

# TABLE OF CONTENTS

## SECTION 1: FIRST TRIMESTER

### INTRODUCTION AND OVERVIEW

- 4 Embryology and Anatomy of the First Trimester  
*Anne Kennedy, MD*
- 16 Approach to the First Trimester  
*Anne Kennedy, MD*

### ABNORMAL INTRAUTERINE GESTATION

- 20 Failed First-Trimester Pregnancy  
*Anne Kennedy, MD*
- 24 Perigestational Hemorrhage  
*Roya Sohaey, MD*
- 28 Chorionic Bump  
*Anne Kennedy, MD*
- 30 Complete Hydatidiform Mole  
*Paula J. Woodward, MD*

### ECTOPIC GESTATION

- 34 Tubal Ectopic  
*Anne Kennedy, MD and Roya Sohaey, MD*
- 40 Interstitial Ectopic  
*Paula J. Woodward, MD*
- 44 Cervical Ectopic  
*Karen Y. Oh, MD*
- 48 Cesarean Scar Ectopic  
*Karen Y. Oh, MD*
- 50 Abdominal Ectopic  
*Karen Y. Oh, MD*
- 52 Ovarian Ectopic  
*Roya Sohaey, MD*
- 54 Heterotopic Pregnancy  
*Karen Y. Oh, MD*

### PERTINENT DIFFERENTIAL DIAGNOSES

- 56 Abnormal Gestational Sac and Contents  
*Anne Kennedy, MD*
- 62 Adnexal Mass in Pregnancy  
*Karen Y. Oh, MD*

## SECTION 2: BRAIN

### INTRODUCTION AND OVERVIEW

- 68 Embryology and Anatomy of the Brain  
*Anne Kennedy, MD*
- 84 Approach to the Supratentorial Brain  
*Anne Kennedy, MD*
- 90 Approach to the Posterior Fossa  
*Anne Kennedy, MD*

## CRANIAL DEFECTS

- 96 Exencephaly, Anencephaly  
*Paula J. Woodward, MD*
- 100 Occipital, Parietal Cephalocele  
*Paula J. Woodward, MD*
- 104 Atretic Cephalocele  
*Paula J. Woodward, MD*
- 106 Frontal Cephalocele  
*Roya Sohaey, MD*

## MIDLINE DEVELOPMENTAL ANOMALIES

- 108 Agenesis/Dysgenesis of the Corpus Callosum  
*Karen Y. Oh, MD*
- 112 Interhemispheric Cyst/AVID  
*Karen Y. Oh, MD*
- 116 Aprosencephaly, Atelencephaly  
*Anne Kennedy, MD*
- 118 Lobar Holoprosencephaly  
*Anne Kennedy, MD*
- 122 Semilobar Holoprosencephaly  
*Anne Kennedy, MD*
- 124 Lobar Holoprosencephaly  
*Anne Kennedy, MD*
- 126 Septo-Optic Dysplasia  
*Anne Kennedy, MD*
- 130 Syntelencephaly  
*Anne Kennedy, MD*

## CORTICAL DEVELOPMENTAL ANOMALIES

- 134 Schizencephaly  
*Karen Y. Oh, MD*
- 138 Lissencephaly  
*Anne Kennedy, MD*
- 142 Gray Matter Heterotopia  
*Anne Kennedy, MD*
- 144 Pachygyria, Polymicrogyria  
*Anne Kennedy, MD*

## CYSTS

- 148 Choroid Plexus Cyst  
*Roya Sohaey, MD*
- 150 Arachnoid Cyst  
*Anne Kennedy, MD*

