

Cambridge University Press

978-1-107-53471-1 - Traumatic Brain and Spinal Cord Injury: Challenges and Developments

Edited by Cristina Morganti-Kossmann, Ramesh Raghupathi and Andrew Maas

Frontmatter

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# Traumatic Brain and Spinal Cord Injury

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# Traumatic Brain and Spinal Cord Injury

## Challenges and Developments

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**Cristina Morganti-Kossmann:**

This book is dedicated to the victims of neurotrauma, in hope that the endeavours of the global neurotrauma research community will one day make a difference in improving the treatments and outcomes of those affected by brain and spinal cord injuries.

**Ramesh Raghupathi:**

Reva, Varuna and Vikram for their understanding and support.

**Andrew Maas:**

Dedicated to Liz, Marilyn, Sheila and Emily for understanding my commitment to Neurotrauma and coping with my frequent absence.

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[More information](#)

---

Contents

*List of contributors* ix  
*Preface* xiii

Section 1 – Traumatic Brain Injury	
1	<b>Current evaluation of TBI epidemiology in an ageing society with improved preventive measures</b> 1 Peter L. Reilly
2	<b>Neurotrauma: an emerging epidemic in low- and middle-income countries</b> 17 Gourikumar K. Prusty, Gopalakrishna Gururaj, and Kallol K. Dey
3	<b>Blast-induced traumatic brain injury and post-traumatic stress disorder</b> 30 Ankit I. Mehta, Gerald A. Grant, and Lawrence F. Marshall
4	<b>Psychological effects of mild traumatic brain injury: their nature and treatment</b> 43 Jennie Ponsford
5	<b>Developments of neuroimaging techniques to diagnose and visualize white matter damage</b> 54 Virginia F.J. Newcombe and David K. Menon
6	<b>New advances in monitoring the injured brain metabolism</b> 67 David M. Benglis, Jr., Brett Trimble, and A. Ross Bullock
7	<b>Potential use and limitations of microdialysis for monitoring of neurochemical changes after TBI</b> 82 Lars Hillered and Per Enblad
8	<b>Metabolic and therapeutic differences in pediatric and adult TBI: implications for clinical care and therapeutic hypothermia</b> 92 Michael J. Bell and Patrick M. Kochanek
9	<b>Utility of biomarkers for diagnosis and prognosis of traumatic brain injury</b> 103 Kevin K.W. Wang, Linda Papa, and Ronald L. Hayes
10	<b>Animal models of mild and severe TBI: what have we learned in the past 30 years?</b> 114 Jenna M. Ziebell, Frances Corrigan, and Robert Vink
11	<b>Pediatric brain trauma: what do age-appropriate animal models teach us about the age-at-injury effect?</b> 126 Ramesh Raghupathi and Jimmy W. Huh
12	<b>The complexity of traumatic axonal injury</b> 138 Kathryn E. Saatman
13	<b>Cerebral inflammation after traumatic injury: regulation of secondary damage, repair or both?</b> 155 Bridgette D. Semple and Cristina Morganti-Kossmann
14	<b>Controversial findings on the role of NMDA receptors in traumatic brain injury</b> 169 Esther Shohami and Anat Biegon
15	<b>Plasticity and recovery of the injured brain</b> 180 Dorothy A. Kozlowski and Theresa A. Jones
16	<b>Design and analysis of clinical trials in TBI</b> 192 Bob Roozenbeek and Andrew Maas

Contents

17 **Future perspectives for the treatment of traumatic brain injury patients: decompressive craniectomy, hypothermia and erythropoietin** 205  
Alistair D. Nichol, Jeffrey V. Rosenfeld, and D. James Cooper

Section 2 – Traumatic Spinal Injury

18 **Global epidemiology of traumatic spinal cord injury** 216  
Julio C. Furlan and Charles H. Tator

19 **Classification and surgical stabilization of the injured spine** 229  
Ricky Rasschaert and Thomas Kossmann

