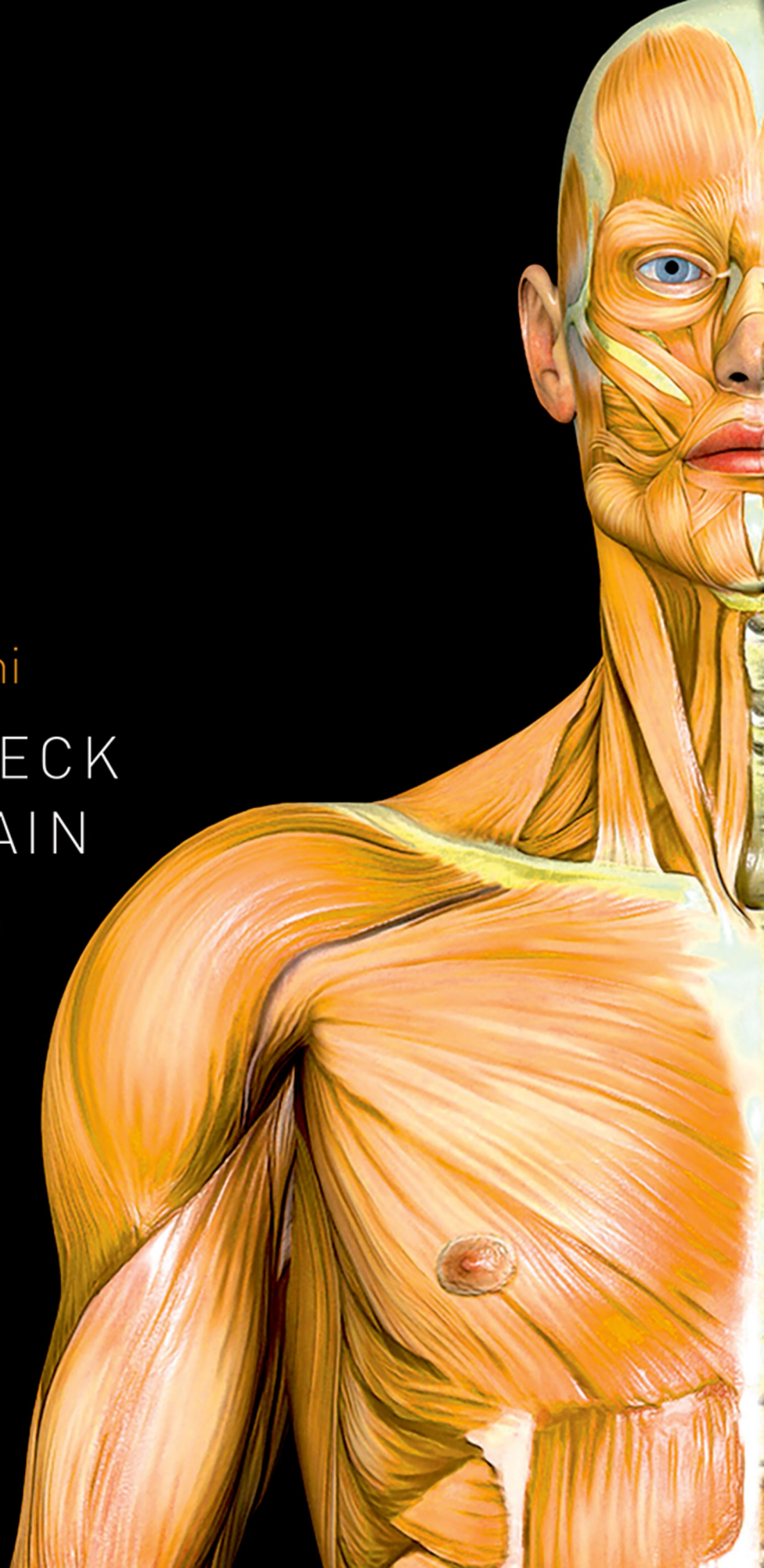
CUNNINGHAM'S MANUAL OF PRACTICAL ANATOMY



Rachel Koshi

HEAD, NECK AND BRAIN

16th Edition

3

OXFORD

CUNNINGHAM'S MANUAL OF PRACTICAL ANATOMY

Volume 3

Cunningham's Manual of Practical Anatomy

Volume 1 Upper and lower limbs
Volume 2 Thorax and abdomen
Volume 3 Head, neck and brain

