



**BARÇA**  
**INNOVATION HUB**  
Universitas

# **INJURIES AND TEAM SPORTS**

**RETURN TO TRAINING AND  
COMPETITION**

## → 4.1 Return to play: decisions to make to return a player to competition

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- Introduction
- General concepts
- Decision-making
- Key points
- Ethical aspects of RTP (return to play)
- Interference from other teams, physicians or interests
- Conclusions

### **Introduction**

Injury management is a fundamental part of sports medicine. The final phase of the process, where we determine when players can return to training and, more importantly, when they can return to competition, is a key stage in the process called return to play (RTP). It is argued that players should return as early as possible so that they can contribute to the team's performance without losing competitive skills. At the same time, it is important that the return is not premature, as this can cause setbacks in the recovery process, injury relapse and a higher probability of additional injuries.

## What are the latest trends in current philosophy on the decision-making process?

Taking into account the latest scientific publications, the study of RTP has made limited progress **Delvaux, F., Rochcongar, P., Bruyère, O. et al.** (2014). Today, there are few studies that adequately address this area and focus on the reality of the sport itself **Heiderscheit, B. C., Sherry, M. A., Silder, A. et al.** (2010). There are two key questions here:

- 1) How do we currently evaluate RTP?
- 2) How should we need understand the RTP process? Should RTP be considered simply as a static process with a series of parameters that must be overcome and achieved when the injured player has reached the final stage, or is it a dynamic, adaptable, modifiable and constantly creative decision-making process?

Every single decision made from the very beginning of the injury process affects the final RTP criteria. The first decision leads to the next and the process becomes a network of decisions that involves a feedback loop where the different variables interact. But what are the variables?

- 1) A correct and accurate diagnosis, based on the biological properties of the affected tissue.
- 2) Strict control of physical load during the recovery process.
- 3) A well-planned management of the modifying risk factors and the modifying factors of each decision.

To fully understand and explain these variables in depth, it is important to emphasize that RTP must be understood as a dynamic and individualized process.

The main objective is to reduce the risk of new injuries and not to understand RTP strictly in terms of time. During a dynamic process, there are many different factors that will interact and modify the final outcome.

## **A correct and accurate diagnosis, based on the biological properties of the affected tissue**

A common and serious error with RTP is an incorrect diagnosis. This is linked to incorrect and poorly planned decisions in regards to the injury, which impact final outcomes (**Orchard, J., Best, T. M., y Verrall, G. M.** 2005). Consequently, it is important to understand that the RTP decision-making process is influenced from the very beginning of the recovery process. A correct diagnosis is the most important step in RTP; in fact, it is the cornerstone of the process. We cannot simply base decisions on an MRI or on data obtained via GPS (global positioning system technology applied to soccer that analyzes athletes' strength and speed). Rather, we must consider all the parts together, along with the clinical symptomatology, and understand that they are all important components in the decision-making process. Internal load components, such as the quantity and quality of sleep, stress, mood and nutrition are becoming increasingly relevant to the RTP process.

In regards to the diagnosis, many variables must be taken into account when working with professional athletes. Anatomic variability and the different healing capacities of connective tissues, such as the tendon, the muscles and the fascias (**Garrett, W. E. Jr.** 1996; **Voleti, P. B., Buckley, M. R., & Soslowsky, L. J.** 2012) are important to consider when planning the recovery process and return to competition of a muscle injury (**Miller, M. D., Arciero, R. A., Cooper, D. E. et al.** 2009). As such, it must be taken into account that a tendon heals very differently from a muscle. It is also important to differentiate between a first-time injury and a recurring injury, which could trigger a chronic problem.

It is essential to differentiate the recovery process based on the exact needs of the injured player and carefully monitor rehabilitation progress and the impact that an injury may have had on his physical condition, cognitive qualities and spatial mobility, along with other factors specific to each sport. It is also vital to provide dietary and lifestyle advice that can positively influence the recovery process. It is also the responsibility of the medical team to ensure that players do not take harmful or prohibited substances in an attempt to speed up the RTP process.

There is a wide range of definitions for RTP, but the most suitable definition (**Müller et al.** 2014) would be full readiness to train and participate in matches. Furthermore, the training phase must be understood as part of the

recovery process, whereby the player may receive permission or medical discharge, but not for competition. There are a number of objectives to consider before making a decision to return to competition. These include:

- Reaching pre-injury levels of physical fitness.
- Completion of a rehabilitation program.
- Full activity and readiness for intense training sessions.

