

INTERNATIONAL EDITION

Not authorised for sale in United States, Canada, Australia, New Zealand, Puerto Rico or the U.S. Virgin Islands

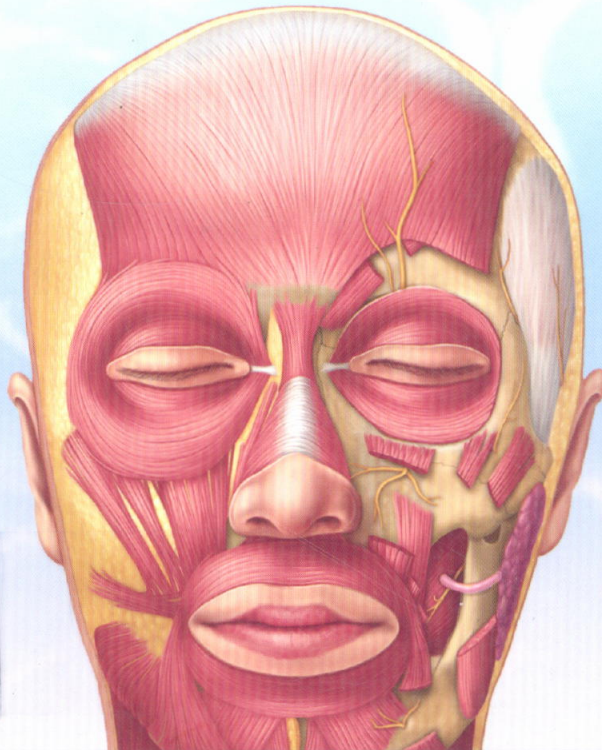
MOORE

Clinically  
Oriented  
Anatomy EIGHTH EDITION

KEITH L. MOORE

ARTHUR F. DALLEY

ANNE M. R. AGUR



B0052183

ห้องสมุดวพ.นครราชสีมา

# Contents

Preface / vii  
Acknowledgments / xi  
List of Clinical Blue Boxes / xix  
List of Tables / xxv  
Figure Credits / xxix

## 1 OVERVIEW AND BASIC CONCEPTS 1

**Approaches to Studying Anatomy / 2**  
Regional Anatomy / 2  
Systemic Anatomy / 3  
Clinical Anatomy / 4

**Anatomicomedical Terminology / 4**  
Anatomical Position / 5  
Anatomical Planes / 5  
Terms of Relationship and Comparison / 6  
Terms of Laterality / 8  
Terms of Movement / 8

**Anatomical Variations / 11**

**Integumentary System / 12**

**Fascias, Fascial Compartments, Bursae, and Potential Spaces / 16**

**Skeletal System / 18**  
Cartilage and Bones / 19  
Classification of Bones / 20  
Bone Markings and Formations / 20  
Bone Development / 21  
Vasculature and Innervation of Bones / 22  
Joints / 24

**Muscle Tissue and Muscular System / 28**  
Types of Muscle (Muscle Tissue) / 28  
Skeletal Muscles / 30  
Cardiac Striated Muscle / 36  
Smooth Muscle / 36

**Cardiovascular System / 37**  
Vascular Circuits / 37  
Blood Vessels / 38

**Lymphoid System / 42**

**Nervous System / 45**  
Central Nervous System / 46  
Peripheral Nervous System / 46  
Somatic Nervous System / 57  
Autonomic Nervous System / 57

**Medical Imaging Techniques / 66**  
Conventional Radiography / 66  
Computed Tomography / 67  
Ultrasonography / 68  
Magnetic Resonance Imaging / 68  
Nuclear Medicine Imaging / 70

## 2 BACK 71

**Overview of Back and Vertebral Column / 72**

**Vertebrae / 72**  
Structure and Function of Vertebrae / 72  
Regional Characteristics of Vertebrae / 75  
Ossification of Vertebrae / 85  
Variations in Vertebrae / 87

**Vertebral Column / 95**  
Joints of Vertebral Column / 95  
Movements of Vertebral Column / 101  
Curvatures of Vertebral Column / 102  
Vasculature of Vertebral Column / 104  
Nerves of Vertebral Column / 105

**Muscles of Back / 116**  
Extrinsic Back Muscles / 116  
Intrinsic Back Muscles / 117  
Surface Anatomy of Back Muscles / 124  
Suboccipital and Deep Neck Muscles / 124

