Introduction:
Greetings! Welcome to your pediatric radiology rotation. Whether this is your first trip with us or you are back for additional rotations, your time here should be well spent. Pediatric radiology is an exciting and dynamic field, representing the only radiology subspecialty where you can “do it all.” Each imaging modality is represented in pediatric radiology, and most pediatric radiologists practice all of them, including neuro and nuclear medicine. On behalf of all of the Pediatric Radiology attendings, we welcome you. We love what we do and hope that you will enjoy your rotation in our department.

Faculty in Pediatric Radiology:
Meryle Eklund, MD - Educational Liaison
Jeanne Hill, MD - Director, Division of Pediatric Radiology
Anil Rao, MBBS
Paul Thacker, MD
Cephus Simmons, RA

Core Lecture Series in Pediatric Radiology

Introductory Course
  1. Pediatric Chest
  2. Pediatric Abdomen
  3. Pediatric Fractures
  4. Pediatric Ultrasound

Year 1
  1. Child abuse
  2. Pediatric Acute Abdomen
  3. Pediatric Airway
  4. Pediatric Genitourinary Ultrasound
  5. Imaging of the Child with Urinary Tract Infection
  6. Benign and Malignant Pediatric Bone Lesions
  7. Pediatric Mediastinal Masses
  8. Pediatric Abdominal Masses
  9. Emergent Pediatric Procedures: Lecture/Lab
 10. Pediatric Biliary Imaging
 11. Fetal MRI
 12. Journal Club

Year 2
  1. Neonatal Respiratory Distress
  2. Imaging of Congenital Lung Abnormalities
  3. Inflammatory Diseases of the Pediatric Chest
  4. Pediatric Musculoskeletal MRI
5. Pediatric Inflammatory Bowel Disease – MRE
6. The Pediatric Foot
7. Trauma in the Pediatric Patient
8. The Pediatric Hip
9. Neonatal Cranial and Spinal Sonography
10. Safety and Pediatric Imaging

Interdisciplinary Lectures/Conferences - attendance and participation in interdisciplinary conferences is strongly encouraged and should be prioritized over routine work in the reading room, with rare exception

1. Pediatric Radiology Urology Conference – Monthly on the fourth Tuesday at 7am
2. Pediatric Radiology Gastroenterology Conference – Monthly on the fourth Tuesday at noon (optional)
3. Pediatric Hematology Oncology Tumor Boards – Weekly on Wednesday at 4pm
4. SCAN team (Child abuse) – Weekly on Wednesday at 1pm
5. Surgery Radiology Conference – Weekly on Thursday at 3pm

*the senior resident on rotation is encouraged to prepare and present imaging for the patients being discussed in surgery conference. Cases should be reviewed with the assigned attending radiologist prior to conference.

Evaluations:
At the completion of the rotation, each resident will receive a single cumulative evaluation which will be derived by faculty consensus. This will be presented to the resident, residency director, and clinical competency committee by E-value. However, our goal is for resident performance to be assessed daily by each faculty with the residents being made aware when a job is well done in addition to any deficiencies which need correcting.
Pediatric Radiology – Rotation 1

Goals and Objectives:

1) Patient Care
   a) Residents should have knowledge of the indication for the examination requested. When the reason for the examination is not clear, the resident should effectively communicate with the patient or referring physician until this is clarified.
   b) The resident should be familiar with the available medical records and how to access them for the purposes of patient care.
   c) Communicate effectively and demonstrate caring, respectful behavior when interacting with patients and their families, answering their questions and helping them to understand the ultrasound or fluoroscopic procedure as well as its clinical significance.

2) Medical knowledge: At the end of the rotation, the resident should be able to:
   a) Identify normal/abnormal airways on chest radiographs of the infant or older child
   b) Identify abnormalities requiring emergent surgical management. Learn to interpret pediatric chest radiographs in infants and older children.
   c) Identify normal and abnormal skeletal structures.
   d) Describe the proper procedure for fluoroscopy of an infant/older child
   e) Be able to perform the following routine fluoroscopic procedures under direct supervision:
      i) VCUG
      ii) Esophagram
      iii) Modified barium swallow
      iv) UGI
      v) Contrast enema
      vi) Feeding tube placement
   f) Make preliminary review of pediatric outpatient and inpatient/ICU films and discuss findings with the radiologist, then dictate as directed
   g) Assist the technologist in preparation of the patient for fluoroscopic examinations
   h) Be aware of the common indications for pediatric sonographic procedures
   i) Participate in the following sonographic procedures:
      i) Renal sonography
      ii) Cranial sonography
      iii) Hypertrophic pyloric stenosis
      iv) Fluid localization in the chest and abdomen

3) Practice Based Learning and Improvement
   a) The resident should demonstrate evidence of independent reading and learning through the use of printed and electronic sources
   b) Use information technology to manage information, to access online medical information, and for self-directed learning

