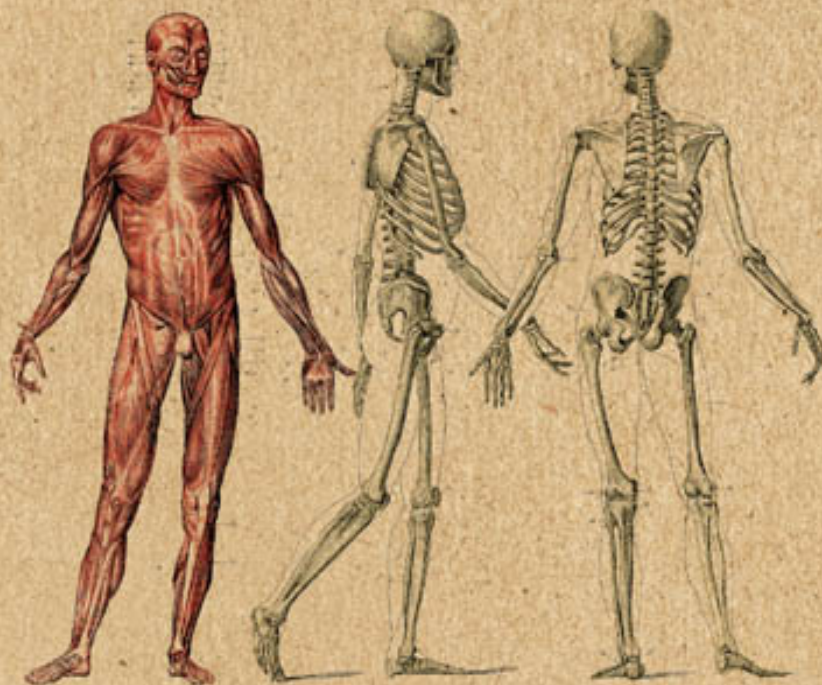


30-SECOND ANATOMY

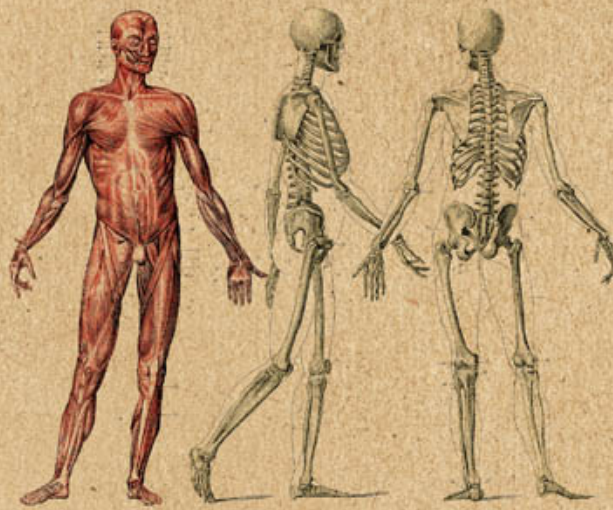
The 50 most important structures
and systems in the human body
each explained in half a minute