## DESTRUCTIVE LESIONS

- 154 Intracranial Hemorrhage  
*Karen Y. Oh, MD*

# TABLE OF CONTENTS

## 158 Encephalomalacia, Porencephaly

Anne Kennedy, MD

## 162 Hydranencephaly

Anne Kennedy, MD

## POSTERIOR FOSSA MALFORMATIONS

### 164 Aqueductal Stenosis

Paula J. Woodward, MD

### 168 Chiari 2 Malformation

Roya Sohaey, MD

### 172 Chiari 3 Malformation

Roya Sohaey, MD

### 174 Dandy-Walker Malformation

Karen Y. Oh, MD

### 178 Vermian Dysgenesis

Karen Y. Oh, MD

### 180 Blake Pouch Cyst

Anne Kennedy, MD

### 184 Mega Cisterna Magna

Karen Y. Oh, MD

### 186 Cerebellar Hypoplasia

Anne Kennedy, MD

### 190 Rhombencephalosynapsis

Anne Kennedy, MD

## VASCULAR MALFORMATIONS

### 194 Vein of Galen Aneurysmal Malformation

Paula J. Woodward, MD and Karen Y. Oh, MD

### 198 Arteriovenous Fistula

Anne Kennedy, MD

### 200 Dural Sinus Malformation

Anne Kennedy, MD

## TUMORS

### 202 Brain Tumors

Paula J. Woodward, MD

### 204 Choroid Plexus Papilloma

Paula J. Woodward, MD

### 206 Intracranial Lipoma

Paula J. Woodward, MD

## PERTINENT DIFFERENTIAL DIAGNOSES

### 208 Absent Cavum Septi Pellucidi

Anne Kennedy, MD

### 212 Mild Ventriculomegaly

Roya Sohaey, MD

### 216 Abnormal Calvarium

Anne Kennedy, MD

### 222 Posterior Fossa Cyst/Fluid Collection

Anne Kennedy, MD

## SECTION 3: SPINE

### 228 Embryology and Anatomy of the Spine

Paula J. Woodward, MD

### 234 Approach to the Fetal Spine

Paula J. Woodward, MD

### 236 Spina Bifida

Roya Sohaey, MD

### 242 Iniencephaly

Paula J. Woodward, MD

### 244 Caudal Regression Sequence

Paula J. Woodward, MD

### 248 Kyphosis, Scoliosis

Paula J. Woodward, MD

### 250 Tethered Cord

Roya Sohaey, MD

### 252 Diastematomyelia

Paula J. Woodward, MD

### 254 Sacrococcygeal Teratoma

Paula J. Woodward, MD

## SECTION 4: FACE AND NECK

### 262 Embryology and Anatomy of the Face and Neck

Roya Sohaey, MD

### 274 Approach to the Fetal Face and Neck

Roya Sohaey, MD

### 278 Cleft Lip, Palate

Roya Sohaey, MD

### 284 Dacryocystocele

Roya Sohaey, MD

### 286 Coloboma

Anne Kennedy, MD

### 288 Epignathus

Paula J. Woodward, MD

### 292 Epulis

Anne Kennedy, MD

### 294 Goiter

Roya Sohaey, MD

### 298 Cystic Hygroma

Roya Sohaey, MD

### 302 Cervical Teratoma

Paula J. Woodward, MD

## PERTINENT DIFFERENTIAL DIAGNOSES

### 304 Abnormal Orbits/Eyes

Roya Sohaey, MD

### 310 Abnormal Ears

Roya Sohaey, MD

### 314 Micrognathia

Anne Kennedy, MD

### 318 Macroglossia

Anne Kennedy, MD

## SECTION 5: CHEST

### 322 Embryology and Anatomy of the Chest

Paula J. Woodward, MD

### 330 Approach to the Fetal Chest

Paula J. Woodward, MD

### 332 Congenital Diaphragmatic Hernia

Paula J. Woodward, MD

### 336 Congenital Pulmonary Airway Malformation

Paula J. Woodward, MD

### 340 Bronchopulmonary Sequestration

Paula J. Woodward, MD

### 344 Bronchogenic Cyst

Paula J. Woodward, MD

# TABLE OF CONTENTS

## 346 Congenital High Airway Obstruction Sequence (CHAOS)

*Paula J. Woodward, MD*

## 348 Pulmonary Agenesis

*Roya Sohaey, MD and Anne Kennedy, MD*

## 350 Lymphangioma

*Karen Y. Oh, MD and Roya Sohaey, MD*

## 354 Mediastinal Teratoma

*Paula J. Woodward, MD*

### PERTINENT DIFFERENTIAL DIAGNOSES

## 356 Solid/Echogenic Chest Mass

*Paula J. Woodward, MD*

## 360 Cystic Chest Mass

*Paula J. Woodward, MD*

