

# Index

- A
- Abdominal ectopic pregnancy, 113
- Abdominal vessels, perinatal necropsy and, 38
- Abdominal wall, defects of, in fetal examination, 150–151
- Aberdeen clinicopathological classification, of fetal/neonatal death, 2, 208–210
- Abnormal vaginal tract flora, pregnancy and
  - bacterial vaginosis, 385–386
  - candidiasis, 386–388
- Abortion, spontaneous
  - definition of, 102
  - etiology of, 103–107
    - chromosomal abnormalities, 103–104
    - congenital anatomical abnormalities, 104
    - environmental, 106
    - general comments, 103
    - immunology, 107
    - infection, 104
    - maternal disease, 104–106
    - occupational, 106
    - paternal effects, 106–107
  - incidence of, 102–103
  - pathogenesis of, 109
  - pathology of, 107–109
    - classification, 107–108
    - histology, 109
  - placentation, 109–110
- Abruptio placenta, placental macroscopic abnormalities, 64–65
- Acardiac twin, 269–270
- Accessory auricle, 798
- Achondrogenesis type II, 780–782
- Acidurias, neonatal period, inborn errors of metabolism, 172–173
- Acne, neonatal, 802
- Acquired parenchymal damage, 727–735
  - basal ganglia, 731–732
  - brain damage, 727–728
  - brainstem, 732–733
  - cerebellum, 733
  - cerebral cortex, 732
  - diffuse white mater ischemia, 730
  - gray matter, 731
  - hypoxic-ischemic injury, 728
  - multicystic
    - leukoencephalopathy, 730–731
  - parenchymal damage timing, 728–729
  - periventricular leukomalacia, 729–730
  - pontosubicular necrosis, 733
  - spinal cord, 734–735
  - thalamus, 731–732
- Acute atherosclerosis, of placenta, 70
- Acute chorioamnionitis, 90–93
- Acute lymphoblastic leukemia (ALL), 340
- Acute myeloid leukemia, 354
- Acute nonlymphoblastic leukemia (ANLL), 340
- Adhesion and mutilation (ADAM) complex, 75
- Adipose tumors, 350
- Adrenal glands, 666–675
  - adrenal cortex hormone
    - production, 667–668
  - adrenal cortex hormone regulation, 667–668
  - infections, 673–675
  - ontogeny, 667
  - pathology, 668–673
  - tumors of, 675
- Albinism, 800–801
- Alcohol
  - congenital malformations and, 130
  - perinatal death and, 216
- Alcohol-based cleansing solutions, iatrogenic disease and, 450
- ALL. *See* Acute lymphoblastic leukemia
- Alveolar capillary dysplasia, 546–547
- Aminoacidopathies, neonatal period, inborn errors of metabolism, 170–172
  - acidurias, 172–173
  - maple syrup urine disease, 170, 172
  - nonketotic hyperglycemia, 172
- Amniocentesis, 136
  - prenatal diagnosis and, 433–434
- Amniochorial membranes, 77–78
  - of placenta, 77–78
  - amnion nodosum, 77
  - meconium staining, 77–78
  - squamous metaplasia, 77
- Amnion disruption sequence, in fetal examination, 155–156

- Amnion nodosum, 77  
 Amnion rupture sequence, 75  
 Amniotic bands, 131  
   of umbilical cord, 75  
 Amniotic band syndrome, 75  
 Amniotic constriction bands, 798  
 Amniotic deformity, 75  
 Amyoplasia, 750–751  
 Anaplastic Wilm's tumor,  
   incidence of, 329, 330  
 Anemia  
   inherited, bleeding and, 197  
   microangiopathic hemolytic,  
     196–197  
 Anencephaly, 79  
   in early central nervous system  
     development, 704–705  
   in fetal examination, 148–149  
 Angiokeratoma, 806  
 Aniridia, 332, 657, 836  
 ANLL. *See* Acute nonlymphoblastic  
   leukemia  
 Anophthalmia, 831–832  
 Anorectal malformations,  
   484–486  
 Anterior chamber dysgenesis,  
   835–836  
 Antibiotics, neonatal lung disease  
   and, 450  
 Anti-Kell antibodies, maternal  
   factors and, 190–191  
 Antioxidant therapy, neonatal lung  
   disease and, 446  
 $\alpha$ -1antitrypsin deficiency,  
   510–511  
   etiology of, 510  
   histologic findings in, 510–511  
   pathogenesis of, 510  
   prognosis of, 511  
   treatment of, 511  
 Aorta coarctation, 584  
 Aortic stenosis, 588–589  
 Aplasia cutis congenita, 798–799  
 ARPKD. *See* Autosomal recessive  
   polycystic kidney disease  
 Arrhythmia, cardiac conduction  
   system, 614–615  
 Arrhythmogenic right ventricular  
   cardiomyopathy, 606  
 Arterial duct abnormalities,  
   583–584  
 Arteries, iatrogenic disease and,  
   447–448  
 Arthrogyposis, 749–750  
 Asphyxia, 274–285  
   birth, pathology of, 557  
   causes of, 277–280  
     fetal conditions, 279–280  
     maternal disorders, 278  
     placental disorders, 278  
     umbilical cord, 278–279  
   definition of, 274  
   effects of, 274–277  
     on fetal brain, 276–277  
     on fetal breathing, 275–276  
     on fetal circulation, 275  
   incidence of, 274  
   macerated stillbirths,  
     pathological findings in,  
       231–232  
   pathological findings, 280–285  
     early deaths, 280–282  
     late deaths, 282–285  
   pathophysiology of, 274–275  
 Assisted ventilation, neonatal  
   therapy, complications  
   of, 440  
 Asthma, perinatal death and, 217  
 Atrial isomerism, 595–596  
 Atrial septal defect, 582–583  
 Atrioventricular septal defect,  
   581–582  
 Autopsy, neuromuscular disorders,  
   investigation of, 766–767  
 Autosomal dominant defects,  
   124–125  
 Autosomal dominant polycystic  
   kidney disease, 634–636  
 Autosomal recessive defects,  
   125–126  
 Autosomal recessive polycystic  
   kidney disease (ARPKD),  
   152, 633–634  
 Autosomal trisomy, 127  
**B**  
 Bacterial infections, pregnancy and  
   group B streptococcus, 396–398  
   listeria monocytogenes, 398–399  
   tuberculosis, 395–396  
 Bacterial vaginosis, pregnancy and,  
   385–386  
   background of, 385  
   clinical features of, 385  
   diagnosis of, 385  
   epidemiology of, 385  
   microbiology of, 385  
   pathogenesis of, 385  
   prevention of, 386  
   public health issues for, 386  
   treatment of, 385  
 Beckwith-Wiedemann syndrome  
   (BWS), 80, 332  
 Biliary system, 501–502  
   canaliculi, 501  
   cysts of, 506–507  
   extrahepatic bile ducts, 502  
   gallbladder, 502  
   intrahepatic ducts, 502  
 Biliary tract, development of,  
   abnormalities of,  
   503–507  
 Bilobate placenta, 61  
 Biochemical investigations  
   sampling, perinatal  
   necropsy and, 47  
 Birth asphyxia, pathology of, 557  
 Birthmarks, 803–808  
   angiokeratoma, 806  
   café-au-lait spots, 803–804  
   congenital vascular  
     abnormalities, 805  
   epidermal nevi, 807–808  
   lentiginos, 804  
   lymphangiomas, 806–807  
   malignant melanoma, 804–805  
   melanocytic nevi, 804–805  
   Mongolian spot, 803  
   organoid nevi, 807–808  
   port wine stain, 806  
   strawberry nevus, 805  
 Birth trauma, 3–4, 285–293  
   causes of, 285–286  
   definition of, 285  
   incidence of, 285  
   pathophysiology of, 285–286  
   types of, 286–293  
     brain emboli, 291–292  
     bruising, 286–287  
     caput succedaneum, 287  
     chinon, 287  
     extradural hemorrhage, 290  
     laceration, 286–287  
     occipital osteodiasis, 291  
     skull fractures, 291  
     spinal cord injuries, 292–293  
     subaponeurotic (subgaleal)  
       hemorrhage, 287–288  
     subdural hemorrhage, 290  
     subperiosteal hemorrhage  
       (cephalhematoma),  
       288–289

- tears of the dural folds, 290–291
- visceral injuries, 293
- Bladder, congenital abnormalities of, 642–643
- Bladder exstrophy, 488, 643
- Bleeding. *See also* Fetal bleeding; Maternal bleeding
  - perinatal death and, 217
- Blood loss, neonatal, 187
- Blood sampling, iatrogenic disease and, 446–449
- Blood transfusion, neonatal lung disease and, 453
- Blueberry muffin, 357
- Bone disease, prematurity and, 252–253
- BPMS. *See* British Perinatal Mortality Survey
- Brain emboli, birth trauma and, 291–292
- Brain, fetal, asphyxia and, 276–277
- Brain injury, prematurity and, 250–253
  - intraventricular hemorrhage, 250–251
  - periventricular leukomalacia, 251
  - prognosis of, 252
- Brainstem, disorders of, 713
- Breast milk, prematurity and, 252
- Breathing, fetal, asphyxia and, 275–276
- British Perinatal Mortality Survey (BPMS), of fetal/neonatal death, 210
- Bronchogenic cysts, 541
- Bronchomalacia, 540
- Bronchopulmonary dysplasia, 553–556
  - prematurity and, 247–249
- Bruising, birth trauma and, 286–287
- Burns, neonatal lung disease and, 449
- BWS. *See* Beckwith-Wiedemann syndrome
- C**
- Café-au-lait spots, 803–804
- Calcification, placental
  - macroscopic abnormalities, 68
- Campylobacter, 104
- Candida albicans*, 49, 92, 93, 255
- Candidiasis, pregnancy and, 386–388
  - background of, 386
  - clinical features of, 387
  - diagnosis of, 387
  - epidemiology of, 386
  - microbiology of, 386
  - pathogenesis of, 386–387
  - prevention of, 387
  - public health issues for, 387–388
  - treatment of, 387
- Captopril, 427
- Caput succedaneum, birth trauma and, 287
- Cardiac conduction system, 612–615
  - arrhythmia, 614–615
  - histological sampling, 613–614
  - normal anatomy of, 612–613
- Cardiomyopathy, 602–608
  - arrhythmogenic right ventricular, 606
  - dilated, 605
  - histiocytoid, 607
  - hypertrophic, 602–605
  - metabolic, 608
  - mitochondrial, 607–608
  - restrictive, 605–606
  - ventricular myocardium
    - noncompaction, 606–607
- Cardiovascular system
  - cardiac conduction system, 612–615
  - cardiomyopathy, 602–608
  - circulation, 573–579
    - ductus arteriosus, 574
    - ductus venosus, 573–574
    - foramen ovale, 573–574
    - lungs, 574
    - postnatal adaptation, 574–575
    - systemic, 574
  - ectopia cordis, 151, 598–599
  - heart
    - development of, 571–573
    - examination of, 575–579
  - inflammation, 599–601
    - infectious endocarditis, 599–600
    - myocarditis, 600–601
    - pericarditis, 601
  - myocardial infarction, 601–602
  - myocardial ischemia, 601–602
  - persistent left superior vena cava, 598
  - structural congenital heart disease, 579–598
    - aorta coarctation, 584
    - aortic stenosis, 588–589
    - arterial duct abnormalities, 583–584
    - atrial isomerism, 595–596
    - atrial septal defect, 582–583
    - atrioventricular septal defect, 581–582
    - common arterial trunk, 590–591
    - coronary artery structural abnormalities, 596–598
    - double inlet ventricle, 591
    - double outlet ventricle, 591–592
    - ductus arteriosus, 583–584
    - Ebstein’s malformation, 593–594
    - great arteries transposition, 589–590
    - hypoplastic left heart, 589
    - pulmonary atresia, 584–588
    - pulmonary stenosis, 584–588
    - pulmonary veins
      - abnormalities, 592–593
    - tricuspid atresia, 594
    - truncus arteriosus, 590–591
    - Uhl’s anomaly, 594–595
    - ventricular septal defect, 579–581
  - structural heart disease, in fetus, 599
  - tumors, 608–610
    - fibroma, 609
    - rhabdomyoma, 312, 608–609
    - teratoma, 609
  - vascular system of, 610–612
    - coronary arteries, 611–612
    - fibromuscular dysplasia, 610–611
    - iatrogenic disease, 610
    - idiopathic arterial calcification, 611
    - Marfan syndrome, 610
- Central nervous system
  - congenital tumors of, 355–356
  - malformation syndromes, 506
  - neonatal period, inborn errors of metabolism, 174–175

- Central nervous system, early development of, 702–703
- malformations related to, 703–716
- cerebellar disorders, 711–714
- cerebral development disorders, 705–711
- hindbrain disorders, 711–714
- hydrocephalus, 714–716
- neural tube defects, 703–705
- spinal cord, 711–714
- vascular disorders, 714
- Cerebellar disorders, central nervous system, early development of, malformations related to, 711–714
- Cerebral development disorders, central nervous system, early development of, malformations related to, 705–711
- Cerebral heterotopias, 710–711
- Cerebral pathology, macerated stillbirths, pathological findings in, 232
- Cerebrohepato renal syndrome. *See* Zellweger syndrome
- Cervical ectopic pregnancy, 113
- Cervical tumors, 338
- Cesarean section delivery, intrapartum period, complications of, 432
- CF. *See* Cystic fibrosis
- CF transmembrane conductance regulator gene (CFTR), 137
- Chagas disease, 93
- Chest drains, complications of, neonatal lung disease and, 446
- Chest wall hamartoma, 350
- Chiari malformations, 712
- Chinon, birth trauma and, 287
- Chlamydia trachomatis, 112
- pregnancy and, 389–391
- background of, 389
- clinical features of, 390
- diagnosis of, 390
- epidemiology of, 390
- microbiology of, 389
- pathogenesis of, 390
- prevention of, 390–391
- transmission of, 390
- treatment of, 390
- Cholesterol synthesis in development, neonatal period, inborn errors of metabolism, 175–176
- Chorangiosis, of placenta, 71
- Chorioangioma, placental macroscopic abnormalities, 67–68
- Choriocarcinoma, 117
- Chorionicity, 263–264
- Chorionic villus sampling, 134–136
- complications with, 134–135
- congenital abnormalities and, 134–136
- indications for, 134
- prenatal diagnosis and, 434–435
- Chromosome abnormalities, 78, 126–127, 152
- autosomal trisomy, 127, 153–154
- triploidy, 126–127, 154
- Chronic chorioamnionitis, 97
- Chronic deciduitis, 97
- Chronic histiocytic intervillitis, 97–98
- Chronic lung disease (CLD), 553–556
- neonatal therapy, complications of, 440
- prematurity and, 247–249
- Chronic uterine infection, pregnancy and, 382
- Chronic villitis, 93–97
- cytomegalovirus and, 93
- herpes viruses and, 93
- infections, 93–95
- syphilis and, 93
- toxoplasmosis and, 93
- Circulation in cardiovascular system, 573–579
- ductus arteriosus, 574
- ductus venosus, 573–574
- foramen ovale, 573–574
- lungs, 574
- postnatal adaptation, 574–575
- systemic, 574
- fetal, asphyxia and, 275
- Circumvallate placenta, 62
- Classification systems, of fetal/neonatal death, 208–213
- Aberdeen clinicopathological classification, 2, 208–210
- British Perinatal Mortality Survey, 210
- Neonatal and Intrauterine Death Classification According to Etiology, 213
- Nordic-Baltic classification, 212–213
- placental and fetal pathology classification, 210–211
- Wigglesworth classification, 2, 211–212
- Clear cell sarcoma, 354
- Cleft lip and palate (CL/P), gastrointestinal malformations, 467–468
- CMV. *See* Cytomegalovirus
- Coagulopathy, bleeding and, 193–197
- acquired defects, 194–195
- congenital defects, 195
- investigation of, 194
- microangiopathic hemolytic anemia, 196–197
- purpura fulminans, 196
- thrombocytopenia, 195
- thrombosis, 195
- Cocaine abuse, placenta and, 83
- Coiling, of umbilical cord, 74–75
- Collagen vascular disease, placenta and, 82
- Collodion baby, 810
- Colon, gastrointestinal malformations of, 481–486
- anorectal malformations, 484–486
- colonic atresia, 476
- Hirschsprung's disease, 481–482
- Hirschsprung's enterocolitis, 483–484
- intestinal neuronal dysplasia, 484
- megacystis-microcolon-intestinal hypoperistalsis syndrome, 484
- Common arterial trunk, 590–591
- Congenital abnormalities, prenatal diagnosis of, 131–142
- cystic fibrosis and, 137–138
- DNA analysis and, 137
- Down syndrome, 138, 140
- earlier diagnosis in, 138–139
- fetus examination, 140–142
- invasive tests, 134–137
- laboratory advances in, 139–140
- neural tube defects, 138, 139
- novel imaging techniques, 139