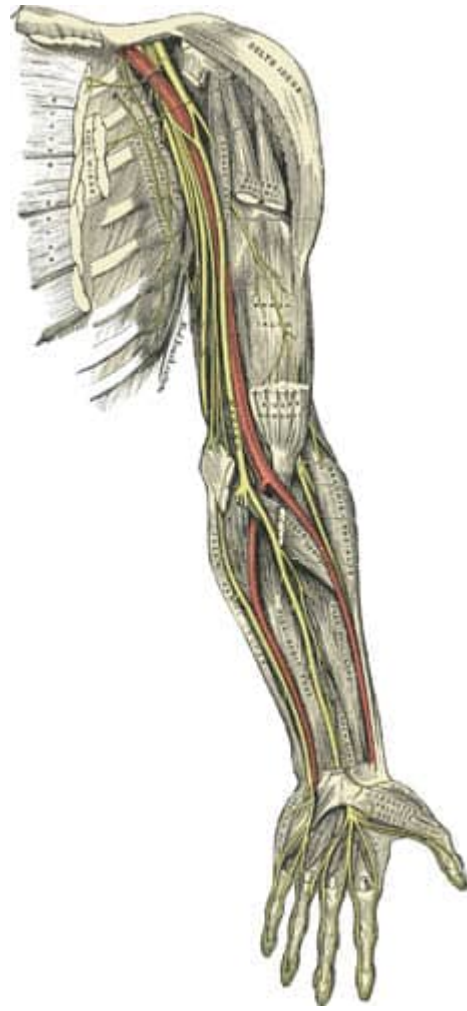
Editor
Gabrielle M. Finn

30-SECOND ANATOMY

The 50 most important structures
and systems in the human body
each explained in half a minute



Editor
Gabrielle M. Finn



30-SECOND

ANATOMY

The 50 most important structures and systems in the human body, each explained in half a minute

Editor

Gabrielle M. Finn

Contributors

Judith Barbaro-Brown

Jo Bishop

Andrew Chaytor

Gabrielle M. Finn

December S. K. Ika

Marina Sawdon

Claire France Smith



Published in the UK in 2011 by

Ivy Press

210 High Street, Lewes,
East Sussex BN7 2NS, U.K.

www.ivypress.co.uk

Copyright © The Ivy Press Limited 2012

All rights reserved. No part of this publication may be reproduced or transmitted in any form by any means, electronic or mechanical, including photocopying, recording, or by any information storage-and-retrieval system, without written permission from the copyright holder.

British Library Cataloguing-in-Publication Data

A CIP catalogue record for this book is available from the British Library.

ISBN 978-1-78240-071-4

Ivy Press

This book was conceived, designed and produced by Ivy Press

Creative Director **Peter Bridgewater**

Publisher **Jason Hook**

Editorial Director **Caroline Earle**

Art Director **Michael Whitehead**

Designer **Ginny Zeal**

Illustrator **Ivan Hissey**

Profiles Text **Viv Croot**

Glossaries Text **Charles Phillips**

Project Editor **Jamie Pumfrey**

Typeset in Section

Printed in China

10 9 8 7 6 5 4 3 2 1

Distributed worldwide (except North America) by Thames & Hudson Ltd., 181A High
Holborn, London WC1V 7QX, United Kingdom

