Pediatric Radiology

This exam content assesses the candidate's knowledge and skills related to the clinical practice of pediatric radiology. The domain encompasses a wide range of ages in pediatric imaging including fetal and neonatal studies. All clinical areas will be tested including neuroradiology, general radiology, and a limited number of pediatric-specific interventional procedures.

Included in this document:

Domain Critical Concepts

1. Neuroradiology
    a. Be familiar with spine/cranial sonography
    b. Diagnose congenital brain anomalies
    c. Identify brain tumors
2. Chest/Airway
    a. Diagnose neonatal lung disease
    b. Identify congenital lung lesions
    c. Recognize foreign bodies
    d. Understand imaging of common airway pathology (e.g. abscess, croup, epiglottitis)
3. Cardiovascular
    a. Diagnose congenital heart disease
        i. Plain radiography
        ii. MRI in common conditions
        iii. Recognize appearance of surgical corrections
    b. Identify vascular conditions (e.g. Takayasu arteritis, Kawasaki disease)
4. GI
    a. Identify neonatal bowel obstruction and underlying pathologies
    b. Diagnose benign and malignant liver tumors
    c. Recognize imaging features in emergency conditions (e.g. appendicitis, intussusception)
5. GU
    a. Diagnose genitourinary tract tumors
    b. Identify congenital renal lesions
    c. Recognize imaging features in emergency conditions (torsion, trauma)
6. MSK
    a. Identify pediatric fractures
    b. Diagnose bone tumors
    c. Recognize non-accidental trauma
    d. Identify Imaging features of common syndromes (eg. osteogenesis imperfecta, ostechondromatosis)
7. Multisystem
    a. Diagnose systemic conditions (e.g. Langerhans cell histiocystosis, cystic fibrosis, sickle cell disease, NF)

b. Recognize normal and malpositioned lines
c. Identify imaging features of syndromes (eg. Trisomy 21, neurocutaneous, VACTERL)
d. Diagnose imaging findings in cancer predisposition syndromes (e.g., Beckwith-Wiedemann, hemihypertrophy)

Domain Blueprint

1. Neuroradiology: 15%-20%
2. Cardiovascular: 5%-10%
3. Chest/pulmonary/lung: 15%-20%
4. Gastrointestinal: 20%-25%
5. Multisystem disease: up to 5%
6. Genitourinary: 15%-20%
7. Musculoskeletal: 15%-20%
8. Fetal: up to 5%

   Categories of disease include:
   a. Infectious/inflammatory
   b. Neoplastic
   c. Traumatic
   d. Congenital/syndrome
   e. Toxic/metabolic
   f. Normal variant
   g. Vascular
   h. Idiopathic
   i. Normal/growth and development

Domain Overview

1. General Pediatric Imaging: Basic Knowledge/Competency
    1. National patient safety goals as they apply to pediatric imaging
    2. Contrast reactions in children (features, prevention, and treatment)
    3. General knowledge of practice-based imaging guidelines and appropriateness criteria (ACR Appropriateness Criteria and Practice Guidelines and Technical Standards)
    4. ALARA principles (e.g., Image Gently Campaign) for modalities using ionizing radiation
    5. Age-related development and normal anatomy
    6. Appropriate appearance of surgical devices and support apparatus
    7. Communication of urgent/emergent findings
    8. List of urgent/emergent findings in children
2. Brain, Head and Neck, and Spine
    1. Skull
        1. Congenital
            1. Synostoses
            2. Congenital dermal sinus
            3. Dermoid/epidermoid
        2. Inflammatory
            1. Osteomyelitis

3. Trauma
    1. Caput succedaneum
    2. Subgaleal hemorrhage
    3. Cephalohematoma
    4. Fractures (especially non-accidental injury/abuse)
4. Basic temporal bone anatomy
    1. Congenital
    2. Mondini malformation
    3. Michele malformation
5. Inflammatory disorders
    1. Cholesteatoma
    2. Mastoiditis
6. Variants
    1. Lückenschädel
    2. Wormian bones
    3. Parietal foramina

