

INTRODUCTION

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The Penn State Sports Concussion Program was initially developed by Drs. Ruben J. Echemendia and Margot Putukian in the 1990s. After both left Penn State in the early 2000s, I was asked to assume responsibility for the part of the program focusing on neuropsychology and gladly took it on. Since that time, during about the past 15 years, sports concussion has received increasingly intense research and media attention. In the past, concussions in sports were often disregarded as “dings,” or “getting your bell rung.” Currently, no one with even relatively casual knowledge of concussion would say these things. With Ann McKee’s Boston University group recently publishing their chronic traumatic encephalopathy (CTE) study on former National Football League (NFL) players, the potential long-term impact of repeated concussions has been brought into vivid relief. Her Boston University group found that 110 of the 111 former NFL players’ brains were consistent with CTE (Mez et al., 2017). With that said, acute sports concussions, although serious neurological events, if approached with knowledge and care, can often be managed well.

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Neuropsychology of Sports-Related Concussion, P. A. Arnett (Editor)

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AUDIENCE AND SCOPE FOR THE BOOK

In this book, the focus is on concussions that occur through participation in sport. There are certainly other mechanisms of concussion that could lead to similar outcomes (e.g., blast injury as a result of combat injuries, motor vehicle accidents), but treatment of concussions that occur outside of the context of sports goes beyond the scope of this book. Although the various chapters sometimes provide slightly different definitions of sports concussion, all are consistent with McCrory and colleagues' (2017) recent consensus statement indicating that "sport related concussion is a traumatic brain injury induced by biomechanical forces" (p. 839).

With this in mind, I think readers will find much to round out their knowledge of sports concussion in this book, with chapters written by some of the leading experts in this field. Even if you have relatively little understanding of sports concussion, you will find this book to be accessible and easy to follow. If you already have more specialized knowledge, the chapters will expand your understanding with cutting-edge researchers in the field providing an up-to-date accounting of particular areas. Almost all chapters end with a section titled "Key Questions to Be Addressed in the Next 5 Years" that details suggested directions for research moving forward.

If you are involved in the management of sports-related concussions, this book will also meet your needs. Nearly every chapter includes a case study that illustrates its main theme. Of note, all cases included have been de-identified to protect the confidentiality of the individuals discussed. Additionally, most chapters have a section at the end titled "Key Clinical Take-Home Points" that includes fundamental knowledge that all health care providers involved in the care of sports concussion can use immediately. Finally, as a didactic teaching tool, this book can be used as core reading for a class on sports-related concussion that is at the upper undergraduate or beginning graduate level course.

ORGANIZATION OF THE BOOK

In terms of its organization, the book is divided into four topical sections that are essential for understanding neuropsychological aspects of sports concussion. The first section, Symptom Outcomes and Management, includes chapters by Michael A. McCrea and colleagues on persistent postconcussive symptoms; Melissa N. Womble, Michael (Micky) W. Collins, and colleagues from the University of Pittsburgh group on posttraumatic headache and migraine assessment; and a final chapter, by Erin Guty, Megan Bradson, and me, at Penn State on depression and anxiety in sports concussion management.

The second section, Biological Underpinnings and Consequences, includes three informative chapters. The initial chapter, by Victoria C. Merritt and me, focuses on genetic factors, with the next chapter by Emily C. Grossner, Andrew R. Mayer, and Frank G. Hillary, providing an informative review of the use of neuroimaging in sports concussion. The final chapter of this section is on CTE by Michael L. Alosco, Rose C. Healy, and Robert A. Stern from the Boston University group. The third section, Factors Affecting the Validity of Neuropsychological Results, addresses a range of important measurement issues that can affect the validity of neuropsychological results in the sports concussion context. Tracey Covassin and her collaborators at Michigan State provide an authoritative review on sex differences in sports concussion, followed by a chapter by Amanda R. Rabinowitz on issues relating to the assessment of effort on testing based on some of her seminal work in this area. The next chapter, by Arthur (Art) Maerlender, provides a wide-ranging review of a host of validity issues in neuropsychological assessment in this context, followed by a final chapter by Jessica Meyer and me that presents some empirical data comparing the sensitivity of the ImPACT test with traditional neuropsychological measures. The final section, Specialty Contributions to Sports Concussion, begins with an excellent chapter by Ruben J. Echemendia and colleagues focusing on neuropsychology in professional sports, taking advantage of his many years of experiences consulting with Major League Soccer, the NFL, and the National Hockey League, among other professional sports leagues. A chapter by my colleagues at Penn State, Alexa E. Walter and Semyon (Sam) M. Slobounov, then presents a fascinating presentation of virtual-reality paradigms as applied to sports concussion, followed by a chapter by one of the central players in developing the field of pediatric concussion, Frank M. Webbe and his colleague Denise S. Vagt. The final substantive chapter of the book is written by Neha Gupta and Wayne J. Sebastianelli; the latter is medical director of Penn State Sports Medicine and has had long-term involvement working with that institution's athletes. This chapter focuses on how the paradigm for management of concussions in orthopedic settings has changed dramatically in recent years.

QUESTIONS ADDRESSED BY THE BOOK

With this overview in mind, you will be able to address a number of important questions upon reading this book:

1. How are persistent postconcussion symptoms (including headache, depression, and anxiety, among others) best managed, and what do we still need to learn about such symptoms to improve our care of concussed athletes?

2. Why is it important to understand genetic and other biological factors that may alter risk for persisting symptomatology post-concussion, and what do we do with this information?
3. When taking into consideration all the factors that can influence the validity of neuropsychological tests in the sports concussion context, what approach will allow us to provide the most accurate assessment of cognitive functioning postconcussion?
4. Finally, how should we alter our approach to managing sports concussion in different contexts and populations to provide the most accurate assessment and treatment?

To conclude, I hope you will enjoy this book. It provides authoritative accounts of some central areas of interest in the neuropsychology of sports concussion. Each chapter can be digested and considered on its own, but by reading the entire book, you will appreciate the significance of the broader themes covered. Happy reading!

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