- placental examination, 140
- pregnancy termination for fetal abnormality, 6–7
- ultrasound examination, 131–133
- Congenital cytomegalovirus, pregnancy and, 408
- Congenital epulis, 468
- Congenital fiber type disproportion, 758
- Congenital (infantile) fibrosarcoma, 347–348
- Congenital glaucoma, 836
- Congenital heart disease. *See also* Structural congenital heart disease
- Congenital hydrocalycosis, 642
- Congenital hydronephrosis, 631, 642
- Congenital hyperlactatemia, neonatal period, inborn errors of metabolism, 173–174
- oxidative phosphorylation disorders, 173–174
- pyruvate metabolism disorders, 173
- Congenital infections, pregnancy and, 379
- Congenital inflammatory myopathies, 753–754
- Congenital leukemia, 340–341
- Congenital lobar emphysema, 542
- Congenital malformations
  - causes of, 124–131
  - alcohol, 130
  - amniotic bands, 131
  - chromosome abnormalities, 126–127
  - drugs, 129–130
  - environmental teratogens, 128–129
  - heat, 130–131
  - infection, 130
  - maternal disorders, 129
  - multifactorial disorders, 128
  - physical agents, 130–131
  - pregnancy reduction, 131
  - prescribed medication and, 129–130
  - radiation, 131
  - recreational drugs, 130
  - sex chromosome abnormality, 128
  - single-gene defects, 124–126
  - structural chromosome abnormality, 127
  - tobacco, 130
  - ultrasound, 131
  - fetal obstetrician's perspective of, 4–5
- Congenital mesoblastic nephroma, 312, 350–351
- Congenital muscular dystrophies, 758–761
  - $\alpha$ -dystroglycanopathies, 759–760
  - with laminin- $\alpha$ 2 deficiency, 759
  - Ulrich congenital muscular dystrophy, 760–761
- Congenital myasthenic syndromes, 761
- Congenital myofibromatosis, 345
- Congenital myopathies, 756–758
  - congenital fiber type disproportion, 758
  - myotubular myopathy, 757–758
  - nemaline myopathy, 757
- Congenital myotonic dystrophy, 756
- Congenital nephromegaly, 629
- Congenital nephrotic syndrome, 639–640
- Congenital neuroblastoma, 338–340
- Congenital ocular melanosis, 839–840
- Congenital pulmonary adenomatoid malformation, 542–544
- Congenital pulmonary (cystic) adenomatoid malformation (CPAM), 357
- Congenital rubella syndrome, 405–406
- Congenital sinus, 798
- Congenital soft tissue tumors, 344
  - mesenchymal tumors, 344
- Congenital tumors
  - adipose tumors, 350
  - of central nervous system, 355–356
  - chest wall hamartoma, 350
  - congenital neuroblastoma, 338–340
  - congenital soft tissue tumors, 344
  - mesenchymal tumors, 344
- environmental agents and, 333–334
- etiology of, 330
- extrarenal rhabdoid tumor, 348–349
- fibromatoses, 345–349
  - congenital (infantile) fibrosarcoma, 347–348
  - congenital myofibromatosis, 345
  - cranial fasciitis, 347
  - dermatofibrosarcoma protuberans, 347
  - fibrodysplasia myositis, 348
  - fibrosis hamartoma of infancy, 348
  - giant cell fibroblastoma, 347
  - hyalinosis, 348
  - infantile desmoid-type fibromatosis, 346
  - inflammatory myofibroblastic tumor, 347
  - juvenile fibromatosis, 348
- germ cell tumors, 337–338
- of gonads, 356
- hematologic tumors, 340–341
  - acute myeloid leukemia, 354
  - congenital leukemia, 340–341
  - lymphoma, 341
- hepatoblastoma, 355
- histiocytic disorders, 341–342
  - hemophagocytic lymphohistiocytosis, 341
  - Langerhans' cell histiocytosis, 341
- histological types of, 328
- incidence of, 329–330
- infantile
  - hemangioendothelioma, 354
- inherited, 330
- investigation of, 335
- juvenile xanthogranuloma, 343
- of liver, 357
- liver tumors, 354
- malformation syndromes and, 331–332
- maternal medical therapies and, 333–334
- mesenchymal hamartoma, 355
- neural tumors, 349–350
  - melanotic neuroectodermal tumor of infancy, 349–350
  - retinal anlage tumor, 349–350

- Congenital tumors (*cont.*)  
 neuroblastoma, 352  
 nonsyndromic malformations  
 and, 332–333  
 oncogenesis, 334–335  
 pregnancy, maternal malignant  
 disease in, 357–358  
 presence of, 327  
 renal tumors, 350–354  
 cell cell sarcoma, 354  
 congenital mesoblastic  
 nephroma, 350–351  
 metanephric tumors, 351  
 nephroblastomatosis, 352–353  
 nephrogenic rests, 352–353  
 ossifying renal tumor of  
 infancy, 354  
 rhabdoid tumor of kidney,  
 353–354  
 rhabdomyosarcoma, 349  
 of skin, 357  
 teratomas, 335–338  
 sacrococcygeal, 312, 336–337  
 vascular tumors, 344–345  
 Wilms' tumor, 352
- Congenital varicella, pregnancy  
 and, 410
- Congenital vascular abnormalities,  
 805
- Conjoined twins, 266
- Connective tissue disorders,  
 macerated stillbirths,  
 maternal disorders  
 associated with, 235
- Constriction, of umbilical cord,  
 74–75
- Continuous positive airway  
 pressure (CPAP), 249
- Cordocentesis, prenatal diagnosis  
 and, 435
- Cornea, developmental  
 abnormalities of, 833–835
- Coronary artery structural  
 abnormalities, 596–598
- Corpus callosum, agenesis of, 708
- CPAM. *See* Congenital pulmonary  
 (cystic) adenomatoid  
 malformation
- CPAP. *See* Continuous positive  
 airway pressure
- Cranial fasciitis, 347
- Craniorachischisis, in early central  
 nervous system  
 development, 704–705
- Cryptophthalmos, 833
- Currarino syndrome, 332
- Cutaneous mastocytosis, 818
- Cutis laxa, 800
- Cyclopia, 832–833
- Cystic fibrosis (CF), congenital  
 abnormalities and,  
 137–138
- Cytogenetics, perinatal necropsy  
 and, 47
- Cytomegalovirus (CMV)  
 chronic villitis and, 93  
 infection and, 5  
 pregnancy and, 407–409  
 background of, 407  
 clinical features of, 408  
 congenital cytomegalovirus,  
 408  
 diagnosis of, 408  
 epidemiology of, 407–408  
 pathogenesis of, 408  
 prevention of, 409  
 public health issues for, 409  
 transmission of, 407–408  
 treatment of, 408–409  
 virology of, 407  
 stillbirth and, 2
- D**
- Dandy-Walker-type malformation,  
 506, 713
- Darier's disease, 816
- Death. *See* Fetal death; Neonatal  
 death; Perinatal death
- Decidua, development of, 55
- Deformation, 124
- Denys-Drash syndrome, 332
- Dermatofibrosarcoma protuberans  
 (DFSP), 347
- Dermoid cysts, 798
- Dermostenosis, neonatal period,  
 inborn errors of  
 metabolism, 177–178,  
 179
- DFSP. *See* Dermatofibrosarcoma  
 protuberans
- Diabetes  
 macerated stillbirths, maternal  
 disorders associated  
 with, 235  
 perinatal death and, 217  
 prematurity and, 243
- Diabetes mellitus, placenta and,  
 81–82
- Diabetic woman, infant of, 27,  
 525
- Diaphragmatic hernia, 489–490
- Diastrophic dysplasia group,  
 784–785
- DIC. *See* Disseminated  
 intravascular  
 coagulation
- Diethylstilbestrol, 130, 427
- Diet, perinatal death and, 216
- DiGeorge syndrome, 35
- Dilated cardiomyopathy, 605
- Dipalmitoylphosphatidylcholine  
 (DPPC), 246
- Disseminated intravascular  
 coagulation (DIC), 194
- Distal arthrogyroses, 752
- Diuretics, iatrogenic disease and,  
 450–451
- Dizygosity, 263
- DNA analysis, congenital  
 abnormalities and, 137
- Double inlet ventricle, 591
- Double outlet ventricle, 591–592
- Down syndrome (DS), 525  
 bleeding and, 197–198  
 prenatal diagnosis, 138, 140
- Drugs  
 bleeding and, maternal factors  
 of, 193  
 congenital malformations and,  
 129–130  
 liver and, 521–522  
 prematurity and, 243
- Ductal plate malformation,  
 syndromes associated  
 with, 505–506
- Ductus arteriosus, 583–584
- Dura folds, tears of, birth trauma  
 and, 290–291
- Dysplasia, 124
- $\alpha$ -dystroglycanopathies, congenital  
 muscular dystrophies,  
 759–760
- Dystrophic epidermolysis bullosa,  
 815
- E**
- Ear  
 developmental abnormalities of,  
 844–845  
 external ear, 844–845  
 inner ear, 845  
 middle ear, 845

- embryology of, 843, 845–846
  - external, 843–844
  - internal, 844
  - middle, 844
- oculogenesis, 845
- olfaction, 845
- otogenesis, 845
- Ebstein's malformation, 593–594
- Eclampsia, placenta and, 80–81
- ECMO. *See* Extracorporeal membrane oxygenation
- Ectodermal dysplasia, 799
- Ectopia cordis, 151, 598–599
- Ectopic pregnancy, 112–113
  - abdominal, 113
  - cervical, 113
  - ovarian, 113
  - tubal, 112–113
- Edema, of placenta, 69–70
- EFE. *See* Endocardial fibroelastosis
- Ehlers-Danlos syndrome, 799–800
- Elective preterm delivery, prematurity and, 241–242
- Encephalocele
  - in early central nervous system development, 705
  - in fetal examination, 148
- Endocardial fibroelastosis (EFE), 317
- Endocrine pancreas, 681–691
  - normal histological variations, 681–682
  - ontogeny, 681
  - pathology of, 682–691
- Endocrine system
  - adrenal glands, 666–675
    - adrenal cortex hormone production, 667–668
    - adrenal cortex hormone regulation, 667–668
  - infections, 673–675
  - ontogeny, 667
  - pathology, 668–673
  - tumors of, 675
- endocrine pancreas, 681–691
  - normal histological variations, 681–682
  - ontogeny, 681
  - pathology of, 682–691
- fetal growth, 663
- fetal hormones, 663
- placenta and, 663–664
- parathyroid glands, 679–681
  - ontogeny, 679
  - pathology of, 679–681
- pituitary-hypothalamic axis, 664–666
  - hormone production, 664–665
  - hormone regulation, 664–665
  - ontogeny, 664
  - pathology, 665–666
- thyroid gland, 675–679
  - histological variation in, 676
  - ontogeny, 675–676
  - pathology of, 676–679
- Endotracheal intubation injuries, neonatal therapy, complications of, 437–439
- Entanglements, of umbilical cord, 73–74, 279
- Enteric duplication, 471–472
- Environmental teratogens, 128–129
- Epidermal nevi, 807–808
- Epidermolysis bullosa simplex, 814
- Epidermolytic hyperkeratosis, 812–813
- Epilepsy, perinatal death and, 217
- Epithelioid trophoblastic tumor, 117
- Erythema toxicum neonatorum, 801
- Escherichia coli, 255, 382
- Esophageal atresia, 469–470
- Esophagus, gastrointestinal malformations of, 469–470
  - esophageal atresia, 469–470
- Ethnic groups, perinatal death and, 215
- Evisceration, perinatal necropsy and, 36–37
- EXIT. *See* Ex utero intrapartum treatment
- Exocrine pancreas
  - developmental anomalies, 490–491
    - annular pancreas, 491
    - ectopic pancreatic tissue, 491
    - pancreas divisum, 490–491
  - development of, 490
  - fibrocystic disease, 491–492
  - mucoviscidosis, 491–492
  - pancreatic cysts, 491–492
- Exomphalos, 486–487
- Extracellular water (ECW), 245
- Extrachorial placentation, 61
- Extracorporeal membrane oxygenation (ECMO), neonatal therapy, complications of, 443–444
- Extracranial injuries, intrapartum period, complications of, 430
- Extradural hemorrhage, birth trauma and, 290
- Extrahepatic bile ducts, 502
- Extrahepatic biliary atresia, 507–510
  - etiology of, 508
  - histological findings in, 508–509
  - pathogenesis of, 508
  - prognosis of, 509–510
  - treatment of, 509–510
- Extrapulmonary air leakage, neonatal therapy, complications of, 442–443
- Extrarenal rhabdoid tumor, 348–349
- Extrauterine life adaptation, preterm infant and, 245–246
- Ex utero intrapartum treatment (EXIT), 328
- Eye
  - anophthalmia, 831–832
  - anterior chamber dysgenesis, 835–836
  - congenital glaucoma, 836
  - cornea, developmental abnormalities of, 833–835
  - cryptophthalmos, 833
  - cyclopia, 832–833
  - embryology of
    - accessory ocular glands, 828
    - anterior chamber, 827–828
    - choroid, 827–828
    - ciliary body, 827–828
    - cornea, 827–828
    - embryology of, 825–827
    - extraocular muscles, 828
    - eyelids, 828
    - hyaloid vessels, 828
    - iris, 827–828
    - lens, 827
    - posterior chamber, 827–828
    - retina, 827