2. Vertebral column
    1. Congenital
        1. Absence or hypoplasia of odontoid
        2. Os odontoideum
        3. Segmentation anomalies
        4. Klippel-Feil anatomy
        5. Sprengel deformity
        6. Butterfly vertebra
        7. Spinal dysraphism
        8. Diastematomyelia
        9. Sacral agenesis (including caudal regression syndrome)
        10. Partial absence (including Currarino triad/ASP)
    2. Inflammatory
        1. Discitis
        2. Infectious spondylitis (tuberculosis)
    3. Neoplasms
        1. Ewing sarcoma
        2. Aneurysmal bone cyst
        3. Osteoblastoma
        4. Osteoid osteoma
        5. Langerhans cell histiocytosis
        6. Metastases (including leukemia and lymphoma)
    4. Trauma
        1. Fractures/dislocations
        2. Atlanto-dens and atlanto-occipital injuries
        3. Spondylolysis/spondylolisthesis
        4. Insufficiency fracture (and etiologies)
    5. Miscellaneous

6. Dysplasia/syndromes
    1. Mucopolysaccharidoses
7. Scheuermann disease
8. Scoliosis (repair and hardware complications)

3. Brain
    1. Congenital
        1. Migrational disorders
        2. Lissencephaly
        3. Pachygyria
        4. Schizencephaly
        5. Heterotopic gray matter
        6. Polymicrogyria
        7. Holoprosencephaly
        8. Anomalies of corpus callosum
        9. Hydranencephaly
        10. Dandy-Walker malformations
        11. Chiari malformation types I and II
        12. Cephalocele
        13. Neurocutaneous syndromes
        14. Vein of Galen malformation
        15. Causes of hydrocephalus
            1. Aqueductal stenosis
            2. Syndromic
            3. Masses
    2. Inflammatory
        1. Bacterial infections
        2. Meningitis
        3. Cerebritis
        4. Abscess
        5. Viral infections (encephalitis)
        6. TORCH infections
    3. Neoplasms
        1. Posterior fossa
            1. Medulloblastoma
            2. Ependymoma
            3. Brainstem glioma
            4. Astrocytoma
        2. Supratentorial
            1. Pineal region tumors
            2. Craniopharyngioma
            3. Astrocytoma
            4. Oligodendroglioma
            5. Primitive neuroectodermal tumor (PNET)
            6. Choroid plexus tumors

4. Cerebral infarction/ischemia
    1. Childhood infarcts
    2. Arteritis
    3. Sickle cell (including moyamoya)
    4. Carotid occlusion
    5. Venous sinus thrombosis
    6. Intracranial hemorrhage
    7. Neonatal hypoxic ischemic injury
    8. Vascular borderzone infarctions
    9. Multicystic encephalomalacia
5. Trauma (including nonaccidental injuries)
    1. Cerebral injury (including shearing injuries and concussion)
    2. Subdural hematoma
    3. Epidural hematoma
    4. Subarachnoid hemorrhage
6. Syndromic/systemic
    1. Neurocutaneous syndromes
7. Vascular
    1. Arteriovenous malformations, congenital “aneurysms” (vein of Galen)
8. Congenital
    1. Myelomeningocele/meningocele
    2. Lipomyelomeningocele
    3. Diastematomyelia
    4. Tethered cord
    5. Dermal sinus
    6. Intradural lipoma
    7. Hydrosyringomyelia
    8. Neurenteric cysts
9. Tumors
    1. Neurofibroma
    2. Astrocytoma
    3. Ependymoma
    4. Metastases
    5. Neuroblastoma, ganglioneuroblastoma, ganglioglioma
10. Sacrococcygeal masses
    1. Germ cell tumors (i.e., teratoma)
    2. Neuroblastoma
    3. Lymphoma
    4. Rhabdomyosarcoma
11. Other
    1. Infections
    2. Demyelinating disorders
    3. Trauma
    4. Vascular malformations

