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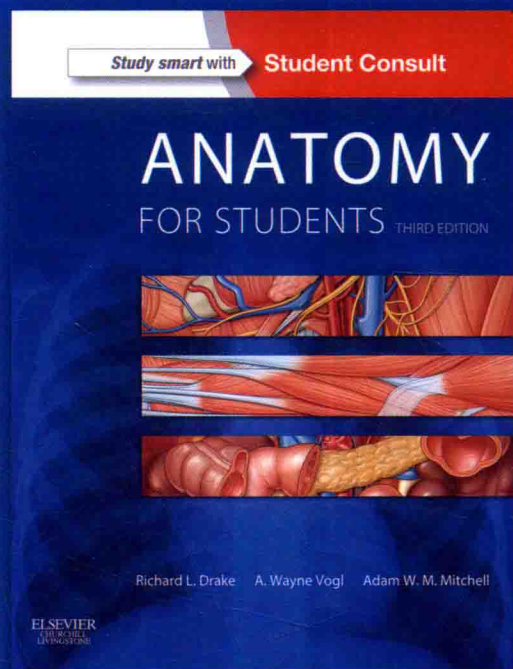
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Gray's Anatomy for Students

格氏解剖学教学版

(第3版)

Richard L. Drake
A. Wayne Vogl
Adam W. M. Mitchell



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Adam W. M. Mitchell

Dedications

To my wife, Cheryl, who has supported me; and my parents, who have guided me.

—Richard L. Drake

To my family, to my professional colleagues and role models, and to my students—this book is for you.

—A. Wayne Vogl

To Cathy, Max, and Elsa

—Adam W. M. Mitchell

Preface

The 3rd edition of Gray's Anatomy for Students builds on the past and looks toward the future.

It maintains the goals and objectives of the 1st and 2nd editions while at the same time continuing to incorporate input from our readers and adjusting the content to align with the evolving educational environment.

One of the major focuses of our attention as we prepared the 3rd edition was clinical content. The reason for this is that learning in context has become an important theme not only in medical education but in anatomical sciences education generally. We dealt with the clinical content in two ways. First, we reevaluated and updated the "In the clinic" boxes, clinical material in the body of the text, clinical cases at the end of the chapters and in the online resources, and in the surface anatomy section. Second, we added new clinical material so that the reader would have up-to-date examples relating anatomical information to clinical situations.

In addition to updating and revising the clinical content, the section on cranial nerves has been significantly expanded. Understanding these important components of the nervous system is critical for students at every level. To facilitate student learning a new figure

summarizing the location, function, and distribution of each cranial nerve has been added, as has a new figure summarizing how major structures, including cranial nerves, enter and leave the cranial cavity. We also have included a new figure illustrating the clinical importance of vascular structures in and around the cranial cavity.

We believe that with these changes the 3rd edition of *Gray's Anatomy for Students* is a much improved version of the 2nd edition and hope that the book will continue to be a valuable learning resource for students.

Richard L. Drake
A. Wayne Vogl
Adam W. M. Mitchell
December 2013

About the Book

The idea

In the past 20 years or so, there have been many changes that have shaped how students learn human anatomy in medical and dental schools and in allied health programs, with curricula becoming either more integrated or more systems based. In addition, instructional methods focus on the use of small group activities with the goals of increasing the amount of self-directed learning, and acquiring the skills for the life-long acquisition of knowledge. An explosion of information in every discipline has also been a force in driving curricular change as it increases the amount to be learned without necessarily increasing the time available. With these changes, we felt it was time for a new text to be written that would allow students to learn anatomy within the context of many different curricular designs, and within ever-increasing time constraints.

We began in the fall of 2001 by considering the various approaches and formats that we might adopt, eventually deciding upon a regional approach to anatomy with each chapter having four sections. From the beginning, we wanted the book to be designed with multiple entry points, to be targeted at introductory level students in a broad spectrum of fields, and to be a student-oriented companion text for *Gray's Anatomy*, which is aimed at a more professional audience. We wrote the text first and subsequently constructed all the artwork and illustrations to complement and augment the words. Preliminary drafts of chapters, when complete, were distributed to an international editorial board of anatomists, educators, and anatomy students for review. Their comments were then considered carefully in the preparation of the final book.