**Contents of Vertebral Canal / 128**  
Spinal Cord / 128  
Spinal Nerves and Nerve Roots / 128  
Spinal Meninges and Cerebrospinal Fluid (CSF) / 130  
Vasculature of Spinal Cord and Spinal Nerve Roots / 135

## 3 UPPER LIMB 140

**Overview of Upper Limb / 141**

**Comparison of Upper and Lower Limbs / 142**

**Bones of Upper Limb / 143**  
Clavicle / 143  
Scapula / 143  
Humerus / 146  
Bones of Forearm / 147  
Bones of Hand / 148  
Surface Anatomy of Upper Limb Bones / 151



## **Fascia, Efferent Vessels, Cutaneous Innervation, and Myotomes of Upper Limb / 158**

- Fascia of Upper Limb / 158
- Venous Drainage of Upper Limb / 160
- Lymphatic Drainage of Upper Limb / 162
- Cutaneous Innervation of Upper Limb / 163
- Motor Innervation (Myotomes) of Upper Limb / 163

## **Pectoral and Scapular Regions / 167**

- Anterior Axio-Appendicular Muscles / 167
- Posterior Axio-Appendicular and Scapulohumeral Muscles / 170
- Surface Anatomy of Pectoral, Scapular, and Deltoid Regions / 176

## **Axilla / 183**

- Axillary Artery / 185
- Axillary Vein / 188
- Axillary Lymph Nodes / 188
- Brachial Plexus / 189

## **Arm / 201**

- Muscles of Arm / 201
- Brachial Artery / 206
- Veins of Arm / 206
- Nerves of Arm / 207
- Cubital Fossa / 209
- Surface Anatomy of Arm and Cubital Fossa / 209

## **Forearm / 215**

- Compartments of Forearm / 215
- Muscles of Forearm / 215
- Arteries of Forearm / 228
- Veins of Forearm / 230
- Nerves of Forearm / 231
- Surface Anatomy of Forearm / 234

## **Hand / 241**

- Fascia and Compartments of Palm / 241
- Muscles of Hand / 243
- Long Flexor Tendons and Tendon Sheaths in Hand / 249
- Arteries of Hand / 249
- Veins of Hand / 252
- Nerves of Hand / 252
- Surface Anatomy of Hand / 256

## **Joints of Upper Limb / 263**

- Sternoclavicular Joint / 264
- Acromioclavicular Joint / 266
- Glenohumeral Joint / 266
- Elbow Joint / 271
- Proximal Radio-Ulnar Joint / 274
- Distal Radio-Ulnar Joint / 276
- Wrist Joint / 278
- Intercarpal Joints / 278
- Carpometacarpal and Intermetacarpal Joints / 281
- Metacarpophalangeal and Interphalangeal Joints / 282

# **4 THORAX 290**

## **Overview of Thorax / 291**

### **Thoracic Wall / 291**

- Skeleton of Thoracic Wall / 293
- Thoracic Apertures / 297

- Joints of Thoracic Wall / 298
- Movements of Thoracic Wall / 300
- Muscles of Thoracic Wall / 305
- Fascia of Thoracic Wall / 307
- Nerves of Thoracic Wall / 310
- Vasculature of Thoracic Wall / 313
- Breasts / 315
- Surface Anatomy of Thoracic Wall / 318

## **Viscera of Thoracic Cavity / 326**

- Pleurae, Lungs, and Tracheobronchial Tree / 327
- Overview of Mediastinum / 348
- Pericardium / 348
- Heart / 356
- Superior Mediastinum and Great Vessels / 382
- Posterior Mediastinum / 387
- Anterior Mediastinum / 393
- Surface Anatomy of Heart and Mediastinal Viscera / 393
- Auscultatory Areas / 394

# **5 ABDOMEN 404**

## **Overview: Walls, Cavities, Regions, and Planes / 406**

### **Anterolateral Abdominal Wall / 408**

- Fascia of Anterolateral Abdominal Wall / 408
- Muscles of Anterolateral Abdominal Wall / 409
- Neurovasculature of Anterolateral Abdominal Wall / 415
- Internal Surface of Anterolateral Abdominal Wall / 423
- Inguinal Region / 424
- Spermatic Cord, Scrotum, and Testes / 428
- Surface Anatomy of Anterolateral Abdominal Wall / 432

### **Peritoneum and Peritoneal Cavity / 439**

- Embryology of Peritoneal Cavity / 440
- Peritoneal Formations / 441
- Subdivisions of Peritoneal Cavity / 443

