

Contents

- 1 Introduction to Human Embryology 1**
 - Embryological Terminology 2
 - Importance of and Advances in Embryology 2
 - Descriptive Terms 7
 - Clinically Oriented Questions 8
- 2 Human Reproduction 9**
 - The Reproductive Organs 10
 - Gametogenesis 12
 - Female Reproductive Cycles 16
 - Transportation of the Gametes 21
 - Maturation of Sperms 22
 - Viability of Oocytes and Sperms 22
 - Clinically Oriented Questions 22
- 3 The First Week of Human Development 23**
 - Fertilization 24
 - Cleavage of the Zygote 27
 - Formation of the Blastocyst 28
 - Clinically Oriented Questions 29
- 4 The Second Week of Human Development 30**
 - Formation of the Amniotic Cavity and Embryonic Disc 31
 - Development of the Chorionic Sac 33
 - Implantation Sites of the Blastocyst 33
 - Clinically Oriented Questions 35
- 5 The Third Week of Human Development 36**
 - Gastrulation: Formation of the Germ Layers 37
 - Neurulation: Formation of the Neural Tube 40
 - Development of the Somites 42
 - Development of the Intraembryonic Coelom 45
 - Early Development of the Cardiovascular System 46
 - Development of the Chorionic Villi 48
 - Clinically Oriented Questions 48
- 6 Human Development during Weeks Four to Eight 49**
 - Folding of the Embryo 50
 - Germ Layer Derivatives 50
 - Control of Embryonic Development 50
 - Highlights of Development during Weeks Four to Eight 54
 - Estimation of Embryonic Age 60
 - Clinically Oriented Questions 61
- 7 The Fetal Period: The Ninth Week to Birth 62**
 - Estimation of Fetal Age 63
 - Highlights of the Fetal Period 64
 - Factors Influencing Fetal Growth 68
 - Procedures for Assessing Fetal Status 68
 - Clinically Oriented Questions 70
- 8 The Placenta and the Fetal Membranes 71**
 - The Placenta 72
 - Parturition 79
 - The Amnion and the Amniotic Fluid 84
 - The Umbilical Vesicle (Yolk Sac) 86
 - The Allantois 87
 - Fetal Membranes in Multiple Pregnancies 87
 - Clinically Oriented Questions 91
- 9 Body Cavities and Mesenteries 92**
 - The Embryonic Body Cavity 93
 - Development of the Diaphragm 95
 - Clinically Oriented Questions 100
- 10 Pharyngeal Apparatus 101**
 - Pharyngeal Arches 102
 - Pharyngeal Pouches 107
 - Pharyngeal Grooves 109
 - Pharyngeal Membranes 109
 - Development of the Thyroid Gland 109
 - Development of the Tongue 113
 - Development of the Salivary Glands 115
 - Development of the Face 117

- Development of the Nasal Cavities **121**
 Development of the Palate **122**
 Clinically Oriented Questions **128**
- 11 The Respiratory System 129**
 Development of the Larynx **131**
 Development of the Trachea **131**
 Development of the Bronchi and Lungs **131**
 Clinically Oriented Questions **137**
- 12 The Alimentary or Digestive System 138**
 The Foregut **139**
 Development of the Spleen **145**
 The Midgut **146**
 The Hindgut **148**
 Clinically Oriented Questions **161**
- 13 The Urogenital System 162**
 Development of the Urinary System **164**
 Development of the Suprarenal Glands **173**
 Development of the Genital System **173**
 Development of the Inguinal Canals **186**
 Clinically Oriented Questions **189**
- 14 The Cardiovascular System 190**
 Early Development of the Heart and Blood Vessels **191**
 Later Development of the Heart **195**
 Anomalies of the Heart and Great Vessels **205**
 Derivatives of the Pharyngeal Arch Arteries **214**
 Pharyngeal Arch Artery Anomalies **214**
 Fetal and Neonatal Circulation **217**
 Development of the Lymphatic System **219**
 Clinically Oriented Questions **224**
- 15 The Musculoskeletal System 225**
 Skeletal System **226**
 Development of Bone and Cartilage **227**
 Development of the Joints **229**
 Development of the Axial Skeleton **229**
 Development of the Appendicular Skeleton **236**
- Muscular System **237**
 Development of the Limbs **242**
 Clinically Oriented Questions **252**
- 16 The Nervous System 253**
 Origin of the Nervous System **254**
 Development of the Spinal Cord **254**
 Congenital Anomalies of the Spinal Cord **258**
 Development of the Brain **260**
 Congenital Anomalies of the Brain **270**
 Development of the Peripheral Nervous System **274**
 Development of the Autonomic Nervous System **276**
 Clinically Oriented Questions **277**
- 17 The Eye and Ear 278**
 Development of the Eye and Related Structures **279**
 Development of the Ear **287**
 Clinically Oriented Questions **290**
- 18 The Integumentary System 291**
 Development of the Skin **292**
 Development of the Hairs **294**
 Development of the Nails **295**
 Development of the Mammary Glands **295**
 Development of the Teeth **296**
 Clinically Oriented Questions **301**
- 19 Human Birth Defects 302**
 Teratology: The Study of Abnormal Development **303**
 Anomalies Caused by Genetic Factors **303**
 Anomalies Caused by Environmental Factors **311**
 Anomalies Caused by Multifactorial Inheritance **319**
 Clinically Oriented Questions **320**
- References and Suggested Reading 321**
- Answers to Clinically Oriented Questions 326**
- Index 335**