

Contents

1 General Concepts, 1

THE STUDY OF ANATOMY, 1

Gross Anatomy, 1

Histology, 1

Neuroanatomy, 1

Developmental Anatomy, 1

Surface Anatomy, 1

Imaging Anatomy, 1

TERMINOLOGY, 2

The Anatomical Position, 2

Anatomical Cuts and Planes, 2

Terms of Relationship, 2

BODY COVERINGS, BODY CAVITIES, AND FASCIA, 2

Skin, 3

Fascia, 5

Mucous Membrane, 6

Serous Body Cavities, 6

SKELETON (CARTILAGE AND BONES), 6

Cartilage, 6

Bone (Osteology), 7

JOINTS (ARTHROLOGY), 11

By Degree of Movement, 11

By Joint Tissues, 11

Synovial Joints, 12

MUSCULAR SYSTEM (MYOLOGY), 14

Skeletal (Striated) Muscle, 14

Smooth Muscle, 18

Cardiac Muscle, 18

Voluntary Versus Involuntary Muscle (Exceptions), 18

CARDIOVASCULAR SYSTEM (CARDIOLOGY AND ANGIOLOGY), 18

Blood, 19

The Heart, 19

Blood Vessels, 20

Fetal Circulation, 21

Changes in Circulation at Birth, 21

Lymphatic System, 21

NERVOUS SYSTEM, 24

The Neuron, 25

Definitions and Terms, 26

Division Based on Location, 27

Division Based on Function, 27

Peripheral Nerves, 27

IMAGING, 34

Radiology, 35

Magnetic Resonance Imaging, 38

2 The Back, 40

SURFACE FEATURES OF THE BACK, 40

SKELETON OF THE BACK, 40

Posterior Aspect of the Skull, 40

Vertebral Column, 41

The Articulated Spine, 45

Joints of the Spine, 45

Joints Between Bodies, 46

SPINAL CORD, 47

Location and Length, 47

External Features, 47

Internal Features, 49

Meningeal Coverings, 51

Meningeal Spaces, 51

Protection, 52

Blood Supply, 52

MUSCLES OF THE BACK, 52

Extrinsic Group, 52

Intrinsic Group, 52

Movements of the Spine, 55

3 The Thorax, 57

SKELETON, 57

THE THORACIC OR CHEST WALL, 61

Surface Features, 61

Muscles, 62

Intercostal Blood Vessels and Nerves, 63

THE PLEURAL CAVITIES AND LUNGS, 65

Pleura, 65

Lungs, 65

Bronchi and Bronchial Tree, 67

Blood and Nerve Supply, 69

Mechanics of Breathing, 70

THE MEDIASTINUM, 71

The Middle Mediastinum, 71

Anterior Mediastinum, 80
Superior and Posterior Mediastinum, 80

4 The Abdomen, Pelvis, and Perineum, 88

SKELETON AND SUBDIVISIONS, 88

Skeleton of the Abdomen, 88
Divisions of the Abdomen, 88

THE ABDOMINAL WALLS, 89

Anterolateral Abdominal Wall, 89
Superior Abdominal Wall, 94
Posterior Abdominal Wall, 95
Inferior Abdominal Wall, 97

PERITONEUM AND THE PERITONEAL CAVITY, 98

Nomenclature, 98
Development of the Gut and Peritoneum, 98

BLOOD AND NERVE SUPPLY TO THE ABDOMEN, 100

Arterial Supply: The Abdominal Aorta, 100
Venous Return: The Inferior Vena Cava, 101
Nerves of the Abdomen, 101

THE ABDOMINAL VISCERA, 103

The Gut (Alimentary Canal), 103
Urinary System, 120
Suprarenal Glands, 123
The Male Genital System, 124
The Female Genital System, 126

5 The Neck, 131

INTRODUCTION, 131

The Cervical Skeleton, 131
Surface Anatomy, 131

COVERINGS AND REGIONS, 133

Fascial Coverings, 133
Regions of the Neck, 136

THE ANTERIOR TRIANGLE, 136

Boundaries, 136
Roof, 138
Floor, 138
Contents, 138
Arteries, 141
The Submandibular Triangle, 145

THE POSTERIOR TRIANGLE, 147

Boundaries, 147
Roof, 147
Floor, 147
Contents, 148

THE ROOT, 150

Boundaries, 150
Contents, 150

THE SUBOCCIPITAL REGION, 155

Location, 155

Contents, 155

Muscles, 157

THE PREVERTEBRAL REGION, 158

Muscles, 159
Nerve Supply, 159

MOVEMENTS OF THE NECK, 159

6 The Head by Regions, 161

THE SKULL, 161

Neurocranium, 161
The Facial Skeleton (Viscerocranium), 161

VIEWS, 161

Frontal View, 161
Lateral View, 164
Superior View, 166
Posterior View, 166
Basal or Inferior View, 166

POSTNATAL DEVELOPMENT, 171

Growth, 171
Fusion of Bones, 171
Sutures and Fontanelles, 171
Development of Key Bones, 171
Sexual Dimorphism, 173
Summary of External Foramina of the Skull, 173

THE FACE AND SCALP, 173

Regions of the Face, 173
Facial Grooves, 175
Skin and Fascia, 176
Sensory (Cutaneous) Nerves of the Face, 176
Arteries of the Face, 178
Veins of the Face, 179
Muscles of the Face, 180
Motor Nerves of the Face: The Facial Nerve, 185
Features of the Face, 186

THE CONTENTS OF THE NEUROCRANIUM, 192

Internal Aspect of the Base of the Skull, 192
Foramina of the Internal Aspect of the Skull, 195
Meninges, 195
Venous Sinuses, 199
Single, Unpaired Sinuses, 200
The Brain, 201
Blood Supply to the Brain: Arterial Circle (of Willis), 207
The Cranial Nerves, 207
Review of the Cavernous Sinus and Its Contents, 211
The Petrosal Nerves, 211