- Eye (*cont.*)
- sclera, 827–828
  - vitreous body, 828
  - familial exudative
    - vitreoretinopathy, 839
  - globe
    - abnormalities of, 831–835
    - colobomas, 833
    - enlargement of, 833
  - infection of, 842–843
  - iris, developmental
    - abnormalities of, 836
  - lens, developmental
    - abnormalities of, 836–837
  - microphthalmia, 831–832
  - nanophthalmia, 832
  - ocular development, genetic
    - regulation of, 828–829
  - ocular pigmentation, disorders of, 839–840
  - oculogenesis, developmental
    - abnormalities of, 829–831
  - optic nerve development, disorders of, 840–843
  - periocular tissues, abnormalities of, 829
  - persistence hyperplastic primary vitreous, 838
  - postnatal development of, 829
  - retina, developmental
    - abnormalities of, 838–839
  - synophthalmia, 832–833
  - trauma and, 843
  - vitreoretinal disorders, 839
- F**
- Familial exudative vitreoretinopathy, 839
- Fatty acid oxidation, disorders, 516, 762
- Faxiton, 29
- Fenestrate placenta, 61
- Fetal akinesia, 749
- Fetal bleeding, 185–186
  - fetal factors, 193–198
    - coagulopathy, 193–197
    - Down syndrome, 197–198
    - inherited anemia, 197
    - leukemoid reaction, 198
  - fetomaternal hemorrhage, 185–186, 280
  - intrapartum blood loss, 186–187, 280
  - maternal factors of, 187–193
    - drugs, 193
    - immune, 189–191
    - infection, 189
    - intrauterine growth restriction, 187–189
    - leukemia, 193
    - maternal antiphospholipid syndrome, 192–193
    - maternal idiopathic thrombocytopenic purpura, 192
    - maternal systemic lupus erythematosus, 192
    - neonatal alloimmune thrombocytopenia, 191–192
    - toxins, 193
    - vitamin B<sub>12</sub> deficiency, 193
  - neonatal blood loss, 187
  - neonatal factors, 193–198
    - coagulopathy, 193–197
    - Down syndrome, 197–198
    - inherited anemia, 197
    - leukemoid reaction, 198
  - twin-to-twin transfusion syndrome, 186- Fetal blood sampling, congenital abnormalities and, 136–137
- Fetal brain standard blocks, perinatal necropsy and, 46
- Fetal death
  - association with, 213–214
  - avoidability of, 213
  - causes of, 213–214
  - classification systems of, 208–213
    - Aberdeen clinicopathological classification, 208–210
    - British Perinatal Mortality Survey, 210
    - Neonatal and Intrauterine Death Classification
      - According to Etiology, 213
    - Nordic-Baltic classification, 212–213
    - placental and fetal pathology classification, 210–211
    - Wigglesworth classification, 211–212
  - epidemiological analyses of, 206–207
    - place of birth, 206
    - time trends, 206–207
  - parvovirus B19, 404
- Fetal growth, endocrine system and, 663
- Fetal growth restriction, 26
  - asymmetric, 27
  - causes of, 26
  - fetal obstetrician's perspective of, 3
- Fetal hormones, endocrine system and, 663
  - placenta and, 663–664
- Fetal hydrops, 78–79
  - association of, 298–301
  - causes of, 298–301
  - chromosomal abnormality, 298
  - clinical presentation of, 297–298
  - fetal fluid distribution/control, 302–303
    - amniotic fluid dynamics, 303
  - fetal malformation, 298–300
  - histological examination, 313–315
  - intrauterine infection, 300–301
  - investigation of, 304–305
  - mechanisms of, 303–304
  - pathological abnormalities
    - significance in, 317–318
  - pathological findings of, 307–313
    - external, 307–308
    - internal, 308–313
  - placenta and, 315–316
  - prenatal therapy for, 305–306
- Fetal hypoxia, 79
- Fetal life, inborn errors of
  - metabolism, 167–169
  - hydrops fetalis, 168, 169
  - maternal intoxication, 168–169
- Fetal obstetrician's perspective, necropsy and, 2–6
  - congenital malformations, 4–5
  - cord entanglement, 4
  - cord knots, 4
  - fetal growth restriction, 3
  - hypoxia, intrapartum, 4
  - infection, 5
  - placental pathology, 3
  - stillbirth, classification of, 2
  - stillbirth, intrapartum, 3–4
  - stillbirth, investigation of, 2–3



- subsequent pregnancies, management of, 5–6
- Fetal stem artery thrombosis, placental macroscopic abnormalities, 68
- Fetal surgery
  - closed, prenatal diagnosis and, 436–437
  - congenital abnormalities and, 137
  - open, prenatal diagnosis and, 436–437
- Fetal thrombotic vasculopathy, of placenta, 71–72
- Fetal tissue biopsies, prenatal diagnosis and, 435–436
- Fetal tumors, 80
- Fetomaternal hemorrhage, 185–186, 280
- Fetoscopy, prenatal diagnosis and, 436–437
- Fetus
  - effects on, medication during pregnancy and, 428
  - examination of
    - abdominal wall defects, 150–151
    - amnion disruption sequence, 155–156
    - anencephaly, 148–149
    - artifactual abnormalities in, 145–146
    - chromosome anomalies, 152–154
    - congenital abnormalities and, 140–142
    - cystic kidneys, 151–152
    - disposal and, 144–145
    - encephalocele, 148
    - fetal anomalies, 146–148
    - hydrocephalus, 146–148
    - pathologist and, 142–144
    - posterior nuchal fluid accumulation/translucency, 149–150
    - reconstruction and, 144–145
  - placenta abnormalities and, 78–80
  - anencephaly, 79
  - Beckwith-Wiedemann syndrome, 80
  - chromosomal abnormalities, 78
  - fetal hydrops, 78–79
  - fetal hypoxia, 79
  - fetal tumors, 80
  - inborn errors of metabolism, 78, 79
  - nonimmune hydrops, 78–79
  - termination of, for
    - abnormalities, 6–7
- Fibroblast growth factor receptor 3 (FGFR3) related lethal skeletal dysplasias, 773
- Fibrocystic disease, 491–492
- Fibrodysplasia myositis, 348
- Fibromatoses, 345
- Fibrosis hamartoma of infancy, 348
- First trimester, ultrasound
  - examination, of
    - congenital abnormalities, 132
- Floppy baby, neonatal period,
  - inborn errors of metabolism, 174
- Fluid balance, preterm infant and, 245
- Fluid overload, neonatal therapy, complications of, 439–440
- Focal dermal hypoplasia, 800
- Forebrain patterning defects, 706–707
- Fowler syndrome, 714
- Fractures, 790
  - intrapartum period, complications of, 431
  - of skull, birth trauma and, 291
- Funeral arrangements, necropsy and, 15
- G**
  - Galactosemia, 516–517
  - Galen aneurysm, vein of, 714
  - Gallbladder, 525
    - biliary system and, 502
  - Gastric teratomas, 338
  - Gastrointestinal malformations
    - abdominal wall defects, 486–490
      - exomphalos, 486–487
      - gastroschisis, 487–488
    - colon, 481–486
      - anorectal malformations, 484–486
      - Hirschsprung's disease, 481–482
      - Hirschsprung's enterocolitis, 483–484
    - intestinal neuronal dysplasia, 484
    - megacystis-microcolon-intestinal hypoperistalsis syndrome, 484
  - development of, 466–467
  - hernias, 486–490
    - diaphragmatic hernia, 489–490
  - oral cavity, 467–470
    - cleft lip and palate, 467–468
    - esophagus, 469–470
    - salivary glands, 468–469
    - tongue, 468
  - rectum, 481–486
    - anorectal malformations, 484–486
    - Hirschsprung's disease, 481–482
    - Hirschsprung's enterocolitis, 483–484
    - intestinal neuronal dysplasia, 484
    - megacystis-microcolon-intestinal hypoperistalsis syndrome, 484
  - small intestine, 471–481
    - bowel ischemia, 481
    - congenital short, 474
    - duodenal atresia, 475
    - enteric duplication, 471–472
    - fixation, 472–474
    - ileal atresia, 475–476
    - intestinal atresia, 474–476
    - intestinal stenosis, 474–476
    - jejunal atresia, 475–476
    - meconium abnormalities, 476–479
    - mesenteric cysts, 471–472
    - rotation abnormalities, 472–474
    - split notochord syndrome, 472
    - vitellointestinal duct remnants, 472
  - stomach, 470–471
    - infantile hypertrophic pyloric stenosis, 470
    - microgastria, 470
    - pyloric atresia, 470–471
- Gastrointestinal stromal tumors (GIST), 357
- Gastroschisis, 487–488
- GBS. *See* Group B streptococcus

- Genetic metabolic disease,  
 laboratory investigations  
 in, 163–167  
 amino acids, 163–165  
 DNA analysis, 167  
 enzyme assay, 167  
 fatty acids, 165–166  
 histology, 167  
 immunocytochemistry, 167  
 metabolite analysis, 163  
 neurotransmitter analysis, 166  
 organic acids, 165–166  
 in vivo neurometabolic  
 techniques, 166
- Genetics, perinatal death and, 218
- Genital herpes, pregnancy and,  
 411–412
- Genitourinary system, perinatal  
 necropsy and, 38
- Genomic imprinting, 110–112, 127
- Germ cell tumors, 337–338
- Gestational trophoblastic disease,  
 114–117  
 clinical presentation of,  
 114–115  
 definition of, 114  
 genetics of, 115–116  
 parietal/complete hydatidiform  
 mole, 114  
 pathology of, 115–116  
 prognosis of, 116–117
- GFAP. *See* Glial fibrillary acidic  
 protein
- Giant cell fibroblastoma, 347
- GIST. *See* Gastrointestinal stromal  
 tumors
- Glial fibrillary acidic protein  
 (GFAP), 356
- Globe  
 abnormalities of, 831–835  
 colobomas, 833  
 enlargement of, 833
- Glomerulocystic disease, 634–636
- Glomerulonephritis, perinatal  
 death and, 217
- Glucose metabolism, preterm  
 infant and, 245–246
- Glucose transporter (GLUT), 344
- Goltz's syndrome, 800
- Gonads, congenital tumors of, 356
- Gonorrhea, pregnancy and,  
 391–392  
 background of, 391  
 clinical features of, 391  
 diagnosis of, 392  
 epidemiology of, 391  
 microbiology of, 391  
 pathogenesis of, 391  
 prevention of, 392  
 public health issues for, 392  
 treatment of, 392
- Gorlin syndrome, 332
- Graft-versus-host disease (GVHD),  
 453
- Great arteries transposition,  
 589–590
- Group B streptococcus (GBS), 380,  
 382  
 pregnancy and, 396–398  
 background of, 396–397  
 clinical features of, 397  
 diagnosis of, 397  
 epidemiology of, 397  
 microbiology of, 397  
 pathogenesis of, 397  
 prevention of, 398  
 public health issues for, 398  
 treatment of, 397
- Growth restricted baby, 26, 242
- GVHD. *See* Graft-versus-host  
 disease
- H**
- Habitual abortion, 102
- Hamartomas, 328
- Harlequin fetus, 812
- HbF. *See* Hemoglobin F
- β-hCG. *See* β-human chorionic  
 gonadotrophin
- HDNB. *See* Hemolytic disease of  
 the newborn
- Head and neck tumors, 337–338
- Heart  
 cardiovascular system  
 development of, 571–573  
 examination of, 575–579  
 development of, 571–573  
 chambers, 572–573  
 fields, 571  
 septation, 572–573  
 tube looping, 571–572  
 examination of, 575–579  
 abnormal anatomy, 577–579  
 measurements, 579  
 normal anatomy, 575–577  
 weight, 579
- Heart disease, perinatal death and,  
 217
- Heat, congenital malformations  
 and, 130–131
- HELLP syndrome (hypertension,  
 elevated liver enzymes,  
 and low platelets), 169,  
 242
- Hematologic tumors, 340–341  
 congenital leukemia, 340–341  
 lymphoma, 341
- Hemihypertrophy, 332
- Hemochromatosis. *See* Neonatal  
 hemochromatosis
- Hemoglobin F (HbF), 185
- Hemolytic disease of the newborn  
 (HDNB), maternal  
 factors and, 189
- Hemophagocytic  
 lymphohistiocytosis  
 (HLH), 341
- Hemophilia A (factor VIII  
 deficiency), 195
- Hemorrhages, 723–727  
 extradural, birth trauma and,  
 290  
 fetomaternal, 185–186, 280  
 intracerebellar, 727  
 intracranial, 723–727  
 intraventricular, 232, 724–727  
 prematurity and, 250–251  
 fetal blood loss, 185–186  
 fetomaternal hemorrhage,  
 185–186, 280  
 twin-to-twin transfusion  
 syndrome, 186  
 fetal factors, 193–198  
 coagulopathy, 193–197  
 Down syndrome, 197–198  
 inherited anemia, 197  
 leukemoid reaction, 198  
 intrapartum blood loss, 186–187  
 maternal factors of, 187–193  
 drugs, 193  
 immune, 189–191  
 infection, 189  
 maternal antiphospholipid  
 syndrome, 192–193  
 maternal idiopathic  
 thrombocytopenic  
 purpura, 192  
 maternal systemic lupus  
 erythematosus, 192  
 intrauterine growth  
 restriction, 187–189  
 leukemia, 193

