

Diving Physiology In Plain English

Eighth Edition Expanded



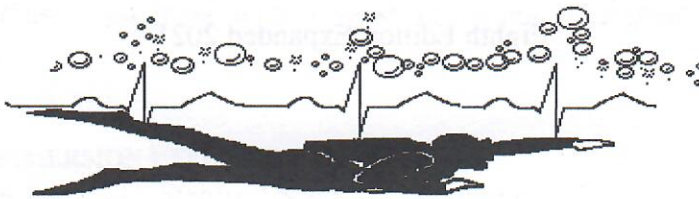
Jolie Bookspan, Ph.D.

DIVING PHYSIOLOGY

IN

PLAIN ENGLISH

JOLIE BOOKSPAN, MED, PhD, FAWM



Eighth Edition Expanded, 2021

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**DIVING PHYSIOLOGY
IN
PLAIN ENGLISH**

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prior, written permission of the author.

Nothing in this book is medical advice or
diving instruction. See your health care providers and get training
before attempting anything presented.

REVIEWERS

OVERALL REVIEW

Enrico Camporesi, M.D., Caroline Fife, M.D., Lee Greenbaum, Ph.D., Bill Hamilton, Ph.D., Paul Sheffield, Ph.D., Peter Bennett, D.Sc., and Hugh Van Liew, Ph.D.

G. D. Golden, physicist, pilot, engineer. World class fussing over every detail in Chapters 1, 3, 4, and the glossary.

Dan Orr, Director, Divers Alert Network.

CHAPTER 1 DECOMPRESSION TABLES AND COMPUTERS

John Crea. Pressure units, non-Haldane models.

Bill Hamilton, Ph.D. Detailed review, entire chapter.

Ron Nishi, DCIEM, Canada. Series Model section.

Mark Robinson, engineer with a sense of humor. Complete review and equation checking.

CHAPTER 2 IMMERSION EFFECTS

David Hsu, Ph.D., U. Stanford School of Medicine.

CHAPTER 3 DIVING IN COLD AND HEAT

Al Paolone, Ed.D., Environmental physiology professor Biokinetics Research Laboratory Temple University.

CHAPTER 4 GENDER FACTS AND FOLKLORE

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Richard Vann, Ph.D., Duke University Medical Center. Mammary implant section.

CHAPTER 5 DIVING INJURIES

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Lung injury information.

Jim Clark, M.D., University of Pennsylvania Institute of Environmental Medicine.
Lung injury information.

David Hsu, Ph.D. Oxygen toxicity section.

Philip James, M.D., Wolfson Hyperbaric Medicine Unit Dundee, Scotland.
Decompression sickness and lung injury sections.

Rev. Ed Lanphier, M.D., Dept. of Preventive Medicine University of Wisconsin.
Headache section.

Lawrence Martin, M.D., Chief of Pulmonary and Critical Medicine Mt. Sinai,
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CHAPTER 6 EXERCISE

Audrey Tannenbaum, M.Ed., A.T.C., C.S.C.S., Maccabean Games Triathlon Gold
Medalist.

CHAPTER 7 NUTRITION

Carl Gisolfi, Ph.D., authority on fluid regulation during exercise in the heat. Several
issues in electrolyte drink section.

Audrey Tannenbaum, M.Ed., A.T.C., C.S.C.S., Maccabean Games Triathlon Gold
Medalist.

GLOSSARY

John Crea, decompression guru. Gases and decompression.

Russ Gazzara, Ph.D., extra tall, extra Italian, FDA neurophysiology researcher.
Physiology entries.

David Josephson, audio engineer. Physical science entries, SI and English (Common)
systems of measurement.

Mark Robinson. Physics entries.

Larry 'Harris' Taylor, Ph.D. Gas issues.

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REVIEWS

Delightful.

– *Dr. Leon Greenbaum, Executive Director UHMS*

It's great! I think it will become THE source of information on diving physiology.

– *Alex Brylske, Dive Training magazine's technical editor*

I bought it somewhat out of curiosity to see if a scientist really could write anything in plain English. It's really a must read for everyone interested in the subject.

