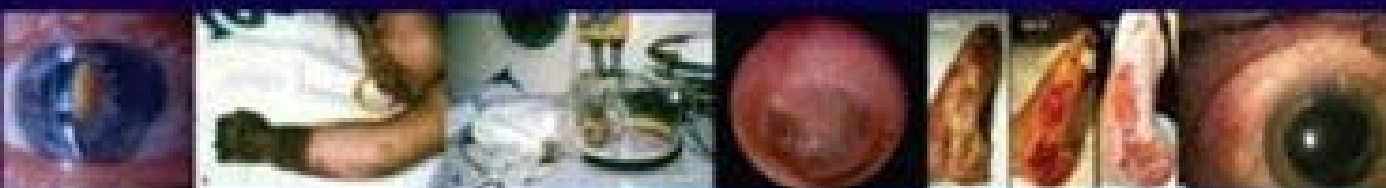


NEUMAN & THOM

# PHYSIOLOGY AND MEDICINE OF HYPERBARIC OXYGEN THERAPY



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# Dedication



To all of our colleagues in the practice of hyperbaric medicine who have worked so tirelessly to bring our specialty into the mainstream of medicine.

And, most importantly, to our best friends and wives—Doris and Lynne.

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# Preface



If one is to be candid, the field of hyperbaric medicine is a relatively new one. The biological effects of pressure were sporadically investigated in the 18th and early 19th centuries, but the first cohesive, scientific analysis was carried out by Paul Bert, who published *La Pression Barometrique* in 1878. Hyperbaric chambers were used initially to treat a variety of “humors,” but then interest began to focus on decompression sickness. It was not until the second half of the 20th century that hyperbaric chambers were used to treat conditions other than decompression illness on a more frequent basis. As such, early pioneers were clinically oriented and had their roots in either diving or aerospace medicine.

Thus hyperbaric medicine began as a clinical discipline. Early practitioners had a physiological rationale for hyperbaric oxygen therapy (HBOT), but clinical utilization was emphasized over basic science. It has been only recently that the basic science behind hyperbaric medicine has been explored, and this continues with ever-increasing sophistication. Of equal importance, it has been only recently that more rigor has been applied to the clinical situations in which HBOT might benefit patients. There is now a pool of knowledge concerning basic physiology and clinical outcomes that would benefit from being collected into one volume.

This was the purpose of this textbook. It was our goal to try to assemble all of the important physiological information, as well as the carefully conducted clinical investigations of HBOT. This text is meant to be a reference tool for researchers and clinicians to help them gain a better understanding of the fundamental mechanisms of HBOT; it also serves as a critical review of the indications for HBOT. It is not intended to be a simple

recitation of the virtues of hyperbaric medicine but rather an academic approach to the subject. With this in mind the book is organized to deal with the practical issues of HBOT and the physiology behind the treatment. It addresses each of the generally accepted indications for HBOT with what the editors hope is fair academic vigor.

We feel that two chapters deserve special mention. The first of these is the chapter devoted to “Fitness to Dive.” Because so many of the current clinicians practicing hyperbaric medicine no longer have their background in diving medicine, we felt this chapter was especially important. Practicing hyperbaric physicians are often called upon to examine commercial and sport divers to assess their fitness to dive, and at times to treat diving-related injuries. Our coverage of other diving medicine topics was limited, however, because there are several excellent texts in this area. The reader is referred to Bennett and Elliott’s *Physiology of Medicine and Diving* as well as Bove and Davis’s *Diving Medicine*. This text is not meant to replace those texts but rather to accompany them, and for all to be found side by side at any hyperbaric chamber installation. The second chapter that warrants special mention is devoted to the unconventional uses of hyperbaric medicine. In current times, with medicine being scrutinized carefully for its ever-increasing costs, this chapter turns a critical eye to conditions for which HBOT has been advocated without there being a firm rationale and/or data for its use. We make no apologies for the critical nature of this chapter. We believe such directness is overdue within the field of hyperbaric medicine.

With so many individuals as authors, the editors have tried to the best of their abilities to create a more or less uniform style for the

chapters so that the reader may go from one chapter to another more easily. The symbols for respiratory abbreviations and concepts are those used by Elsevier throughout their publications. The units of pressure are those used most frequently in the field of hyperbaric medicine.

We hope this book meets the needs of our many colleagues.

TOM S. NEUMAN, MD, FACP, FACPM  
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