CUNNINGHAM'S MANUAL OF PRACTICAL ANATOMY

Sixteenth edition

Volume 3 Head, neck and brain

Dr Rachel Koshi MBBS, MS, PhD

Professor of Anatomy
Apollo Institute of Medical Sciences and Research
Chittoor, India

OXFORD
UNIVERSITY PRESS

OXFORD
UNIVERSITY PRESS

Great Clarendon Street, Oxford, OX2 6DP,
United Kingdom

Oxford University Press is a department of the University of Oxford.
It furthers the University's objective of excellence in research, scholarship,
and education by publishing worldwide. Oxford is a registered trade mark of
Oxford University Press in the UK and in certain other countries

Thirteenth edition 1966
Fourteenth edition 1977
Fifteenth edition 1986

Impression: 1

Published in the United States of America by Oxford University Press
198 Madison Avenue, New York, NY 10016, United States of America

British Library Cataloguing in Publication Data
Data available

Library of Congress Control Number: 2016956732

ISBN 978–0–19–251648–0

Printed and bound by Replika Press Pvt Ltd, India

I fondly dedicate this book to the late Dr K G Koshi for his encouragement and support when I chose a career in anatomy, and to Dr Mary Jacob, under whose guidance I learned the subject and developed a love for teaching.

Oxford University Press would like to dedicate this book to the memory of the late George John Romanes, Professor of Anatomy at Edinburgh University (1954–1984), who brought his wisdom to previous editions of *Cunningham's*.

Foreword

It gives me great pleasure to pen down the Foreword to the 16th edition of *Cunningham's Manual of Practical Anatomy*. Just as the curriculum of anatomy is incomplete without dissection, so also learning by dissection is incomplete without a manual.

Cunningham's Manual of Practical Anatomy is one of the oldest dissectors, the first edition of which was published as early as 1893. Since then, the manual has been an inseparable companion to students during dissection.

I remember my days as a first MBBS student, the only dissector known in those days was *Cunningham's* manual. The manual helped me to dissect scientifically, step by step, explore the body, see all structures as mentioned, and admire God's highest creation—the human body—so perfectly. As a postgraduate student, I marvelled at the manual and learnt details of structures, in a way as if I had my teacher with me telling me what to do next. The clearly defined steps of dissection, and the comprehensive revision tables at the end, helped me personally to develop a liking for dissection and the subject of anatomy.

Today, as a Professor and Head of Anatomy, teaching anatomy for more than 30 years, I find *Cunningham's* manual extremely useful to all the students dissecting and learning anatomy.

With the explosion of knowledge and ongoing curricular changes, the manual has been revised at frequent intervals. The 16th edition is more student friendly. The language is simplified, so that the book can be comprehended by one and all. The objectives are well defined. The clinical application notes at the end of each chapter are an academic feast to the learners. The lucidly enumerated steps of dissection make a student explore various structures, the layout, and relations and compare them with the simplified labelled illustrations in the manual. This helps in sequential dissection in a scientific way and for knowledge retention. The text also includes multiple choice questions for self-assessment and holistic comprehension.

Keeping the concept of 'Adult Learning Principles' in mind, i.e. adults learn when they 'DO', and with a global movement towards 'competency-based curriculum', students learn anatomy when they dissect; *Cunningham's* manual will help students to dissect on their own, at their own speed and time, and become competent doctors, who can cater to the needs of the society in a much better way.

I recommend this invaluable manual to all the learners who want to master the subject of anatomy.

Dr Pritha S Bhuiyan
Professor and Head, Department of Anatomy
Professor and Coordinator, Department of Medical Education
Seth GS Medical College and KEM Hospital, Parel, Mumbai

Preface to the sixteenth edition

Cunningham's Manual of Practical Anatomy has been the most widely used dissection manual in India for many decades. This edition is extensively revised. The language has been modernized and simplified to appeal to the present-day student. Opening remarks have been added at the start of a chapter, or at the beginning of the description of a region where necessary. This volume on the head and neck, brain, and spinal cord starts with the description of the bones, cavities, organs, muscles, vessels, and nerves of the head and neck. The brain and spinal cord are discussed in the following section. The last section in the volume presents a series of cross-sectional gross anatomy images, as well as computerized tomograms and magnetic resonance images of the head, neck and brain, to enable further understanding of the intimate relationship between the structures described here.

