THIEME Atlas of Anatomy

Latin Nomenclature

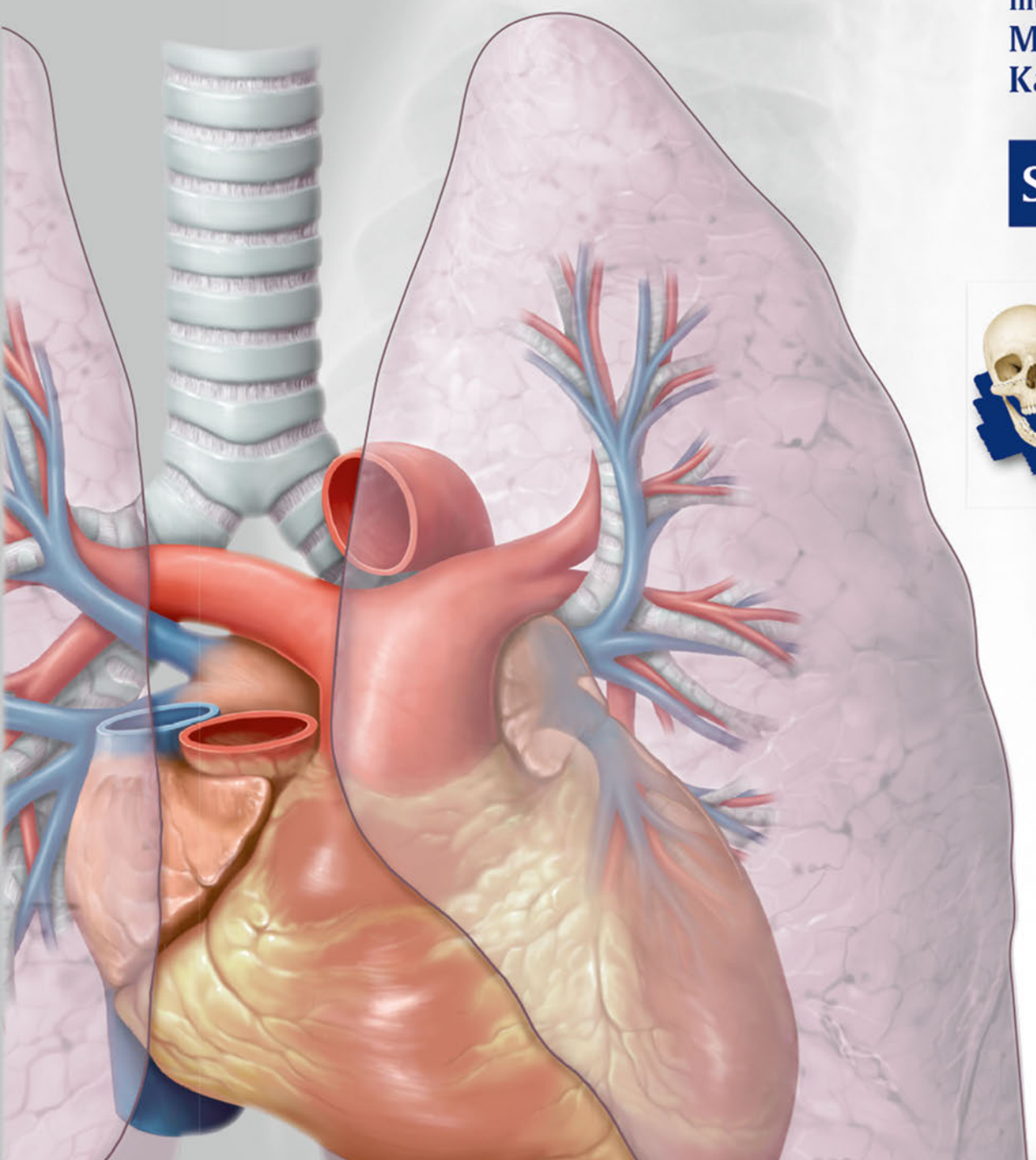
Volume 2
Internal Organs

Michael Schuenke
Erik Schulte
Udo Schumacher

Consulting Editors
Wayne A. Cass
Hugo Zeberg

Illustrations by
Markus Voll
Karl Wesker

Second Edition

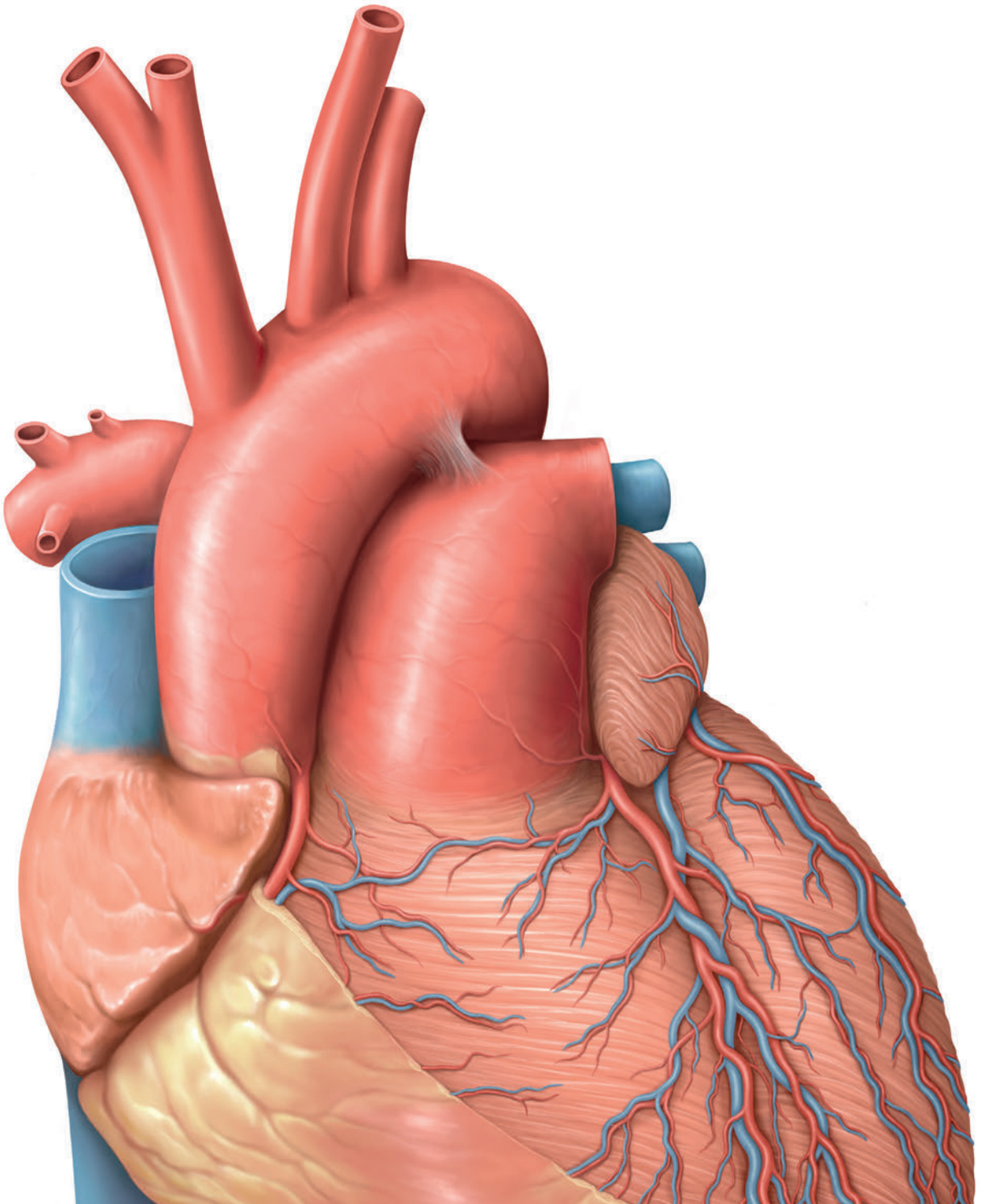


Includes online self-testing tool!
www.winkingskull.com

Thieme

To access additional material or resources available with this e-book, please visit http://www.thieme.com/bonuscontent. After completing a short form to verify your e-book purchase, you will be provided with the instructions and access codes necessary to retrieve any bonus content.