CONTENTS

Introduction

The Skeletal System

GLOSSARY

Types of bone tissue

The bone joints

The ligaments, cartilage & tendons

The skull

The spine & ribcage

profile: Vesalius

The pelvis

The lower limbs

The upper limbs

The hands & feet

The Muscular System

GLOSSARY

Types of muscle tissue

Movements

The facial muscles

The neck muscles

The upper limb muscle groups

The lower limb muscle groups

profile: Leonardo da Vinci

The abdominal & back muscles

The respiratory muscles

The Cardiovascular & Respiratory Systems

GLOSSARY

The circulatory system

The heart

The major arteries & veins

The microcirculation

The portal circulation

The spleen

profile: William Harvey

The lungs

The bronchial tree

The Digestive System

GLOSSARY

The stomach

The small intestine

The large intestine

The liver & gall bladder

The pancreas

profile: Eustachius

The kidneys

The bladder

The lymphatic system

The Sensory & Speech Organs

GLOSSARY

The dermatomes

The skin, hair & nails

The eyes

The nose

profile: Galen

The ears

The tongue

The pharynx, larynx & vocal cords

The Endocrine & Nervous Systems

GLOSSARY

The endocrine system

The brain & brainstem

The spinal cord

profile: Henry Gray

The autonomic nervous system

The cranial nerves

The nerve plexuses

The Reproductive System

GLOSSARY

The female reproductive system

The pelvic floor muscles

profile: William Hunter

The male reproductive system

The perineum

APPENDICES

Resources

Notes on contributors

Index

Acknowledgements

INTRODUCTION

Gabrielle M. Finn

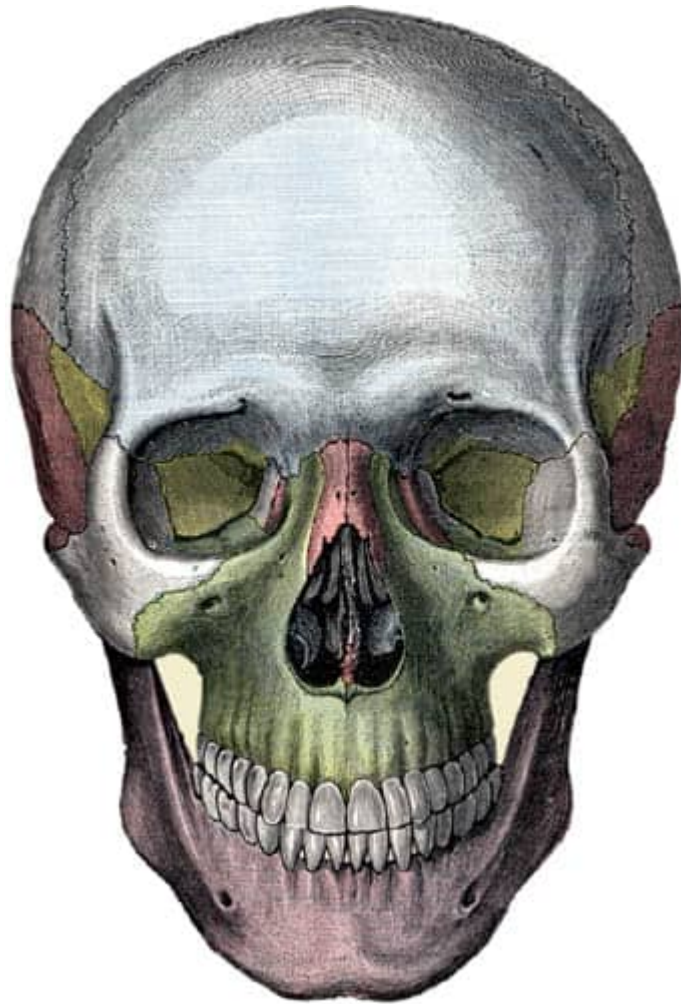
Anatomy is both within and all around us. By learning a little anatomy, we come to understand how our bodies are built: An anatomical drawing that depicts the bones, muscles, ligaments, tendons and organs of the body is a map of the inner landscape we all share. Yet at the same time, our experience of the body, our knowledge of its skeleton and organs, informs the way we see the world. For this reason, human anatomy has a widespread symbolism in popular culture, from the hearts printed on Valentine's Day cards to the skull as a symbol of danger.

