

# Training Load, Recovery, and Injury: A Simple or Complex Relationship?

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This month's *Journal of Athletic Training* is a special thematic issue on training load and recovery monitoring and management. The concept of training load and recovery as important variables for mitigating injury risk potential has gained attention based on research highlighting their potential association with injury. As a result, many clinicians seek to better understand strategies for monitoring and managing the training load and recovery behaviors of their patients and clients.

This special issue is a response to our readership's desire to learn more about evidence-based practices for training-load and recovery management. We are pleased to provide a series of current concepts papers (Gabbett, Impellizzeri et al) that offer contrasting views regarding the use of training-load metrics to guide injury-prevention practices. In addition, we present new research that further explores the relationships among training load, injury, and injury risk factors across a wide spectrum of populations, such as adolescent athletes (Albrecht et al), professional rugby athletes (West et al), baseball athletes (Pexa et al), and dancers (Debien et al). Collectively, these investigators highlight the complex relationship between training load and injury and suggest that no single measure can fully explain this relationship.

Although the notion that an excessive training load may increase the risk for injury has gained attention, emerging evidence indicates that reduced training loads may also be problematic. This factor may be particularly important after injury as patients undergo dramatic reductions in external training loads during rehabilitation and after return to sport. This concept is examined via original research on physical activity levels after anterior cruciate ligament reconstruction (Lisee et al). Thus, clinicians may need to think about how either overloading or underloading may influence the injury risk and long-term outcomes after injury.

Perhaps one of the biggest questions that clinicians face when beginning to monitor an individual's training load and recovery metrics is "What is most important to

measure?" This decision is complicated by the broad range of options from single-item, self-report instruments to wearable sensors that can measure a vast array of variables related to both physical and physiological outputs. Insight into the question of what is important to measure is supplied in a current concepts paper (Windt et al) and 2 systematic reviews (Kupperman et al, Duignan et al). These authors offer overviews of the evidence supporting both internal and external training-load metrics and provide a critical decision-making framework for integrating such measures into one's clinical practice.

Understanding that training load is one piece of the injury risk and recovery puzzle, we have also included work that addresses other important factors, such as the roles of nutrition and the autonomic nervous system. Smith-Ryan et al deliver an update on nutritional strategies that can be implemented to aid recovery after injury and intensive training. In addition, Ebersole et al explore the potential for using heart rate to understand how individuals may or may not be recovering after exercise.

We extend our thanks to all the authors and coauthors for their contributions to this special issue. Furthermore, we are grateful to the thoughtful comments and suggestions provided by the external reviewers, as they greatly improved the clarity and quality of the material presented. We are also extremely thankful to Editor-in-Chief Jay Hertel, PhD, ATC, FNATA, and the editorial staff at the *Journal of Athletic Training* as we would not have been able to complete this task without their invaluable assistance along the way.

The importance of assessing training load and recovery in determining one's risk of injury is an evolving area in which athletic trainers play a vital role in the monitoring and management of this information. Thus, we hope that the information in this issue offers further insights to guide your clinical practice and opens the door for new research questions to be addressed.

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