4. Neck
    1. Congenital
        1. Fibromatosis colli
        2. Lymphatic malformations
        3. Branchial cleft cysts
        4. Thyroglossal duct cysts
    2. Neoplasms
        1. Lymphoma
        2. Neuroblastoma
        3. Rhabdomyosarcoma
        4. Hemangiomas
    3. Infectious/inflammatory
        1. Adenitis
        2. Retropharyngeal abscess
    4. Thyroid disorders
        1. Absence/hypoplasia/ectopic
        2. Thyroiditis
        3. Thyroid masses
        4. Goiter
5. Head/Face
    1. Congenital
        1. Vascular malformations
        2. Persistent hyperplastic primary vitreous (PHPV)
    2. Inflammatory
        1. Orbital masses
        2. Ocular masses
        3. Orbital cellulitis
        4. Sinusitis
    3. Neoplastic/mass like
        1. Retinoblastoma
        2. Nasopharyngeal masses
        3. Carcinoma
        4. Juvenile angiofibroma
        5. Sinus masses
    4. Trauma
        1. Facial fracture (Le Fort classification)

3. Chest and Airway
    1. Upper airway
        1. Congenital
            1. Tracheomalacia/bronchomalacia/laryngomalacia
            2. Laryngeal stenosis, web, cleft
            3. Choanal atresia
            4. Masses: hemangioma
        2. Inflammatory

1. Tonsillar enlargement/adenoidal hypertrophy
2. Croup
3. Epiglottitis
4. Tracheitis
5. Retropharyngeal abscess

3. Neoplasm
    1. Juvenile angiofibroma
    2. Subglottic hemangioma
    3. Laryngeal papilloma
4. Trauma
    1. Foreign body
    2. Acquired subglottic stenosis

2. Chest
    1. Congenital
        1. Agenesis/hypoplasia
        2. Venolobar syndrome
        3. Bronchial atresia
        4. Bronchopulmonary foregut malformations
            1. Sequestration
            2. Bronchogenic cyst
            3. Congenital pulmonary airway malformation (CPAM)
            4. Congenital lobar overinflation
            5. Hybrid lesions
            6. Tracheal bronchus
            7. Tracheoesophageal fistula
    2. Inflammatory
        1. Infections
            1. Bacterial pneumonia
                1. Streptococcus
                2. Staphylococcus
                3. Pertussis
                4. Chlamydia
                5. Mycoplasma
                6. Round pneumonia
            2. Complications
                1. Necrosis
                2. Abscess
                3. Fistulae
                4. Empyema
                5. Pneumatocele
            3. Viral pneumonia
                1. Respiratory syncytial virus (RSV)
                2. Influenza
                3. COVID

4. Tuberculosis
5. Fungal infections
6. Other opportunistic infections
7. inflammatory pseudotumor

2. Small airways disease
    1. Reactive airways disease
    2. Viral pneumonia
3. Bronchiectasis: causes
    1. Cystic fibrosis
    2. Immotile cilia syndrome
    3. Chronic infection (primary immune disorders)
    4. Foreign body
    5. Aspiration

3. Neoplasms/mass-like lesions
    1. Anterior mediastinal masses
        1. Lymphoma/leukemia
        2. Germ cell tumors
        3. Thymoma/carcinoma
        4. Other masses: thymic cysts and bronchogenic cysts
        5. Normal prominent thymus and thymic rebound
    2. Middle mediastinal masses
        1. Adenopathy (lymphoma/mets)
        2. Congenital masses: bronchogenic cysts, esophageal duplication cyst and neurenteric cyst
    3. Posterior mediastinal masses
        1. Neurogenic tumors
    4. Primary lung tumors
        1. Adenoma/carcinoid tumor
    5. Chest wall neoplasms/masses
        1. Ewing sarcoma family (including Askin tumor)
        2. Benign rib and spine neoplasms
        3. Vascular malformations
        4. Infections

4. Trauma
    1. Contusion
    2. Air leak
        1. Pneumothorax
        2. Pneumomediastinum
        3. Bronchopleural fistula
        4. Fracture of tracheobronchial tree
            1. Airway foreign body
            2. Post-traumatic diaphragmatic hernia