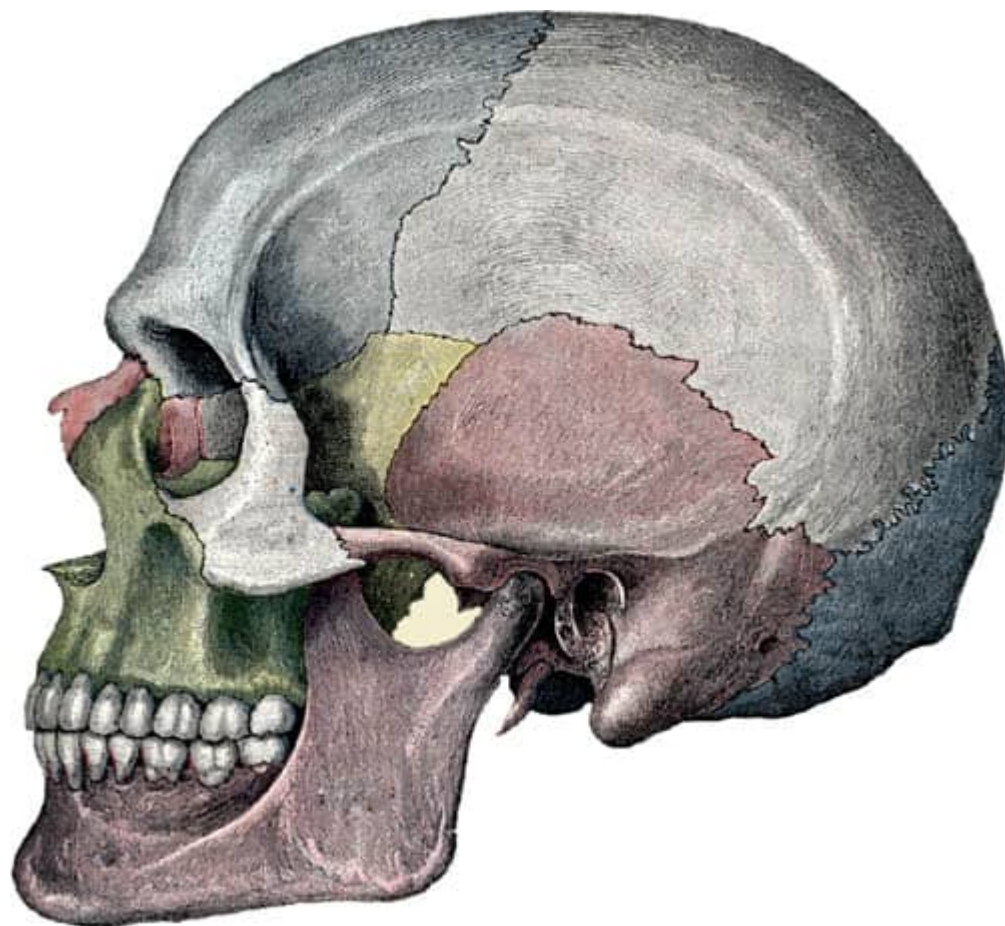
Gruesome history

Traditionally, many people may have seen anatomy as an academic discipline, of interest to only medical students, but in recent years the subject has had a boom in popularity. This is due largely to its entry into the public arena through touring exhibitions of cadaveric specimens and televised human dissections by anatomists, such as Gunther von Hagens and Alice Roberts. Behind this new interest lies a long and gruesome history.

The origins of anatomical study were in animal vivisection and the dissection of human corpses. The ancient Greek physician Galen based his ideas of human anatomy on knowledge gained from dissections and vivisections of pigs and primates. The Renaissance artist Leonardo da Vinci, creator of *The Last Supper* and the *Mona Lisa*, was famed for his anatomical drawings and derived his knowledge of the inside of the human body from working with corpses supplied by doctors in hospitals in Milan and Florence. Anatomy has also been associated with crime, as in the case of the

nineteenth-century murders perpetrated in Scotland by William Burke and William Hare. A pair of Irish immigrants, they robbed graves and embarked on a serial-killing spree in 1827–28 in order to sell corpses to Dr Robert Knox, an anatomy lecturer with students from Edinburgh University medical school. The pair were caught: Hare was granted immunity for testifying, and Burke was hanged on 28 January 1829; ironically, his remains ended up in the medical school's anatomy museum.





Anatomical blueprint

Despite the fact that anatomy describes the blueprint for the living body, one of the subject's most common associations is death – the bones that structure our living bodies are our final physical remains.

