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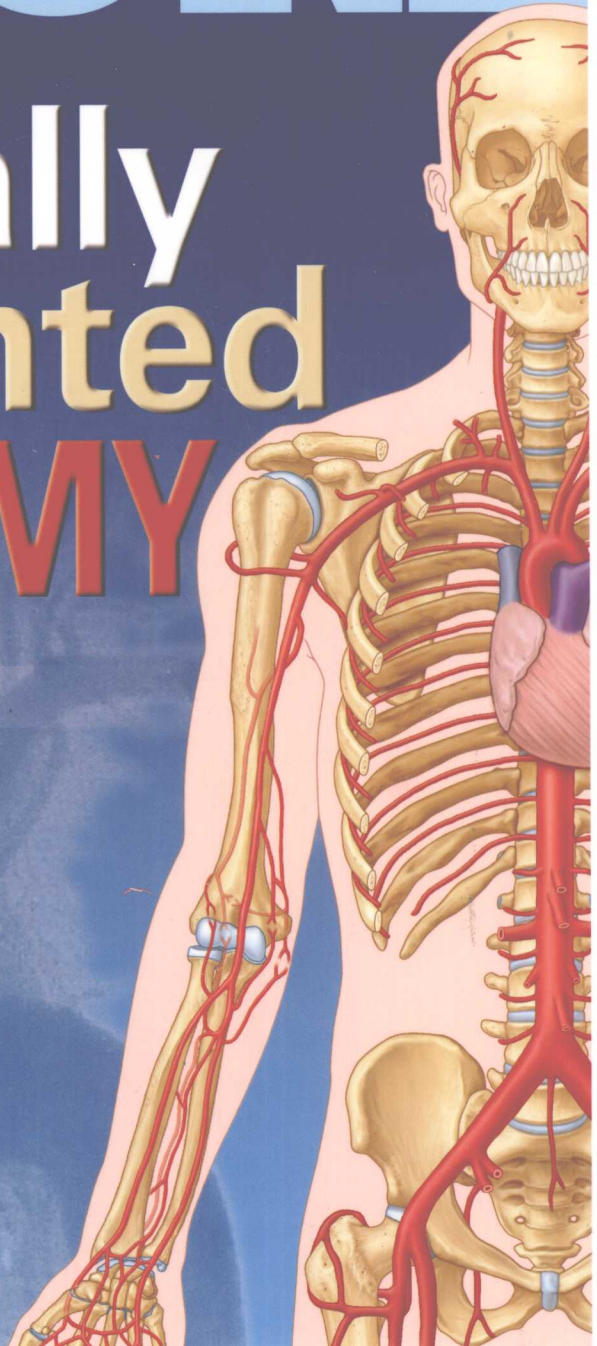
MOORE

Clinically Oriented ANATOMY

Seventh Edition

Keith L. Moore
Arthur F. Dalley
Anne M.R. Agur

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Clinically Oriented ANATOMY

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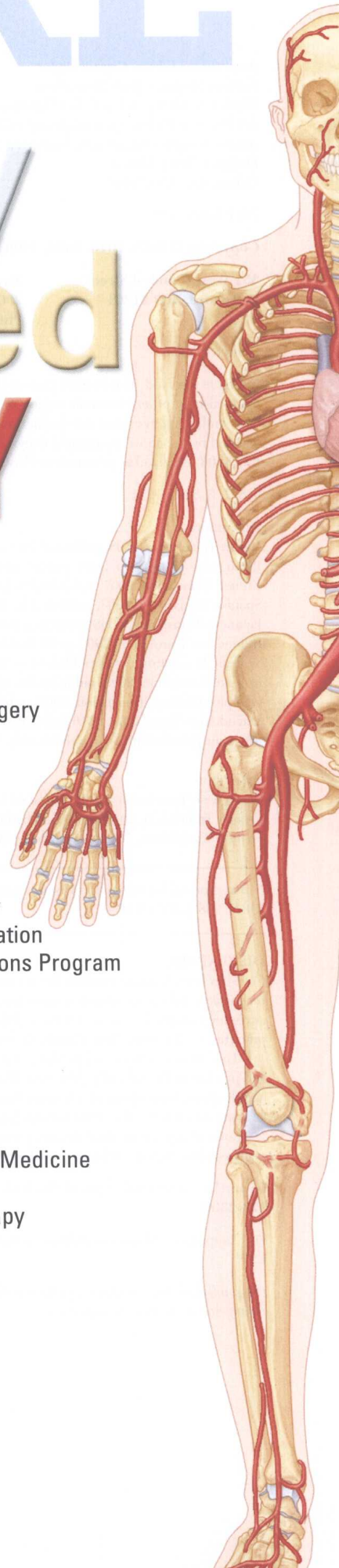
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Clinically Oriented ANATOMY