5. Vascular
    1. Pulmonary thromboembolic disease

2. Other venous thrombosis or occlusion, anomalous vessels
3. Arteriovenous malformations

6. Unique chest problems in neonate
    1. Respiratory distress syndrome
    2. Transient tachypnea of newborn
    3. Neonatal pneumonia
    4. Congenital diaphragmatic hernia
    5. Chronic lung disease of infancy (bronchopulmonary dysplasia)
    6. Meconium aspiration syndrome
    7. Extracorporeal membrane oxygenation (ECMO) therapy and its complications
    8. Air leak in the neonate
        1. Including pulmonary interstitial emphysema
7. Miscellaneous: includes chest manifestations of systemic disorders
    1. Idiopathic pulmonary hemosiderosis
    2. Alveolar proteinosis
    3. Collagen vascular diseases
    4. Spontaneous pneumothorax and pneumomediastinum
    5. Cardiogenic and noncardiogenic pulmonary edema
    6. Histiocytosis

4. Cardiovascular: Cardiac
    1. Congenital Heart Disease
        1. Anomalies of visceroatrial situs
            1. Asplenia
            2. Polysplenia
            3. Situs inversus
        2. Left-to-right shunts
            1. Ventricular septal defect
            2. Patent ductus arteriosus
            3. Atrial septal defect
            4. Atrioventricular septal defect
            5. Aortopulmonary window
            6. Partial anomalous pulmonary venous return
        3. Intermixing (admixture) states with increased pulmonary blood flow
            1. Total anomalous pulmonary venous connection (TAPVC) without obstruction
            2. D-transposition of the great arteries
            3. Truncus arteriosus
            4. Single ventricle
        4. Intermixing (admixture) states with decreased pulmonary blood flow
            1. Tetralogy of Fallot
            2. Pulmonary atresia with ventricular septal defect (VSDV
            3. Single ventricle with right ventricular outflow tract (RVOT) obstruction
        5. Left-sided obstruction

    1. Coarctation
    2. Hypoplastic left heart syndrome
    3. Cor triatriatum
    4. Obstructed TAPVC
6. Other congenital heart disease
    1. Pulmonary valve stenosis
    2. Pulmonary atresia with intact ventricular septum
    3. Ebstein anomaly
    4. Congenital absence of the pericardium
    5. Vascular rings and slings
    6. Right aortic arch with aberrant left subclavian artery
    7. Double aortic arch and variants
    8. Circumflex aortic arch
    9. Pulmonary sling
7. Anomalous coronary artery origins
    1. Anomalous right coronary artery from the left sinus of Valsalva
    2. Anomalous left coronary artery from the right sinus of Valsalva
    3. Anomalous left coronary artery from the pulmonary artery
8. Systemic venous variants
    1. Left superior vena cava (SVC)
    2. Interrupted inferior vena cava (IVC) with azygos continuation
9. Cardiac masses
    1. Rhabdomyoma, fibroma
    2. Thrombus
10. Syndromes with congenital heart disease or vascular disease
    1. Marfan syndrome
    2. Loeys-Dietz syndrome
    3. Ehlers-Danlos syndrome
    4. Williams syndrome
    5. Alagille syndrome
    6. Neurofibromatosis type 1
    7. Trisomy 21
    8. Holt Oram syndrome
    9. Turner syndrome
    10. PHACE syndrome
11. Acquired cardiac disease
    1. Pericarditis
    2. Myocarditis
    3. Kawasaki disease
12. Cardiomyopathies
    1. Hypertrophic
    2. Dilated
    3. Restrictive
    4. Arrhythmogenic right ventricular dysplasia (ARVD)

13. Cardiac operations
    1. Atrial switch for transposition of great arteries
    2. Norwood procedure
    3. Glenn Shunt
    4. Fontal shunt