## SECTION 6: HEART

### INTRODUCTION AND OVERVIEW

## 364 Embryology and Anatomy of the Cardiovascular System

*Thomas A. Miller, DO and Michael D. Puchalski, MD*

## 374 Approach to the Fetal Heart

*Michael D. Puchalski, MD*

### ABNORMAL LOCATION

## 380 Heterotaxy, Cardiosplenic Syndromes

*Michael D. Puchalski, MD and Thomas A. Miller, DO*

## 384 Ectopia Cordis

*Anne Kennedy, MD*

### SEPTAL DEFECTS

## 388 Ventricular Septal Defect

*Michael D. Puchalski, MD*

## 390 Atrioventricular Septal Defect

*Michael D. Puchalski, MD*

## 394 Atrial Septal Aneurysm

*Paula J. Woodward, MD*

### RIGHT HEART MALFORMATIONS

## 396 Ebstein Anomaly

*Michael D. Puchalski, MD*

## 400 Tricuspid Dysplasia

*Michael D. Puchalski, MD*

## 402 Tricuspid Atresia

*Michael D. Puchalski, MD*

## 404 Pulmonary Stenosis, Atresia

*Michael D. Puchalski, MD*

### LEFT HEART MALFORMATIONS

## 408 Hypoplastic Left Heart

*Michael D. Puchalski, MD*

## 412 Coarctation and Interrupted Aortic Arch

*Michael D. Puchalski, MD*

## 416 Aortic Stenosis

*Michael D. Puchalski, MD*

## 420 Total Anomalous Pulmonary Venous Return

*Michael D. Puchalski, MD and Anne Kennedy, MD*

### CONOTRUNCAL MALFORMATIONS

## 424 Tetralogy of Fallot

*Michael D. Puchalski, MD*

## 428 Transposition of the Great Arteries

*Michael D. Puchalski, MD*

## 432 Truncus Arteriosus

*Michael D. Puchalski, MD*

## 436 Double-Outlet Right Ventricle

*Michael D. Puchalski, MD*

### MYOCARDIAL AND PERICARDIAL ABNORMALITIES

## 438 Echogenic Cardiac Focus

*Roya Sohaey, MD*

## 440 Cardiomyopathy

*Michael D. Puchalski, MD*

## 444 Rhabdomyoma

*Michael D. Puchalski, MD and Thomas A. Miller, DO*

## 448 Pericardial Effusion

*Anne Kennedy, MD*

## 450 Pericardial Teratoma

*Paula J. Woodward, MD*

### ABNORMAL RHYTHM

## 452 Irregular Rhythm

*Michael D. Puchalski, MD and Thomas A. Miller, DO*

## 454 Tachyarrhythmia

*Michael D. Puchalski, MD and Thomas A. Miller, DO*

## 458 Bradyarrhythmia

*Michael D. Puchalski, MD and Thomas A. Miller, DO*

### PERTINENT DIFFERENTIAL DIAGNOSES

## 462 Abnormal Cardiac Axis

*Anne Kennedy, MD*

## 468 Chamber Asymmetry

*Michael D. Puchalski, MD*

## SECTION 7: ABDOMINAL WALL AND GASTROINTESTINAL TRACT

### INTRODUCTION AND OVERVIEW

## 474 Embryology and Anatomy of the Abdominal Wall and GI Tract

*Janice L. B. Byrne, MD, Marcia L. Feldkamp, PhD, PA, and Paula J. Woodward, MD*

## 484 Approach to the Abdominal Wall and GI Tract

*Paula J. Woodward, MD and Janice L. B. Byrne, MD*

### ABDOMINAL WALL DEFECTS

## 490 Gastroschisis

*Roya Sohaey, MD*

## 496 Omphalocele

*Roya Sohaey, MD*

## 502 Pentalogy of Cantrell

*Paula J. Woodward, MD*

## 504 Body Stalk Anomaly

*Anne Kennedy, MD*

# TABLE OF CONTENTS

- 508 **Bladder Exstrophy**  
*Anne Kennedy, MD*
- 512 **Cloacal Exstrophy/OEIS Syndrome**  
*Anne Kennedy, MD*

## BOWEL ABNORMALITIES

- 516 **Esophageal Atresia**  
*Karen Y. Oh, MD and Paula J. Woodward, MD*
- 520 **Duodenal Atresia**  
*Karen Y. Oh, MD and Paula J. Woodward, MD*
- 524 **Jejunal, Ileal Atresia**  
*Karen Y. Oh, MD*
- 528 **Colonic Atresia**  
*Roya Sohaey, MD*
- 530 **Anal Atresia**  
*Anne Kennedy, MD*
- 532 **Cloacal Malformation/Urogenital Sinus**  
*Paula J. Woodward, MD and Nicole S. Winkler, MD*
- 536 **Volvulus**  
*Paula J. Woodward, MD*
- 538 **Enteric Duplication Cyst**  
*Paula J. Woodward, MD*