Seventh Edition



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X008802



In Loving Memory of Marion

My best friend, wife, colleague, mother of our five children and grandmother of our nine grandchildren for her love, unconditional support, and understanding. Wonderful memories keep you in our hearts and minds. • (KLM)

To Pam and Ron

I am grateful to my eldest daughter Pam, who assumed the office duties her mother previously carried out. She is also helpful in many other ways. I am also grateful to my son-in-law Ron Crowe whose technical skills have helped me prepare the manuscript for this book. • (KLM)

To My Grandchildren

Melissa, Kristin, Alecia, Lauren, Mitchel, Caitin, Jayme, Courtney and Brooke. With best wishes for your future endeavours. Love, Grandpa • (KLM)

To Muriel

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To my husband, Enno, and my children, Erik and Kristina, for their support and encouragement. • (AMRA)

To Our Students

You will remember some of what you hear, much of what you read, more of what you see, and almost all of what you experience and understand fully.

To Anatomical Donors

With sincere appreciation to all those who donate their bodies for anatomical study and research, without whom anatomical textbooks and atlases, and anatomical study in general would not be possible.



Preface

A third of a century has passed since the first edition of *Clinically Oriented Anatomy* appeared on bookstore shelves. Although the factual basis of anatomy is remarkable among basic sciences for its longevity and consistency, this book has evolved markedly since its inception. This is a reflection of changes in the clinical application of anatomy, new imaging technologies that reveal living anatomy in new ways, and improvements in graphic and publication technology that enable superior demonstration of this information. Efforts continue to make this book even more student friendly and authoritative. The seventh edition has been thoroughly reviewed by students, anatomists, and clinicians for accuracy and relevance and revised with significant new changes and updates.

KEY FEATURES

Clinically Oriented Anatomy has been widely acclaimed for the relevance of its clinical correlations. As in previous editions, the seventh edition places clinical emphasis on anatomy that is important in physical diagnosis for primary care, interpretation of diagnostic imaging, and understanding the anatomical basis of emergency medicine and general surgery. Special attention has been directed toward assisting students in learning the anatomy they will need to know in the twenty-first century, and to this end new features have been added and existing features updated.

Extensive art program. The seventh edition is distinguished by an extensive revision of the art program. Working with a team of artists from Imagineering, every illustration has been revised, improving accuracy and consistency and giving classical art derived from *Grant's Atlas of Anatomy* a fresh, vital, new appearance. An effort has been made to ensure that all the anatomy presented and covered in the text is also illustrated. The text and illustrations have been developed to work together for optimum pedagogical effect, aiding the learning process and markedly reducing the amount of searching required to find structures. The great majority of the clinical conditions are supported by photographs and/or color illustrations; multipart illustrations often combine dissections, line art, and medical images; tables are accompanied by illustrations to aid the student's understanding of the structures described.

Clinical correlations. Popularly known as "blue boxes," the clinical information sections have grown, and many of

them are supported by photographs and/or dynamic color illustrations to help with understanding the practical value of anatomy. In response to our readers' suggestions, the blue boxes have been grouped together within chapters, enabling presentation of topics with less interruption of the running text.