Dissection forms an integral part of learning anatomy, and the practice of dissections enables students to retain and recall anatomical details learnt in the first year of medical college during their clinical practice. To make the dissection process easier and more meaningful, in this edition, each dissection is presented with a heading, and a list of objectives to be accomplished. Many of the details of dissections have been retained from the earlier edition, but are presented as numbered, stepwise easy-to-follow instructions that help students navigate their way through the tissues of the body, and to isolate, define, and study important structures.

This manual contains a number of old and new features that enable students to integrate the anatomy learned in the dissection hall with clinical practice. Numerous X-rays, CTs, and MRIs enable the student to visualize internal structures in the living. Matters of clinical importance when mentioned in the text are highlighted.

A brand new feature of this edition is the presentation of one or more clinical application notes at the end of each chapter. Some of these notes focus attention on the anatomical basis of commonly used physical diagnostic tests such as the corneal and gag reflex. Others deal with the underlying anatomy of clinical conditions such as stroke, otitis media, and radiculopathy. Clinical anatomy of common procedures, such as tracheostomy, are described. Many clinical application notes are in a Q&A format that challenges the student to brainstorm the material covered in the chapter. Multiple-choice questions on each section are included at the end to help students assess their preparedness for the university examination.

It is hoped that this new edition respects the legacy of *Cunningham's* in producing a text and manual that is accurate, student friendly, comprehensive, and interesting, and that it will serve the community of students who are beginning their career in medicine to gain knowledge and appreciation of the anatomy of the human body.

Dr Rachel Koshi

Contributors

Dr J Suganthy, Professor of Anatomy, Christian Medical College, Vellore, India.
Dr Suganthy wrote the MCQs, reviewed manuscripts, and provided help and advice with the artwork.

Dr Aparna Irodi, Professor of Radiology, Christian Medical College and Hospital, Vellore, India.
Dr Irodi kindly researched, identified, and explained the radiology images.

Dr Ivan James Prithishkumar, Professor of Anatomy, Christian Medical College, Vellore, India.
Dr Prithishkumar wrote some of the clinical applications and reviewed the text as a critical reader.

Dr Tripti Meriel Jacob, Associate Professor of Anatomy, Christian Medical College, Vellore, India.
Dr Jacob wrote some of the clinical applications and reviewed the text as a critical reader.

Acknowledgements

Dr Koshi would like to thank the following:

Radiology Department, Christian Medical College, Vellore, India.
The Radiology Department kindly provided the radiology images.

Ms Geraldine Jeffers, Senior Commissioning Editor, and **Karen Moore**, Senior Production Editor, and the wonderful editorial team of Oxford University Press for their assistance.

Reviewers

Oxford University Press would like to thank all those who read draft materials and provided valuable feedback during the writing process:

Dr TS Roy MD, PhD, Professor and Head, Department of Anatomy, All India Institute of Medical Sciences, New Delhi 110029, India.

Dr S Basu Ray, MBBS, MD, NDNB, MNAMS, Professor, Department of Anatomy, All India Institute of Medical Sciences, New Delhi 110029, India.

Dr Sabita Mishra, Professor, Director and Head, Department of Anatomy, Maulana Azad Medical College, New Delhi, India.

Dr Tony George Jacob, MD, DNB, PhD, Assistant Professor, Department of Anatomy, All India Institute of Medical Sciences, New Delhi 110029, India.

Dr CS Ramesh Babu, Associate Professor of Anatomy, Department of Anatomy, Muzaffarnagar Medical College, Muzaffarnagar, India.

Dr Neerja Rani, Assistant Professor, Department of Anatomy, All India Institute of Medical Sciences, New Delhi 110029, India.

Contents

PART 1

Head and neck

CHAPTER 1

Introduction to the head and neck

The section on head and neck deals with the bones, cavities, organs, muscles, vessels, and nerves of the head and neck. It does not include the study of the brain, which is dealt with in a separate section devoted to the brain and spinal cord.

The head and neck section begins with a description of the bones of the region—the cervical vertebrae and skull. The dissectors should study these bones and the bony prominences in the living, as a preliminary to the dissection of the head and neck.

The next few chapters (the scalp and face, anterior triangle, posterior triangle, and back of the neck) complete the superficial dissection of the head and neck. The cranial cavity and deeper structures of the head and neck (the orbit, ear, oral cavity, nasal cavity, pharynx, and larynx) are then dissected and described. The joints of the neck and contents of the vertebral canal are discussed last.