- toxins, 193  
 vitamin B<sub>12</sub> deficiency, 193  
 neonatal factors, 193–198  
   alloimmune  
     thrombocytopenia,  
       191–192  
     coagulopathy, 193–197  
     Down syndrome, 197–198  
     inherited anemia, 197  
     leukemoid reaction, 198  
     neonatal blood loss, 187  
 parenchymal hemorrhagic  
 infarction, 726–727  
 pulmonary, 557  
 subaponeurotic (subgaleal),  
   birth trauma and,  
     287–288  
 subarachnoid, 724  
 subdural, 723–724  
   birth trauma and, 290  
   intrapartum period,  
     complications of, 430  
 subependymal germinal matrix,  
   724–727  
 subperiosteal  
   (cephalhematoma),  
   birth trauma and,  
     288–289
- Hepatic vascular lesions, 524–525  
 Hepatitis. *See* Neonatal hepatitis  
 Hepatoblastoma, 355, 523–524  
   incidence of, 329  
 Hereditary fructose intolerance,  
   517  
 Hernia, diaphragmatic, 489–490  
 Herpes, neonatal, pregnancy and,  
   412  
 Herpes simplex, stillbirth and, 2  
 Herpes simplex viruses (HSV),  
   pregnancy and, 411–413  
   background of, 411  
   clinical features of, 412  
   diagnosis of, 413  
   epidemiology of, 411  
   genital herpes, 411–412  
   neonatal herpes, 412  
   pathogenesis of, 412  
   prevention of, 413  
   public health issues for, 413  
   transmission of, 411  
   treatment of, 413  
   virology of, 411  
 Herpes viruses, chronic villitis and,  
   93
- Heterotopic pregnancy, 114  
   histologic studies in, 114  
 Hexachlorophene, neonatal lung  
 disease and, 449–450  
 Hindbrain disorders, central  
 nervous system, early  
 development of,  
 malformations related to,  
 711–714  
 Hirschsprung's disease, 332,  
 481–482  
 Hirschsprung's enterocolitis,  
 483–484  
 Histiocytic disorders, congenital  
 tumors and, 341–342  
   hemophagocytic  
     lymphohistiocytosis,  
       341  
     Langerhans' cell histiocytosis,  
       341  
 Histiocytoid cardiomyopathy, 607  
 Histiocytosis X, 819–820  
 HIV-1. *See* Human  
 immunodeficiency  
 virus 1  
 HIV-2. *See* Human  
 immunodeficiency  
 virus 2  
 HLH. *See* Hemophagocytic  
 lymphohistiocytosis  
 HPA-1a. *See* Human platelet-  
 specific alloantigen  
 β-human chorionic gonadotrophin  
 (β-hCG), 103  
 Human fetal brain, pathological  
 reactions in, 719–723  
   capillary proliferation, 721  
   cell death, 719  
   edema, 719  
   gliosis, 719–720  
   injury patterns, 721–723  
   mineralization, 721  
   phagocytosis, 721  
 Human immunodeficiency virus 1  
 (HIV-1), pregnancy and,  
 413–415  
   clinical features of, 414  
   diagnosis of, 414–415  
   pathogenesis of, 414  
   prevention of, 415  
   public health issues for, 415  
   transmission of, 414  
   treatment of, 415  
   virology of, 413–414
- Human immunodeficiency virus 2  
 (HIV-2), pregnancy and,  
 415–416  
   background of, 415  
   clinical features of, 415  
   diagnosis of, 415  
   epidemiology of, 415  
   prevention of, 416  
   public health issues for, 416  
   transmission of, 415  
   treatment of, 415–416  
 Human immunodeficiency viruses,  
 pregnancy and, 413  
 Human platelet-specific  
 alloantigen (HPA)-1a,  
 185, 191  
 Hurler's disease, 78  
 Hutchinson's syndrome, 339  
 Hyaline membrane disease,  
 551–553  
 Hyalinosis, 348  
 Hyalinosis cutis et mucosae, 817  
 Hydrocephalus  
   central nervous system, early  
   development of,  
   malformations related to,  
   714–716  
   in fetal examination, 146–148  
 Hydrops fetalis  
   fetal life, inborn errors of  
   metabolism, 168, 169  
   parvovirus B19, 403–404  
 3-hydroxyisobutyryl-CoA  
 deacylase deficiency,  
 neonatal period, inborn  
 errors of metabolism,  
 175  
 Hyperammonemias, neonatal  
 period, inborn errors of  
 metabolism, 173  
 Hyperhomocysteinemia, placenta  
 and, 83  
 Hyperpepicolic acidemia (HPA),  
 180  
 Hypertension  
   macerated stillbirths, maternal  
   disorders associated  
   with, 234–235  
   placenta and, 81  
 Hypertrophic cardiomyopathy,  
 602–605  
 Hypochondrogenesis, 782–784  
 Hypoplastic left heart, 589  
 Hypospadias, 645

- Hypoxia, intrapartum, fetal  
obstetrician's perspective  
of, 4. *See also*  
Intrapartum asphyxia
- I**
- Idiopathic villitis of unknown  
etiology, 95–97  
chronic chorioamnionitis, 97  
chronic deciduitis, 97  
chronic histiocytic intervillitis,  
97–98  
decidua/vasculitis/perivasculitis,  
97–98  
isolated fetal vasculitis, 98
- IEMs. *See* Inborn errors of  
metabolism
- Ijtihad, 14
- Immune disease, maternal factors  
and, 189–191  
anti-Kell antibodies, 190–191  
hemolytic disease of the  
newborn, 189  
RhD, 189–190
- Inborn errors of metabolism  
(IEMs), 78, 79  
clinical presentation of, in fetal  
life, 167–169  
hydrops fetalis, 168, 169  
maternal intoxication,  
168–169  
clinical presentation of, in  
neonatal period,  
169–181  
baby with malformations,  
174–181  
floppy baby, 174  
intoxicated baby, 170–174  
Menkes' disease, 174  
prominent visceral  
involvement, 174  
general principles of, 162–163  
postmortem diagnosis protocol  
of, 181
- Incontinentia pigmenti, 815–816
- Indomethacin, neonatal lung  
disease and, 446
- Infantile desmoid-type  
fibromatosis, 346
- Infantile hemangioendothelioma,  
354
- Infantile hypertrophic pyloric  
stenosis, 470
- Infantile Refsum's disease (IRD),  
180
- Infantile seborrheic dermatitis,  
802
- Infarction, placental macroscopic  
abnormalities, 63
- Infections, 445  
ascending, 559–561  
abortion, 559  
neonate, 559–561  
stillbirths, 559  
chronic villitis and, 93–95  
congenital malformations and,  
130  
cytomegalovirus and, 5  
of eye, 842–843  
fetal obstetrician's perspective  
of, 5  
liver failure and, 519–521  
adenovirus, 520  
enteroviruses, 520  
hepatotropic viruses, 520–521  
herpes viruses, 520  
nonviral, 520–521  
parvovirus B19, 520  
maternal factors and, 189  
neonatal lung disease and, 453  
pregnancy and  
abnormal vaginal tract flora,  
385–388  
bacterial, 395–399  
chronic uterine, 382  
congenital, 379  
pneumonia, 384–385  
preterm birth and, 379–382  
protozoan, 399–402  
sexually transmitted, 388–395  
urinary tract infection,  
382–384  
viral, 402–416  
prematurity and, 255–256  
of respiratory system  
fungal, 561  
viral, 561–562
- Inflammation, in cardiovascular  
system, 599–601  
infectious endocarditis, 599–600  
myocarditis, 600–601  
pericarditis, 601
- Inflammatory myofibroblastic  
tumor, 347
- Inherited anemia, bleeding and,  
197
- Inspissated meconium syndrome,  
477–478
- Interpregnancy interval, perinatal  
death and, 215
- Intervillous thrombosis, placental  
macroscopic  
abnormalities, 65
- Intestinal neuronal dysplasia, 484
- Intoxicated baby, neonatal period,  
inborn errors of  
metabolism, 170–174  
aminoacidopathies, 170–172  
congenital hyperlactatemia,  
173–174  
hyperammonemias, 173  
organic acidurias, 172–173
- Intracerebellar hemorrhage, 727
- Intrahepatic cholestasis of  
pregnancy, placenta and,  
82
- Intrahepatic ducts, 502
- Intrapartum asphyxia, 274–285
- Intrapartum blood loss, 186–187
- Intrapartum period, complications  
of, 273–296, 429–432  
asphyxia, 274–285  
causes of, 277–280  
definition of, 274  
effects of, 274–277  
incidence of, 274  
pathological findings, 280–285  
pathophysiology of, 274–275  
birth trauma, 285–293  
causes of, 285–286  
definition of, 285  
incidence of, 285  
pathophysiology of, 285–286  
types of, 286–293  
Cesarean section delivery, 432  
extracranial injuries, 430  
fractures, 431  
occipital osteodiastasis, 430  
peripheral nerve injuries, 431  
skull fractures, 430  
spinal cord injuries, 431  
subdural hemorrhage, 430  
visceral injuries, 431
- Intrauterine constraint, 752–753
- Intrauterine fetal death, placenta  
following, 78
- Intrauterine growth restriction  
(IUGR)  
hematology abnormalities in,  
187–189  
maternal factors and, 187–189  
placenta and, 83–84  
Intrauterine growth restriction,  
prematurity and, 242,  
243

- Intraventricular hemorrhage, 232, 724  
 prematurity and, 250–251
- Invasive mole, 117
- Invasive tests, of congenital  
 abnormalities, 134–137  
 amniocentesis, 136  
 chorionic villus sampling, 134–136  
 fetal blood sampling, 136–137  
 fetal surgery, 137
- Iris coloboma, 836
- Iris, developmental abnormalities of, 836
- Isolated fetal vasculitis, 98
- Isovaleric aciduria (IVA), neonatal period, inborn errors of metabolism, 172
- ITP. *See* Maternal idiopathic thrombocytopenic purpura
- IUGR. *See* Intrauterine growth restriction
- J**
- Jaundice, 507–514  
 $\alpha$ -1 antitrypsin deficiency, 510–511  
 etiology of, 510  
 histologic findings in, 510–511  
 pathogenesis of, 510  
 prognosis of, 511  
 treatment of, 511
- extrahepatic biliary atresia, 507–510  
 etiology of, 508  
 histological findings in, 508–509  
 pathogenesis of, 508  
 prognosis of, 509–510  
 treatment of, 509–510
- neonatal hepatitis, 511–513  
 etiology of, 511  
 histological findings in, 511  
 metabolic etiology clues, 511–513  
 pathogenesis of, 511  
 prognosis of, 513  
 treatment of, 513  
 viral etiology clues, 513
- paucity of intrahepatic bile ducts, 513–514  
 etiology of, 513  
 histological findings in, 513–514
- pathogenesis of, 513  
 prognosis of, 514  
 treatment of, 514  
 rare cause of, 514
- Jeune asphyxiating thoracodystrophy (JATD), 506
- Junctional epidermolysis bullosa, 814–815
- Juvenile fibromatosis, 348
- Juvenile xanthogranuloma (JXG), 343
- JXG. *See* Juvenile xanthogranuloma
- K**
- Keratinocyte, 795
- Keratosis follicularis, 816
- Kernicterus, 740–741
- Kidney(s)  
 clear cell carcinoma of, incidence of, 329  
 cystic, in fetal examination, 151–152  
 immature, acquired diseases of, 645–646  
 malformations of, 626  
 crossed ectopia, 626  
 ectopia, 626  
 fusion, 626  
 malrotation, 626  
 rhabdoid tumor of, 353–354  
 supernumerary, 628
- Kleihauer test, stillbirth and, 2
- Klinefelter's syndrome, 657
- Knots, of umbilical cord, 73–74, 278–279
- L**
- Labor, medication during pregnancy and, 428
- Laceration, birth trauma and, 286–287
- Lamb syndrome, 357
- Lamellar ichthyosis, 810–812
- Langerhans' cell histiocytosis (LCH), 341
- Langerhans' cell histiocytosis, incidence of, 329
- Langerhans' cells, 797
- Langer-Saldino dysplasia, 780–782
- Laryngeal atresia, 536–537
- Laryngeal clefts, 537–538
- Laryngeal cysts, 538
- Laryngeal obstruction, 537
- Laryngeal stenosis, 537
- Laryngomalacia, 538
- LCH. *See* Langerhans' cell histiocytosis
- LCHAD. *See* Long chain 3-hydroxyacyl-CoA dehydrogenase
- Left superior vena cava, persistent, cardiovascular system, 598
- Lens, developmental abnormalities of, 836–837
- Lentigines, 804
- Leukemia, bleeding and, maternal factors of, 193
- Leukemoid reaction, bleeding and, 198
- Lingual thyroid, 468
- Lipoid proteinosis, 817
- Liquid ventilation, neonatal therapy, complications of, 445
- Lissencephaly, 709–710
- Listeria monocytogenes, 49, 92, 93, 104  
 pregnancy and, 398–399  
 background of, 398  
 clinical features of, 398–399  
 diagnosis of, 399  
 epidemiology of, 398  
 microbiology of, 398  
 pathogenesis of, 398  
 prevention of, 399  
 public health issues for, 399  
 treatment of, 399
- Listeria, stillbirth and, 2
- Liver  
 biopsy, 521  
 congenital tumors of, 357  
 development of, abnormalities of, 503–507  
 drugs, 521–522  
 functional development of, 502–503  
 detoxifying function, 503  
 hemopoiesis, 503  
 metabolic function, 503  
 synthetic function, 503  
 normal development of, 501  
 physiological adaptations at birth of, 502–503  
 total parenteral nutrition, 522–523  
 histology of, 522  
 pathogenesis of, 522

