The Oxygen Status of Arterial Blood

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of Arterial Blood

Editors
R. Zander, Mainz, F. Mertzlufft, Homburg/Saar

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Foreword

The subject ‘Oxygen in Blood’ has received a new impetus due to advances in the diagnosis of oxygen deficiency and the increasing
therapeutic application of oxygen, especially in the paramedical field. Clinical, patient-oriented applied physiology and anesthesiology both play extensive roles in emergency and intensive medical care and are already ideal traditional partners for a common critical evaluation of this field. Therefore, ‘The Oxygen Status of Arterial Blood’ is treated in this book from the points of view of the two classical partners, applied physiology and clinical anesthesiology. This volume is based upon the corresponding German publication ‘Der Sauerstoff-Status des arteriellen Blutes’ (Karger, Basel; 1988).

Specialists from various medical fields were brought together for a necessary appraisal of current knowledge in this field and asked to submit appropriate contributions for publication. Questions concerning O2 partial pressure, O2 saturation, Hb concentration, and O2 concentration were discussed from diverse angles. In addition to the significance and diagnostic value of these parameters, a first attempt has been made to establish a set of terms and definitions transcending the various fields, as well as to determine normal values and threshold values indicating the need for therapy. Equipment and methods, together with their calibration and quality control are presented in detail.

The collection of the various contributions in the form of this interdisciplinary volume represents an attempt to present this complex question ‘in a simple and coherent manner. A simplified nomenclature and an appendix with definitions and symbols, normal values and therapeutic

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thresholds, as well as measured values and the appropriate methods for obtaining them should be of help to the reader.

It is our hope that this book will help surmount the often criticized tendency for theory and practice to drift apart. It should thus be useful for scientists and clinicians as well as medical students and health workers. It is in this sense that physiologists and anesthetists are called upon to get together and put their knowledge into diagnostic and therapeutic practice in the interests of the patient.

Our special thanks are due to all the authors, whose contributions have made this book possible, to Dr. Martin Reddington for the technically accurate translation into English, and to Karger Verlag for producing this volume.

Furthermore, we would especially like to thank those firms, without whose generous financial support this book would not have been possible: Andos (Hamburg; FRG), Critikon International (Tampa, FL; USA), and NOVA biomedical (Waltham, MA; USA).
Preface

The supply of O2 to the organs is determined by a chain of events, in which the transport of O2 in the blood, in particular the arterial transport, is of central importance. In the present volume, an attempt has been made to summarize the current state of knowledge concerning normal and therapeutic threshold values, methods of measurement and diagnosis, together with their relevance for the clinical application of arterial O2 status.

Considering the necessity for a critical appraisal of the appropriate terminology, the two editors, Professor Dr. med. R. Zander (physiology) and Dr. med. F. Mertzlufft (anesthesiology) brought together clinicians and scientists from various disciplines for the first time to treat this subject critically with a wide audience in mind. The present volume contains the contributions of the assembled experts. It is particularly noteworthy that the editors have undertaken to arrange clinically relevant data from several new points of view, and with the use of a unified nomenclature. A compilation of definitions, symbols, normal values, therapeutic threshold values, and a summary of measured values and methods give this book the character of an indispensable and handy reference work.

We have the impression that the editors’ intentions have been fulfilled in this English edition as well as they were in the German one. We hope with the editors that the English edition will also be able to awake an understanding for the overall subject and the significance of the arterial O2 status.

Vienna, Boston, June 1990

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