

# PART A

# SPORTS SCIENCE

Edited by Mathew G. Wilson

# PREFACE

Mathew G. Wilson

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**S**port and exercise science is a multi-disciplinary field concerned with the understanding and enhancement of human performance. It includes the knowledge, methods and application of sub-specialties including exercise physiology, biomechanics, psychology and nutrition, as well as how they interact. In simple terms, sport science is the application of scientific principles to ethically maximize the performance of an athlete or team. Numerous skills are required to be an effective sport scientist, but establishing a high-functioning relationship with and between the athlete, coach, and the athlete's medical team, and the ability to relay complex scientific principles to the lay audience are essential. Athletes and coaches rarely, if ever, attend sport science conferences. But both are driven by the outcome measure of 'winning'. So the question of "Will I run faster, jump higher, score more [points, tries, goals] by undertaking sport science intervention X?" is entirely appropriate.

Rightly or wrongly, the term 'marginal gains' has recently entered the sport science vernacular; the concept being that many tiny improvements can add up to make a meaningful difference. But one important role sport scientists often undertake is advising athletes and coaches on what NOT to do. All too often, athletes (and coaches) are obsessed with finding the latest performance innovation, training modality, supplement, or technology, resulting in a loss of focus on the basics; which are, completion of a well-constructed training programme, an appropriate nutrition and sleep hygiene/recovery routine, and an apt pre-competition taper. Secondary interventions such as heat acclimatisation prior to a hot and humid competition, developing emotional control mechanisms for stressful situations, or using cold-water immersion for recovery in a tournament situation, are of course, valuable additions in the context of the performance task.

In the following, the most relevant sport science articles from the Aspetar Journal have been compiled under several headings; training methodology and assessment, environmental physiology, hydration and nutrition, recovery strategies, sleep and jetlag, exercise and immunity, and psychology. A key theme running through the majority of articles is ensuring that there is a balance between evidenced-based practice and evidence-informed practice. Just because intervention X works in the laboratory, does not necessarily mean it will work on the field of play. Sport scientists might have to decide what is the least worst option vs. the best or optimal option. Perhaps we should replace the 'marginal gains' philosophy with 'minimising loses'.

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