5. Cardiovascular: Vascular
    1. Congenital
        1. Vascular malformations
    2. Trauma
        1. Acute traumatic aortic injury
        2. Arterial contrast extravasation
        3. Pseudoaneurysm
        4. Arteriovenous fistulae
        5. Hypoperfusion complex
    3. Inflammatory/infectious
        1. Aortitis
    4. Vasculitides
        1. Takayasu disease and Kawasaki disease
    5. Syndromic/systemic vascular diseases
        1. Syndromes
            1. Ehlers-Danlos
            2. Marfan
            3. Neurofibromatosis and other causes of mid-aortic syndrome
            4. Williams
    6. Idiopathic
        1. Fibromuscular dysplasia
        2. Mid-aortic syndrome
        3. Thrombotic
        4. Deep venous thrombosis
        5. Catheter-related thrombosis and evaluation
6. Gastrointestinal (GI) tract
    1. Biliary system
        1. Congenital
            1. Biliary atresia
            2. Neonatal hepatitis
            3. Choledochal cyst (classification)
            4. Acquired miscellaneous
        2. Cholelithiasis
        3. Hydrops of gallbladder
        4. Cholangitis
        5. Cholecystitis
    2. Liver
        1. Infection
            1. Abscess

        2. Hepatitis
    2. Tumors and tumor-like conditions
        1. Benign
            1. Mesenchymal hamartoma
            2. Hemangioma
        2. Malignant
            1. Hepatoblastoma
            2. Hepatoma
            3. Metastases
        3. Trauma
            1. Lacerations
            2. Subcapsular hematoma
            3. Contusion
        4. Vascular
            1. Portal vein thrombosis
            2. Cavernous transformation
            3. Portal hypertension
            4. Budd-Chiari syndrome
            5. Transplant complications
    3. Other: systemic conditions involving liver
        1. Glycogen storage disease
3. Spleen
    1. Congenital
        1. Abnormal visceroatrial situs
        2. Wandering spleen
    2. Infection
        1. Fungal abscesses
    3. Benign
        1. Lymphangioma
    4. Malignant
        1. Lymphoma/leukemia
    5. Trauma
    6. Splenic infarction
    7. Sickle cell disease
    8. Etiologies for splenomegaly
4. Pancreas
    1. Pancreas divisum
    2. Cystic fibrosis
    3. Pancreatitis (and pseudocyst)
    4. Non-accidental trauma
    5. Choledochal cyst
    6. Familial pancreatitis
5. Aerodigestive track
    1. Pharynx and esophagus

1. Congenital and developmental anomalies
    1. Esophageal atresia and tracheoesophageal fistula (classification)
2. Inflammatory lesions
    1. Retropharyngeal abscess/cellulitis
    2. Infectious esophagitis
3. Trauma
    1. Foreign bodies
    2. Iatrogenic perforation
4. Esophageal stricture (etiologies)
5. Gastroesophageal reflux

2. Stomach
    1. Congenital/neonatal
        1. Volvulus
        2. Gastric outlet obstruction
        3. Hypertrophic pyloric stenosis
    2. Inflammatory
        1. Corrosive ingestion
        2. Inflammatory
        3. Peptic diseases
    3. Bezoars

3. Small Bowel
    1. Congenital
        1. Duodenal webs, stenosis, and other obstructions
        2. Malrotation with/without midgut volvulus
        3. Duodenal, jejunal, and ileal stenosis and/or atresia
        4. Meconium ileus
        5. Meconium peritonitis
        6. Mesenteric and omental cysts
        7. Duplication cysts
        8. Meckel diverticula (including other omphalomesenteric anomalies)
        9. Abdominal wall defects
            1. Omphalocele and gastroschisis
            2. Hernias
    2. Neoplasms
        1. Benign
            1. Polyps and leiomyomas
        2. Malignant
            1. Lymphoma
            2. Gastrointestinal stromal tumors
    3. Malabsorption
        1. Cystic fibrosis
    4. Trauma
    5. Miscellaneous