## PERITONEAL ABNORMALITIES

- 540 **Meconium Peritonitis, Pseudocyst**  
*Paula J. Woodward, MD*
- 544 **Mesenteric Lymphangioma**  
*Paula J. Woodward, MD*

## HEPATOBIILIARY ABNORMALITIES

- 546 **Gallstones**  
*Roya Sohaey, MD*
- 548 **Choledochal Cyst**  
*Roya Sohaey, MD*
- 550 **Congenital Hepatic Hemangioma**  
*Paula J. Woodward, MD*
- 552 **Mesenchymal Hamartoma**  
*Paula J. Woodward, MD*
- 554 **Malignant Liver Tumors**  
*Paula J. Woodward, MD*

## PERTINENT DIFFERENTIAL DIAGNOSES

- 558 **Echogenic Bowel**  
*Roya Sohaey, MD*
- 560 **Ascites**  
*Karen Y. Oh, MD*
- 562 **Cystic Abdominal Mass**  
*Paula J. Woodward, MD*

## RENAL DEVELOPMENTAL VARIANTS

- 588 **Unilateral Renal Agenesis**  
*Karen Y. Oh, MD*
- 590 **Duplicated Collecting System**  
*Karen Y. Oh, MD*
- 594 **Pelvic Kidney**  
*Karen Y. Oh, MD*
- 596 **Horseshoe Kidney**  
*Karen Y. Oh, MD*
- 598 **Crossed Fused Ectopia**  
*Karen Y. Oh, MD*

## RENAL MALFORMATIONS

- 600 **Bilateral Renal Agenesis**  
*Karen Y. Oh, MD*
- 604 **Ureteropelvic Junction Obstruction**  
*Roya Sohaey, MD*
- 608 **Urinoma**  
*Roya Sohaey, MD*
- 610 **Obstructive Renal Dysplasia**  
*Roya Sohaey, MD*
- 614 **Multicystic Dysplastic Kidney**  
*Roya Sohaey, MD*
- 618 **Autosomal Recessive Polycystic Kidney Disease**  
*Anne Kennedy, MD*
- 622 **Mesoblastic Nephroma**  
*Paula J. Woodward, MD*

## ADRENAL ABNORMALITIES

- 626 **Adrenal Hemorrhage**  
*Anne Kennedy, MD*
- 628 **Neuroblastoma**  
*Paula J. Woodward, MD*
- 632 **Congenital Adrenal Hyperplasia**  
*Roya Sohaey, MD*

## BLADDER MALFORMATIONS

- 634 **Posterior Urethral Valves**  
*Karen Y. Oh, MD*
- 638 **Prune-Belly Syndrome**  
*Karen Y. Oh, MD*
- 642 **Ureterocele**  
*Karen Y. Oh, MD*
- 646 **Urachal Anomalies**  
*Paula J. Woodward, MD*

## GENITAL ABNORMALITIES

- 650 **Disorders of Sexual Development**  
*Roya Sohaey, MD*
- 656 **Hypospadias**  
*Roya Sohaey, MD*
- 658 **Ovarian Cyst**  
*Anne Kennedy, MD*
- 662 **Hydrocolpos**  
*Paula J. Woodward, MD and Nicole S. Winkler, MD*

## SECTION 8: GENITOURINARY TRACT

### INTRODUCTION AND OVERVIEW

- 570 **Embryology and Anatomy of the Genitourinary Tract**  
*Paula J. Woodward, MD*
- 580 **Approach to the Fetal Genitourinary Tract**  
*Paula J. Woodward, MD*
- 584 **Urinary Tract Dilatation**  
*Roya Sohaey, MD*

# TABLE OF CONTENTS

## PERTINENT DIFFERENTIAL DIAGNOSES

- 664 **Hydronephrosis**  
*Roya Sohaey, MD*
- 668 **Echogenic Kidneys**  
*Paula J. Woodward, MD*
- 670 **Unilateral Enlarged Kidney**  
*Paula J. Woodward, MD*
- 674 **Suprarenal Mass**  
*Roya Sohaey, MD*
- 676 **Scrotal Mass**  
*Paula J. Woodward, MD*