- Liver (*cont.*)  
 prognosis of, 522–523  
 treatment of, 522–523  
 trauma, 521  
 tumors of, 354, 523–525  
   hepatic vascular lesions, 524–525  
   hepatoblastoma, 523–524  
   mesenchymal hamartoma, 525  
 vasculature of, 501
- Liver, failure of  
 in neonate, 514–521  
   infectious causes, 519–521  
   metabolic causes of, 515–517  
   neonatal hemochromatosis, 517–519  
   storage disorders, 517
- Liver tumors, 354, 523–525
- Long chain 3-hydroxyacyl-CoA dehydrogenase (LCHAD), 169
- Lower respiratory tract  
 alveolar capillary dysplasia, 546–547  
 bronchial abnormalities, 540  
 bronchogenic cysts, 541  
 bronchomalacia, 540  
 congenital lobar emphysema, 542  
 congenital pulmonary adenomatoid malformation, 542–544  
 laryngeal atresia, 536–537  
 laryngeal clefts, 537–538  
 laryngeal cysts, 538  
 laryngeal obstruction, 537  
 laryngeal stenosis, 537  
 laryngomalacia, 538  
 lung hypoplasia, 547–549  
 lymphangiectasia, 547  
 normal development of, 532–534  
 pulmonary agenesis, 540–541  
 pulmonary cystic disease, 541  
 pulmonary heterotopias/hamartomas, 545–546  
 pulmonary sequestration, 544–545  
 tracheal agenesis, 538  
 tracheal stenosis, 538–539  
 tracheoesophageal fistula, 539  
 tracheomalacia, 540
- Lung disease. *See* Neonatal lung disease
- Lung hypoplasia, 547–549
- Lymphangiectasia, 547
- Lymphangiomas, 806–807
- Lymphoma, 341  
 incidence of, 329
- M**
- Macerated stillbirths  
 maternal disorders associated with, 234–236  
 connective tissue disorders, 235  
 diabetes, 235  
 hypertension, 234–235  
 massive fetomaternal, 235–236  
 smoking, 236  
 multiple gestations and, 236  
 pathological findings in, 230–234  
   asphyxia, 231–232  
   cerebral pathology, 232  
   incidence of, 230–231  
   malformations, 233–234  
   mode of death, 231  
   placental abnormalities, 234
- Maceration  
 changes associated with, 224–226  
 chromosome analysis, 228  
 examination limitations of, 226–227  
 histological examination, 227  
 microbiological studies, 227–228  
 placental examination, 228–230  
 radiographic examination, 228  
 ultrasound, 228
- Magnetic resonance imaging (MRI), prenatal diagnosis and, 432–433
- Malaria, pregnancy and, 400–402  
 background of, 400–401  
 clinical features of, 401  
 diagnosis of, 401–402  
 epidemiology of, 401  
 microbiology of, 401  
 pathogenesis of, 401  
 prevention of, 402  
 public health issues for, 402  
 transmission of, 401  
 treatment of, 402
- Malformation, 123–124
- Malformations, baby, neonatal  
 period, inborn errors of metabolism, 174–181  
 3-hydroxyisobutyryl-CoA deacylase deficiency, 175  
 of central nervous system, 174–175  
 cholesterol synthesis in development, 175–176  
 dermostenosis, 177–178, 179  
 mevalonate kinase deficiency, 176  
 peroxisomal structure/function disorders, 178  
 rhizomelic chondrodysplasia punctata, 181  
 Smith-Lemli-Opitz syndrome, 176–177  
 Zellweger syndrome, 178–181
- Malignant melanoma, 804–805
- Maple syrup urine disease (MSUD), neonatal period, inborn errors of metabolism, 170, 172
- Marginal hematoma, placental macroscopic abnormalities, 64
- MAS. *See* Meconium aspiration syndrome
- Massive fetomaternal, macerated stillbirths, maternal disorders associated with, 235–236
- Maternal antiphospholipid syndrome (APLS), maternal factors and, 192–193
- Maternal diseases, prematurity and diabetes, 243  
 drug abuse, 243  
 rhesus hemolytic disease, 243
- Maternal disorders  
 congenital malformations and, 129  
 placenta and, 80–84
- Maternal floor infarction, placental macroscopic abnormalities, 66–67
- Maternal idiopathic thrombocytopenic purpura (ITP), maternal factors and, 192
- Maternal intoxication, fetal life, inborn errors of metabolism, 168–169
- Maternal malignant disease, placenta and, 83
- Maternal serum AFP (MSAFP), 138

- Maternal systemic lupus erythematosus, maternal factors and, 192
- MCAD. *See* Medium-chain acyl-coenzyme-A deficiency
- Meckel-Gruber syndrome, 506
- Meckel's syndrome, 152
- Meconium abnormalities, small intestine malformations and, 476–479
- in spissated meconium syndrome, 477–478
- meconium disease, 477–478
- meconium ileus, 476–477
- meconium peritonitis, 478–479
- Meconium aspiration syndrome (MAS), 557–558
- Meconium peritonitis, 478–479
- Meconium plug syndrome, 477
- Meconium staining, 77–78
- Mediastinal tumors, 338
- Medication, maternal, during pregnancy, 424–428
- fetus, effects on, 428
- labor and, 428
- nonteratogenic drug effects, 427–428
- over-the-counter, 426
- teratogenic, 426–427
- Medication, prescribed, congenital malformations and, 129–130
- Medium-chain acyl-coenzyme-A deficiency (MCAD), 10, 172
- Megacystitis/megaureter syndrome, 644
- Megalocornea, 834
- Megalourethra, 645
- Melanocytes, 796–797
- Melanocytic nevi, 804–805
- incidence of, 329
- Melanotic neuroectodermal tumor of infancy, 349–350
- Membranes
- development of, 59
- perinatal necropsy and, 49
- Meningocerebral dysplasia, 714
- Menkes' disease, Neonatal period, inborn errors of metabolism, 174
- Mesenchymal hamartoma, 355, 525
- Mesenchymal tumors, congenital soft tissue tumors, 344
- Mesenteric cysts, 471–472
- Metabolic cardiomyopathy, 608
- Metabolic myopathies, 761–763
- fatty acid oxidation disorders, 762
- mitochondrial myopathies, 762–763
- myopathic glycogenoses, 761–762
- Metanephric tumors, 351
- Methylmalonic aciduria (MMA), neonatal period, inborn errors of metabolism, 172
- Mevalonate kinase deficiency, neonatal period, inborn errors of metabolism, 176
- Microangiopathic hemolytic anemia, 196–197
- Microcornea, 834
- Microdeletion syndromes, 127
- Microgastria, 470
- Microphthalmia, 831–832
- Microstomia, 468
- Milia, 802
- Miliaria, 802
- Mitochondrial cardiomyopathy, 607–608
- Mitochondrial disease, 741
- Mitochondrial inheritance, 128
- Mitochondrial myopathies, 762–763
- Mitochondrial respiratory chain disorders, 515
- Mixed gonadal dysgenesis, 657
- Mixed-lineage leukemia (MLL), 340
- Mole
- invasive, 117
- parietal/complete hydatidiform, 114
- Molecular genetics, perinatal necropsy and, 47
- Mongolian spot, 803
- Monoamniotic twins, 270, 271
- Monochorionic, 263–264
- Monochorionic placenta
- complications, 266–269
- Monosomy X, 126, 149, 154, 301, 308
- Monozygosity, 263
- Monozygotic malformations, 265–266
- Mosaicism, 110–112
- Mouth. *See* Taste
- MRI. *See* Magnetic resonance imaging
- MSAFP. *See* Maternal serum AFP
- MSUD. *See* Maple syrup urine disease
- Mucoviscidosis, 491–492
- Multifactorial disorders, 128
- Mycoplasma hominis, 382
- Myelomeningocele, in early central nervous system development, 704–705
- Myocardial infarction, 601–602
- Myocardial ischemia, 601–602
- Myopathic glycogenoses, 761–762
- Myotubular myopathy, 757–758
- N**
- NAIT. *See* Neonatal alloimmune thrombocytopenia
- Nanophthalmia, 832
- Nappy rash, 801–802
- Nasal dermoid, 847
- Nasal glioma, 846
- NEC. *See* Necrotizing enterocolitis
- Necropsy. *See also* Neonatal necropsy; Perinatal necropsy
- authorization for, 10–13
- benefits of, 15
- communication and, 15
- congenital abnormalities, prenatal diagnosis of, 6–7
- pregnancy termination for fetal abnormality, 6–7
- falling rate of, 7–8
- alternatives to, 7, 22
- parental experience, 7–8
- parental opinion, 7–8
- fetal obstetrician's perspective of, 2–6
- congenital malformations, 4–5
- cord entanglement, 4
- cord knots, 4
- fetal growth restriction, 3
- hypoxia, intrapartum, 4
- infection, 5
- placental pathology, 3
- stillbirth, classification of, 2
- stillbirth, intrapartum, 3–4
- stillbirth, investigation of, 2–3
- subsequent pregnancies, management of, 5–6

- Necropsy. (*cont.*)  
 funeral arrangements and, 15  
 neonatal, neonatologist's  
   perspective of, 8–10  
   cause of death, 9  
   counseling, 10  
   diagnosis accuracy, 9  
   education, 9–10  
   pathogenic mechanisms, 9  
   unexpected associated findings, 9  
   wider benefits to society, 9  
 neonatal postmortem rates,  
   trends in, 13–15  
 perinatal  
   abdominal vessels, 38  
   audit and, 21–22  
   biochemical investigations  
     sampling, 47  
   body cavity examination,  
     34–36  
   clinical information, 22–24  
   cytogenetics, 47  
   development, 25–27  
   equipment for, 27–28  
   evisceration, 36–37  
   external examination, 33  
   fetal brain standard blocks,  
     46  
   genitourinary system, 38  
   growth, 25–27  
   head/cranial contents, 39–44  
   heart examination, 39  
   histological examination,  
     45–46  
   membranes, 49  
   microbiological examination,  
     46  
   molecular genetics, 47  
   negative findings, importance  
     of, 21  
   photography, 33  
   placental examination,  
     47–48  
   placental surface, 49–50  
   placenta, slicing of, 50  
   postmortem examination,  
     28–29  
   postmortem imaging, 29–32  
   postmortem report, 50  
   skeleton, 44–45  
   spinal cord, 44  
   structured request forms,  
     23–24, 25  
   thoracic/upper abdominal  
     viscera, 38–39  
   umbilical cord, 49  
   postmortem role in training/  
     audit, 8  
     clinical practice audit, 8  
     obstetrician training, 8  
   purpose of, 1–2  
   training and, 15–16  
 Necrotizing enterocolitis (NEC),  
   479–481  
   prematurity and, 253  
 Nemaline myopathy, 757  
 Neonatal acne, 802  
 Neonatal adrenoleukodystrophy  
   (NALD), 180  
 Neonatal alloimmune  
   thrombocytopenia  
   (NAIT), maternal factors  
   and, 191–192  
 Neonatal and Intrauterine Death  
   Classification According  
   to Etiology (NICE), of  
   fetal/neonatal death, 213  
 Neonatal blood loss, 187  
 Neonatal death  
   association with, 213–214  
   avoidability of, 213  
   causes of, 213–214  
   classification systems of,  
     208–213  
     Aberdeen clinicopathological  
       classification, 208–210  
     British Perinatal Mortality  
       Survey, 210  
     Neonatal and Intrauterine  
       Death Classification  
       According to Etiology,  
       213  
     Nordic-Baltic classification,  
       212–213  
     placental and fetal pathology  
       classification, 210–211  
     Wigglesworth classification,  
       211–212  
   epidemiological analyses of,  
     206–207  
   place of birth, 206  
   time trends, 206–207  
 Neonatal hemochromatosis,  
   517–519  
   etiology of, 517–518  
   histological findings in, 518–519  
   pathogenesis of, 517–518  
   prognosis of, 519  
   treatment of, 519  
 Neonatal hepatitis, 511–513  
   etiology of, 511  
   histological findings in, 511  
   metabolic etiology clues,  
     511–513  
   pathogenesis of, 511  
   prognosis of, 513  
   treatment of, 513  
   viral etiology clues, 513  
 Neonatal herpes, pregnancy and,  
   412  
 Neonatal lung disease,  
   pharmacological  
   interventions in,  
   complications of  
   antibiotics, 450  
   antioxidant therapy, 446  
   chest drains, 446  
   diuretics, 450–451  
   indomethacin, 446  
   infection, 453  
   monitoring, 446–449  
   prostaglandin E<sub>1</sub>, 451  
   steroids, 451  
   surfactant therapy, 445–446  
 Neonatal necropsy, neonatologist's  
   perspective of, 8–10  
   cause of death, 9  
   counseling, 10  
   diagnosis accuracy, 9  
   education, 9–10  
   pathogenic mechanisms, 9  
   unexpected associated findings,  
     9  
   wider benefits to society, 9  
 Neonatal period, inborn errors of  
   metabolism, 169–181  
 baby with malformations,  
   174–181  
   3-hydroxyisobutyryl-CoA  
   deacylase deficiency, 175  
 of central nervous system,  
   174–175  
   cholesterol synthesis in  
   development, 175–176  
   desmosterolosis, 177–178, 179  
   mevalonate kinase deficiency,  
     176  
   peroxisomal structure/  
   function disorders, 178  
   rhizomelic chondrodysplasia  
   punctata, 181



- Smith-Lemli-Opitz syndrome, 176–177
- Zellweger syndrome, 178–181
- floppy baby, 174
- intoxicated baby, 170–174
- aminoacidopathies, 170–172
  - congenital hyperlactatemia, 173–174
  - hyperammonemias, 173
  - organic acidurias, 172–173
- Menkes' disease, 174
- prominent visceral involvement, 174
- Neonatal therapy, complications
- of, 437–445
- non-respiratory, 450
- antibiotics, 450
  - antioxidant therapy, 446
  - arteries, 447–448
  - blood sampling, 446–449
  - blood transfusion, 453
  - burns, 449
  - diuretics, 450–451
  - graft-*versus*-host disease, 453
  - hexachlorophene, 449–450
  - indomethacin, 446
  - infection, 453
  - monitoring, 446–449
  - prostaglandin E<sub>1</sub>, 451
  - skeletal abnormalities, 453, 454
  - steroids, 451
  - systemic treatments, 450
  - tolazoline, 451
  - topical preparations, 449
  - total parenteral nutrition, 451–453
  - vascular cannulation, 446–449
  - veins, 448–449
- respiratory system, 437–443
- assisted ventilation
    - complications, 440
  - chest drains, 446
  - chronic lung disease, 440
  - endotracheal intubation
    - injuries, 437–439
  - extracorporeal membrane
    - oxygenation, 443–444
  - extrapulmonary air leakage, 442–443
  - fluid overload, 439–440
  - liquid ventilation, 445
  - nitric oxide, 444–445
  - oxygen toxicity, 441
  - patent ductus arteriosus, 439–440
  - pneumothorax, 441–442
  - positive pressure ventilation, 441
  - pulmonary air leak, 441
  - pulmonary gas embolism, 443
  - pulmonary interstitial
    - emphysema, 442
  - respiratory distress syndrome, 440
  - surfactant therapy, 445–446
- Neonatal varicella, pregnancy and, 410
- Nephroblastomatosis, 352–353
- Nephrogenic rests, 352–353
- Nervous system
- acquired diseases of
    - acquired parenchymal damage, 727–735
    - hemorrhage, 723–727
    - human fetal brain,
      - pathological reactions in, 719–723
  - infections of, 735–740
    - bacterial, 738–740
    - fungal, 740
    - protozoal, 737
    - viral, 735–737
  - metabolic disorders, 740–471
- Neural tube defects
- central nervous system, early
    - development of,
      - malformations related to, 703–705
    - prenatal diagnosis, 138, 139
- Neural tumors
- melanotic neuroectodermal
    - tumor of infancy, 349–350
  - retinal anlage tumor, 349–350
- Neuroblastoma, 352
- incidence of, 329
- Neuromuscular disorders, 748–749
- investigation of, 766–767
    - autopsy, 766–767
  - prenatal diagnosis of, 765–766
  - fetal ultrasound examination, 765
  - prenatal genetic testing, 765–766
- Neuromuscular transmission disorders, 761
- congenital myasthenic syndromes, 761
  - transient neonatal myasthenia, 761
- Neuronal migration disorders, 708–709
- NICE. *See* Neonatal and Intrauterine Death Classification According to Etiology
- Niemann-Pick disease, 78
- NIH. *See* Nonimmune hydrops
- Nitric oxide, neonatal therapy, complications of, 444–445
- Nonimmune hydrops (NIH), 78–79, 168
- Noninvoluntary capillary hemangioma (NICH), 344
- Nonketotic hyperglycemia (NKH), neonatal period, inborn errors of metabolism, 172
- Nonteratogenic drug effects, during pregnancy, 427–428
- Nordic-Baltic classification, of fetal/neonatal death, 212–213
- Nose, tumors of, 846–847
- Novel imaging techniques, congenital abnormalities and, 139
- NT. *See* Nuchal translucency scanning
- Nuchal translucency (NT) scanning, 132
- Nutrition, prematurity and, 252–254
- bone disease, 252–253
  - breast milk, 252
  - necrotizing enterocolitis, 253
  - parenteral nutrition problems, 252
- O**
- Obliterative fibromuscular sclerosis, of placenta, 71
- Obstetric endoscopy, prenatal diagnosis and, 436
- Occipital osteodiastasis
- birth trauma and, 291, 430
  - intrapartum period,
    - complications of, 430
- Ocular development, genetic regulation of, 828–829