The text is not meant to be exhaustive in coverage, but to present enough anatomy to provide students with a structural and functional context in which to add further detail as they progress through their careers. *Gray's Anatomy* was used as the major reference, both for the text and for the illustrations, during the preparation of this book, and it is the recommended source for acquiring additional detail.

The book

Gray's Anatomy for Students is a clinically oriented, student-friendly textbook of human anatomy. It has been prepared primarily for students in a variety of professional programs (e.g., medical, dental, chiropractic, and physical therapy

programs). It can be used by students in traditional, systemic, combined traditional/systemic, and problem-based curricula and will be particularly useful to students when lectures and laboratories in gross anatomy are minimal.

ORGANIZATION

Using a regional approach, *Gray's Anatomy for Students* progresses through the body in a logical fashion, building on the body's complexities as the reader becomes more comfortable with the subject matter. Each chapter can be used as an independent learning module, and varying the sequence will not affect the quality of the educational experience. The sequence we have chosen to follow is back, thorax, abdomen, pelvis and perineum, lower limb, upper limb, and head and neck.

We begin with "The body," which contains an overview of the discipline of gross anatomy and an introduction to imaging modalities and general body systems. We follow this with the back because it is often the first area dissected by students. The thorax is next because of its central location and its contents (i.e., the heart, the great vessels, and the lungs). This also begins a progression through the body's cavities. The abdomen and pelvis and perineum follow logically in sequence from the thorax. Continuing downward toward the feet, the lower limb is next, followed by the upper limb. The last region discussed is the head and neck. This region contains some of the most difficult anatomy in the body. Covering all other regions first gives the student the opportunity to build a strong foundation from which to understand this complex region.

CONTENT

Each regional anatomy chapter consists of four consecutive sections: conceptual overview, regional anatomy, surface anatomy, and clinical cases.

The conceptual overview provides the basis on which information in the later sections is built. This section can be read independently of the rest of the text by students who require only a basic level of understanding and can also be read as a summary of important concepts after the regional anatomy has been mastered.

The regional anatomy section provides more detailed anatomy along with a substantial amount of relevant clinical correlations. It is not an exhaustive discussion but instead provides information to a level that we feel is necessary for understanding the organization of the region.

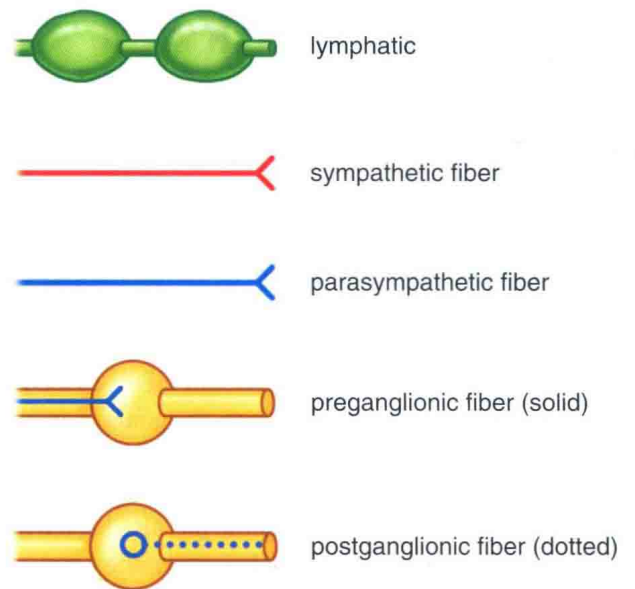
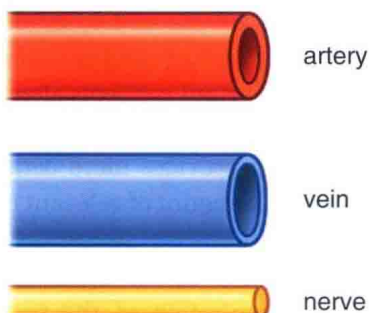
About the Book

Throughout this section, two levels of clinical material are provided. Clinical hooks are fully integrated with the main anatomical text and function to relate (“hook”) the anatomy discussed directly to a clinical application without taking students out of their train of thought and without disrupting the flow of the text. Although fully integrated with the anatomical text, these passages are differentiated from it by the use of green highlighting. “In the clinic” summaries provide students with useful and relevant clinical information demonstrating how applying anatomical knowledge facilitates the solving of clinical problems. These are spread throughout the text close to the most relevant anatomical discussion.

