FIRSTBEAT

Supporting Athlete Well-Being

Contents

Introduction

Supporting athlete well-being is the responsibility of teams, athletes, coaches and sports science departments across all sports. How effectively this is done can affect performance, player development and mental health.

An athlete's well-being is impacted by their situation on and off the field of play so a holistic approach is required. Suffering from poor physical or mental well-being away from the team facility can see a player's performances suffer, whilst the mental and physical pressures that come with competing at a high level can take their toll on body and mind if not managed correctly. 1 in 5 people experience a mental health issue each year in the United States[1]. Just because someone is an elite athlete doesn't make them immune to the same issues.

That's why athlete well-being is becoming a priority across the sporting spectrum. Examples of what is being done around the world include:

- UK Sport has highlighted athlete welfare as a key priority in 2019
- NCAA Chief Medical Officer cites athlete mental health as the number one health and safety concern in college sports
- The English Premier League's Elite Player Performance Plan (EPPP) education department is delivering a program to support the mental, lifestyle and welfare development of all academy players

This guide will look at what impacts well-being in elite sport and aims to help you support every athlete you work with. It will focus on; identifying psychological stressors athletes encounter, the importance of good quality sleep, and monitoring internal load.

[1] https://www.nami.org/Learn-More/Mental-Health-By-the-Numbers

Stressors

In the competitive world of sport, athletes encounter a combination of physical and psychological stressors every day. Internal and external pressure to perform, training variance, erratic travel schedules or even traumatic life events are just some examples of the stressors which influence athlete well-being.

Stress is an inescapable part of sport at the elite level and it is a double-edged sword. How athletes cope can lead to drastically different results. Harness stress correctly and it can propel players to perform at their peak when it matters most, letting them thrive under the high-pressure environment of game day. But, struggle to balance stressors with appropriate recovery – or fail to take them into account when monitoring load – and it can lead to mental errors, depleting mental well-being, and physiological issues like injury and illness.

> "Success is not immune to anxiety or depression."
> Kevin Love, Cleveland Cavaliers

A Yale Stress Center study found that life event stress and perceived stress impaired short-term muscular recovery from resistance exercise[2] . Whilst research published in the International Journal of Kinesiology & Sports Science found that mental stress negatively impaired decision speed in basketball[3].

There can be serious consequences beyond performance, too. In 2015, FIFPro (the worldwide representative organization for professional soccer players) found that, of 607 players surveyed, 37 percent reported symptoms of anxiety or depression[4].

> Did you know...
> University of Missouri researchers found college football players were 3.19 times more likely to have an injury restriction during weeks where they had high academic stress[5].

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[2] https://www.ncbi.nlm.nih.gov/pubmed/22688829
[3] http://www.journals.aiac.org.au/index.php/IJKSS/article/view/2041
[4] https://fifpro.org/news/new-research-links-severe-injuries-to-mental-illness-in-football/en/
[5] https://munews.missouri.edu/news-releases/2015/0803-high-academic-stress-linked-to-increased-illness-injuries-among-college-football-players/

Fletcher et. al describe the three types of psychological stressors athletes experience as; *Organizational*, *Competitive*, and *Personal*.

If an athlete is overwhelmed by a stressor in any of these categories their performance and mental well-being can suffer dramatically.

Type of stressor	Definition	Common examples
Competitive	Stressors related directly to the sporting situation the athlete finds themselves in	• Injury • Returning from injury • Pressure approaching game day • In-game pressure • The opposition • Competition for places • Issue with form and/or technique
Organizational	The environmental demands primarily associated with the organization the athlete is operating within	• Training issues (e.g. change in set-up, coach, training content, training practicalities) • Interpersonal conflict with teammates/coaches • Perceived lack of support from organization • Travel/accommodation issues
Personal	The environmental and personal demands placed on the athlete directly associated with personal life events	• Lifestyle issues/changes (sleep, alcohol use) • Financial issues • Traumatic life events • Outside commitments (e.g. Student-athlete education commitments)

Table 1: The three categories of stressors impacting athletes.

Encouraging open communication with players, introducing strategies to improve resilience, and adjusting according to specific situations can help players avoid becoming overwhelmed.

Measuring stress and recovery is a powerful tool to show the athlete how their body is responding to different stressors. It also acts as another piece of the puzzle for coaches as they plan sessions around optimizing performance. Using Formula 1 racing as an example, Firstbeat measurements highlighting stress-recovery balance led to one team adjusting their travel schedules and changing the routine for drivers during days off to help maximize recovery. Data showing exactly when the drivers were experiencing stress throughout the day was also used to control stress derived from the media and press.

