the athlete. This can be useful for the coach to determine and adjust the training load for a specific session.

The Profile of Mood States questionnaire

The Profile of Mood States (POMS) questionnaire is a tool that evaluates emotional states through several dimensions, including vigor, fatigue, anxiety and depression. It can be useful to assess the readiness of athletes to train or to measure their internal load after training. A short form of the POMS is also available to measure rapidly the emotional state of the athlete throughout the training.

Acute / chronic workload ratio method

The acute / chronic workload ratio (ACWR) is one of many methods that can help estimate how prepared an athlete is to sustain increases in training load and to prevent injury. This ratio compares the **acute** training load (during a training session) to the **chronic** training load (in the last few weeks).



An ACWR of 1 or less indicates the acute training load is low compared to the chronic training load. In that case, the athlete is considered to have developed adequate fitness to sustain the training.

- Example: A swimmer does an average of 22 laps per training. In her next competition, she will have to do 20 laps. The resultant ACWR is **0.91** ($20 / 22$).



An ACWR beyond 1 indicates the acute training load is high compared to the chronic training load. The athlete may be fatigued, because the training load is higher to what they are used to perform.

- Example: A runner is able to train for around 110 minutes. As part of his training plan, he needs to reach 140 minutes of training next week. The resultant ACWR is **1.27** ($140 / 110$).

Studies suggest keeping the **ACWR values between 0.80 and 1.30** to reduce injury risk, and that values equal or greater to 1.50 are linked to higher risk of injury.



The ACWR is not a rule to apply in every case, but rather a **general guideline** to support adequate progression in training load. Specific elements should be considered in the ACWR estimation:

- **Determinants** of training load (see **p.5**);
- **Competitions**, that generally lead to an increase in training load;
- **Practicing more than one sport**, because variable training intensities and frequencies can add up and skew this ratio.

Putting it into practice

Think about a specific situation regarding training load that occurred recently while you were a coach. This could be either in the context of a new training exercise, planning a training session or preparing for a competition.

Describe the situation.

How did the athlete(s) react to the training load? You can refer to elements related to internal load (physical, affective, cognitive).

Are there things you would do differently in this situation? Think about training load myths and determinants, and supportive behaviors suggested in this guide.

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