Evolution and variation

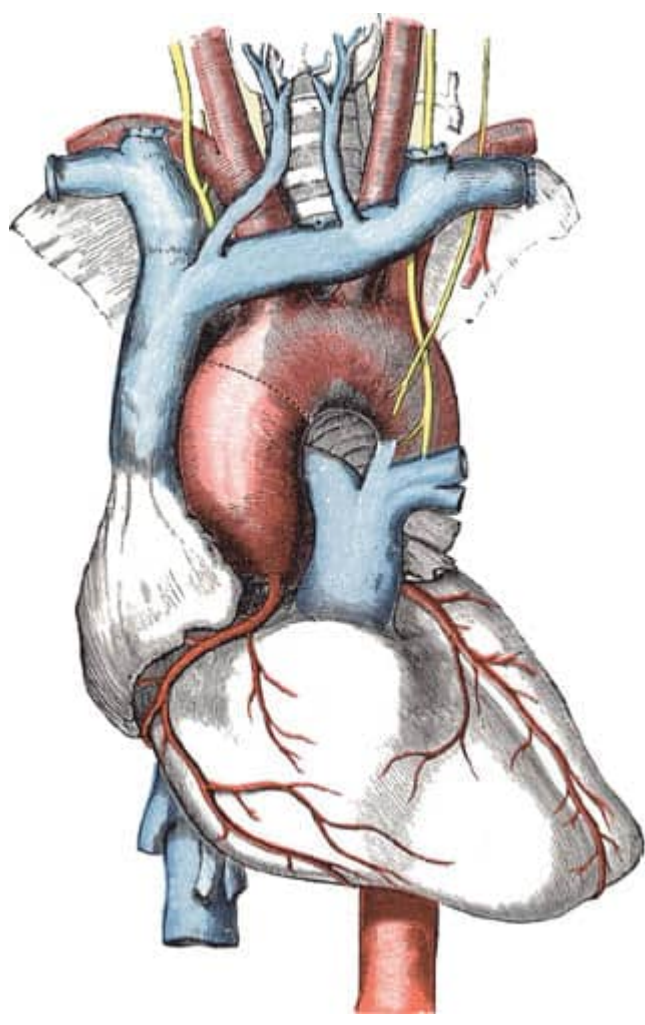
Anatomy is an ancient discipline, and you might think that there is nothing new to know in the field. Yet, remarkably, human anatomy continues to evolve. This evolution is very slow, but it exists and persists. Take, for example, the coccygeal bones at the base of the spine: These used to be the point at which the human tail started. Another example of continual evolution is the palmaris longus muscle in the forearm; due to its limited function, this muscle has become redundant, and evolution in some individuals has resulted in its absence in around 15 per cent of people.

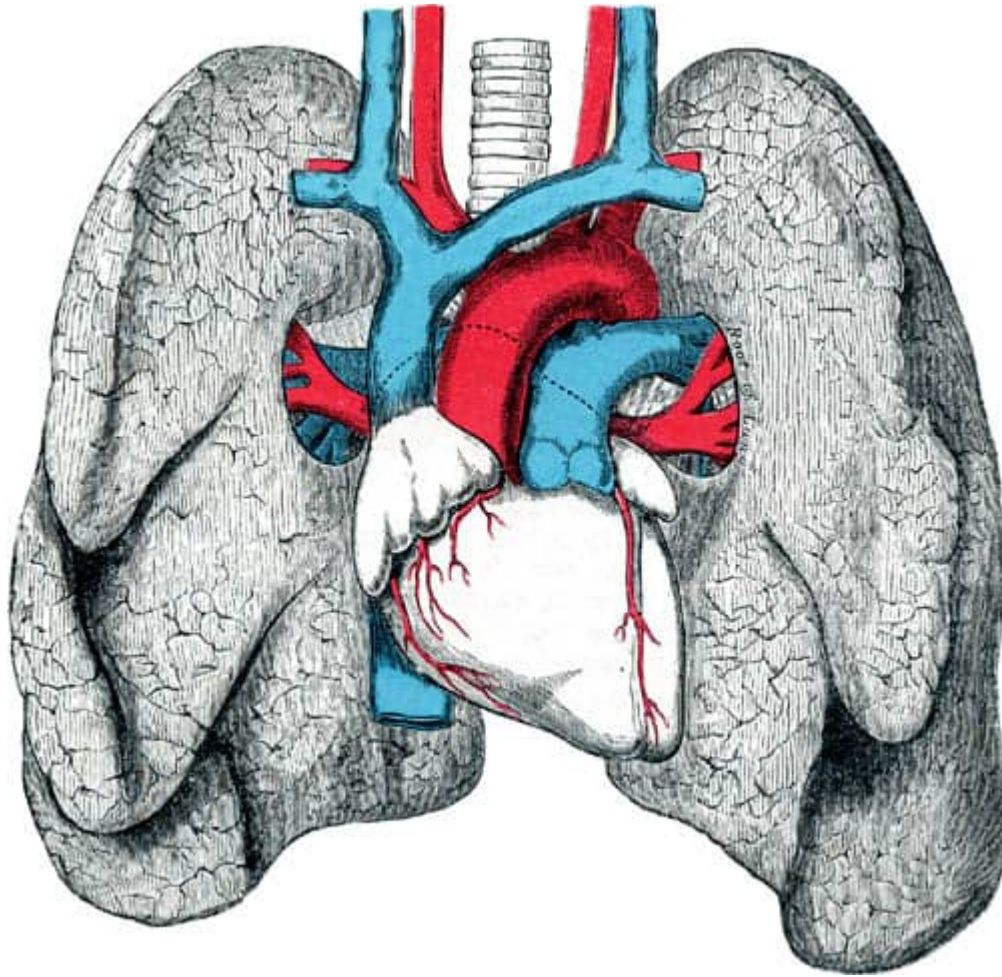
One of the biggest challenges facing anyone who wants to study anatomy is anatomical variation. As we have seen, anatomy provides a blueprint for how all bodies are structured; however, in a world with a population heading for an estimated 7 billion people, variation will and does exist. A primary example is found in the arteries within the pelvis; there are fifty-four known variations of how these vessels distribute themselves. Moreover, variation exists not only from person to person, but also from side to side within an individual body. Some people have a larger ear on the right than on the left; or a person may have a single horseshoe-shaped kidney instead of the normal two kidneys; or the pathways followed by nerves may vary from the accepted convention. This book presents the most commonly encountered anatomy.