Surface anatomy assists students in visualizing the relationship between anatomical structures and surface landmarks. This section also provides students with practical applications of the anatomical information, combining visual inspection with functional assessment, as occurs during any type of patient examination.

The final section of each chapter consists of clinical cases. These cases represent the third level of clinical material in the book. In these cases the clinical problem is described, and a step-by-step process of questions and answers leads the reader to the resolution of the case. The inclusion of these cases in each chapter provides students with the opportunity to apply an understanding of anatomy to the resolution of a clinical problem.

Illustrations are an integral part of any anatomy text. They must present the reader with a visual image that brings the text to life and presents views that will assist in the understanding and comprehension of the anatomy. The artwork in this text accomplishes all of these goals. The illustrations are original and vibrant, and many views are unique. They have been designed to integrate with the text, present the anatomy in new ways, deal with the issues that students find particularly difficult, and provide a conceptual framework for building further understanding. To ensure that the illustrations of the book work together and to enable students to cross-refer from one illustration to another, we have used standard colors throughout the book, except where indicated otherwise.



The position and size of the artwork was one of the parameters considered in the overall design of each page of the book.

Clinical images are also an important tool in understanding anatomy and are abundant throughout the text. Examples of state-of-the-art medical imaging, including MRIs, CTs, PETs, and ultrasound, as well as high-quality radiographs, provide students with additional tools to increase their ability to visualize anatomy in vivo and, thus, increase their understanding.

What the book does not contain

Gray's Anatomy for Students focuses on gross anatomy. While many curricula around the world are being presented in a more integrated format combining anatomy, physiology, histology, and embryology, we have focused this textbook on understanding only the anatomy and its application to clinical problems. Except for some brief references to embryology where necessary for a better understanding of the anatomy, material from other disciplines is not included. We felt that there are many outstanding textbooks covering these subject areas, and that trying to cover everything in a single book would produce a text of questionable quality and usefulness, not to mention enormous size!

Terminology

In any anatomical text or atlas, terminology is always an interesting issue. In 1989, the Federative Committee on Anatomical Terminology (FCAT) was formed and

was charged with developing the official terminology of the anatomical sciences. The *Terminologia Anatomica* (2nd edition, Thieme, Stuttgart/New York, 2011) was a joint publication by this group and the 56 member associations of the International Federation of Associations of Anatomists (IFAA). We have chosen to use the terminology presented in this publication in the interest of uniformity. Other terminology is not incorrect; we just felt that using terminology from this single, internationally recognized source would be the most logical and straightforward approach.

Although we use anatomical terms for orientation as much as possible, we also use terms such as “behind” or “in front of” occasionally to make the text more readable. In these cases, the context clarifies the meaning.

Anatomical use of adverbs

During the writing of this book, we had many long discussions about how we were going to describe anatomical relationships as clearly as possible, but maintain the readability of the text. One issue that arose continually in our discussions was the correct use of the “-ly” adverb form of

anatomical orientation terms, such as anterior, posterior, superior, inferior, lateral, and medial. We reached the following consensus:

-ly adverbs *e.g., anteriorly, posteriorly*, have been used to modify (describe) verbs in passages where an action or direction is mentioned. For example, “The trachea passes inferiorly through the thorax.”

circumstantial adverbs, *e.g., anterior, posterior*, have been used to indicate the fixed location of an anatomical feature. For example, “The trachea is anterior to the esophagus.”

Furthermore, both usages may occur in the same passage. For example, “The trachea passes inferiorly through the thorax, anterior to the esophagus.”

We have very much enjoyed the process of putting this book together. We hope that you enjoy using it to the same degree.

Richard L. Drake
A. Wayne Vogl
Adam W. M. Mitchell

Index of Clinical Content

1 The body

In the Clinic

- Determination of skeletal age 14
- Bone marrow transplants 15
- Bone fractures 16
- Avascular necrosis 16
- Osteoporosis 17
- Epiphyseal fractures 18
- Degenerative joint disease 22
- Joint replacement 24
- The importance of fascias 25
- Muscle paralysis 26
- Muscle atrophy 26
- Muscle injuries and strains 26
- Atherosclerosis 27
- Varicose veins 28
- Anastomoses and collateral circulation 28
- Lymph nodes 31
- Dermatomes and myotomes 37
- Referred pain 48