– *Ed Tepper, Scuba Instructor, Orlando, FL*

Easy to read and chock full of interesting facts. It can be picked up and opened at random, and read profitably. The layout is esthetically pleasing; the glossary is a blast!

– *David Hsu, Ph.D., M.D. Stanford*

What makes this book so special is that it makes science delicious. There is just about everything a diver needs to know in fascinating detail. I use it almost everyday.

– *Edmond Kay, M.D. Hyperbaric physician, Seattle*

The best nuts and bolts book about diving physiology out there today. I highly recommend it as a must read for all divers. It is superb!

– *Rod Farb, Photographer, film maker, explorer*

The best and easiest to read book on dive physiology on the market.

– *Parham P. Baker, DeepEdge*

Informative, knowledgeable, yet reads like a novel.

– Alan J. Ostrowe, M.D. aka scubadoc

The most extraordinarily well thought out, clearly written text of its kind.

- Caroline Fife, M.D. Director of the Hermann Center for Hyperbaric Medicine, Chief Consultant, CHecs Training Pro

Enough information to choke a biologist.

- Mac Hopkin, Scuba Instructor, Florida

Entertaining, thorough, and accurate.

- Ron Ryan, Past manager of Catalina Hyperbaric Chamber, consultant, and ScubaPro test lab personnel

Required text for all our technical diving courses.

- Captain Billy Deans, Renowned technical diver and trainer.

“No bubble is so iridescent or floats longer than that blown by a successful teacher.” Sir William Osler (1849-1919), Canadian Physician. Dr. Jolie Bookspan has been listening to her students for years, patiently finding the best way to get across difficult concepts of Human Physiology. Many of her students hated science, and with good reason. It can be so dry, especially when poorly taught. She had to develop new ways to impart her knowledge, but more importantly she had to learn new ways of germinating interest in the subject so that her ideas would bear fruit. With this book, she has virtually redefined the art of teaching by exploiting humor as a form of "synaptic glue" seldom used in a serious scientific text. Her wit is fun and richly layered. That is what makes this book so compelling. She makes science delicious.

As you can see by now, I enjoyed reading this book immensely. It turns out to be one of the most valuable books in my collection for a number of reasons. First, as the manager of an interactive Diving Medicine web site for the University of Washington, I often find myself trying to teach Diving Physiology on-line to divers with a variety of backgrounds from the absolute neophyte to the scientist/colleague. Take for instance the subject of Immersion. After reading the chapter titled “Effects of Immersion,” it struck me that those effects are not intuitive. It makes sense after you read it, but information on hydrostatic gradients and centralization of blood volume (Fat-Face-Chicken-Legs-Effect) was not only interesting but also invaluable to me as an educator. This book is not a “Read Once & Shelve Forever” type, but falls squarely into the “Read Often

& Frequently Reference” category. In its place of honor beside my computer, my signed copy has started to look more like a well-used phone book than a physiology text.

I reviewed a sample of the most common “Frequently Asked Questions” taken on-line at my web site during the last two years of operation. It is uncanny how relevant this book is. Asthma, barotrauma, compartment off-gassing, decompression theory; it is all here and handled with the skill that comes from years of teaching. I was pleasantly surprised that many popular clinical topics were also covered in much more detail than I have come to expect. “Diving Headaches” (a common topic) is a masterpiece of completeness, as is “Oxygen Toxicity.” With few exceptions, there is just about everything a diver needs to know here in fascinating detail.

My only disappointment was to find that the physiology of childhood and adolescence was missing. It would have been particularly relevant to have included it here in light of all the economic pressures to get divers in the water at an ever younger age. I strongly council parents to restrain themselves from pushing their children into the water with SCUBA gear for a few years into adolescence. The criticisms are few, the accolades many.

Dr. Jolie Bookspan has written more than just a “handy compendium” (her words). This is an encyclopedia of the most valuable information a diver might want to know. A very entertaining way to learn and teach science. Yes, I do love this book!

– Edmond Kay, MD, Director of Hyperbaric Medicine, HealthForce Partners.



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01/2014
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