### **Abdominal Viscera / 448**

- Overview of Abdominal Viscera and Digestive Tract / 448
- Esophagus / 451
- Stomach / 452
- Small Intestine / 461
- Large Intestine / 468
- Spleen / 487
- Pancreas / 488
- Liver / 491
- Biliary Ducts and Gallbladder / 501
- Kidneys, Ureters, and Suprarenal Glands / 515
- Summary of Innervation of Abdominal Viscera / 527

### **Diaphragm / 533**

- Vessels and Nerves of Diaphragm / 534
- Diaphragmatic Apertures / 535
- Actions of Diaphragm / 536

### **Posterior Abdominal Wall / 537**

- Fascia of Posterior Abdominal Wall / 537
- Muscles of Posterior Abdominal Wall / 539
- Nerves of Posterior Abdominal Wall / 540
- Vessels of Posterior Abdominal Wall / 541

## **Sectional Medical Imaging of Abdomen / 549**

## 6 PELVIS AND PERINEUM 553

### Introduction to Pelvis and Perineum / 554

#### Pelvic Girdle / 554

- Bones and Features of Pelvic Girdle / 554
- Orientation of Pelvic Girdle / 558
- Pelvic Girdle Sexual Differences / 558
- Joints and Ligaments of Pelvic Girdle / 558

#### Pelvic Cavity / 565

- Walls and Floor of Pelvic Cavity / 565
- Peritoneum and Peritoneal Cavity of Pelvis / 570
- Pelvic Fascia / 572

#### Neurovascular Structures of Pelvis / 576

- Pelvic Arteries / 576
- Pelvic Veins / 582
- Lymph Nodes of Pelvis / 582
- Pelvic Nerves / 583

#### Pelvic Viscera / 589

- Urinary Organs / 589
- Rectum / 595
- Male Internal Genital Organs / 603
- Female Internal Genital Organs / 609
- Lymphatic Drainage of Pelvic Viscera / 627

#### Perineum / 630

- Fasciae and Pouches of Urogenital Triangle / 633
- Features of Anal Triangle / 637
- Male Urogenital Triangle / 646
- Female Urogenital Triangle / 656

#### Sectional Imaging of Pelvis and Perineum / 661

- Magnetic Resonance Imaging / 661

## 7 LOWER LIMB 666

### Overview of Lower Limb / 667

### Development of Lower Limb / 668

#### Bones of Lower Limb / 668

- Arrangement of Lower Limb Bones / 670
- Hip Bone / 671
- Ilium / 672
- Femur / 674
- Patella / 678
- Tibia and Fibula / 678
- Bones of Foot / 681
- Surface Anatomy of Bones of Foot / 683

#### Fascia, Veins, Lymphatics, Efferent Vessels, and Cutaneous

#### Nerves of Lower Limb / 691

- Subcutaneous Tissue and Fascia / 691
- Venous Drainage of Lower Limb / 691
- Lymphatic Drainage of Lower Limb / 694
- Cutaneous Innervation of Lower Limb / 695
- Motor Innervation of Lower Limb / 697