1. Necrotizing enterocolitis
2. Ischemic bowel
3. Intussusception
4. Henoch-Schölein purpura
5. Graft vs host disease

4. Colon
    1. Congenital
        1. Imperforate anus /anorectal malformation
        2. Duplications
        3. Colonic atresia
        4. Hirschsprung disease
        5. Meconium plug/neonatal small left colon syndrome
    2. Infectious/inflammatory
        1. Appendicitis
        2. Infectious colitis/typhlitis
    3. Neoplasms
        1. Benign: polyps, leiomyoma
        2. Malignant – lymphoma

7. Genitourinary system
    1. Growth and development/normal variants: kidney (echogenic pyramids, lobulation)
    2. Kidneys
        1. Congenital anomalies
            1. Ureteropelvic junction (UPJ) obstruction
            2. Duplication
            3. Multicystic dysplastic kidney
            4. Agenesis
            5. Horseshoe kidney
            6. Ectopia
                1. Ptosis
                2. Pelvic
                3. Crossed fused ectopia
            7. Relationship of congenital renal anomalies with other congenital anomalies (VATER association, spinal dysraphism, etc.)
        2. Cystic renal disease
            1. Autosomal recessive
            2. Autosomal dominant
            3. Cysts associated with syndromes
            4. Associated liver disease (fibrosis)
        3. Inflammatory
            1. Acute pyelonephritis
            2. Chronic pyelonephritis
            3. Abscess
            4. Reflux nephropathy
        4. Neoplasms

        1. Wilms tumor, renal cell, clear cell, rhabdoid tumor
        2. Nephrogenic rests
        3. Mesoblastic nephroma
        4. Cystic nephroma
        5. Leukemia/lymphoma
    5. Trauma
        1. Subcapsular hematoma
        2. Perinephric hematoma
        3. Laceration (including those communicating with collecting system)
        4. Contusion
        5. Avulsion of vascular pedicle
        6. UPJ avulsion or laceration
    6. Vascular
        1. Arterial stenosis
        2. Renal vein thrombosis
        3. Tumor thrombus
    7. Involvement by systemic disorders
        1. Tuberous sclerosis
        2. Von Hippel-Lindau disease
        3. Miscellaneous
        4. Urolithiasis/nephrocalcinosis
        5. Renal transplantation
3. Adrenal gland
    1. Neoplasms
        1. Neuroblastoma
        2. Adrenocortical carcinoma
        3. Pheochromocytoma
    2. Trauma
        1. Hemorrhage (neonatal) and adrenal calcification
        2. Other
    3. Congenital adrenal hyperplasia
4. Bladder, ureters, and urethra
    1. Congenital
        1. Posterior urethral valves
        2. Ureterovesical junction obstruction
        3. Primary megaureter
        4. Bladder diverticula
        5. Ureteral duplication
        6. Ureterocele
        7. Urachal abnormalities
        8. Epispadias/exstrophy
        9. Prune belly syndrome
        10. Urologic sequela of anorectal anomalies
    2. Infectious/inflammatory

1. Urinary tract infection
2. Viral cystitis
3. Hemorrhagic cystitis
4. Trauma
5. Extravasation

3. Neoplasms
    1. Rhabdomyosarcoma
4. Miscellaneous
    1. Vesicoureteral reflux
    2. Neurogenic bladder
    3. Dysfunctional voiding

5. Male genital tract: scrotal
    1. Emergency
        1. Testicular torsion
    2. Infectious/inflammatory
        1. Epididymitis/orchitis
    3. Differential for scrotal fluid collections
        1. Hernia
        2. Undescended testis
    4. Neoplasms
        1. Germ cell tumors
        2. Stromal cell tumors
        3. Metastases
        4. Leukemia/lymphoma
6. Female genital tract
    1. Congenital
        1. Cloacal anomalies
    2. Ovaries
        1. Torsion
        2. Ovarian cysts (including neonatal physiologic)
        3. Germ cell tumors
        4. Cystic neoplasms
        5. Polycystic ovarian disease
    3. Uterus and vagina
        1. Congenital anomalies: vaginal occlusion (hydrometrocolpos, etc.)
        2. Fusion anomalies of the müllerian duct (uterus didelphys, etc.)
        3. Masses
            1. Rhabdomyosarcoma
            2. Clear cell adenocarcinoma
        4. Intersex states