What does reaching pre-injury levels mean? Does it mean a point where the player is always 100% healthy? How can we be sure that the player was healthy and injury-free before the injury occurred? (**Askling, C., Saartok, T., & Thorstensson, A.** 2006)

It is important to understand whether pre-injury variables were a possible risk factor for injury. Often, the pre-injury level is part of poor adaptation to training and competition, which could indicate that the player was already at risk.

Would the player have been less likely to suffer this injury if his pre-injury condition had been better? Was there any indication that the player was at risk of suffering a specific injury? Is the injury related to a loss of strength? And if the player was experiencing a deficit in terms of muscular force, what was the cause?

There are many possible factors that can contribute to a player being exposed to a higher risk of injury. The type of injury, its biology, the cause of strength deficits and loss of cognitive agility are key factors for determining rehabilitation and RTP processes (**Askling, C., Saartok, T., y Thorstensson, A.** 2006)

### **The individualization of training loads is the second key component of RTP**

The world of sports has become more scientific and players and trainers have to quickly adapt if they want to keep up with "sports today". Some training strategies and methodologies are now obsolete. The majority of exercises, including those known as secondary prevention, do not have any preventive effect and the majority of the time only serve to overload the muscles. Therefore, it is vital that we discuss this change in the concept of prevention. The objective should not be seen as prevention per se, but rather we need to look at the concept of adaptation. Injury due to muscle overload

should not be understood as a mechanical alteration of healthy tissue, but rather as a series of aberrant adaptive responses that, over time, will not allow tissue to adapt to increased loads and stress. There have been numerous advances in understanding how the human body functions. This has led to new methods and ideologies in terms of training structures, types and intensities, aimed at maximizing athletic performance, but, at the same time, maintaining the player's health as well. Medical teams must do everything they can to improve their multidisciplinary approach and understand the decisions that players make. All stakeholders must be educated on the evolution of a specific player's rehabilitation, highlighting the practical implications and benefits.

A static assessment of a player's abilities, regardless of the specific athletic environment, is a current-day mistake and a new challenge that sports physicians must tackle. Important information is not only sourced from the doctor's office. Beyond a clinical examination and magnetic resonance scans, many medical teams and coaches believe it is important to use GPS (**Hallén, A., y Ekstrand, J. 2014; Järvinen, T. A., Kääriäinen, M., Järvinen, M. et al. 2000**) when individualizing the progress of the injury and in order to obtain a solid framework for validating RTP and load management for soft tissue. The technology used to monitor workloads provides us with a large amount of data and physicians must validate what could be useful to establishing an *individualized profile*. This kind of profile is obtained by collecting data from each training session and can indicate when the player is in an optimal state of health and physical fitness. There are different profiles within a team: predominance of acceleration, deceleration or a combination of both profiles. This implies that RTP will differ depending on the specific abilities of each player. The variables collected daily from trainings and matches will help shape the player's status. The most important variables are acceleration, deceleration, high-speed running (HSR), HML, sprints and step balance. That way, we can find out the individual characteristics of each player and can use this information to improve the player's adjustment profile. Monitoring these long-term variables creates a complete profile of each player based on their individual characteristics. It can help us identify when players are most vulnerable to injury, their tolerance to training sessions and help us better understand their recovery progress. During this process, adapted circuits focus on the objective that needs to be achieved. Circuits will differ depending on whether the goal is speed (HSR or high speed running, the maximum speed reached by an athlete in a given action) or strength (acceleration/deceleration; to be able to accelerate and brake, considerable

strength is necessary). The rehabilitator will design circuits where different physical qualities that are necessary to making progress in the injury rehabilitation process can be worked on.

### **Intelligent management of modifiers**

The rules of different sports significantly affect an athlete's return to play; in soccer, a player needs to fully recover from an injury, while in handball or basketball a player can start playing earlier, as these sports allow frequent player changes during a match. Returning to play does not have to mean that the player must play the entire match when they first return. The rules of soccer allow for substitutions, which gives teams the opportunity to gradually introduce a player back into the game and ensure that the tension and load are not too high or too soon. Physicians must have expertise in sports and a deep knowledge of the environment to be able to intelligently manage the decisions made jointly with the player, coaching staff and trainers. Thus the experience acquired by physicians will depend more and more on this knowledge.