## SECTION 9: MUSCULOSKELETAL

### DYSPLASIAS

- 680 **Approach to Skeletal Dysplasias**  
*Janice L. B. Byrne, MD*
- 686 **Bone Length Charts**  
*Janice L. B. Byrne, MD*
- 688 **Achondrogenesis, Hypochondrogenesis**  
*Janice L. B. Byrne, MD*
- 694 **Achondroplasia**  
*Paula J. Woodward, MD and Janice L. B. Byrne, MD*
- 698 **Amelia/Phocomelia**  
*Janice L. B. Byrne, MD*
- 702 **Atelosteogenesis**  
*Janice L. B. Byrne, MD*
- 706 **Campomelic Dysplasia**  
*Janice L. B. Byrne, MD*
- 710 **Chondrodysplasia Punctata**  
*Janice L. B. Byrne, MD*
- 714 **Hypophosphatasia**  
*Janice L. B. Byrne, MD*
- 718 **Osteogenesis Imperfecta**  
*Janice L. B. Byrne, MD*
- 722 **Short Rib-Polydactyly Syndromes**  
*Janice L. B. Byrne, MD*
- 726 **Thanatophoric Dysplasia**  
*Janice L. B. Byrne, MD*

### EXTREMITY MALFORMATIONS

- 732 **Clubfoot**  
*Roya Sohaey, MD*
- 736 **Rocker-Bottom Foot**  
*Roya Sohaey, MD*
- 738 **Sandal Gap Foot**  
*Roya Sohaey, MD*
- 740 **Radial Ray Malformation**  
*Janice L. B. Byrne, MD*
- 744 **Clinodactyly**  
*Roya Sohaey, MD*
- 746 **Polydactyly**  
*Janice L. B. Byrne, MD*
- 750 **Syndactyly**  
*Janice L. B. Byrne, MD*
- 754 **Split Hand/Foot Malformation**  
*Janice L. B. Byrne, MD*

- 758 **Arthrogryposis, Akinesia Sequence**  
*Janice L. B. Byrne, MD*
- 764 **Proximal Focal Femoral Dysplasia**  
*Karen Y. Oh, MD*
- 768 **Fibular/Tibial Hemimelia**  
*Karen Y. Oh, MD*

## PERTINENT DIFFERENTIAL DIAGNOSES

- 770 **Mildly Short Femur/Humerus**  
*Karen Y. Oh, MD*
- 774 **Angulated Bones**  
*Janice L. B. Byrne, MD*
- 780 **Abnormal Ossification**  
*Janice L. B. Byrne, MD*

## SECTION 10: PLACENTA, MEMBRANES, AND UMBILICAL CORD

### INTRODUCTION AND OVERVIEW

- 784 **Approach to the Placenta and Umbilical Cord**  
*Roya Sohaey, MD*

### PLACENTA AND MEMBRANE ABNORMALITIES

- 790 **Placental Abruption**  
*Roya Sohaey, MD*
- 794 **Placenta Previa**  
*Roya Sohaey, MD*
- 798 **Vasa Previa**  
*Roya Sohaey, MD*
- 800 **Morbidly Adherent Placenta**  
*Anne Kennedy, MD*
- 806 **Placental Lake, Intervillous Thrombus**  
*Roya Sohaey, MD*
- 810 **Succenturiate Lobe**  
*Roya Sohaey, MD*
- 812 **Circumvallate Placenta**  
*Roya Sohaey, MD*
- 814 **Marginal and Velamentous Cord Insertion**  
*Roya Sohaey, MD*
- 816 **Chorioangioma**  
*Paula J. Woodward, MD*
- 820 **Placental Teratoma**  
*Paula J. Woodward, MD*
- 822 **Placental Mesenchymal Dysplasia**  
*Anne Kennedy, MD*

### UMBILICAL CORD ABNORMALITIES

- 824 **Single Umbilical Artery**  
*Roya Sohaey, MD*
- 826 **Umbilical Vein Varix**  
*Anne Kennedy, MD*
- 828 **Persistent Right Umbilical Vein**  
*Roya Sohaey, MD*

## PERTINENT DIFFERENTIAL DIAGNOSES

- 830 **Placental Cysts and Masses**  
*Roya Sohaey, MD*

# TABLE OF CONTENTS

- 834 **Umbilical Cord Cysts and Masses**  
*Roya Sohaey, MD*

## SECTION 11: MULTIPLE GESTATIONS

- 840 **Approach to Multiple Gestations**  
*Anne Kennedy, MD*
- 846 **Dichorionic Diamniotic Twins**  
*Anne Kennedy, MD*
- 850 **Monochorionic Diamniotic Twins**  
*Anne Kennedy, MD*
- 854 **Monochorionic Monoamniotic Twins**  
*Anne Kennedy, MD*
- 858 **Discordant Twin Growth**  
*Anne Kennedy, MD*
- 862 **Twin-Twin Transfusion Syndrome**  
*Anne Kennedy, MD*
- 866 **Twin Reversed Arterial Perfusion**  
*Anne Kennedy, MD*
- 870 **Conjoined Twins**  
*Anne Kennedy, MD*
- 874 **Triplets and Beyond**  
*Anne Kennedy, MD*
- 878 **Fetus-in-Fetu**  
*Anne Kennedy, MD*