Anatomy – systems and functions

Anatomy has its own technical language, in which muscles and bones have lengthy Latin or Greek names. Simple physical actions, such as the movement of the lower limb (leg), have multiple anatomical descriptions depending on the direction of the movement. There are in excess of 200 bones, 600 muscles and numerous veins, arteries and nerves. Don't let that put you off. This book does not attempt to explain the location and function of each individual structure; instead, it breaks the body down into functional systems and describes the fifty most relevant components, using illustrations and avoiding complex terminology.

Another consideration is that anatomical structures – whether a single muscle in the thigh or a digestive organ, such as the stomach – do not work alone. Although the text maps out individualized functions for each structure, the reality is that everything works together. The function of one organ might rely on a hormone produced by another, or the movement at a joint may result from the actions of three or four muscles working together. Think about the bigger picture.





Medical pioneers

Great breakthroughs in anatomy have often taken the form of correcting earlier errors.

The Englishman William Harvey (1578–1625) – featured on [here](#) – was the first to establish the true role in the body of the heart (top) and lungs (below).

How this book works

Traditionally, anatomy is regarded as the study of the body's form or structure, whereas physiology describes its functioning. However, form and function cannot be mutually exclusive. This book does not divorce the two; it describes both how the body is built and how it works.

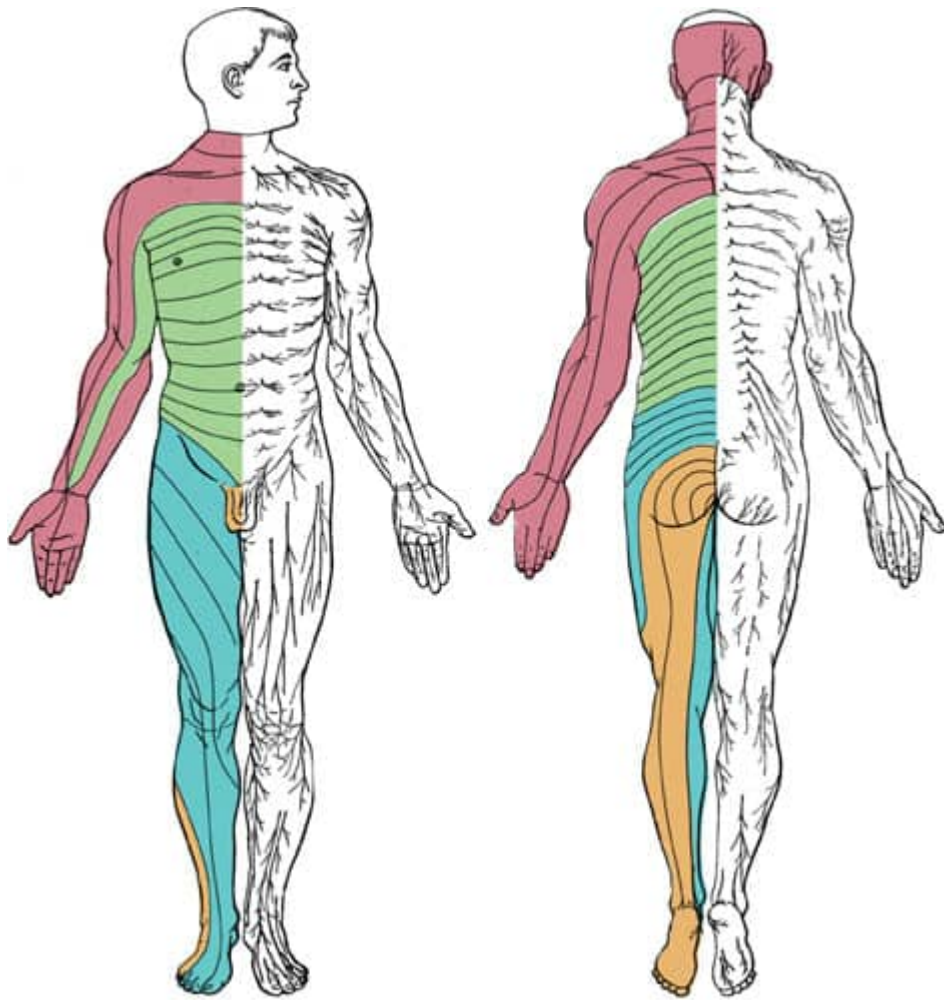
The construction of the human body can be described in one of two ways: regionally or systematically. A regional approach to writing about anatomy would be to describe the individual areas of the body, such as the leg, the arm or the head; a systematic approach would describe the body systems – digestive, musculoskeletal, reproductive and so on. The approach in *30-Second Anatomy* is based on these systems. The book is organized into seven chapters, each addressing a system of the body. By the end, it is hoped that you'll have dissected your way through the body, learning the bare bones of its anatomy, in a simple, easy-to-follow manner.

Each anatomical component is presented as a 30-second anatomy. Accompanying this is the 3-second incision for those who simply want a quick slice. The 3-minute dissection that follows serves to illustrate the claim of Sigmund Freud, the Austrian neurologist and founder of psychoanalysis, that 'Anatomy is destiny'. It provides examples of weird and wonderful aspects of human anatomy and describes what happens when bodily structures go wrong.

The first chapter deals with the skeletal system. The human body is constructed around the skeleton; the bones are a scaffolding onto which everything else is built. The second chapter looks at the muscular system and how humans move. The next two chapters are oriented around the main organs of the cardiovascular and digestive systems, addressing key functions, such as breathing and eating, and how the blood is pumped around the body. Next comes a tour of the special senses – skin, sight and hearing, to name but a few. The sixth chapter considers overall control of bodily function – the brain and the nervous system. Finally, we end with a

nod to the circle of life by examining the reproductive system. Within each chapter you will also find a profile of a key anatomist.

The structure of this book is such that you can dip in and out, reading the odd entry here and there, or you can go through it system by system, or read it cover to cover. So why not lift the hood on your anatomy – and read on to enjoy finding out the mechanics of how you work!



Mapping the body

The brain and nervous system interact with all the other body systems to control the functions of the body. Anatomists have mapped how sensory fibres issuing from nerves in the spinal cord supply and receive input from specific areas of skin up and down the human frame.

THE SKELETAL SYSTEM

