

# HYPOXIA AND MOUNTAIN MEDICINE

EDITORS: JOHN R. SUTTON, GEOFFREY COATES  
AND CHARLES S. HOUSTON

## TABLE OF CONTENTS

	Acknowledgements .....	viii
	Foreword .....	ix
	Dedication—Hermann Rahn .....	x
	<i>Charles S. Houston</i>	
SECTION I	PSYCHOMOTOR EFFECTS OF HYPOXIA	
Chapter 1	Task Learning Under Mild Hypoxia .....	1
	<i>Eric W. Farmer, Henry T. Lupa, Fiona Dunlop and John F. McGowan</i>	
Chapter 2	Noninvasive Monitoring of Cerebral Oxygenation and Hemodynamics by Near Infrared Spectroscopy .....	9
	<i>John S. Wyatt</i>	
Chapter 3	Cerebral Hypoxia in Fast Jet Aircrew: G-Induced Loss of Consciousness .....	18
	<i>A. Richard Prior</i>	
Chapter 4	Presyncope Induced by Lower Body Negative Pressure and Psychomotor Performance .....	27
	<i>David H. Glaister</i>	
	DISCUSSION .....	37
SECTION II	HORMONAL CONTROL OF ELECTROLYTE AND FLUID BALANCE IN HYPOXIA	
Chapter 5	The Renin-Angiotensin-Aldosterone System during Hypoxia: Is the Adrenal an Oxygen Sensor? .....	42
	<i>Hershel Raff, Robert C. Brickner and Barbara Jankowski</i>	
Chapter 6	Role of the Peripheral Arterial Chemoreceptors in Electrolyte Homeostasis and Cardiovascular Regulation .....	50
	<i>Reinhard Behm</i>	
Chapter 7	Hormonal Control of Fluid and Electrolyte Balance at High Altitude in Normal Subjects .....	61
	<i>John R. Claybaugh, David P. Brooks and Allen Cymerman</i>	
Chapter 8	Aldosterone, Antidiuretic Hormone and Atrial Natriuretic Peptide in Acute Mountain Sickness .....	73
	<i>Peter Bärtsch, Sidney Shaw, Peter Weidmann, Mario Francioli, Marco Maggiorini and Oswald Oelz</i>	

Chapter 9	Fluid, Electrolyte and Hormonal Metabolism in COPD . . . . .	82
	<i>Mark O. Farber</i>	
	DISCUSSION . . . . .	89
SECTION III	CLINICAL ASPECTS OF HYPOXIA: FROM CELL TO ICU	
Chapter 10	Mechanisms of Liver Preservation Injury . . . . .	95
	<i>Stephen W. Chung, Steven Strasberg, Claire M.B. Holloway and Gary A. Levy</i>	
Chapter 11	Pathological Dependence of Oxygen Consumption . . . . .	108
	<i>James A. Russell</i>	
Chapter 12	Pathogenesis of Lactic Acidosis with Hypoxia . . . . .	115
	<i>Allen I. Arieff</i>	
	DISCUSSION . . . . .	131
SECTION IV	OXYGEN DEPENDENCE OF MUSCLE METABOLISM AND WORK: INSECT-MAMMAL COMPARISON	
Chapter 13	Oxygen and $\dot{V}O_2$ max: Are Muscle Mitochondria Created Equal? . . . . .	136
	<i>Raul K. Suarez</i>	
Chapter 14	Allometric Scaling of Muscle Performance and Metabolism: Mammals . . . . .	143
	<i>Hans Hoppeler and C. Richard Taylor</i>	
Chapter 15	Allometric Scaling of Muscle Performance and Metabolism: Insects . . . . .	152
	<i>Timothy M. Casey, C.P. Ellington and Julie M. Gabriel</i>	
Chapter 16	Intestinal Determinants of Muscle Performance . . . . .	163
	<i>Jared M. Diamond and Kimberley A. Hammond</i>	
Chapter 17	ATPases and Energy Metabolism as Proactive and Reactive Components in Control of ATP Turnover Rates . . . . .	171
	<i>Peter W. Hochachka and Gordon O. Matheson</i>	
	DISCUSSION . . . . .	186
SECTION V	EXERCISE IN THE HYPOXIC ENVIRONMENT	
Chapter 18	Work and Training at Altitude . . . . .	192
	<i>Benjamin D. Levine, Robert C. Roach and Charles S. Houston</i>	
Chapter 19	Pre-Acclimatization to High Altitude in a Hypobaric Chamber: Everest Turbo . . . . .	202
	<i>Jean-Paul Richalet, Jacques Bittel, Jean-Pierre Herry, Christine Janin, Gustave Savourey, Jean-Louis Le Trong and Jean-François Auvert</i>	
Chapter 20	Increased Glucose Dependency in Circulatory Compensated Hypoxia . . . . .	213
	<i>George A. Brooks</i>	
	DISCUSSION . . . . .	227
SECTION VI	MECHANISMS OF HIGH ALTITUDE ILLNESS	
Chapter 21	Stress Failure in Pulmonary Capillaries: A Mechanism for High Altitude Pulmonary Edema . . . . .	229
	<i>John B. West and Odile Mathieu-Costello</i>	

Chapter 22	Subacute Mountain Sickness Syndromes: Role of Pulmonary Hypertension .....	241
	<i>Inder S. Anand and Y. Chandrashekhar</i>	
Chapter 23	The Role of Cerebral Blood Flow in Acute Mountain Sickness .....	252
	<i>Ralf W. Baumgartner, Peter Bärtsch, Marco Maggiorini, Andreas Thomi and Oswald Oelz</i>	
Chapter 24	Cerebral Spinal Fluid Pressure and Cerebral Blood Velocity in Acute Mountain Sickness .....	260
	<i>Glenn S. Hartig and Peter H. Hackett</i>	
Chapter 25	Hyperbaria and High Altitude Illness .....	266
	<i>Robert Roach and Peter H. Hackett</i>	
	DISCUSSION .....	274
SECTION VII HISTORICAL LECTURE		
Chapter 26	The Life and Work of Nathan Zuntz .....	279
	<i>Hans-Christian Gunga and K. Kirsch</i>	
	Closing Remarks .....	292
	ABSTRACTS .....	296
Appendix	The Lake Louise Consensus on The Definition and Quantification of Altitude Illness .....	327

John R. Sutton  
Geoff Cortes  
Co-Chairmen  
Hypoxia Symposium, 1991