Clinical Case

- Appendicitis 50

2 Back

In the Clinic

- Spina bifida 74
- Vertebroplasty 74
- Scoliosis 75
- Kyphosis 76
- Variation in vertebral numbers 76
- The vertebrae and cancer 77
- Osteoporosis 77
- Back pain 79
- Herniation of intervertebral discs 79
- Joint diseases 80
- Ligamenta flava 82
- Vertebral fractures 82
- Surgical procedures on the back 84
- Nerve injuries affecting superficial back muscles 99
- Lumbar cerebrospinal fluid tap 106

- Herpes zoster 109
- Back pain—alternative explanations 110

Clinical Cases

- Sciatica versus lumbago 118
- Cervical spinal cord injury 118
- Psoas abscess 119
- Dissecting thoracic aneurysm 119
- Sacral tumor 120

3 Thorax

In the Clinic

- Axillary tail of breast 141
- Breast cancer 141
- Cervical ribs 150
- Collection of sternal bone marrow 152
- Rib fractures 152
- Surgical access to the chest 160
- Thoracostomy (chest) tube insertion 160
- Intercostal nerve block 160
- Pleural effusion 167
- Pneumothorax 167
- Imaging the lungs 178
- High-resolution lung CT 178
- Bronchoscopy 178
- Lung cancer 179
- Pericarditis 184
- Pericardial effusion 184
- Constrictive pericarditis 184
- Valve disease 197
- Clinical terminology for coronary arteries 201
- Heart attack 202
- Classic symptoms of heart attack 203
- Are heart attack symptoms the same in men and women? 203
- Common congenital heart defects 203
- Cardiac auscultation 204
- Cardiac conduction system 206
- Ectopic parathyroid glands in the thymus 212
- Venous access for central and dialysis lines 215
- Using the superior vena cava to access the inferior vena cava 215
- Coarctation of the aorta 217

Thoracic aorta 217
Aortic arch and its anomalies 217
Abnormal origin of great vessels 217
The vagus nerves, recurrent laryngeal nerves, and hoarseness 221
Esophageal cancer 224
Esophageal rupture 225

Clinical Cases

Cervical rib 241
Lung cancer 242
Chest wound 242
Myocardial infarction 243
Broken pacemaker 246
Coarctation of the aorta 247
Aortic dissection 247
Pneumonia 249
Esophageal cancer 250
Venous access 251

4 Abdomen

In the Clinic

Surgical incisions 278
Laparoscopic surgery 279
Cremasteric reflex 299
Masses around the groin 301
Peritoneum 305
The greater omentum 308
Epithelial transition between the abdominal esophagus and stomach 315
Duodenal ulceration 315
Examination of the upper gastrointestinal tract 316
Examination of the bowel lumen 316
Examination of the bowel wall and extrinsic masses 316
Meckel's diverticulum 318
Computed tomography (CT) scanning and magnetic resonance imaging (MRI) 318
Carcinoma of the stomach 318
Appendicitis 322
Congenital disorders of the gastrointestinal tract 325
Bowel obstruction 326
Diverticular disease 327
Ostomies 327
Annular pancreas 336

Pancreatic cancer 336
Segmental anatomy of the liver 339
Gallstones 341
Jaundice 341
Spleen disorders 342
Vascular supply to the gastrointestinal system 351
Hepatic cirrhosis 356
Surgery for obesity 365
Psoas muscle abscess 371
Diaphragmatic hernias 372
Hiatus hernia 373
Urinary tract stones 380
Urinary tract cancer 381
Nephrostomy 382
Kidney transplant 383
Investigation of the urinary tract 385
Abdominal aortic stent graft 389
Inferior vena cava filter 391
Retroperitoneal lymph node surgery 393

Clinical Cases

Traumatic rupture of the diaphragm 410
Chronic thrombosis of the inferior vena cava 410
Liver biopsy in patients with suspected liver cirrhosis 411
Hodgkin's lymphoma 412
Inguinal hernia 413
Ureteric stone 413
Intraabdominal abscess 414
Complications of an abdominoperineal resection 415
Carcinoma of the head of the pancreas 417
Caval obstruction 418
Diverticular disease 418
Endoleak after endovascular repair of abdominal aortic aneurysm 419
Metastatic lesions in the liver 420

5 Pelvis and perineum

In the Clinic

Bone marrow biopsy 444
Pelvic fracture 446
Common problems with the sacro-iliac joints 448
Pelvic measurements in obstetrics 454
Defecation 456
Episiotomy 460