Thieme



Volume 2

Internal Organs

THIEME Atlas of Anatomy
Second Edition
Latin Nomenclature

Authors
Michael Schuenke, MD, PhD
Institute of Anatomy
Christian Albrecht University, Kiel

Erik Schulte, MD
Department of Anatomy and Cell Biology
Johannes Gutenberg University, Mainz

Udo Schumacher, MD
FRCPath, CBiol, FIBiol, DSc
Institute of Anatomy II: Experimental Morphology
University Medical Center, Hamburg-Eppendorf

Consulting Editors
Wayne A. Cass, PhD
Professor and Director of Graduate Studies
Department of Anatomy and Neurobiology
University of Kentucky

Hugo Zeberg, MD, PhD
Lecturer
Department of Neuroscience
Karolinska Institutet
Stockholm, Sweden

Illustrations by
Markus Voll
Karl Wesker

Thieme
New York • Stuttgart • Delhi • Rio de Janeiro

Editorial Director, Educational Products: Anne M. Sydor
Editorial Assistant: Tony Paese
Managing Editor: Judith Tomat
Director, Editorial Services: Mary Jo Casey
International Production Director: Andreas Schabert
Vice President, Editorial and E-Product Development: Vera Spillner
International Marketing Director: Fiona Henderson
International Sales Director: Louisa Turrell
Director of Sales, North America: Mike Roseman
Senior Vice President and Chief Operating Officer: Sarah Vanderbilt
President: Brian D. Scanlan
Illustrations: Markus Voll and Karl Wesker
Compositor: Agnieszka & Martin Waletzko, Leonberg, Germany

Library of Congress Cataloging-in-Publication Data is available from the publisher upon request.

Thieme Publishers New York
333 Seventh Avenue, New York, NY 10001 USA
+1 800 782 3488, customerservice@thieme.com

Thieme Publishers Stuttgart
Rüdigerstrasse 14, 70469 Stuttgart, Germany
+49 [0]711 8931 421, customerservice@thieme.de

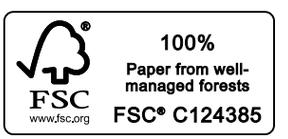
Thieme Publishers Delhi
A-12, Second Floor, Sector-2, Noida-201301
Uttar Pradesh, India
+91 120 45 566 00, customerservice@thieme.in

Thieme Publishers Rio de Janeiro,
Thieme Publicações Ltda.
Edifício Rodolpho de Paoli, 25º andar
Av. Nilo Peçanha, 50 – Sala 2508
Rio de Janeiro 20020-906, Brasil
+55 21 3172 2297

Important note: Medicine is an ever-changing science undergoing continual development. Research and clinical experience are continually expanding our knowledge, in particular our knowledge of proper treatment and drug therapy. Insofar as this book mentions any dosage or application, readers may rest assured that the authors, editors, and publishers have made every effort to ensure that such references are in accordance with **the state of knowledge at the time of production of the book.**

Nevertheless, this does not involve, imply, or express any guarantee or responsibility on the part of the publishers in respect to any dosage instructions and forms of applications stated in the book. **Every user is requested to examine carefully** the manufacturers' leaflets accompanying each drug and to check, if necessary in consultation with a physician or specialist, whether the dosage schedules mentioned therein or the contraindications stated by the manufacturers differ from the statements made in the present book. Such examination is particularly important with drugs that are either rarely used or have been newly released on the market. Every dosage schedule or every form of application used is entirely at the user's
own risk and responsibility. The authors and publishers request every user to report to the publishers any discrepancies or inaccuracies noticed. If errors in this work are found after publication, errata will be posted at www.thieme.com on the product description page.

Some of the product names, patents, and registered designs referred to in this book are in fact registered trademarks or proprietary names even though specific reference to this fact is not always made in the text. Therefore, the appearance of a name without designation as proprietary is not to be construed as a representation by the publisher that it is in the public domain.



Printed in China by Everbest Printing Ltd 5 4 3 2 1

ISBN 978-1-62623-167-2

Also available as an e-book:
eISBN 978-1-62623-168-9

Contents

Structure and Development of Organ Systems

Thorax

Abdomen and Pelvis

21 Topographical Anatomy

Neurovascular Supply to the Organs: A Schematic Approach

Organ Fact Sheets

Appendix

Foreword

Each of the authors of the single volume *Thieme Atlas of Anatomy* was impressed with the extraordinary detail, accuracy, and beauty of the illustrations that were created for the Thieme three-volume series of anatomy atlases. We felt these images were one of the most significant additions to anatomic education in the past 50 years. The effective pedagogical approach of this series, with two-page learning units that combined the outstanding illustrations and captions that emphasized the functional and clinical significance of structures, coupled with the numerous tables sum-marizing key information, was unique. We also felt that the overall organization of each region, with structures presented first systemically—musculoskeletal, vascular, and nervous—and then topographically, supported classroom learning and active dissection in the laboratory.