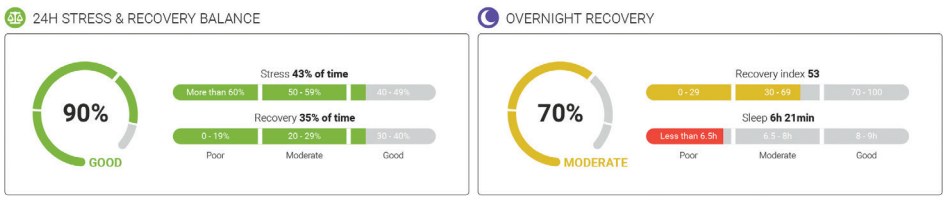

Image 1: Firstbeat's 24H Stress and Recovery Balance and Overnight Recovery metrics show how an athlete is coping beyond training.

Sleep

Getting good quality sleep should be paramount for athletes. It is the primary opportunity for the body to recover.

Failure to find an appropriate stress-recovery balance exposes athletes to injury, illness and fatigue - impacting their ability to push themselves during training or an upcoming game or competition. Simply put, without enough good quality sleep, athletes are on the back foot when it comes to physical and mental recovery.

Among the wider population, inefficient sleep has been directly linked to poor well-being and it is no different for athletes. An individual suffering from poor sleep is more susceptible to feelings of anxiety and even illness. A 2019 study involving Australian Football players found that reduced sleep quantity was associated with increased incidence of illness within the next 7 days[6].

And poor overnight recovery can negatively impact cognitive decision-making and mood as the body is not equipped with the physiological resources to deal appropriately with the stressors it encounters.

To combat this, adults are recommended to get between 7-9 hours of sleep each night[7]. But, due to the added strain they're putting on their body and mind on a daily basis, athletes are recommended to get a minimum of 9 hours sleep.

> Did you know...
> The Firstbeat Sports database shows 52% of athletes monitored are getting fewer than eight hours sleep. If it isn't possible to obtain the recommended hours of sleep then maximizing the quality can have a positive impact.

Unfortunately, sometimes that's simply out of the hands of athletes and coaches as tight travel schedules, game times, and life factors such as new born babies can all limit the amount of sleep obtained. Nevertheless, establishing good team processes is crucial in helping athletes make positive sleep choices.

Teams are starting to wake up to the importance of sleep. They are adjusting protocols accordingly when it comes to varying training intensity, improving sleep environments and educating on the negative impact of electronic devices like tablets and mobile phones in the bedroom.

From placing beds at the practice facility (as Tottenham Hotspur did in 2018[8]) to adjusting the start of practice sessions the morning after travel, teams are taking direct action in a bid to give their players the best chance of achieving effective overnight recovery.

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[6] https://www.jsams.org/article/S1440-2440(18)30262-7/abstract
[7] https://www.sleepfoundation.org/press-release/national-sleep-foundation-recommends-new-sleep-times
[8] https://www.tottenhamhotspur.com/news/2018/november/the-sleep-technologies-keeping-players-fit-and-fresh-at-the-lodge/

Did you know...
23% of 607 professional soccer players surveyed by FifPro reported suffering from sleep disturbance.

The well-being and performance benefits of good quality sleep are well-documented.

A Stanford University study looking at basketball players showed the results of increased sleep in performance[9]. When sleeping for over 10 hours, players achieved better sprint speeds and saw their three-point and free throw shooting percentages increase.

Meanwhile, a 2018 study by Leeds Beckett University noted a correlation between self-reported sleep quality and wellness the following day in youth athletes[10].

There is no one size fits all solution to achieving better sleep. Especially in the competitive sport environment where so many factors limit implementing 'ideal' sleep scenarios. But putting in place specific protocols can help facilitate effective overnight recovery and maintain athlete well-being. Example protocols include rules limiting electronic device use in the bedroom and ensuring sleeping conditions on the road are as similar to home as possible.

Monitoring athlete sleep means you have the data necessary to see if intervention is required, and if implemented changes are working. Individual athlete data allows you to recognize any red flags when it comes to poor sleep which could manifest themselves in the form of physical or psychological hurdles further down the line.

Sleep survival kit:

- Make sure the bedroom is the correct temperature (68-70°F often optimal)
- Keep electronic 'blue light' devices out the bedroom
- Try to keep to the body's biological sleep clock
- A daytime nap can help recharge and recover

Educating athletes on the benefits of sleep hygiene is important. The better they understand the value of effective sleep, the more likely they are to take responsibility for their routine before their head hits the pillow.

The Firstbeat Bodyguard 3 device is an effective way of doing this. Because it highlights the quality of recovery during sleep, not just duration, it provides objective data showing the effect of a pre-sleep routine on overnight recovery. The device can be used as the next step when a player mentions issues with their sleep and actionable decisions on routine and training can then be made using reliable data.