Digital rectal examination 462
 Carcinoma of the colon and rectum 462
 Bladder stones 465
 Suprapubic catheterization 466
 Bladder cancer 466
 Bladder infection 469
 Urethral catheterization 469
 Testicular tumors 470
 Vasectomy 472
 Prostate problems 474
 Ovarian cancer 477
 Imaging the ovary 477
 Hysterectomy 478
 Tubal ligation 479
 Carcinoma of the cervix and uterus 480
 The recto-uterine pouch 481
 Pudendal block 491
 Prostatectomy and impotence 495
 Abscesses in the ischio-anal fossae 504
 Hemorrhoids 504
 Urethral rupture 512

Clinical Cases

Varicocele 527
 Sciatic nerve compression 528
 Pelvic kidney 528
 Left common iliac artery obstruction 529
 Iatrogenic ureteric injury 530
 Ectopic pregnancy 530
 Uterine tumor 531
 Uterine fibroids 532

6 Lower limb

In the Clinic

Pelvic fractures 553
 Femoral neck fractures 557
 Intertrochanteric fractures 558
 Femoral shaft fractures 558
 Varicose veins 569
 Deep vein thrombosis 569
 Vascular access to the lower limb 573
 Trendelenburg's sign 577
 Intramuscular injections 581
 Compartment syndrome 590
 Muscle injuries to the lower limb 599
 Peripheral vascular disease 603

Soft tissue injuries to the knee 613
 Degenerative joint disease/osteoarthritis 614
 Examination of the knee joint 614
 Anterolateral ligament of the knee 615
 Achilles tendon rupture 623
 Neurological examination of the legs 625
 Footdrop 633
 Fracture of the talus 638
 Ankle fractures 641
 Bunions 645
 Morton's neuroma 661

Clinical Cases

Varicose veins 672
 Knee joint injury 673
 Fracture of neck of femur 676
 Deep vein thrombosis 677
 Ruptured calcaneal tendon 678
 Popliteal artery aneurysm 679
 Anterior talofibular ligament tear 680

7 Upper limb

In the Clinic

Fracture of the proximal humerus 705
 Fractures of the clavicle and dislocations of the acromioclavicular and sternoclavicular joints 711
 Dislocations of the glenohumeral joint 712
 Rotator cuff disorders 712
 Inflammation of the subacromial (subdeltoid) bursa 713
 Quadrangular space syndrome 720
 "Winging" of the scapula 727
 Imaging the blood supply to the upper limb 737
 Trauma to the arteries of the upper limb 737
 Subclavian/axillary venous access 737
 Injuries to the brachial plexus 747
 Breast cancer 749
 Rupture of biceps tendon 755
 Blood pressure measurement 756
 Radial nerve injury in the arm 763
 Median nerve injury in the arm 763
 Supracondylar fracture of the humerus 766
 Pulled elbow 766
 Developmental changes in the elbow joint 767
 Fracture of the head of radius 768

Digital rectal examination 462
 Carcinoma of the colon and rectum 462
 Bladder stones 465
 Suprapubic catheterization 466
 Bladder cancer 466
 Bladder infection 469
 Urethral catheterization 469
 Testicular tumors 470
 Vasectomy 472
 Prostate problems 474
 Ovarian cancer 477
 Imaging the ovary 477
 Hysterectomy 478
 Tubal ligation 479
 Carcinoma of the cervix and uterus 480
 The recto-uterine pouch 481
 Pudendal block 491
 Prostatectomy and impotence 495
 Abscesses in the ischio-anal fossae 504
 Hemorrhoids 504
 Urethral rupture 512

Clinical Cases

Varicocele 527
 Sciatic nerve compression 528
 Pelvic kidney 528
 Left common iliac artery obstruction 529
 Iatrogenic ureteric injury 530
 Ectopic pregnancy 530
 Uterine tumor 531
 Uterine fibroids 532

6 Lower limb

In the Clinic

Pelvic fractures 553
 Femoral neck fractures 557
 Intertrochanteric fractures 558
 Femoral shaft fractures 558
 Varicose veins 569
 Deep vein thrombosis 569
 Vascular access to the lower limb 573
 Trendelenburg's sign 577
 Intramuscular injections 581
 Compartment syndrome 590
 Muscle injuries to the lower limb 599
 Peripheral vascular disease 603