Bottom line summaries. Frequent "bottom line" boxes summarize the preceding information, ensuring that primary concepts do not become lost in the many details necessary for thorough understanding. These summaries provide a convenient means of ongoing review and underscore the big picture point of view.

Anatomy described in a practical, functional context. A more realistic approach to the musculoskeletal system emphasizes the action and use of muscles and muscle groups in daily activities, emphasizing gait and grip. The eccentric contraction of muscles, which accounts for much of their activity, is now discussed along with the concentric contraction that is typically the sole focus in anatomy texts. This perspective is important to most health professionals, including the growing number of physical and occupational therapy students using this book.

Surface anatomy and medical imaging. Surface anatomy and medical imaging, formerly presented separately, are now integrated into the chapter, presented at the time each region is being discussed, clearly demonstrating anatomy's relationship to physical examination and diagnosis. Both natural views of unobstructed surface anatomy and illustrations superimposing anatomical structures on surface anatomy photographs are components of each regional chapter. Medical images, focusing on normal anatomy, include plain and contrast radiographic, MRI, CT, and ultrasonography studies, often with correlative line art as well as explanatory text, to help prepare future professionals who need to be familiar with diagnostic images.

Case studies, accompanied by clinico-anatomical problems and board review-style multiple-choice questions. Interactive case studies and multiple-choice questions are available to our readers online at <http://thePoint.lww.com>, providing a convenient and comprehensive means of self-testing and review.

Terminology. The terminology fully adheres to *Terminologia Anatomica* (1998), approved by the International Federation of Associations of Anatomists (IFAA). Although the official English-equivalent terms are used throughout the book, when new terms are introduced, the Latin form, used in Europe, Asia, and other parts of the world, is also provided.

editions of *Clinically Oriented Anatomy* beyond the sharing of materials from *Grant's Atlas*, and has been involved in—and been an asset to—every stage of the development of this and the previous editions.

COMMITMENT TO EDUCATING STUDENTS

This book is written for health science students, keeping in mind those who may not have had a previous acquaintance with anatomy. We have tried to present the material in an interesting way so that it can be easily integrated with what will be taught in more detail in other disciplines such as physical diagnosis, medical rehabilitation,

and surgery. We hope this text will serve two purposes: to educate and to excite. If students develop enthusiasm for clinical anatomy, the goals of this book will have been fulfilled.

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ABBREVIATIONS

a., aa.	artery, arteries
ant.	anterior
B.C.E.	before the Common (Christian) era
C	cervical
C.E.	Common (Christian) era
Co	coccygeal
dim.	diminutive
e.g.	for example
et al.	and others
F	female
Fr.	French
G.	Greek
i.e.	that is
inf.	inferior
L	liter, lumbar
L.	Latin

lev.	levator
lit.	literally
M	male
m., mm.	muscle, muscles
Mediev.	medieval
Mod.	modern
post.	posterior
S	sacral
sup.	superior, superioris
supf.	superficial
T	thoracic
TA	<i>Terminologia Anatomica</i>
TE	<i>Terminologia Embryologica</i>
TH	<i>Terminologia Histologica</i>
v., vv.	vein, veins
vs.	versus

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Keith L. Moore
Arthur F. Dalley II
Anne M. R. Agur

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Cranial Nerves. Cranial Nerve Injuries. **Olfactory Nerve.** Anosmia—Loss of Smell; Olfactory Hallucinations. **Optic Nerve.** Demyelinating Diseases and Optic Nerves; Optic Neuritis; Visual Field Defects. **Oculomotor Nerve.** Injury to Oculomotor Nerve; Compression of Oculomotor Nerve; Aneurysm of Posterior Cerebral or Superior Cerebellar Artery. **Trochlear Nerve.** **Trigeminal Nerve.** Injury to Trigeminal Nerve; Dental Anesthesia. **Abducent Nerve.** **Facial Nerve.** **Vestibulocochlear Nerve.** Injuries to Vestibulocochlear Nerve; Deafness; Acoustic Neuroma; Trauma and Vertigo. **Glossopharyngeal Nerve.** Lesions of Glossopharyngeal Nerve; Glossopharyngeal Neuralgia. **Vagus Nerve.** **Spinal Accessory Nerve.** **Hypoglossal Nerve** / 1078

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Fig. 3.72D Lee JKT, Sagel SS, Stanley RJ, et al.: Computed Body Tomography with MRI Correlation. 3rd ed. Baltimore: Lippincott Williams & Wilkins, 1998.