- Ocular pigmentation, disorders of, 839–840
- Oculogenesis, 845  
developmental abnormalities of, 829–831
- Olfaction, 845
- OMIM. *See* On-Line Mendelian Inheritance in Man
- Oncogenesis, 334–335
- On-Line Mendelian Inheritance in Man (OMIM), 162, 332
- Optic nerve aplasia, 840
- Optic nerve coloboma, 841
- Optic nerve development, disorders of, 840–843
- Optic nerve hypoplasia, 840
- Oral contraceptives, 427
- Organic acidemias, 516
- Organic acidurias, neonatal period, inborn errors of metabolism, 172–173  
isovaleric aciduria, 172  
methylmalonic aciduria, 172  
propionic aciduria, 172–173
- Organoid nevi, 807–808
- Organ retention, following autopsy, 13
- Ossifying renal tumor of infancy, 354
- Osteochondrodysplasias, 771–773
- Osteogenesis imperfecta, 776–779
- Osteomyelitis, 790
- Otogenesis, 845
- Ovarian ectopic pregnancy, 113
- Over-the-counter medications, during pregnancy, 426
- Oxygen toxicity, neonatal therapy, complications of, 441
- P**
- Palmoplantar keratodermas, 813
- Pancreas. *See* Exocrine pancreas
- Pancreatic cysts, 491–492
- Parathyroid glands, 679–681  
ontogeny, 679  
pathology of, 679–681
- Parenteral nutrition problems, prematurity and, 252
- Parietal/complete hydatidiform mole, 114
- Parvovirus B19  
pregnancy and, 402–404  
background of, 402  
clinical features of, 403  
diagnosis of, 404  
epidemiology of, 403  
fetal death, 404  
hydrops fetalis, 301, 315, 403–404  
pathogenesis of, 403  
prevention of, 404  
public health issues for, 404  
transmission of, 403  
treatment of, 404  
virology of, 402–403  
stillbirth and, 2
- Patent ductus arteriosus (PDA), 583–584  
neonatal therapy, complications of, 439–440  
prematurity and, 250
- Pathologist, fetal examination and, 142–144
- Paucity of intrahepatic bile ducts, 513–514  
etiology of, 513  
histological findings in, 513–514  
pathogenesis of, 513  
prognosis of, 514  
treatment of, 514
- PDA. *See* Patent ductus arteriosus
- Pena-Shokeir phenotype, 749
- Pepper's syndrome, 339
- Peptic ulceration, 470
- Periderm, 795
- Perinatal death  
causes of, 207–208  
genetics and, 218  
infant characteristics, 217–218  
birth weight, 217  
growth restriction, 217, 218  
multiple births, 217  
preterm delivery, 217–218  
sex of fetus, 217  
maternal/environmental factors associated with, 214–218  
alcohol consumption, 216  
asthma, 217  
bleeding, 217  
diabetes, 217  
diet, 216  
epilepsy, 217  
ethnic group, 215  
glomerulonephritis, 217  
heart disease, 217  
Interpregnancy interval, 215  
lack of employment, 217  
maternal age, 214  
maternal negative attitude, 217  
maternal size, 216  
maternal smoking, 216  
parity, 214  
past obstetric history, 214–215  
poor housing conditions, 217  
preeclampsia, 216–217  
single parents, 215–216  
social class, 215  
stressful life events, 217  
urinary infection, 217  
studies of, 207
- Perinatal death statistics, accuracy of  
definition problems, 204–205  
registration failure, 205–206
- Perinatal mortality rate (PMR), 273
- Perinatal necropsy  
abdominal vessels, 38  
audit and, 21–22  
biochemical investigations sampling, 47  
body cavity examination, 34–36  
clinical information, 22–24  
cytogenetics, 47  
development, 25–27  
equipment for, 27–28  
evisceration, 36–37  
external examination, 33  
fetal brain standard blocks, 46  
genitourinary system, 38  
growth, 25–27  
head/cranial contents, 39–44  
heart examination, 39  
histological examination, 45–46  
membranes, 49  
microbiological examination, 46  
molecular genetics, 47  
negative findings, importance of, 21  
photography, 33  
placental examination, 47–48  
placental surface, 49–50  
placenta, slicing of, 50  
postmortem examination, 28–29  
postmortem imaging, 29–32  
postmortem report, 50  
skeleton, 44–45  
spinal cord, 44  
structured request forms, 23–24, 25

- thoracic/upper abdominal viscera, 38–39
- umbilical cord, 49
- Periocular tissues, abnormalities of, 829
- Peripheral nerve injuries, intrapartum period, complications of, 431
- Peripheral neuroectodermal tumor (PNET), 349
- Peripheral neuropathies, 763–764
- Periventricular leukomalacia (PVL), 232, 729–730
  - prematurity and, 251
- Perivillous fibrin deposition, placental macroscopic abnormalities, 66–67
- Perlman syndrome, 332
- Peroxisomal structure/function disorders, neonatal period, inborn errors of metabolism, 178
- Persistence hyperplastic primary vitreous, 838
- Persistent pulmonary hypertension (PPH), 558–559
- PGD. *See* Preimplantation genetic diagnosis
- Pharmacological interventions, complications of
  - alcohol-based cleansing solutions, 450
  - antibiotics, 450
  - antioxidant therapy, 446
  - arteries, 447–448
  - blood sampling, 446–449
  - blood transfusion, 453
  - burns, 449
  - chest drains, 446
  - diuretics, 450–451
  - graft-*versus*-host disease, 453
  - hexachlorophene, 449–450
  - indomethacin, 446
  - infection, 453
  - monitoring, 446–449
  - prostaglandin E<sub>1</sub>, 451
  - skeletal abnormalities, 453, 454
  - steroids, 451
  - surfactant therapy, 445–446
  - systemic treatments, 450
  - tolazoline, 451
  - topical preparations, 449
  - total parenteral nutrition, 451–453
  - vascular cannulation, 446–449
  - veins, 448–449
- Phenylalanine hydroxylase (PAH), 162
- Phenylketonuria (PKU), 26, 162
- Photography, perinatal necropsy and, 33
- Piebaldism, 800–801
- PIH. *See* Pregnancy-induced hypertension
- Pituitary-hypothalamic axis, 664–666
  - hormone production, 664–665
  - hormone regulation, 664–665
  - ontogeny, 664
  - pathology, 665–666
- PKU. *See* Phenylketonuria
- Placenta
  - amniochorial membranes, 77–78
    - amnion nodosum, 77
    - meconium staining, 77–78
    - squamous metaplasia, 77
  - development of, 54–56
    - abnormalities in, 61–62
    - of decidua, 55
    - of definitive form, 55–56
    - early, embryology of, 54–55
    - mature placenta, 56
    - membranes, 59
    - umbilical cord, 60
    - uteroplacental circulation, 60, 61
  - examination of
    - congenital abnormalities and, 140
    - indications for, 61
  - in fetal abnormalities, 78–80
    - anencephaly, 79
    - Beckwith-Wiedemann syndrome, 80
    - chromosomal abnormalities, 78
    - fetal hydrops, 78–79, 315–317
    - fetal hypoxia, 79
    - fetal tumors, 80
    - inborn errors of metabolism, 78, 79
    - nonimmune hydrops, 78–79, 315–317
  - following intrauterine fetal death, 78
  - inflammation of
    - acute chorioamnionitis, 90–93
    - chronic villitis, 93–97
    - idiopathic, 95–97
  - macerated stillbirths, pathological findings in, 78, 234
  - macroscopic abnormalities of, 62–69
    - abruptio placenta, 64–65
    - calcification, 68
    - chorioangioma, 67–68
    - fetal stem artery thrombosis, 68
    - infarction, 63
    - intervillous thrombosis, 65
    - marginal hematoma, 64
    - maternal floor infarction, 66–67
    - perivillous fibrin deposition, 66–67
    - placental mesenchymal dysplasia, 69
    - retroplacental hematoma, 64
    - septal cysts, 69
    - subchorial thrombosis, 65
    - white plaque of fibrin, 69
  - in maternal disorders, 80–84
    - cigarette smoking, 83
    - cocaine abuse, 83
    - collagen vascular disease, 82
    - diabetes mellitus, 81–82
    - eclampsia, 80–81
    - hyperhomocysteinemia, 83
    - hypertension, 81
    - intrahepatic cholestasis of pregnancy, 82
    - intrauterine growth restriction, 83–84
    - maternal malignant disease, 83
    - preeclampsia, 80–81
    - sickle cell disease, 82–83
    - microscopic abnormalities of, 69–72
      - acute atherosclerosis, 70
      - chorangiomas, 71
      - edema, 69–70
      - fetal thrombotic vasculopathy, 71–72
      - obliterative fibromuscular sclerosis, 71
      - teratoma, 70
      - thrombophilia, 71–72
      - villous maturity, 69
  - multiple pregnancies and, 61

- Placenta (*cont.*)  
 pathology of, fetal obstetrician's perspective of, 3  
 placentation, 61–62  
 slicing of, perinatal necropsy and, 50  
 in sudden infant death syndrome, 80  
 umbilical cord, 72–77  
 amniotic bands, 75  
 coiling, 74–75  
 constriction, 74–75  
 cord length, 72, 279  
 entanglements, 73–74, 279  
 insertion, 73  
 knots of, 73–74, 279  
 single umbilical artery, 72–73  
 swelling of, 75  
 torsion, 74–75  
 vessel abnormalities, 75–77  
 villous structure, 57–59  
 electron microscopy, 59  
 morphometry, 59
- Placenta accreta, 62
- Placental and fetal pathology  
 classification, of fetal/neonatal death, 210–211
- Placental insufficiency, 83–84
- Placental mesenchymal dysplasia, placental macroscopic abnormalities, 69
- Placental site trophoblastic tumor, 117
- Placenta membranacea, 62
- Placenta previa, 62
- Plasmodium falciparum, 98
- Pleuropulmonary blastoma, 357
- PMR. *See* Perinatal mortality rate
- PNET. *See* Peripheral neuroectodermal tumor
- Pneumonia, pregnancy and, 384–385  
 background of, 384  
 carriage of, 384  
 clinical features of, 384  
 diagnosis of, 384  
 epidemiology of, 384  
 incidence of, 384  
 microbiology of, 384  
 pathogenesis of, 384  
 prevention of, 384  
 public health issues for, 385  
 seroprevalence of, 384  
 transmission of, 384  
 treatment of, 384
- Pneumothorax, neonatal therapy, complications of, 247, 441–442
- Poland syndrome, tumor and, 332
- Polyasplenia, 696
- Polymicrogyria, 711
- Polytopic field defect, 124
- Pompe's disease, 78, 603, 604
- Port wine stain, 806
- Positive pressure ventilation, neonatal therapy, complications of, 441
- Posterior nuchal fluid  
 accumulation/translucency, in fetal examination, 149–150
- Postmortem report, perinatal necropsy and, 50
- PPH. *See* Persistent pulmonary hypertension (PPH)
- Preeclampsia  
 perinatal death and, 216–217  
 placenta and, 80–81
- Pregnancy  
 ectopic, 112–113  
 abdominal, 113  
 cervical, 113  
 ovarian, 113  
 tubal, 112–113  
 heterotopic, 114  
 infections and  
 abnormal vaginal tract flora, 385–388  
 bacterial, 395–399  
 chronic uterine, 382  
 congenital, 379  
 pneumonia, 384–385  
 preterm birth and, 379–382  
 protozoan, 399–402  
 sexually transmitted, 388–395  
 urinary tract, 382–384  
 viral, 402–416  
 maternal malignant disease in, congenital tumors and, 357–358  
 maternal medication during, 424–428  
 fetus, effects on, 428  
 labor and, 428  
 nonteratogenic drug effects, 427–428  
 over-the-counter drugs, 426  
 teratogenic drugs, 426–427  
 problems of, in prematurity, 241–244  
 subsequent, management of, fetal obstetrician's perspective of, 5–6  
 termination of  
 for fetal abnormalities, 6–7  
 in first trimester, 6  
 late, 7  
 in second trimester, 6–7  
 Pregnancy-induced hypertension (PIH), prematurity and, 242, 243  
 Pregnancy reduction, congenital malformations and, 131  
 Preimplantation genetic diagnosis (PGD). *See* Prenatal diagnosis
- Prematurity  
 brain injury and, 250–253  
 intraventricular hemorrhage, 250–251  
 periventricular leukomalacia, 251  
 prognosis of, 252  
 causes of, 240–245  
 epidemiology, 240–241  
 multiple pregnancies, 241  
 pregnancy problems, 241–244  
 reproductive history, 241  
 elective preterm delivery and, 241–242  
 extreme, outcome for, 256–257  
 infection and, 255–256  
 intrauterine growth restriction and, 242, 243  
 maternal diseases and  
 diabetes, 243  
 drug abuse, 243  
 rhesus hemolytic disease, 243  
 nutrition and, 252–254  
 bone disease, 252–253  
 breast milk, 252  
 necrotizing enterocolitis, 253  
 parenteral nutrition problems, 252  
 pregnancy-induced hypertension and, 242, 243  
 preterm delivery morbidity/mortality and, 244–245  
 respiratory problems, 246–250  
 bronchopulmonary dysplasia, 247–249  
 chronic lung disease, 247–249  
 patent ductus arteriosus, 250  
 pulmonary air leaks, 247