Soft tissue injuries to the knee 613
 Degenerative joint disease/osteoarthritis 614
 Examination of the knee joint 614
 Anterolateral ligament of the knee 615
 Achilles tendon rupture 623
 Neurological examination of the legs 625
 Footdrop 633
 Fracture of the talus 638
 Ankle fractures 641
 Bunions 645
 Morton's neuroma 661

Clinical Cases

Varicose veins 672
 Knee joint injury 673
 Fracture of neck of femur 676
 Deep vein thrombosis 677
 Ruptured calcaneal tendon 678
 Popliteal artery aneurysm 679
 Anterior talofibular ligament tear 680

7 Upper limb

In the Clinic

Fracture of the proximal humerus 705
 Fractures of the clavicle and dislocations of the acromioclavicular and sternoclavicular joints 711
 Dislocations of the glenohumeral joint 712
 Rotator cuff disorders 712
 Inflammation of the subacromial (subdeltoid) bursa 713
 Quadrangular space syndrome 720
 "Winging" of the scapula 727
 Imaging the blood supply to the upper limb 737
 Trauma to the arteries of the upper limb 737
 Subclavian/axillary venous access 737
 Injuries to the brachial plexus 747
 Breast cancer 749
 Rupture of biceps tendon 755
 Blood pressure measurement 756
 Radial nerve injury in the arm 763
 Median nerve injury in the arm 763
 Supracondylar fracture of the humerus 766
 Pulled elbow 766
 Developmental changes in the elbow joint 767
 Fracture of the head of radius 768