[9] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3119836/
[10] https://www.researchgate.net/publication/324017204_The_influence_of_training_load_exposure_to_match_play_and_sleep_duration_on_daily_wellbeing_measures_in_youth_athletes

Internal Load

Load management plays an important role in optimizing performance, reducing injury risk and maintaining athlete well-being. But finding the balance between high-intensity training that allows athletes to improve whilst also ensuring enough rest and recovery is a delicate balancing act.

Monitoring an athlete's internal load is one piece of the jigsaw. It allows you to see each player's individual response to a training or game workload and react appropriately.

Using internal load data alongside other factors already discussed such as sleep quality and response to stressors can help create a picture of an athlete's situation. When interpreted correctly this data can help inform decisions on everything from session intensity and participation to starting lineup decisions and return to play protocol.

Ignoring your squad's response to workload can expose players to higher risks of injury. Monitoring Acute:Chronic Workload Ratio (ACWR) is one approach used to track an athlete's exposure to injury risk.

A recent study by Southampton Football Club found that, when players' chronic load (accumulated load over an extended period of time) was low, an ACWR of above 2 was associated with a 5-7 times greater injury rate amongst players[11].

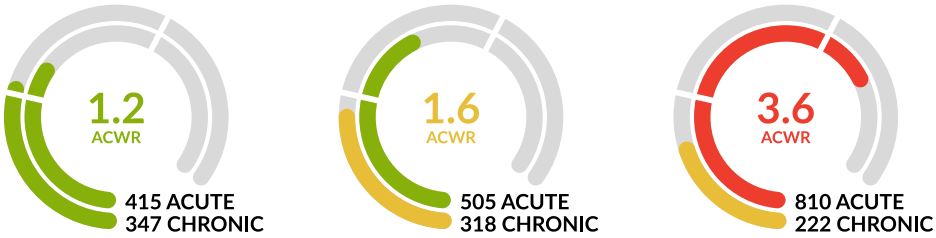

Image 2: Three examples of the Acute vs Chronic Training Load as shown on the Firstbeat Sports dashboard. For a detailed introduction to this Firstbeat feature visit, https://www.firstbeat.com/en/blog/interpreting-acute-vs-chronic-training-load-a-firstbeat-sports-feature/

Tracking internal load metrics such as Training Effect and TRIMP (Training Impulse) allows you to plan accordingly. An athlete's response to training can change on a daily basis. Failing to factor in their individual response can mean a wide variance between expected and actual training effect from a training program.

And we shouldn't just focus on those players playing every minute of every game, either.

Maintaining the fitness levels of players who aren't getting as many game minutes is as important, if not more so, to maintain their physical well-being and make sure they're ready to play when called upon. It also helps prevent unwanted injuries which can occur when players are suddenly exposed to increased workload as game time increases.

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[11] https://bjsm.bmj.com/content/early/2019/02/21/bjsports-2018-099422

Incorporating top up sessions for those lacking game exposure into weekly training plans can help combat this.

The time of season is another important factor to consider when tracking internal load and designing training programs. Unlike pre-season where there is a focus on increasing baseline fitness and, therefore, higher intensity sessions, busy periods where fixtures come thick and fast mean coaches may have to implement strategies that prioritize recovery in order to maintain physical and mental well-being of the team.

Using internal load data, such as the TRIMP metric provided in Firstbeat Sports, lets you make sure the right physiological reactions are taking place when you want them to among your team. Comparing single session results against established training load norms can help pinpoint players at risk and those who can be pushed harder.

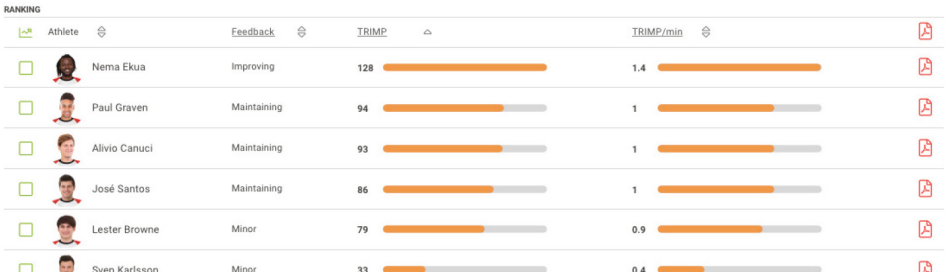


Image 3: This table shows TRIMP for an entire squad during one session designed for high intensity work. Coaches should recognize the low TRIMP scores and check these players' recent TRIMP scores to identify any developing trend.