- respiratory distress syndrome, 246–247
  - retinopathy, 254–255
  - spontaneous preterm birth and, 243–244
  - tocolytic therapy and, 244
  - Prenatal diagnosis
    - amniocentesis, 433–434
    - cardiocentesis, 435
    - chorionic villus sampling, 434–435
    - closed fetal surgery, 436–437
    - of congenital abnormalities, 131–142
      - cystic fibrosis and, 137–138
      - DNA analysis and, 137
      - Down syndrome, 138, 140
      - earlier diagnosis in, 138–139
      - fetus examination, 140–142
      - invasive tests, 134–137
      - laboratory advances in, 139–140
      - neural tube defects, 138, 139
      - novel imaging techniques, 139
      - placental examination, 140
      - ultrasound examination, 131–133
    - fetal surgery, 436–437
    - fetal tissue biopsies, 435–436
    - fetoscopy, 436–437
    - magnetic resonance imaging, 432–433
    - obstetric endoscopy, 436
    - open fetal surgery, 436–437
    - ultrasonography, 432
  - Preterm birth, infections and, 379–382
  - Preterm delivery morbidity/mortality, prematurity and, 244–245
  - Preterm infant, 245–246
    - extrauterine life adaptation, 245–246
    - fluid balance, 245
    - glucose metabolism, 245–246
    - temperature control, 245
  - Prevotella bivia, 382
  - Primary fetal neuromuscular disorders, 754–755
  - Primary sexual determination errors, 656
  - Prominent visceral involvement, neonatal period, inborn errors of metabolism, 174
  - Propionic aciduria, neonatal period, inborn errors of metabolism, 172–173
  - Prostaglandin E<sub>1</sub>, neonatal lung disease and, 451
  - Prostatic utricle cyst, 645
  - Protozoan infections, pregnancy and
    - malaria, 400–402
    - toxoplasmosis, 399–400
  - Prune belly syndrome, 644
  - Pseudo-Zellweger syndrome (PZS), 180–181
  - Pterygium syndromes, 751–752
  - Public health issues
    - for bacterial vaginosis, 386
    - for candidiasis, 387–388
    - for Chlamydia trachomatis, 391
    - for cytomegalovirus, 409
    - for gonorrhea, 392
    - for group B streptococcus, 398
    - for herpes simplex viruses, 413
    - for human immunodeficiency virus 1, 415
    - for human immunodeficiency virus 2, 416
    - for Listeria monocytogenes, 399
    - for malaria, 402
    - for parvovirus B19, 404
    - for pneumonia, 385
    - for rubella, 407
    - for syphilis, 394–395
    - for toxoplasmosis, 400
    - for trichomonas vaginalis, 389
    - for tuberculosis, 396
    - for urinary tract infections, 383–384
    - for varicella zoster virus, 411
  - Pulmonary agenesis, 540–541
  - Pulmonary air leak, 556–557
    - neonatal therapy, complications of, 441
    - prematurity and, 247
  - Pulmonary atresia, 584–588
  - Pulmonary cystic disease, 541
  - Pulmonary gas embolism, neonatal therapy, complications of, 443
  - Pulmonary hemorrhage, 557
  - Pulmonary heterotopias/hamartomas, 545–546
  - Pulmonary interstitial emphysema, neonatal therapy, complications of, 442
  - Pulmonary sequestration, 544–545
  - Pulmonary stenosis, 584–588
  - Pulmonary veins, abnormalities of, 592–593
  - Purpura fulminans, 196
  - PVL. *See* Periventricular leukomalacia
  - Pyloric atresia, 470–471
  - Pyruvate carboxylase (PC), 173
  - Pyruvate dehydrogenase (PDH), 173
- ## R
- Radiation, congenital
    - malformations and, 131
  - Rapidly involutinal capillary hemangioma (RICH), 344
  - RDS. *See* Respiratory distress syndrome
  - Recreational drugs, congenital malformations and, 130
  - Rectum, gastrointestinal malformations of, 481–486
    - anorectal malformations, 484–486
    - Hirschsprung's disease, 481–482
    - Hirschsprung's enterocolitis, 483–484
    - intestinal neuronal dysplasia, 484
    - megacystis-microcolon-intestinal hypoperistalsis syndrome, 484
  - Recurrent abortion, 102
  - Reduced ocular pigmentation, 840
  - Registration, failure of, perinatal death statistics, accuracy of, 205–206
  - Renal agenesis, 626–628, 714
  - Renal cystic disease, 151–152, 632–637
    - autosomal dominant polycystic kidney disease, 634–636
    - autosomal recessive polycystic kidney disease, 151, 633–634
    - glomerulocystic disease, 634–636
    - with multiple malformations syndromes, 636–637
  - Renal dysplasia, 629–631
  - Renal glomerular lesions, 641
  - Renal hypoperfusion, 637–639
  - Renal hypoplasia, 628–629
  - Renal infection, 640–641

- Renal pelvis, congenital abnormalities of, 641–642
- Renal tubular dysgenesis, 631–632
- Renal tubular transport, hereditary abnormalities, 637
- Renal tumors, 350
- Reproductive system
- abnormal virilization, 658–659
    - undervirilized male, 658
    - virilized female, 658–659
  - female, 659
  - male, 659
  - normal development of, 651–656
    - ducts, 654–656
    - external genitalia, 654–656
    - indifferent gonads, 651–652
    - ovaries, 652–654
    - testes, 652
  - pathology of, 656–658
    - Klinefelter's syndrome, 657
    - mixed gonadal dysgenesis, 657
    - primary sexual determination errors, 656
    - Turner's syndrome, 656–657
- Respiratory distress syndrome (RDS), 246–247, 551
- neonatal therapy, complications of, 440
  - prematurity and, 246–247
- Respiratory problems, prematurity and, 246–250
- bronchopulmonary dysplasia, 247–249
  - chronic lung disease, 247–249
  - patent ductus arteriosus, 250
  - pulmonary air leaks, 247
  - respiratory distress syndrome, 246–247
- Respiratory system
- acquired pathology, 549–559
  - antioxidant enzymes, 535
  - biochemical maturation, 535
  - developmental anomalies, 536–562
  - examination of, 531–532
  - infection, 559–562
  - lower respiratory tract, 536–547
  - lung control, 534–535
  - lung development, 534–535
  - lung hypoplasia, 547–549
  - lung liquid secretion, 535
  - neonatal therapy, complications of, 437–443
    - assisted ventilation
      - complications, 440
    - chronic lung disease, 440
    - endotracheal intubation
      - injuries, 437–439
    - extrapulmonary air leakage, 442–443
    - fluid overload, 439–440
    - oxygen toxicity, 441
    - patent ductus arteriosus, 439–440
    - pneumothorax, 441–442
    - positive pressure ventilation, 441
    - pulmonary air leak, 441
    - pulmonary gas embolism, 443
    - pulmonary interstitial emphysema, 442
    - respiratory distress syndrome, 440
  - normal development of, 532–534
    - alveolar phase, 533–534
    - canalicular phase, 533
    - lower respiratory tract, 532–534
    - pseudoglandular phase, 532
    - upper respiratory tract, 532
  - physiological maturation, 535
  - pulmonary vascular changes, at birth, 535–536
  - surfactant, 535
  - upper respiratory tract, 536
- Restriction fragment length polymorphisms (RFLPs), 137
- Restrictive cardiomyopathy, 605–606
- Restrictive dermopathy, 753
- Reticuloendothelial system
- spleen
    - developmental anomalies of, 696–698
    - neoplasms, 698
    - normal development of, 696
    - splenomegaly, 698
  - thymus, 698–700
    - normal development of, 698–699
    - pathological thymic involution, 699–700
    - thymic aplasia, 700
    - thymic hypoplasia, 700
- Retina, developmental abnormalities of, 838–839
- Retinal anlage tumor, 349–350
- Retinoblastoma, incidence of, 329, 330
- Retinoic acid, 427
- Retinol, 130
- Retinopathy, prematurity and, 254–255
- Retrocaval ureter, 642
- Retrolental fibroplasia, 841–842
- Retroplacental hematoma, placental macroscopic abnormalities, 64
- RFLPs. *See* Restriction fragment length polymorphisms
- Rhabdoid tumor, of kidney, 353–354
- Rhabdomyosarcoma, 349
- Rhesus hemolytic disease (RhD)
  - maternal factors and, 189–190
  - prematurity and, 243
- Rhizomelic chondrodysplasia punctata (RCDP), neonatal period, inborn errors of metabolism, 181
- Rocker-bottom feet, 35
- Rubella
  - pregnancy and, 404–407
    - background of, 404
    - clinical features of, 405
    - congenital rubella syndrome, 405–406
    - diagnosis of, 406
    - epidemiology of, 404–405
    - pathogenesis of, 405
    - prevention of, 406–407
    - public health issues for, 407
    - transmission of, 404–405
    - treatment of, 406
    - virology of, 404
  - stillbirth and, 2
- Rushton's classification, 107, 108
- S**
- Sclerema neonatorum, 803
- Sclerocornea, 834
- Second trimester, ultrasound examination, of congenital abnormalities, 132–134
- Septal cysts, placental macroscopic abnormalities, 69

- Sequence, 124
- Sex chromosome abnormality, 128, 656–657
- Sexually transmitted infections, pregnancy and  
 chlamydia trachomatis, 389–391  
 gonorrhoea, 391–392  
 syphilis, 392–395  
 trichomonas vaginalis, 388–389
- SF. *See* Surfactant proteins
- SGF. *See* Splenogonadal fusion
- Short rib dysplasia, 785
- Sialic acid storage disease, 78
- Sickle cell disease, placenta and, 82–83
- SIDS. *See* Sudden infant death syndrome
- Single-gene defects, 124–126  
 autosomal dominant, 124–125  
 autosomal recessive, 125–126  
 X-linked dominant, 126  
 X-linked recessive, 126
- Single umbilical artery, 72–73
- Skeletal abnormalities, neonatal  
 lung disease and, 453, 454
- Skeletal malformation syndromes, 506
- Skeletal muscle, development of, 747–748
- Skeleton, perinatal necropsy and, 44–45
- Skin  
 conditions of, 801–808  
 birthmarks, 803–808  
 erythema toxicum  
 neonatorum, 801  
 infantile seborrheic dermatitis, 802  
 milia, 802  
 miliaria, 802  
 nappy rash, 801–802  
 neonatal acne, 802  
 sclerema neonatorum, 803  
 subacute fat necrosis, 802–803  
 congenital genetically  
 determined disease,  
 810–815  
 blistering disorders, 813  
 collodion baby, 810  
 dystrophic epidermolysis  
 bullosa, 815  
 epidermolysis bullosa  
 simplex, 814  
 epidermolytic hyperkeratosis,  
 812–813  
 harlequin fetus, 812  
 junctional epidermolysis  
 bullosa, 814  
 keratinization disorders, 810  
 lamellar ichthyosis, 810–812  
 palmoplantar keratodermas,  
 813  
 X-linked ichthyosis, 812  
 congenital infections, 808–810  
 bacterial infections, 809–810  
 viral infections, 808  
 congenital tumors of, 357  
 Darier's disease, 816  
 development of, 795–797  
 albinism, 800–801  
 cutis laxa, 800  
 dermis, 797  
 dermoepidermal junction, 797  
 disorders of, 798–799  
 Ehlers-Danlos syndrome,  
 799–800  
 focal dermal hypoplasia, 800  
 Goltz's syndrome, 800  
 keratinocyte, 795  
 Langerhans' cells, 797  
 melanocytes, 796–797  
 periderm, 795  
 piebaldism, 800–801  
 of pigment, 800–801  
 with disordered immune  
 responses, 817  
 graft *versus* host disease, 817  
 neonatal lupus erythematosus,  
 817  
 function of, 797–798  
 hyalinosis cutis et mucosae, 817  
 incontinentia pigmenti, 815–816  
 infiltrations, 817–819  
 keratosis follicularis, 816  
 lipoid proteinosis, 817  
 tumor-like lesions, 817–819
- Skull fractures  
 birth trauma and, 291  
 intrapartum period,  
 complications of, 430
- SLO. *See* Smith-Lemli-Opitz syndrome
- Small intestine, gastrointestinal  
 malformations of,  
 471–481  
 congenital short, 474  
 duodenal atresia, 475  
 enteric duplication, 471–472  
 fixation, 472–474  
 ileal atresia, 475–476  
 intestinal atresia, 474–476  
 intestinal stenosis, 474–476  
 jejunal atresia, 475–476  
 mesenteric cysts, 471–472  
 rotation abnormalities, 472–474  
 split notochord syndrome, 472  
 vitellointestinal duct remnants,  
 472
- Smith-Lemli-Opitz (SLO)  
 syndrome, neonatal  
 period, inborn errors of  
 metabolism, 176–177
- Smoking  
 macerated stillbirths, maternal  
 disorders associated  
 with, 236  
 perinatal death and, 216  
 placenta and, 83
- Spinal cord  
 acquired parenchymal damage,  
 734–735  
 central nervous system, early  
 development of,  
 malformations related to,  
 711–714  
 disorders of, 713–714  
 perinatal necropsy and, 44
- Spinal cord injuries  
 birth trauma and, 292–293  
 intrapartum period,  
 complications of, 431
- Spinal muscular atrophy, 755–756
- Spleen  
 developmental anomalies of,  
 696–698  
 neoplasms, 698  
 normal development of, 696  
 splenomegaly, 698
- Splenogonadal fusion (SGF), 697
- Split notochord syndrome, 472
- Spondyloepiphyseal dysplasia  
 congenita, 782–784
- Spontaneous abortion  
 definition of, 102  
 etiology of, 103–107  
 chromosomal abnormalities,  
 103–104  
 congenital anatomical  
 abnormalities, 104  
 environmental, 106  
 general comments, 103

