

# Paradigm for the recovery in team sports

## El paradigma de la recuperación en deportes de equipo

Julio Calleja-González

*Departamento de Educación Física y Deportiva. Facultad de Educación y Deporte. Sección Ciencias de la Actividad Física y del Deporte. Universidad del País Vasco.*

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Post-exercise recovery is a fundamental part of sporting performance<sup>1</sup>. During high-density competition periods, athletes often play over various days, with very short rest times between matches and/or training sessions, which is why recovery processes are a determining strategy, enabling athletes to gain a competitive advantage. In this case, players proportionally invest more time recovering than training. This is why over recent years and based on new competition systems, a greater level of relevance has been given to recovery, despite there still being little scientific evidence regarding joint sports<sup>2</sup>. Furthermore, the use of recovery strategies in Sports Sciences is a relatively new area of scientific research<sup>3</sup>.

As a result of the specialisation of the different roles that make up the technical teams in joint sports, and based on the latest Position Stand "Team Physician Consensus Statement, 2013"<sup>4</sup>, with the aim of improving recovery processes, the figure of the "Applied Sport Scientist focus on recovery" is presented as an alternative in teams and clubs, transversally organising the complex structure of player recovery processes<sup>5</sup>.

The first step towards optimising player recovery requires a thorough customised analysis of the specific mechanisms that produce fatigue. Likewise, it requires a suitable monitoring process of the impact of the load that training and competing generates within the subject<sup>6</sup>, as well as maintaining an appropriate health status and care for common illnesses among players<sup>7</sup>. In this respect, precise diagnostics are often carried out using non-invasive technology and without any kind of interference in the dynamics of the team, with the aim of later customising protocols<sup>8</sup>.

Once the appropriate diagnostic has been developed, we must apply the suitable methods within the vast range of mediums offered to

us in literature for this issue<sup>9</sup>. Its use will depend on the type of activity carried out, as well as the time that goes past until the next training session or competition<sup>4</sup>.

The main methods used for the teams include: nutritional strategies (carbohydrates, proteins), ergogenic supplements such as: beta-alanine, nitrate, or creatine, active recovery, stretching, hydrotherapy, compression cuffs, massage, psychological strategies, rest and sleep<sup>4</sup>. However, there is a void among the scientific community<sup>4</sup> regarding the benefits of some of these formulas, as well as in their posterior pre, per and post-competition application. Currently, the Australian proposal is the most used, due to its level of effectiveness<sup>10</sup>.

Finally, a new aspect is worth considering, given that teams that participate in continental leagues or in the professional American model are making increasing amounts of long-distance journeys<sup>11</sup>. These kinds of journeys, whether by plane, road or train, are associated with a series of phenomena described as "Travel-associated fatigue", due to the combined effects of an alternative routine resulting in physiological disturbances<sup>12</sup>. Among them, one of the most important is peripheral oedema<sup>13</sup>.

As a result, the recovery process in team sports is a maximum priority concept in the current competition system. The limited time available to athletes should include a space to minimise accumulated fatigue. Therefore, its diagnosis and later customised treatment supposes an advantage to consider in the world of joint sports.

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**Correspondence:** Julio Calleja-González  
E-mail: julio.calleja.gonzalez@gmail.com

## Bibliography

1. Calleja-González J, Terrados N, Mielgo-Ayuso J, Delextrat A, Jukic I, Vaquera A, et al. Evidence-based post-exercise recovery strategies in basketball. *Phys Sportsmed*. 2016;44(1):74-8
2. Terrados N, Calleja-González J, Jukic I, Ostojic SM. Physiological and medical strategies in post-competition recovery—practical implications based on scientific evidence. *Ser J Sports Sci*. 2009;3:29-37.
3. Halson S. Recovery techniques. *Gatorade Sport Sciences Institute*. 2013;26:1-6.
4. Herring SA, Kibler WB, Putukian M. Team physician consensus statement: 2013 update. *Med Sci Sports Exerc*. 2013;45:1618-22.
5. Kellmann M. Enhancing Recovery: Preventing Underperformance in Athletes. Champaign, IL: *Human Kinetics*, 2002. p 340.
6. Halson SL. Monitoring training load to understand fatigue in athletes. *Sports Med*. 2014; 44 Suppl 2: S139-47.
7. Terrados N, Calleja-González J. *Fisiología, Entrenamiento y Medicina del Baloncesto*. Barcelona: Padoitribo, 2008. p 355.
8. Wiewelhoeve T, Raeder C, Meyer T, Kellmann M, Pfeiffer M, Ferrauti A. Markers for routine assessment of fatigue and recovery in male and female team sport athletes during high-intensity interval training. *PLoS One*. 2015;10:e0139801.
9. Terrados N, Calleja-González J. Recuperación post-competición del deportista. *Arch Med Dep*. 2010;27(138):281-90.
10. Australian Institute of Sport ABCD Classification System. [http://www.ausport.gov.au/ais/nutrition/supplements/supplements\\_in\\_sport?](http://www.ausport.gov.au/ais/nutrition/supplements/supplements_in_sport?) 2017. (consultado 12/05/2017).
11. Steenland K, Deddens JA. Effect of travel and rest on performance of professional basketball players. *Sleep*. 1997;20:366-9.
12. Kraemer WJ, Hooper DR, Kupchak BR, Saenz C, Brown LE, Vingren JL, et al. The effects of a roundtrip trans-american jet travel on physiological stress, neuromuscular performance, and recovery. *J Appl Physiol*. 2016;121(2):438-48.
13. Clarke MJ, Broderick C, Hopewell S, Juszczak E, Eisinga A. Compression stockings for preventing deep vein thrombosis in airline passengers. *Cochrane Database Syst Rev*. 2016; 9: CD004002.