8. Musculoskeletal imaging
    1. Normal growth and development/variants
    2. Congenital and neonatal
        1. Thanatophoric dysplasia

2. Chondrodysplasia punctata
3. Achondroplasia
4. Asphyxiating thoracic dystrophy
5. Multiple cartilaginous exostoses
6. Enchondromatosis
7. Polyostotic fibrous dysplasia
8. Neurofibromatosis
9. Osteogenesis imperfecta
10. Osteopetrosis
11. Amniotic band syndrome
12. Congenital bowing deformities and pseudoarthroses
13. Tarsal coalition
14. Mucopolysaccharidoses and mucolipidoses
15. Developmental dysplasia of hip

3. Skeletal abnormalities associated with neuromuscular diseases
    1. Meningomyelocele
    2. Cerebral palsy
    3. Muscular dystrophy
4. Infectious inflammatory
    1. Pyogenic osteomyelitis
    2. Septic arthritis
    3. Toxic synovitis of the hip
    4. Tuberculosis
    5. Multifocal osteomyelitis
    6. Dermatomyositis/polymyositis and other inflammatory myopathies
5. Arthropathies
    1. Juvenile idiopathic arthritis
    2. Hemophilic arthropathy
6. Neoplasm
    1. Benign
        1. Osteochondroma
        2. Unicameral bone cyst
        3. Aneurysmal bone cyst
        4. Nonossifying fibroma/fibrous cortical defect
        5. Fibrous dysplasia
        6. Langerhans cell histiocytosis
        7. Osteoid osteoma
        8. Osteoblastoma
        9. Chondroblastoma
        10. Chondromyxoid fibroma
    2. Malignant
        1. Ewing sarcoma
        2. Osteogenic sarcoma
        3. Metastases (including leukemia/lymphoma)

3. Vascular
    1. Vascular malformations
4. Trauma
    1. Fracture
        1. Accidental trauma (including Salter-Harris, greenstick-bowing, and buckle fractures)
        2. Nonaccidental trauma (battered child syndrome)
        3. Growth arrest/bone bar and non union
        4. Slipped capital femoral epiphysis
5. Endocrine/Metabolic
    1. Rickets
    2. Renal osteodystrophy
    3. Hyperparathyroidism
    4. Hypophosphatasia
    5. Scurvy
    6. Bone age determination
6. Osteochondroses
    1. Legg-Perthes disease
    2. Osgood-Schlatter and Sinding-Larsen-Johannson
    3. Kohler disease
    4. Freiberg disease
    5. Osteochondritis dissecans
    6. Blount disease and physiologic bowing

9. Select general/multiorgan system syndromes with salient imaging findings
    1. Syndromes
        1. Neurocutaneous syndrome
        2. Sturge-Weber syndrome
        3. Trisomy 21 syndrome
        4. CHARGE syndrome
        5. Marfan syndrome
        6. Beckwith-Wiedemann syndrome
        7. Turner syndrome
        8. Ehlers-Danlos syndrome
        9. DiGeorge syndrome
        10. Klippel-Trenaunay-Weber syndrome
    2. Multisystemic disorders/processes
        1. Systemic lupus erythematosus and other systemic vasculitides
        2. Juvenile idiopathic arthritis
        3. Primary immune deficiencies (severe combined immunodeficiency (SCIDS), chronic granulomatous disease, and DiGeorge syndrome)
        4. Sickle cell anemia
        5. Child abuse
        6. Immunocompromised host (transplant immune suppression, antibiotics, steroids, and chemotherapy)

7. Includes post-transplant lymphoproliferative syndrome
8. VATER/VACTERYL
9. Retained surgical material
10. Ventriculoperitoneal (VP) shunt complications

10. Interventional
    1. Intussusception reduction
    2. Vascular malformations
    3. Hip aspirations
    4. G and G-J Tube and complication
    5. Neonatal Line positions and complications