THE ORBITAL CAVITY, 211

Skeleton, 211

SUMMARY OF THE FORAMINA OF THE BONY ORBIT, 213

Relationships, 213
Contents of the Orbit, 213

THE PAROTID REGION, 223

Skeleton, 223
 Boundaries, 223
 Contents, 223

THE MASTICATOR REGION, 226

Bony Fossae, 226
 Temporomandibular Joint, 226
 Mastication, 232
 Relationship of Disc to Condyle During Opening
 Movements, 232
 Muscles of Mastication, 236
 The Mandibular Nerve (Cranial Nerve V₃), 243
 The Maxillary Artery, 246
 The Pterygoid Plexus of Veins and the Maxillary Vein, 249

THE PTERYGOPALATINE FOSSA, 250

Location and Terminology, 250
 Contents, 251

THE NASAL CAVITY AND PARANASAL AIR SINUSES, 255

Relationships, 255
 Boundaries, 255
 Blood and Nerve Supply, 257
 Nasal Breathing and Smelling, 260
 Paranasal Air Sinuses, 260

THE ORAL CAVITY, 265

Boundaries and Relationships, 265
 Visual Inspection of the Oral Cavity, 268
 The Teeth, 270
 Hard Palate, 274
 Soft Palate, 275
 The Tongue, 278

THE PHARYNX, 287

Skeleton, 287
 Walls of the Pharynx, 287
 Muscles of the Pharynx, 287
 Interior of the Pharynx, 290
 Nerve and Blood Supply to the Pharynx, 292
 Retropharyngeal Space, 292

THE LARYNX, 292

Functions, 292
 Skeleton of the Larynx, 292
 Joints of the Larynx, 293
 Ligaments of the Larynx, 294
 Interior of the Larynx, 295
 Muscles of the Larynx, 295
 Nerve and Blood Supply, 297

THE EAR, 298

Parts, 298
 Middle Ear Cavity (Tympanic Cavity), 301

BONES, 309

Bones of the Neurocranium, 309
 Bones of the Face, 322

7 Review of the Systemic Anatomy of the Head and Neck, 337

ARTERIES, 337

VEINS, 337

LYMPHATICS AND LYMPH NODES, 337

Superficial Ring of Nodes, 337
 Deep Ring of Lymph Nodes, 343
 Deep Cervical (Jugular) Vertical Chain, 343
 Drainage of Specific Structures and Areas, 344

CRANIAL NERVES AND CRANIAL AUTONOMICS, 345

Cranial Nerves, 345
 Cranial Autonomic Nerves, 360

8 Clinically Applied Anatomy, 365

ANATOMY OF LOCAL ANESTHESIA, 365

Types of Local Anesthesia, 365
 Local Anesthesia of Maxillary Structures, 365
 Local Anesthesia of Mandibular Structures, 370

IMAGING IN DENTISTRY, 376

Intraoral Radiographs, 377
 Extraoral Radiographs, 377
 Other Areas of Clinical Interest, 382

FRACTURES OF THE FACE, 383

Classification, 383
 Surgical Treatment of Facial Disharmonies, 385

SPREAD OF DENTAL INFECTIONS, 389

Primary Sites of Infection, 389
 Secondary Sites, 392
 Tertiary Sites, 392
 Pathways of Dental Infection, 397

9 Overview of the Upper Limb, 400

SKELETON, 400

SHOULDER (PECTORAL) GIRDLE, 400

Arm, 401
 Forearm, 403
 Wrist and Hand, 403

JOINTS, MOVEMENTS, AND MUSCLES, 405

Joints of the Pectoral Girdle, 405
 Glenohumeral Joint, 406
 Elbow (Humeroulnar) Joint, 407
 Radioulnar Joints, 408
 Wrist Joint (Radiocarpal and Midcarpal
 Joints), 409
 Carpometacarpal Joints, 410
 Joints of the Four Fingers, 410
 Joints of the Thumb, 411

MUSCLES, 411

Muscle Groups of the Upper Limb, 411

AXILLA, 423

Boundaries, 423

Contents, 423

NERVE SUPPLY: THE BRACHIAL PLEXUS, 424

Collateral Branches, 424

Terminal Branches, 426

Cutaneous Nerves of the Upper Limb, 426

ARTERIAL SUPPLY, 426**VENOUS RETURN, 427**

Deep Veins, 427

Superficial Veins, 427

LYMPHATIC DRAINAGE, 429**10 Overview of the Lower Limb, 432****SKELETON, 432**

Pelvic Girdle, 432

Thigh, 432

Leg, 432

Ankle and Foot, 434

JOINTS, 435

The Pelvic Girdle, 435

Hip Joint, 437

Knee Joint, 437

Ankle Joints, 440

Movement of the Lower Limb Joints During Walking, 443

MUSCLES, 443

Anterior Thigh Muscles, 443

Medial Thigh Muscles, 443

Muscles of the Gluteal Region, 445

Posterior Thigh Muscles (Hamstrings), 445

Anterior Leg Muscles, 445

Lateral Leg Muscles, 445

Posterior Leg Muscles, 448

Muscles of the Foot, 449

NERVE SUPPLY: THE LUMBAR AND SACRAL PLEXUSES, 449

Lumbar Plexus, 450

Sacral Plexus, 451

ARTERIAL SUPPLY, 454**VENOUS RETURN, 454**

Deep Veins, 454

Superficial Veins, 454

LYMPHATICS, 456

Superficial Lymph Nodes, 456

Deep Lymph Nodes, 456

Review Questions Answers, 458**Index, 460**