#### Posture and Gait / 701

- Standing at Ease / 701
- Walking: The Gait Cycle / 701

#### Anterior and Medial Regions of Thigh / 703

- Organization of Proximal Lower Limb / 703

Anterior Thigh Muscles / 704

Medial Thigh Muscles / 707

Neurovascular Structures and Relationships in Anteromedial Thigh / 710

Surface Anatomy of Anterior and Medial Regions of Thigh / 715

#### Gluteal and Posterior Thigh Regions / 721

Gluteal Region: Buttocks and Hip Region / 721

Muscles of Gluteal Region / 722

Posterior Thigh Region / 728

Neurovascular Structures of Gluteal and Posterior Thigh Regions / 731

Surface Anatomy of Gluteal and Posterior Thigh Regions / 736

#### Popliteal Fossa and Leg / 742

Popliteal Region / 742

Anterior Compartment of Leg / 746

Lateral Compartment of Leg / 751

Posterior Compartment of Leg / 755

Surface Anatomy of Leg / 762

#### Foot / 768

Skin and Fascia of Foot / 769

Muscles of Foot / 769

Neurovascular Structures and Relationships in Foot / 773

Surface Anatomy of Ankle and Foot Regions / 781

#### Joints of Lower Limb / 785

Hip Joint / 785

Knee Joint / 793

Tibiofibular Joints / 802

Ankle Joint / 806

Foot Joints / 808

Surface Anatomy of Joints of Knee, Ankle, and Foot / 816

## 8 HEAD 829

### Overview of Head / 830

#### Cranium / 830

Facial Aspect of Cranium / 835

Lateral Aspect of Cranium / 837

Occipital Aspect of Cranium / 837

Superior Aspect of Cranium / 838

External Surface of Cranial Base / 838

Internal Surface of Cranial Base / 841

Walls of Cranial Cavity / 844

Regions of Head / 845

#### Face and Scalp / 851

Face / 851

Scalp / 851

Muscles of Face and Scalp / 852

Nerves of Face and Scalp / 857

Superficial Vasculature of Face and Scalp / 863

Surface Anatomy of Face / 866

#### Cranial Meninges / 873

Dura Mater / 873

Arachnoid Mater and Pia Mater / 880

Meningeal Spaces / 880

#### Brain / 886

Parts of Brain / 886

Ventricular System of Brain / 886

Arterial Blood Supply to Brain / 890

Venous Drainage of Brain / 891

### **Eye, Orbit, Orbital Region, and Eyeball / 897**

Orbits / 897

Eyelids and Lacrimal Apparatus / 899

Eyeball / 902

Extra-Ocular Muscles of Orbit / 906

Nerves of Orbit / 911

Vasculature of Orbit / 913

Surface Anatomy of Eye and Lacrimal Apparatus / 915

### **Parotid and Temporal Regions, Infratemporal Fossa, and Temporomandibular Joint / 922**

Parotid Region / 922

Temporal Region / 924

Infratemporal Fossa / 924

### **Oral Region / 936**

Oral Cavity / 936

Lips, Cheeks, and Gingivae / 936

Teeth / 938

Palate / 942

Tongue / 946

Salivary Glands / 951

### **Pterygopalatine Fossa / 959**

Pterygopalatine Part of Maxillary Artery / 959

Maxillary Nerve / 959

### **Nose / 963**

External Nose / 963

Nasal Cavities / 964

Vasculature and Innervation of Nose / 967

Paranasal Sinuses / 968

### **Ear / 974**

External Ear / 974

Middle Ear / 975

Internal Ear / 981

## **9 NECK 990**

### **Overview / 991**

### **Bones of Neck / 991**

Cervical Vertebrae / 991

Hyoid Bone / 993

### **Fascia of Neck / 994**

Cervical Subcutaneous Tissue and Platysma / 994

Deep Cervical Fascia / 996

### **Superficial Structures of Neck: Cervical Regions / 998**

Sternocleidomastoid Region / 998

Posterior Cervical Region / 1001

Lateral Cervical Region / 1001

Anterior Cervical Region / 1008

Surface Anatomy of Cervical Regions and Triangles of Neck / 1014

### **Deep Structures of Neck / 1021**

Prevertebral Muscles / 1021

Root of Neck / 1021

### **Viscera of Neck / 1027**

Endocrine Layer of Cervical Viscera / 1027

Respiratory Layer of Cervical Viscera / 1030

Alimentary Layer of Cervical Viscera / 1041

Surface Anatomy of Endocrine and Respiratory Layers of Cervical Viscera / 1048

### **Lymphatics of Neck / 1049**

## **10 SUMMARY OF CRANIAL NERVES 1061**

### **Overview / 1062**

### **Olfactory Nerve (CN I) / 1069**

### **Optic Nerve (CN II) / 1070**

### **Oculomotor Nerve (CN III) / 1072**

### **Trochlear Nerve (CN IV) / 1072**

### **Trigeminal Nerve (CN V) / 1073**

Ophthalmic Nerve (CN V<sub>1</sub>) / 1074

Maxillary Nerve (CN V<sub>2</sub>) / 1074

Mandibular Nerve (CN V<sub>3</sub>) / 1074

### **Abducent Nerve (CN VI) / 1074**

### **Facial Nerve (CN VII) / 1077**

Somatic (Branchial) Motor / 1077

Visceral (Parasympathetic) Motor / 1077

Somatic (General) Sensory / 1077

Special Sensory (Taste) / 1077

### **Vestibulocochlear Nerve (CN VIII) / 1079**

### **Glossopharyngeal Nerve (CN IX) / 1079**

Somatic (Branchial) Motor / 1079

Visceral (Parasympathetic) Motor / 1079

Somatic (General) Sensory / 1080

Special Sensory (Taste) / 1081

Visceral Sensory / 1081

### **Vagus Nerve (CN X) / 1082**

### **Spinal Accessory Nerve (CN XI) / 1083**

### **Hypoglossal Nerve (CN XII) / 1085**

### **APPENDIX A/ 1093**

### **INDEX / 1097**