## SECTION 12: ANEUPLOIDY

- 884 **Approach to Genetic Screening**  
*Roya Sohaey, MD*
- 890 **Trisomy 21**  
*Roya Sohaey, MD*
- 896 **Trisomy 18**  
*Roya Sohaey, MD*
- 902 **Trisomy 13**  
*Roya Sohaey, MD*
- 908 **Turner Syndrome (45,X)**  
*Roya Sohaey, MD*
- 912 **Triploidy**  
*Roya Sohaey, MD*

## SECTION 13: SYNDROMES AND MULTISYSTEM DISORDERS

- 918 **22q11 Deletion Syndrome**  
*Janice L. B. Byrne, MD*
- 920 **Aicardi Syndrome**  
*Anne Kennedy, MD*
- 924 **Amniotic Band Syndrome**  
*Anne Kennedy, MD*
- 928 **Apert Syndrome**  
*Janice L. B. Byrne, MD*
- 932 **Beckwith-Wiedemann Syndrome**  
*Paula J. Woodward, MD and Janice L. B. Byrne, MD*
- 936 **Carpenter Syndrome**  
*Janice L. B. Byrne, MD*
- 938 **CHARGE Syndrome**  
*Anne Kennedy, MD*
- 940 **Cornelia de Lange Syndrome**  
*Janice L. B. Byrne, MD*

- 944 **Cystic Fibrosis**  
*Janice L. B. Byrne, MD*
- 946 **Diabetic Embryopathy**  
*Janice L. B. Byrne, MD*
- 950 **Fraser Syndrome**  
*Paula J. Woodward, MD*
- 952 **Fryns Syndrome**  
*Janice L. B. Byrne, MD*
- 954 **Goldenhar Syndrome**  
*Anne Kennedy, MD*
- 956 **Holt-Oram Syndrome**  
*Janice L. B. Byrne, MD*
- 960 **Idiopathic Infantile Arterial Calcification**  
*Anne Kennedy, MD*
- 962 **Joubert Syndrome**  
*Anne Kennedy, MD*
- 966 **Klippel-Trenaunay-Weber Syndrome**  
*Roya Sohaey, MD*
- 970 **Meckel-Gruber Syndrome**  
*Paula J. Woodward, MD*
- 974 **Multiple Pterygium Syndromes**  
*Janice L. B. Byrne, MD*
- 976 **Neu-Laxova Syndrome**  
*Anne Kennedy, MD*
- 978 **Noonan Syndrome**  
*Janice L. B. Byrne, MD*
- 980 **PHACES Syndrome**  
*Anne Kennedy, MD*
- 982 **Pfeiffer Syndrome**  
*Janice L. B. Byrne, MD*
- 986 **Pierre Robin Sequence**  
*Janice L. B. Byrne, MD*
- 988 **Sirenomelia**  
*Janice L. B. Byrne, MD*
- 992 **Smith-Lemli-Opitz Syndrome**  
*Janice L. B. Byrne, MD*
- 996 **Treacher Collins Syndrome**  
*Roya Sohaey, MD*
- 1000 **Tuberous Sclerosis**  
*Karen Y. Oh, MD*
- 1004 **VACTERL Association**  
*Janice L. B. Byrne, MD*
- 1008 **Valproate Embryopathy**  
*Janice L. B. Byrne, MD*
- 1010 **Warfarin (Coumadin) Embryopathy**  
*Janice L. B. Byrne, MD*
- 1012 **Walker-Warburg Syndrome**  
*Anne Kennedy, MD*

## SECTION 14: INFECTION

- 1016 **Cytomegalovirus**  
*Janice L. B. Byrne, MD and Anne Kennedy, MD*
- 1020 **Parvovirus**  
*Janice L. B. Byrne, MD*
- 1022 **Toxoplasmosis**  
*Janice L. B. Byrne, MD*
- 1024 **Varicella**  
*Janice L. B. Byrne, MD*