Data transparency can help athletes prioritize their own well-being and learn how to take responsibility for their own situation.

Firstbeat's Athlete Portal and Sports App make it possible for coaches to make individual physiological data such as Training Effect available to athletes immediately after a practice session or game. Athletes can be kept in the loop on their own condition by choosing to send them individual reports detailing that session's results. This can help them make informed choices when it comes to what happens beyond training, as well as have a better understanding of why a session may have seemed particularly tough.

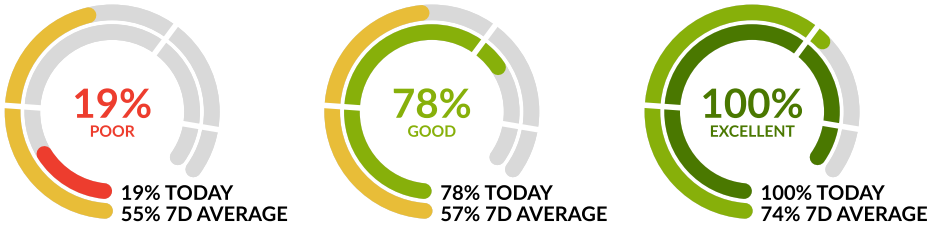


Image 4: Three examples of the Quick Recovery Test (QRT).

How Firstbeat Can Support Well-Being

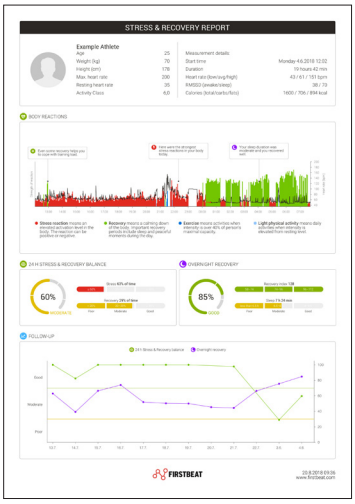
Firstbeat Sports provides a platform to monitor athlete well-being at an individualized level. Every athlete is different and their individual response to situations is important to acknowledge in order to support their well-being and put them on a path to personal and professional success.

Firstbeat Sports' advanced performance analytics provide data that can help you make the right call when it comes to training, travel, and everything in-between, at both individual and squad level.

Stress & Recovery Analysis

Firstbeat's Stress & Recovery Analysis gives both coach and player the big picture beyond training. Monitoring players for a full 24-hour cycle gives insights into how stressors across a full day are impacting an athlete's stress-recovery balance, and how effective their sleep is in terms of recovery achieved.

Data accumulated can help introduce bigger discussions on wellness with specific players, provide coaches with more information when making key decisions, and help athletes take ownership of their own well-being.



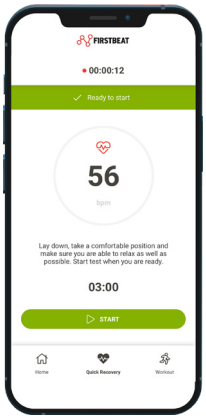
Training Load Monitoring

Firstbeat Sports provides over 50 metrics to monitor a player's response to training. These results are relayed to coaches and, when appropriate, players in real-time and are available in easy to interpret, automated reports after each session.

Analysis of metrics such as Training Effect, time in Intensity Zones and TRIMP lets you stay on the right path when it comes to supporting athlete well-being and fine-tune training programs to maximize effectiveness.

Performance Readiness Checks

The Firstbeat Sports: Athlete app helps athletes take responsibility of their own well-being. Seeing results of training or Quick Recovery Test (QRT) sessions on their phone helps athletes evaluate the effectiveness of recovery strategies and interventions. Conducting the 3-minute QRT via the Firstbeat Sports app means it can be done at the athlete's own convenience and outside of team surroundings. All that's required is Bluetooth heart rate monitor and an iPhone. The feedback is scaled based on individual measurement history to enhance the meaningfulness of results.



How do I learn more?

Visit firstbeat.com/sports-coaching/user-stories to read success stories from teams like Detroit Red Wings, Hertha BSC, UCLA football and Saracens Rugby.

Listen to the Firstbeat Sports Podcast to hear from leading coaches and sports scientists about the latest in performance monitoring: firstbeat.com/en/podcasts/.

MORE INFO: firstbeat.com/sports

"The main benefit we see in using Firstbeat is to drive a dialogue between all the different parties around the team. Whether that is the coaching staff, sports medicine, strength and conditioning, or the athletes. It drives a conversation."

- **Sean Conaty**, Director of Strength and Conditioning for Olympic Sports (Men's Basketball & Volleyball), University at Buffalo

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