- Spontaneous abortion (*cont.*)  
 immunology, 107  
 infection, 104  
 maternal disease, 104–106  
 occupational, 106  
 paternal effects, 106–107  
 incidence of, 102–103  
 pathogenesis of, 109  
 pathology of, 107–109  
 classification, 107–108  
 histology, 109  
 placentation, 109–110
- Spontaneous gastric perforation, 470
- Spontaneous preterm birth, prematurity and, 243–244
- Sporadic aniridia (WAGR syndrome), tumor and, 332
- Squamous metaplasia, 77
- Staphylococcus aureus, 255
- Staphylococcus epidermidis, 255
- Steroids, neonatal lung disease and, 451
- Stillbirth. *See also* Macerated stillbirths  
 cytomegalovirus and, 2  
 fetal obstetrician's perspective of  
 classification of, 2  
 intrapartum, 3–4  
 investigation of, 2–3  
 herpes simplex and, 2  
 Kleihauer test and, 2  
 listeria and, 2  
 parvovirus B19 and, 2  
 rubella and, 2  
 toxoplasmosis and, 2
- Stomach  
 gastrointestinal malformations  
 of, 470–471  
 microgastria, 470  
 pyloric atresia, 470–471  
 infantile hypertrophic pyloric stenosis, 470  
 peptic ulceration, 470  
 spontaneous gastric perforation, 470
- Strawberry hemangiomas, incidence of, 329
- Strawberry nevus, 805
- Structural chromosome abnormality, 127
- Structural congenital heart disease, 579–598  
 aorta coarctation, 584  
 aortic stenosis, 588–589  
 arterial duct abnormalities, 583–584  
 atrial isomerism, 595–596  
 atrial septal defect, 582–583  
 atrioventricular septal defect, 581–582  
 common arterial trunk, 590–591  
 coronary artery structural abnormalities, 596–598  
 double inlet ventricle, 591  
 double outlet ventricle, 591–592  
 ductus arteriosus, 583–584  
 Ebstein's malformation, 593–594  
 great arteries transposition, 589–590  
 hypoplastic left heart, 589  
 pulmonary atresia, 584–588  
 pulmonary stenosis, 584–588  
 pulmonary veins abnormalities, 592–593  
 tricuspid atresia, 594  
 truncus arteriosus, 590–591  
 Uhl's anomaly, 594–595  
 ventricular septal defect, 579–581
- Structural heart disease, in fetus, 599
- Structured request forms, perinatal necropsy and, 23–24, 25
- Subacute fat necrosis, 802–803
- Subaponeurotic (subgaleal) hemorrhage, birth trauma and, 287–288
- Subarachnoid hemorrhage, 724
- Subchorial thrombosis, placenta  
 macroscopic abnormalities, 65
- Subdural hemorrhage, 723–724  
 birth trauma and, 290  
 intrapartum period, complications of, 430
- Subependymal germinal matrix hemorrhage, 724–727
- Subepidermal calcified nodules, 819
- Subperiosteal hemorrhage (cephalhematoma), birth trauma and, 288–289
- Sudden infant death syndrome (SIDS), placenta in, 80
- Surfactant proteins (SF), 246
- Surfactant therapy, neonatal lung disease and, 445–446
- Swelling, of umbilical cord, 75
- Syndrome, 124
- Synophthalmia, 832–833
- Syphilis  
 chronic villitis and, 93  
 pregnancy and, 392–395  
 background of, 392–393  
 clinical features of, 393  
 diagnosis of, 393–394  
 epidemiology of, 393  
 microbiology of, 393  
 pathogenesis of, 393  
 prevention of, 394  
 public health issues for, 394–395  
 treatment of, 394
- Systemic treatments, neonatal lung disease and, 450
- T
- Taste, 847
- TB. *See* Tuberculosis
- Temperature, control of, preterm infant and, 245
- Teratogenic drugs, during pregnancy, 426–427
- Teratomas, 335–338  
 gastric, 338  
 incidence of, 329–330  
 of placenta, 70  
 sacrococcygeal, 312, 336–337  
 of tongue, 468
- Thanatophoric dysplasia  
 with bowed femur, 773–775  
 with straight femur, 776
- Thoracic/upper abdominal viscera, perinatal necropsy and, 38–39
- Thrombocytopenia, 195
- Thrombophilia, of placenta, 71–72
- Thrombosis, 195
- Thymus, 698–700  
 normal development of, 698–699  
 pathological thymic involution, 699–700  
 thymic aplasia, 700  
 thymic hypoplasia, 700
- Thyroid gland, 675–679  
 histological variation in, 676  
 ontogeny, 675–676  
 pathology of, 676–679



- TMD. *See* Transient myeloproliferative disorder
- Tobacco, congenital malformations and, 130
- Tocolytic therapy, prematurity and, 244
- Tolazoline, neonatal iatrogenic disease and, 451
- Tongue, cysts and tumors of, 468  
congenital epulis, 468  
lingual thyroid, 468  
teratoma, 468
- Topical preparations, iatrogenic disease and, 449
- TORCH. *See* Toxoplasmosis, other agents, rubella, cytomegalovirus, and herpes simplex organisms
- Torrance dysplasia, 782–784
- Torsion, of umbilical cord, 74–75
- Total parenteral nutrition, 522–523  
histology of, 522  
iatrogenic disease and, 451–453  
pathogenesis of, 522  
prognosis of, 522–523
- Toxins, bleeding and, maternal factors of, 193
- Toxoplasma gondii, 94, 104
- Toxoplasmosis  
chronic villitis and, 93  
pregnancy and, 399–400  
background of, 399  
clinical features of, 400  
diagnosis of, 400  
epidemiology of, 399  
microbiology of, 399  
pathogenesis of, 400  
prevention of, 400  
public health issues for, 400  
treatment of, 400  
still birth and, 2
- Toxoplasmosis, other agents, rubella, cytomegalovirus, and herpes simplex (TORCH) organisms, 26
- Trachea  
agenesis of, 538  
stenosis of, 538–539
- Tracheoesophageal fistula, 469–470, 539
- Tracheomalacia, 540
- Transepidermal water loss (TEWL), 245
- Transient abnormal myelopoiesis (TAM), 341
- Transient myeloproliferative disorder (TMD), 341
- Transient neonatal myasthenia, 761
- TRAP. *See* Twin reversed arterial perfusion
- Trichomonas vaginalis, pregnancy and, 388–389  
background of, 388  
clinical features of, 389  
diagnosis of, 389  
epidemiology of, 388  
microbiology of, 388  
pathogenesis of, 389  
prevention of, 389  
public health issues for, 389  
treatment of, 389
- Tricuspid atresia, 594
- Triploidy, 126–127, 154
- Trisomy 13, 33
- Trisomy 18, 34, 35, 153
- Trisomy 21, 34, 153, 154
- Truncus arteriosus, 590–591
- Trypanosoma cruzi, 93
- TTS. *See* Twin-to-twin transfusion syndrome
- Tubal ectopic pregnancy, 112–113
- Tuberculosis (TB), pregnancy and, 395–396  
background of, 395  
clinical features of, 395–396  
diagnosis of, 396  
epidemiology of, 395  
microbiology of, 395  
pathogenesis of, 395  
prevention of, 396  
public health issues for, 396  
transmission of, 395  
treatment of, 396
- Tumors  
of cardiovascular system, 608–610  
fibroma, 609  
rhabdomyoma, 608–609  
teratoma, 609  
of liver, 523–525  
hepatic vascular lesions, 524–525  
hepatoblastoma, 523–524  
mesenchymal hamartoma, 525  
of nose, 846–847
- Tumors, congenital  
adipose tumors, 350  
of central nervous system, 355–356  
chest wall hamartoma, 350  
congenital neuroblastoma, 338–340  
congenital soft tissue tumors, 344  
mesenchymal tumors, 344  
environmental agents and, 333–334  
etiology of, 330  
extrarenal rhabdoid tumor, 348–349  
fibromatoses, 345–349  
congenital (infantile) fibrosarcoma, 347–348  
congenital myofibromatosis, 345  
cranial fasciitis, 347  
dermatofibrosarcoma protuberans, 347  
fibrodysplasia myositis, 348  
fibrosis hamartoma of infancy, 348  
giant cell fibroblastoma, 347  
hyalinosis, 348  
infantile desmoid-type fibromatosis, 346  
inflammatory myofibroblastic tumor, 347  
juvenile fibromatosis, 348  
germ cell tumors, 337–338  
of gonads, 356  
hematologic tumors, 340–341  
acute myeloid leukemia, 354  
congenital leukemia, 340–341  
lymphoma, 341  
hepatoblastoma, 355  
histiocytic disorders, 341–342  
hemophagocytic lymphohistiocytosis, 341  
Langerhans' cell histiocytosis, 341  
histological types of, 328  
incidence of, 329–330  
infantile  
hemangioendothelioma, 354  
inherited, 330  
investigation of, 335  
juvenile xanthogranuloma, 343

- Tumors, congenital (*cont.*)  
 of liver, 357  
 liver tumors, 354  
 malformation syndromes and,  
 331–332  
 maternal medical therapies and,  
 333–334  
 mesenchymal hamartoma, 355  
 neural tumors, 349–350  
   melanotic neuroectodermal  
   tumor of infancy,  
   349–350  
   retinal anlage tumor, 349–350  
 neuroblastoma, 352  
 nonsyndromic malformations  
 and, 332–333  
 oncogenesis, 334–335  
 pregnancy, maternal malignant  
 disease in, 357–358  
 presence of, 327  
 renal tumors, 350–354  
   cell cell sarcoma, 354  
   congenital mesoblastic  
   nephroma, 350–351  
   metanephric tumors, 351  
   nephroblastomatosis, 352–353  
   nephrogenic rests, 352–353  
   ossifying renal tumor of  
   infancy, 354  
   rhabdoid tumor of kidney,  
   353–354  
 rhabdomyosarcoma, 349  
 of skin, 357  
 teratomas, 335–338  
   sacroccygeal, 336–337  
 vascular tumors, 345  
 Wilms' tumor, 352  
 Turner's syndrome, 656–657  
 Twin(s)  
 acardiac, 269–270  
 conjoined, 266  
 monoamniotic, 270, 271  
 vanished, 265  
 Twinning, pathology of  
 birth weight discordance,  
 264–265  
 chorionicity, 263–264  
 monochorionic placenta  
 complications, 266–269  
 monozygotic malformations,  
 265–266  
 twin reversed arterial perfusion,  
 269–270  
 zygosity, 263–264
- Twin reversed arterial perfusion  
 (TRAP), 269–270  
 Twin-to-twin transfusion  
 syndrome (TTS), 186,  
 267–269  
 Tyrosinemia, 517
- U  
 Uhl's anomaly, 594–595  
 Ulrich congenital muscular  
 dystrophy, 760–761  
 Ultrasonography, prenatal  
 diagnosis and, 432  
 Ultrasound, congenital  
 malformations and, 131  
 Ultrasound examination, of  
 congenital abnormalities,  
 131–133  
   first trimester, 132  
   second trimester, 132–134  
 Ultrasound soft markers, 132  
 Umbilical cord, 72–77  
 amniotic bands, 75  
 asphyxia and, 278–279  
 coiling, 74–75  
 constriction, 74–75  
 cord length, 72  
 development of, 60  
 entanglements, 73–74  
   fetal obstetrician's perspective  
   of, 4  
 insertion, 73  
 knots of, 73–74  
   fetal obstetrician's perspective  
   of, 4  
 perinatal necropsy and, 49  
 single umbilical artery, 72–73  
 swelling of, 75  
 torsion, 74–75  
 vessel abnormalities, 75–77  
 Uniparental disomy (UPD),  
 110–112, 128  
 UPD. *See* Uniparental disomy  
 Upper respiratory tract  
 developmental anomalies of,  
 532  
   anterior nares, 532  
   lips, 532  
   palate, 532  
   posterior nares, 532  
   normal development of, 532  
 Urea cycle defects, 516  
 Ureaplasma urealyticum, 91, 248,  
 382
- Ureteral dilatation, 642  
 Ureter, congenital abnormalities  
 of, 641–642  
 Ureteric ectopia, 641  
 Ureterocele, 641  
 Uteroplacental circulation,  
 development of, 60, 61  
 Urethra, congenital abnormalities  
 of, 643–645  
 Urethral atresia, 644  
 Urethral diverticulum, 645  
 Urethral duplication, 644–645  
 Urethral valves, 644  
   strictures and, 644  
 Uridine diphosphate glucuronyl  
 transferase (UDPGT),  
 507  
 Urinary infection, perinatal death  
 and, 217  
 Urinary system  
 bladder, congenital  
 abnormalities of,  
 642–643  
 congenital hydronephrosis, 631  
 congenital nephromegaly, 629  
 congenital nephrotic syndrome,  
 639–640  
 development of, 622–624  
 genetic regulation of, 624–626  
 kidneys  
   immature, acquired diseases  
   of, 645–646  
   malformations of, 626  
   supernumerary, 628  
 renal agenesis, 626–628  
 renal cystic disease, 632–637  
   autosomal dominant  
   polycystic kidney disease,  
   634–636  
   autosomal recessive  
   polycystic kidney  
   disease, 633–634  
   glomerulocystic disease,  
   634–636  
   with multiple malformations  
   syndromes, 636–637  
 renal dysplasia, 629–631  
 renal glomerular lesions, 641  
 renal hypoperfusion, 637–639  
 renal hypoplasia, 628–629  
 renal infection, 640–641  
 renal pelvis, congenital  
 abnormalities of,  
 641–642

- renal tubular dysgenesis, 631–632
- renal tubular transport, hereditary abnormalities, 637
- ureter, congenital abnormalities of, 641–642
- urethra, congenital abnormalities of, 643–645
- Urinary tract infections (UTIs), pregnancy and, 382–384
- background of, 382
- clinical features of, 383
- diagnosis of, 383
- epidemiology of, 382–383
- microbiology of, 382
- pathogenesis of, 383
- public health issues for, 383–384
- treatment of, 383
- Urticaria pigmentosa, 818
- Uteroplacental insufficiency, 63
- UTIs. *See* Urinary tract infections
- V**
- Vanished twin, 265
- Varicella pneumonitis, pregnancy and, 410
- Varicella zoster virus (VZV), pregnancy and, 409–411
- background of, 409
- clinical features of, 410
- congenital varicella, 410
- diagnosis of, 410
- epidemiology of, 409
- neonatal varicella, 410
- pathogenesis of, 409–410
- prevention of, 410–411
- public health issues for, 411
- transmission of, 409
- treatment of, 410
- varicella pneumonitis, 410
- virology of, 409
- Vascular cannulation, neonatal iatrogenic disease and, 446–449
- Vascular disorders, central nervous system, early development of, malformations related to, 714
- Vascular nevi, incidence of, 329
- Vascular system, of cardiovascular system, 610–612
- coronary arteries, 611–612
- fibromuscular dysplasia, 610–611
- iatrogenic disease, 610
- idiopathic arterial calcification, 611
- Marfan syndrome, 610
- Vascular tumors, 345
- Veins, neonatal iatrogenic disease and, 448–449
- Ventricular myocardium noncompaction cardiomyopathy, 606–607
- Ventricular septal defect, 579–581
- Verumontanum, polyp of, 645
- Vesicoureteric reflux (VUR), 641
- Vessel abnormalities, in umbilical cord, 75–77
- Villous maturity, of placenta, 69
- Villous structure, of placenta, 57–59
- electron microscopy, 59
- morphometry, 59
- Viral infections, pregnancy and cytomegalovirus, 407–409
- herpes simplex viruses, 411–413
- human immunodeficiency virus 1, 413–416
- human immunodeficiency viruses, 413
- parvovirus B19, 402–404
- rubella, 404–407
- varicella zoster virus, 409–411
- Visceral injuries
- birth trauma and, 293
- intrapartum period, complications of, 431
- Vitamin A, 130
- Vitamin B<sub>12</sub> deficiency, bleeding and, maternal factors of, 193
- Vitamin K deficiency bleeding (VKDB), 194
- Vitelointestinal duct remnants, 472
- Vitreoretinal disorders, 839
- VUR. *See* Vesicoureteric reflux
- VZV. *See* Varicella zoster virus
- W**
- Warfarin, 130, 426
- White plaque of fibrin, placental macroscopic abnormalities, 69
- Wigglesworth classification, of fetal/neonatal death, 211–212
- Wilms' tumor, 352
- X**
- X-linked dominant defects, 126
- X-linked ichthyosis, 812
- X-linked recessive defects, 126
- Z**
- Zellweger syndrome, neonatal period, inborn errors of metabolism, 178–181
- Zygosity, 263–264