Contents

1 The body

What is anatomy? 2

How can gross anatomy be studied? 2

Important anatomical terms 2

Imaging 5

Diagnostic imaging techniques 5

Nuclear medicine imaging 8

Image interpretation 10

Plain radiography 10

Computed tomography 10

Magnetic resonance imaging 11

Nuclear medicine imaging 11

Safety in imaging 11

Body systems 12

Skeletal system 12

Cartilage 12

Bone 13

Joints 18

Skin and fascias 24

Skin 24

Fascia 24

Muscular system 25

Cardiovascular system 27

Lymphatic system 29

Lymphatic vessels 29

Lymph nodes 30

Lymphatic trunks and ducts 30

Nervous system 31

Central nervous system 31

Functional subdivisions of the CNS 32

Somatic part of the nervous system 33

Visceral part of the nervous system 38

Other systems 48

Clinical case 50

2 Back

Conceptual overview 53

General description 53

Functions 54

Support 54

Movement 54

Protection of the nervous system 55

Component parts 56

Bones 56

Muscles 57

Vertebral canal 59

Spinal nerves 60

Relationship to other regions 61

Head 61

Thorax, abdomen, and pelvis 62

Limbs 62

Key features 62

Long vertebral column and short spinal cord 62

Intervertebral foramina and spinal nerves 63

Innervation of the back 63

Regional anatomy 64

Skeletal framework 64

Vertebrae 64

Intervertebral foramina 72

Posterior spaces between vertebral arches 73

Joints 77

Joints between vertebrae in the back 77

Ligaments 80

Anterior and posterior longitudinal ligaments 80

Ligamenta flava 80

Supraspinous ligament and ligamentum nuchae 81

Interspinous ligaments 82

Back musculature 84

Superficial group of back muscles 84

Intermediate group of back muscles 90

Deep group of back muscles 92

Suboccipital muscles 97

Spinal cord 99

Vasculature 100

Meninges 103

Arrangement of structures in the vertebral canal 104

Spinal nerves 106

Surface anatomy 111

Back surface anatomy 111

Absence of lateral curvatures 111

Primary and secondary curvatures in the sagittal plane 112

Useful nonvertebral skeletal landmarks 112

How to identify specific vertebral spinous processes 114

Visualizing the inferior ends of the spinal cord and subarachnoid space 115

Identifying major muscles 116

Clinical cases 118

Contents

1 The body

What is anatomy? 2

How can gross anatomy be studied? 2

Important anatomical terms 2

Imaging 5

Diagnostic imaging techniques 5

Nuclear medicine imaging 8

Image interpretation 10

Plain radiography 10

Computed tomography 10

Magnetic resonance imaging 11

Nuclear medicine imaging 11

Safety in imaging 11

Body systems 12

Skeletal system 12

Cartilage 12

Bone 13

Joints 18

Skin and fascias 24

Skin 24

Fascia 24

Muscular system 25

Cardiovascular system 27

Lymphatic system 29

Lymphatic vessels 29

Lymph nodes 30

Lymphatic trunks and ducts 30

Nervous system 31

Central nervous system 31

Functional subdivisions of the CNS 32

Somatic part of the nervous system 33

Visceral part of the nervous system 38

Other systems 48

Clinical case 50

2 Back

Conceptual overview 53

General description 53

Functions 54

Support 54

Movement 54

Protection of the nervous system 55

Component parts 56

Bones 56

Muscles 57

Vertebral canal 59

Spinal nerves 60

Relationship to other regions 61

Head 61

Thorax, abdomen, and pelvis 62

Limbs 62

Key features 62

Long vertebral column and short spinal cord 62

Intervertebral foramina and spinal nerves 63

Innervation of the back 63

Regional anatomy 64

Skeletal framework 64

Vertebrae 64

Intervertebral foramina 72

Posterior spaces between vertebral arches 73

Joints 77

Joints between vertebrae in the back 77

Ligaments 80

Anterior and posterior longitudinal ligaments 80

Ligamenta flava 80

Supraspinous ligament and ligamentum nuchae 81

Interspinous ligaments 82

Back musculature 84

Superficial group of back muscles 84

Intermediate group of back muscles 90

Deep group of back muscles 92

Suboccipital muscles 97

Spinal cord 99

Vasculature 100

Meninges 103

Arrangement of structures in the vertebral canal 104

Spinal nerves 106

Surface anatomy 111

Back surface anatomy 111

Absence of lateral curvatures 111

Primary and secondary curvatures in the sagittal plane 112

Useful nonvertebral skeletal landmarks 112

How to identify specific vertebral spinous processes 114

Visualizing the inferior ends of the spinal cord and subarachnoid space 115

Identifying major muscles 116

Clinical cases 118

3 Thorax

Conceptual overview 123

General description 123

Functions 124

Breathing 124

Protection of vital organs 124

Conduit 124

Component parts 124

Thoracic wall 124

Superior thoracic aperture 126

Inferior thoracic aperture 126

Diaphragm 127

Mediastinum 128

Pleural cavities 128

Relationship to other regions 130

Neck 130

Upper limb 130

Abdomen 130

Breast 131

Key features 132

Vertebral level TIV/V 132

Venous shunts from left to right 132

Segmental neurovascular supply of thoracic wall 134

Sympathetic system 136

Flexible wall and inferior thoracic aperture 136

Innervation of the diaphragm 138

Regional anatomy 139

Pectoral region 139

Breast 139

Muscles of the pectoral region 142

Thoracic wall 143

Skeletal framework 143

Intercostal spaces 150

Diaphragm 161

Arterial supply 162

Venous drainage 162

Innervation 162

Movements of the thoracic wall and diaphragm during breathing 162

Pleural cavities 162

Pleura 163

Lungs 167

Mediastinum 180

Middle mediastinum 180

Superior mediastinum 210

Posterior mediastinum 222

Anterior mediastinum 230

Surface anatomy 231

Thorax surface anatomy 231

How to count ribs 231

Surface anatomy of the breast in women 232

Visualizing structures at the TIV/V vertebral level 232

Visualizing structures in the superior mediastinum 234

Visualizing the margins of the heart 235

Where to listen for heart sounds 236

Visualizing the pleural cavities and lungs, pleural recesses, and lung lobes and fissures 236

Where to listen for lung sounds 238

Clinical cases 241

4 Abdomen

Conceptual overview 255

General description 255

Functions 256

Houses and protects major viscera 256

Breathing 258

Changes in intraabdominal pressure 258

Component parts 259

Wall 259

Abdominal cavity 260

Inferior thoracic aperture 262

Diaphragm 262

Pelvic inlet 263

Relationship to other regions 263

Thorax 263

Pelvis 263

Lower limb 264

Key features 265

Arrangement of abdominal viscera in the adult 265

Skin and muscles of the anterior and lateral abdominal wall and thoracic intercostal nerves 268

The groin is a weak area in the anterior abdominal wall 269

Vertebral level LI 271

The gastrointestinal system and its derivatives are supplied by three major arteries 271

Venous shunts from left to right 273

All venous drainage from the gastrointestinal system passes through the liver 274

Abdominal viscera are supplied by a large prevertebral plexus 276

Regional anatomy 277

Surface topography 277

Four-quadrant pattern 277

Nine-region pattern 278