

As space medicine evolved from the late 1950s onward, the need arose for a ready reference for students and practitioners on the basic concepts of this new specialty. Through three editions edited by leaders in the development of space medicine, this classic text has met the need. This fourth edition of *Space Physiology and Medicine* provides succinct, evidence-based summaries of the current knowledge base in space medicine and serves as a source of information on the space environment, responses, and practices. Additionally, there is extensive online material available for each chapter, featuring overviews and self-study questions.

Nicogossian
Williams
Huntoon
Doarn
Polk
Schneider
Editors

**Space Physiology
and Medicine**
From Evidence
to Practice
Fourth Edition

Public Health

ISBN 978-1-4939-6650-9



► springer.com



Part I Introduction to Space Medicine

- 1 Evolution of Human Capabilities and Space Medicine** 1
Arnauld E. Nicogossian, Charles R. Doarn, and Yinyue Hu
- 2 The Environment of Space Exploration** 59
Arnauld E. Nicogossian
- 3 Living and Working in Space: An Overview of Physiological Adaptation, Performance, and Health Risks** 95
Arnauld E. Nicogossian, Richard S. Williams, Carolyn L. Huntoon, and Charles R. Doarn

Part II Spacecraft Environments

- 4 Toxicology** 137
John T. James
- 5 Microbiology** 155
Cherie M. Oubre, Duane L. Pierson, and C. Mark Ott
- 6 Acoustics and Audition** 169
Christopher S. Allen, Richard W. Danielson, and John R. Allen
- 7 Radiation Health and Protection** 197
Kira Bacal and Joseph Romano

Part III Space Flight and Crew Health: Adaptation, Pathophysiology, Rehabilitation, and Countermeasures

- 8 Cardiopulmonary System: Aeromedical Considerations** 227
Victor S. Schneider, John B. Charles, Johnny Conkin, and G. Kim Prisk
- 9 Neurology** 245
Millard F. Reschke, Gilles Clément, Shea L. Thorson, Deborah L. Harm, Thomas H. Mader, Alix M. Dudley, Scott J. Wood, Jacob J. Bloomberg, Ajitkumar P. Mulavara, C. Robert Gibson, and Dafydd R. Williams
- 10 Regulatory Physiology** 283
Scott M. Smith, Peggy A. Whitson, Sara R. Zwart, and Carolyn L. Huntoon
- 11 Metabolism and Nutrition** 307
Helen W. Lane, Scott M. Smith, and Vickie L. Kloeris
- 12 Clinical Pharmacology and Therapeutics** 323
Lakshmi Putcha, Peter W. Taylor, Vernie R. Daniels, and Sam L. Pool

13	Musculoskeletal Adaptation to Space Flight	347
	Victor S. Schneider, Lori Ploutz-Snyder, Adrian D. LeBlanc, and Jean Sibonga	
14	Behavioral Health and Performance.....	367
	Walter E. Sipes, James D. Polk, Gary Beven, and Marc Shepanek	
 Part IV Occupational Health and Safety Issues in Space Flight		
15	Principles of Crew Health Monitoring and Care.....	393
	Charles R. Doarn, Richard S. Williams, Victor S. Schneider, and James D. Polk	
16	International Dimension of Space Medicine.....	423
	Charles R. Doarn, Richard S. Williams, Arnauld E. Nicogossian, and James D. Polk	
 Part V Ground-Based and Academic Training Programs		
17	Simulations and Analogs (Test-Beds)	441
	Arnauld E. Nicogossian, Dafydd R. Williams, Richard S. Williams, and Victor S. Schneider	
18	Training in Space Medicine.....	463
	Charles R. Doarn, Richard S. Williams, Arnauld E. Nicogossian, and James D. Polk	
 Part VI Future Perspectives		
19	Commercial Space Tourism and Space as a Biomedical Laboratory	481
	Charles R. Doarn, Arnauld E. Nicogossian, Victor S. Schneider, and Richard S. Williams	
	Acronyms	489
	Author and Subject Matter Expert Index	493
	Subject Index.....	497