This series combines the best of a clinically oriented text and an atlas. Its detail and pedagogical presentation make it a complete support for classroom and laboratory instruction and a reference for life in all the medical, dental and allied health fields. Each of the volumes—*General Anatomy and Musculoskeletal System, Internal Organs,* and *Head, Neck, and Neuroanatomy*—can also be used as a stand-alone text/atlas for an in-depth study of systems often involved in the allied health/medical specialty fields.

We were delighted when Thieme asked us to work with them to create a single-volume atlas from this groundbreaking series, and we owe a great debt to the authors and illustrators of this series in as much as their materials and vision formed the general framework for the single volume *Thieme Atlas of Anatomy.*

We thank the authors and illustrators for this very special contribution to the teaching of anatomy and recommend it for thorough mastery of anatomy and its clinically functional importance in all fields of health care-related specialties.

Lawrence M. Ross, Brian R. MacPherson, and *Anne M. Gilroy*

Preface to the Second Edition

Gain new insights with the help of the *Thieme Atlas of Anatomy*!

In recent years, the combination of theoretical and clinical knowledge has taken on an increasingly important role in medical education and training. The *Thieme Atlas of Anatomy* has always been cognizant of these changes by including references in legends, adding select illustrations and creating new units wholly devoted to a particular clinically relevant topic.

The close relationship between classic and clinical anatomy does not only manifest itself in medical students gaining experience in clinical work early on in their studies. On the contrary, research in clinical anatomy often influences classic anatomy and in turn becomes a part of medical education.

One such example is the findings of decades-long clinical research conducted by colleagues in the Urology Clinic of the University of Leipzig. Among other topics, the urologists in Leipzig have researched how to protect structures important for urine continence during pelvic surgeries, such as radical prostatectomies. This procedure, despite preserving the sphincter and its innervation, often results in postoperative urinary incontinence. The team, led by Professor Jens-Uwe Stolzenburg and Dr. Thilo Schwalenberg, searched for the causes of this phenomenon and discovered that, as a result of surgery to remove the prostate, the location of the sphincter may change or musculo-fibrous structures that anchor the neck of the bladder and the urethral sphincter to the pelvic floor, may get damaged. The team's research has shown that preserving these musculo-fibrous structures during prostatectomy significantly reduces the risk of postoperative urinary incontinence.

The colleagues in Leipzig deserve great credit for recognizing these relationships and for discovering that significantly more structures than "only" the sphincter and its innervation are involved in micturition and continence. It is thanks to the team's research in clinical anatomy that we today have a better understanding of the complex continence mechanism, which we are now able to share with medical students. This volume about the internal organs has been revised to include these latest findings.

We would like to take this opportunity to explicitly thank our readers for their feedback and to encourage them to keep sending us their comments and remarks. The *Thieme Atlas of Anatomy* will continue to give you the support you need!

We wish you success studying with the *Thieme Atlas of Anatomy*!

Michael Schuenke, Erik Schulte, Udo Schumacher,
Markus Voll, and *Karl Wesker*
Kiel, Mainz, Hamburg, Munich, and Berlin

Preface to the First Edition

When Thieme started planning this atlas, they sought the opinions of students and instructors in both the United States and Europe on what constituted an "ideal" atlas of anatomy—ideal to learn from, to master extensive amounts of information while on a busy class sched-ule, and, in the process, to acquire sound, up-to-date knowledge. The result of our work in response to what Thieme learned is this atlas. The *Thieme Atlas of Anatomy*, unlike most other atlases, is a comprehensive educational tool that combines illustrations with explanatory text and summary tables, introducing clinical applications throughout, and presenting anatomic concepts in a step-by-step sequence that includes system-by-system and topographical views.

Because the *Thieme Atlas of Anatomy* is based on a fresh approach to the underlying subject matter, it was necessary to create an entirely new set of illustrations for it—a task that took eight years. Our goal was to provide illustrations that would compellingly demonstrate anatomic relations and concepts, revealing the underlying simplicity of human anatomy without sacrificing detail or aesthetics.