Many different factors influence the decision-making process: linked to the player himself (personal or athletic), his environment (family, manager, fellow athletes with his own experiences), the trainer and the coaching staff. The competitive calendar and reaching a final competition, or the renewal of a contract can precipitate or slow down a situation and as a consequence *modify* how a decision is made.

### **Ethical considerations related to RTP**

Medical teams are club employees and must comply with the club's requirements and needs, but they are also obliged to fulfill their professional obligations and act in the best interest of the player. These interests do not always completely coincide. This means guaranteeing the player's wellbeing in both the short and long term, in an environment where there is constant pressure from all parties to ensure that the most important players are always available or become available as quickly as possible.

This can generate a conflict of interest when the medical team is emotionally involved in the team's success and has the same desire to win titles. This can have detrimental long-term health consequences for players because of the team pressure to return the player to competition prematurely (**Danna, N. R., Beutel, B. G., Campbell, K. A. et al. 2014; Matheson, G. O., Schultz, R., Bido, J., Mitten, M. J., Meeuwisse, W. H., & Shrier, I. 2011; Tol, J. L., Hamilton, B.,**

**Eirale, C. et al. 2014; Creighton, D. W., Shrier, I., Shultz, R. et al. 2010).** Medical teams must find the right balance and a way to ensure a player's success and health within the team structure.

The player's autonomy as a patient gives him rights over his own body and it is he who decides when to play, even if he is still injured, which can create conflict. Autonomy should be linked to informed consent. Players must be part of the discussion when deciding if they are ready to play.

However, players often make decisions from not only from a medical point of view, but are also influenced by internal and external pressure, the importance of the competition, the opportunity to maintain a place in the starting line-up, financial benefits, matches that could lead to international opportunities, etc. In conclusion, regardless of the consequences, medical teams must always act in the interest of the player using their experience and knowledge to make the best possible medical decision. (**Danna, N. R., Beutel, B. G., Campbell, K. A. et al. 2014; Matheson, G. O., Schultz, R., Bido, J., Mitten, M. J., Meeuwisse, W. H., & Shrier, I. 2011; Tol, J. L., Hamilton, B., Eirale, C. et al. 2014; Creighton, D. W., Shrier, I., Shultz, R. et al. 2010).**

Another key issue in terms of ethics and RTP is confidentiality. It is imperative that details on a player's medical conditions are shared with those who need this information (such as the coaching team) and that the player's permission is sought. Given the popularity of soccer, there will always be a debate around the relationship with the media and fans, but it is important that the player's needs and rights be respected and prioritized (**Danna, N. R., Beutel, B. G., Campbell, K. A. et al. 2014; Matheson, G. O., Schultz, R., Bido, J., Mitten, M. J., Meeuwisse, W. H., & Shrier, I. 2011; Tol, J. L., Hamilton, B., Eirale, C. et al. 2014; Creighton, D. W., Shrier, I., Shultz, R. et al. 2010).**

### **National team selection: interferences**

Players on a national team may be exposed to two different medical teams that may have different ways of working. This means that the medical care provided may differ. Typically, international players must be with their international team for 10 day periods (excluding international tournaments such as the World Cup, the European Championships, the Copa América, AFCON [African Cup of Nations]). This may mean that international federations are more willing to pressure players to return to play, their focus being on the national team making a profit. Injuries or recovery setbacks may be seen as a club problem in this context. It is vital that national teams

appropriately manage players, both in terms of training load and injury management. They must be in constant communication with club staff. Both major and minor incidents must be reported, along with their associated risks, to ensure that each player is managed according to their needs.

Just like other aspects of soccer, the concept and principles of RTP continue to evolve. Research and information exchange will play a key role in the development of RTP knowledge at all levels of soccer in the future. The concept of *big data* will have a major impact in the future, as physicians will be able to share medical experience from different environments and countries and use it to improve knowledge.

## Conclusions

- The RTP decision-making process should be understood as dynamic, focused on avoiding new injuries and not on predicting the exact RTP timeline.
- On-field technology can be very useful, since it can individualize the decision-making process, and this will only increase in the near future. However, valuable clinical experience and knowledge of the soccer environment also continue to be very important.
- RTP decisions must be ethical and protect the player's rights and well-being.
- It is important to consider new rules that emerge in specific sports that may influence the RTP decision-making process, along with other specific moderating factors.



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