20 **Spinal cord injury: pathophysiology and prospect of decompressive surgical treatment** 242  
Jefferson R. Wilson and Michael G. Fehlings

21 **Modeling the injured spinal cord to match the human condition** 252  
Jacqueline C. Bresnahan and Michael S. Beattie

22 **Myelin inhibitors of neurite outgrowth in spinal cord injury** 264  
Michael F. Azari and Steven Petratos

23 **Controversies on the role of inflammation in the injured spinal cord** 272  
John C. Gensel and Phillip G. Popovich

24 **Cell transplantation for spinal cord injury** 280  
Nataliya Romanyuk, Pavla Jendelová, and Eva Syková

25 **Combining transplant-based and pharmacological interventions with behavioral training and exercise for recovery from chronic spinal cord injury** 292  
Marion Murray, Laura Krisa, and John Houle

26 **Chances and limits of locomotor training after damage to the central nervous system** 305  
Volker Dietz

27 **Temperature management and therapeutic hypothermia for the treatment of spinal cord injury** 314  
W. Dalton Dietrich

28 **Spinal cord injury clinical trials** 322  
Wise Young

*Index* 334

The colour plates can be found between pages 146 and 147.



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## Preface

The field of neurotrauma is quickly evolving with exciting new developments. Funding agencies are recognizing the great need for advancing care in neurotrauma and are establishing international collaborations; in this spirit of collaboration across the globe, Andrew Maas in Belgium, Ramesh Raghupathi in the United States and I in Australia have synergized our enthusiasm to conceive a book on neurotrauma to capture current state-of-the-art and to highlight new developments – an initiative which, we believe, is timely and desperately needed. The content of the book was very much inspired by the pivotal contributions of the National and International Neurotrauma Societies to the field of traumatic brain and spinal cord injuries. We have been fortunate enough to obtain collaboration from internationally renowned and acclaimed leaders in clinical and laboratory research on these two devastating diseases, for which therapy is still limited and disability a major burden to our societies. Neurotrauma is increasing globally, particularly in low income countries, and from this perspective it is vital to focus our attention on the latest topics of research tackling not only the clinical management, but also the most recent findings from basic science research. We hope that these recent advancements may in the near future lead to a change in practice for the benefit of our patients.

The scope of the proposed book is to present a comprehensive spectrum of the medical and neurobiological issues related to traumatic brain and spinal cord injuries. We anticipate that this book will be of interest both to clinicians and basic scientists, as it provides a comprehensive overview of our current knowledge and a broad discussion of new developments.

The book is divided into two sections: one on traumatic brain injury and the other on spinal cord injury, with a total of 28 chapters. Both sections

follow a similar path beginning with the epidemiology in the developed and emerging economies, where neurotrauma is witnessing a massive expansion. Major clinical issues including advanced experimental monitoring techniques utilised by neurosurgeons and intensive care physicians, and the potential usefulness in identifying novel markers of tissue injury are discussed. It also reflects changes in the focus of neurotrauma research such as the critical effects of blast brain injuries encountered in the combat zones.

The chapters recapitulate the major pathophysiological changes occurring in the injured nervous system, the development of animal models reproducing in the laboratory the features of neurotrauma with success and limitations, the pathological differences between ages and genders, the promise of novel diagnostic and prognostic measures, the fundamentals underlying the improvement in the design of clinical trials, an update on cell transplantation, and rehabilitative approaches to mild brain injury and spinal cord injury, including their effects on plasticity of the nervous system. Finally the book presents past, current and future therapeutic strategies for the treatment of these devastating diseases including hypothermia, decompressive surgery and multifunctional treatments.

We would like to thank first of all our colleagues who immediately agreed to contribute to this book. A special recognition goes to the Cambridge University Press team including Nicholas Dunton who first approved the proposal for the book, and to Lucy Edwards who tirelessly helped the organizational preparation of the work. Finally, I would like to express my most sincere thanks to Andrew and Ramesh for the pleasure in working as a team throughout these months.