With the *Thieme Atlas of Anatomy*, it was our intention to create an atlas that would guide students in their initial study of anatomy, stimulate their enthusiasm for this intriguing and vitally important subject, and provide a reliable reference for experienced students and professionals alike.

"If you want to attain the possible, you must attempt the impossible" (Rabindranath Tagore).

Michael Schuenke, Erik Schulte, Udo Schumacher, Markus Voll, and *Karl Wesker*

A Note on the Use of Latin Terminology

To introduce the Latin nomenclature into an English textbook is a delicate task, particularly because many Latin loanwords have passed into general use. Some loanwords are so common that fluency of the text would be disturbed if they were to be translated back into Latin. These Latin loanwords have typically undergone several adaptations before becoming part of the English language. A term such as *sympathetic trunk* (lat. *truncus sympaticus*) has undergone morphological adaptation (through the loss of masculine suffix *-us*), orthographical adaptation (through the substitution of a 'Germanic' *k* for a Latin *c*), and phonological adaptation (*th* and *e* instead of *t* and *i*). In addition, the word order has been reversed. The Latin term *sympaticus* is in fact borrowed from the late Greek word *sympathetikos* (from *sympathes* "having a fellow feeling, affected by like feelings"), thereby illustrating that terms move between languages when cultures meet.

Other anatomical terms are so colloquial (e.g., *hand*), that a Latin term (e.g., *manus*) would be inappropriate to use at all occasions. Clearly, the text would easily become unreadable if a strict translation of all English terms into Latin were imposed.

As a result, Latin has been used as long as it does not disrupt the flow of the text and whenever possible in figures and tables. In some cases, dual terminology has been used, with either the English or Latin word in parenthesis. As much as possible, the terminology of *Terminologia Anatomica* (1998) has been followed.

Hugo Zeberg, M.D., Ph.D.
Lecturer
Karolinska Institutet

Acknowledgments

First, we wish to thank our families. This atlas is dedicated to them.

We also thank Prof. Reinhard Gossrau, M.D., for his critical comments and suggestions. We are grateful to several colleagues who rendered valuable help in proofreading: Mrs. Gabriele Schünke, Jakob Fay, M.D., Ms. Claudia Dücker, Ms. Simin Rassouli, Ms. Heinke Teichmann, and Ms. Sylvia Zilles. We are also grateful to Dr. Julia Jürns-Kuhnke for helping with the figure labels.

We extend special thanks to Stephanie Gay and Bert Sender, who prepared the layouts. Their ability to arrange the text and illustrations on facing pages for maximum clarity has contributed greatly to the quality of the atlas.

We particularly acknowledge the efforts of those who handled this project on the publishing side: Jürgen Lüthje, M.D., Ph.D., executive editor at Thieme Medical Publishers, has "made the impossible possible." He not only reconciled the wishes of the authors and artists with the demands of reality but also managed to keep a team of five people working together for years on a project whose goal was known to us from the beginning but whose full dimensions we only came to appreciate over time. He is deserving of our most sincere and heartfelt thanks.

Sabine Bartl, developmental editor, became a touchstone for the authors in the best sense of the word. She was able to determine whether a beginning student, and thus one who is not (yet) a professional, could clearly appreciate the logic of the presentation. The authors are indebted to her.

We are grateful to Antje Bühl, who was there from the beginning as project assistant, working "behind the scenes" on numerous tasks such as repeated proofreading and helping to arrange the figure labels.

We owe a great debt of thanks to Martin Spencker, managing director of Educational Publications at Thieme, especially to his ability to make quick and unconventional decisions when dealing with problems and uncertainties. His openness to all the concerns of the authors and artists established conditions for a cooperative partnership.

Without exception, our collaboration with the entire staff at Thieme Medical Publishers was consistently pleasant and cordial. Unfortunately, we do not have room to list everyone who helped in the publication of the *Atlas*, and we must limit our acknowledgments to a few colleagues who made a particularly notable contribution: Rainer Zepf and Martin Waletzko for support in all technical matters; Susanne Tochtermann-Wenzel and Manfred Lehnert, representing all those who were involved in the production of the book; Almut Leopold for the index; Marie-Luise Kürschner and her team for creating the cover design; to Liesa Arendt, Birgit Carlsen, and Anne Döbler, representing all those who handled marketing, sales, and promotion.

The Authors