Fig. B3.2B Based on Anatomy as the Basis of Clinical Medicine. 3rd ed.

Fig. B3.7A & B Reprinted with permission from LearningRadiology.com.

Fig. B3.9 Based on Stedman's Medical Dictionary. 27th ed.

Fig. B3.10 Based on Hartwig W: Fundamental Anatomy. Baltimore: Lippincott Williams & Wilkins; 2007. P. 176.

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Fig. B3.14A & B Based on Beckmann CR. Obstetrics and Gynecology. 4th ed. Baltimore: Lippincott Williams and Wilkins, 2002.

Fig. B3.16 Reprinted with permission from Stuart GCE, Reid DF. Diagnostic studies. In: Copeland LJ, ed. Textbook of Gynecology. Philadelphia: Saunders, 1993.

Fig. B3.17A–D Based on Stedman's Medical Dictionary. 27th ed.

Fig. B3.18A & B Based on Fuller J, Schaller-Ayers J: A Nursing Approach. 2nd ed. Philadelphia: Lippincott, 1994. Fig. B3.11 (artist: Larry Ward, Salt Lake City, UT).

Fig. B3.20A & C–E Based on Stedman's Medical Dictionary. 27th ed.

Fig. B3.22 Based on Obstetrics and Gynecology. 4th ed.

Fig. B3.23 Based on A Nursing Approach. 2nd ed.

Fig. B3.24 Based on Stedman's Medical Dictionary. 27th ed.

Fig. B3.26A Based on Stedman's Medical Dictionary. 28th ed.

Fig. B3.26B With permission from Bristow RE, Johns Hopkins School of Medicine, Baltimore, MD.

Fig. 3.27A–C Based on LWW Atlas Plate 6.19A, p. 276

Fig. B3.28 Based on Obstetrics and Gynecology. 4th ed.

Fig. B3.29A and B Based on Stedman's Medical Dictionary. 27th ed.

Fig. B3.32 Based on Stedman's Medical Dictionary. 27th ed.

Fig. B3.33A Based on Stedman's Medical Dictionary. 27th ed. (artist: Neil O. Hardy, Westport, CT) and Clinically Oriented Anatomy, 7th ed., fig. B3.30B

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CHAPTER 4

Fig. 4.1C Based on Olson TR: Student Atlas of Anatomy. Baltimore: Williams & Wilkins, 1996.

Fig. 4.4 Based on Pocket Atlas of Human Anatomy. Rev. 5th ed. Fig. B, p. 49.

Fig. 4.7D Becker RF, Wilson JW, Gehweiler JA: Anatomical Basis of Medical Practice. Baltimore: Williams & Wilkins, 1974.

Fig. 4.30 Based on Student Atlas of Anatomy.

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Fig. B4.3A–E Based on Clark CR: The Cervical Spine. 3rd ed. Philadelphia: Lippincott Williams & Wilkins, 1998.

Fig. B4.3F & G Computed Body Tomography with MRI Correlation. 3rd ed.

Fig. B4.10 Van de Graff. Human Anatomy. 4th ed. Dubuque: WC Brown. P. 163.

Artery; Measuring Pulse Rate; Variations in Origin of Radial Artery; Median Nerve Injury; Pronator Syndrome; Communications Between Median and Ulnar Nerves; Injury of Ulnar Nerve at Elbow and in Forearm; Cubital Tunnel Syndrome; Injury of Radial Nerve in Forearm (Superficial or Deep Branches) / 766

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