4) Interpersonal and Communication Skills
   a) Dictate prompt, accurate, and concise radiologic reports for plain films, basic ultrasound, and fluoroscopic studies using available electronic software applications
   b) Develop effective communication skills with patients, patients’ families, physicians, and other members of the health care team

5) Professionalism
   a) Demonstrate honor, integrity, respect, and compassion to patients, other physicians, and other health care professionals
   b) Demonstrate positive work habits, including punctuality and professional appearance

6) Systems-Based Practice
a) Understand how medical decisions affect patient care within the larger system

**Reading List:**

  o Suggest reading 3 times during residency
- Donnelly: Pocket Radiologist – The Top 100 Diagnoses, 2002
- Pediatric Radiology Curriculum Online Modules  
  o https://www.cchs.net/pediatricradiology/

**Additional Resources:**

-RadPrimer modules – the following modules are pertinent:

a) Airway  
   i) Approach to the pediatric airway  
   ii) Croup  
   iii) Epiglottitis  
   iv) Retropharyngeal abscess
b) Chest  
   i) Approach to the pediatric chest  
   ii) Viral lung infection  
   iii) Pneumomediastinum
c) Neonatal and Congenital Chest Abnormalities  
   i) Meconium aspiration syndrome  
   ii) Neonatal pneumonia  
   iii) Pulmonary interstitial emphysema  
   iv) Surfactant deficiency disease  
   v) Umbilical catheter complications
d) Gastrointestinal  
   i) Approach to the pediatric gastrointestinal tract  
   ii) Ingested button batteries  
   iii) Ingested multiple magnets  
   iv) Ingested coins  
   v) Hypertrophic pyloric stenosis  
   vi) Ileocolic intussusception
e) Neonatal GI abnormalities  
   i) Midgut volvulus  
   ii) Necrotizing enterocolitis
f) Genitourinary  
   i) Approach to the pediatric genitourinary tract  
   ii) Ovarian torsion  
   iii) Trauma, testicles
iv) Testicular torsion

g) Musculoskeletal
   i) Approach to the pediatric musculoskeletal system
   ii) Child abuse, rib fractures

h) Brain, head, and neck
   i) Germinal matrix hemorrhages

-CHOP Ultrasound Tutorials:
  - (choprad10)
  - Renal, Brain, and Pylorus modules
Goals and Objectives

1) Patient Care:
   a) Residents should have knowledge of the indication for the examination requested. When the reason for the examination is not clear, the resident should effectively communicate with the patient or referring physician until this is clarified.
   b) The resident should be familiar with the available medical records and how to access them for the purposes of patient care
   c) Communicate effectively and demonstrate caring, respectful behavior when interacting with patients and their families, answering their questions, and helping them to understand the ultrasound or fluoroscopic procedure as well as its clinical significance

2) Medical knowledge: At the end of the rotation, the resident should be able to:
   a) Describe positioning techniques and technical factors leading to optimum chest, abdomen, GI and GU radiographs of the infant and older child
   b) Demonstrate increasing proficiency in the routine fluoroscopic and sonographic procedures named above
   c) Have increasing involvement in more complex fluoroscopic procedures such as:
      i) Intussusception reduction
      ii) Gastrojejunostomy tube replacement
   d) Have increasing involvement in more complex sonographic procedures such as:
      i) Duplex evaluations of the abdominal vasculature/transplant evaluation
      ii) Spine sonography
      iii) Hip sonography and hip aspiration
   e) Add to knowledgebase in chest radiology and congenital heart diseases through continued reading of films and case reviews

3) Practice Based Learning and Improvement
   a) The resident should demonstrate evidence of independent reading and learning through the use of printed and electronic sources
   b) Use information technology to manage information, to access online medical information, and for self-directed learning

4) Interpersonal and Communication Skills
   a) Dictate prompt, accurate, and concise radiologic reports for plain films, basic ultrasound, and fluoroscopic studies using available electronic software applications
   b) Develop effective communication skills with patients, patients’ families, physicians, and other members of the health care team
   c) Promptly communicate urgent, critical, or unexpected findings to residents, referring physicians or clinicians, and document the communication in the radiologic report

5) Professionalism
   a) Demonstrate honor, integrity, respect, and compassion to patients, other physicians, and other health care professionals
   b) Demonstrate positive work habits, including punctuality and professional appearance

6) Systems-Based Practice
   a) Understand how medical decisions affect patient care within the larger system

Reading List:

  o Suggest reading 3 times during residency
- Donnelly: Pocket Radiologist – The Top 100 Diagnoses, 2002
- Pediatric Radiology Curriculum Online Modules
  o https://www.cchs.net/pediatricradiology/
  o Read head, hip, spine, and pyloric chapters as needed

Additional resources:

RadPrimer modules – the following modules are pertinent:

a) Airway
   i) Exudative tracheitis
b) Chest
   i) Round pneumonia
c) Neonatal and Congenital Chest Abnormalities
   i) Congenital diaphragmatic hernia
   ii) Congenital pulmonary airway malformations
   iii) Congenital lobar emphysema
   iv) Transient tachypnea of the newborn
   v) Bronchopulmonary dysplasia
d) Cardiac
   i) Approach to the pediatric heart
e) Gastrointestinal
   i) Appendicitis
   ii) Small bowel intussusception
   iii) Pancreatitis
   iv) Penumatosis in older children
f) Neonatal GI abnormalities
   i) Duodenal atresia or stenosis
   ii) Duodenal web
   iii) Jejunoileal atresia
   iv) Hirschsprung disease
   v) Meconium ileus
   vi) Meconium plug syndrome
g) Genitourinary
   i) Posterior urethral valves
   ii) Ureteropelvic junction obstruction
   iii) Yelonephritis
   iv) Epididymoorchitis
h) Musculoskeletal
   i) Child abuse, metaphyseal fracture
   ii) Physeal fractures
   iii) Supracondylar fractures
   iv) Slipped capital femoral epiphysis
i) Spine
   i) Approach to pediatric spine
   ii) Tethered spinal cord

-CHOP Ultrasound Tutorials:

  - (choprad10)
- Intussusception, Hips, Appendix modules
Pediatric Radiology – Rotation 3

Goals and Objectives:

7) Patient Care:
   a) Residents should have knowledge of the indication for the examination requested. When the reason for the examination is not clear, the resident should effectively communicate with the patient or referring physician until this is clarified.
   b) The resident should be familiar with the available medical records and how to access them for the purposes of patient care.
   c) Communicate effectively and demonstrate caring, respectful behavior when interacting with patients and their families, answering their questions, and helping them to understand the ultrasound or fluoroscopic procedure as well as its clinical significance.
   d) Screen, protocol, and supervise (with increasing level of responsibility) most pediatric imaging studies.
   e) Understand the bioeffects and safety issues in pediatric radiology and incorporate the ALARA principle to the imaging of children.

8) Medical knowledge: At the end of the rotation, the resident should be able to:
   a) Have progressive independence and responsibility for performing and reporting routine and complex special procedures (fluoro, US, CT, and MRI).
   b) Have an increasing role in consultation with referring physicians.
   c) Have an increasing understanding of pediatric disease and imaging to tailor the imaging work-up to provide requested diagnostic information.
   d) Have reviewed the pediatric section of the ACR teaching file.

9) Practice Based Learning and Improvement
   a) Facilitate the teaching of medical students, sonographers, other residents, and other health care professionals.
   b) Participate in quality assurance programs for technologists, sonographers, and physicians.
   c) Be aware of equipment quality assurance programs.
   d) Apply basic knowledge of study design and statistical methods to the appraisal of clinical studies and other information on diagnostic and therapeutic effectiveness.

10) Interpersonal and Communication Skills
    a) Dictate accurate and concise reports for the most complex imaging studies with concise impressions including diagnosis and/or differential diagnoses as well as recommendations for further imaging and/or management, when appropriate.
    b) Consult effectively with fellows, nurse practitioners, and attending physicians in most aspects of pediatric radiology.
    c) Participate in the presentation of cases during Neonatal ICU rounds, Pediatric Surgery Conference, and Tumor Board.

11) Professionalism
    a) Demonstrate honor, integrity, respect, and compassion to patients, other physicians, and other health care professionals.
    b) Demonstrate positive work habits, including punctuality and professional appearance.

12) Systems-Based Practice
    a) Practice cost-effective evaluation of pediatric patients requiring imaging that does not compromise patient safety or quality of care.
Reading List:

  - Suggest reading 3 times during residency
- Donnelly: Pocket Radiologist – The Top 100 Diagnoses, 2002
- Pediatric Radiology Curriculum Online Modules
  - https://www.cchs.net/pediatricradiology/

Additional resources:

RadPrimer modules – the following modules are pertinent:

a) Airway and Chest
   i) Pseudo-retropharyngeal thickening
   ii) Lung contusion and laceration
   iii) Pulmonary sequestration (intermediate)

b) Gastrointestinal
   i) Hypoperfusion complex
   ii) Duodenal hematoma
   iii) Bowel injury
   iv) Liver trauma
   v) Spleen trauma
   vi) Pancreas trauma
   vii) Omental infarction
   viii) Liver transplant complications, general

c) Genitourinary
   i) Wilms tumor

d) Musculoskeletal
   i) Legg-Calve-Perthes Disease
   ii) Juvenile Tillaux fracture (intermediate)
   iii) Triplane fracture (intermediate)

e) Brain, Head, and Neck
   i) Germinal Matrix hemorrhage

-CHOP Ultrasound Tutorials:
  - (choprad10)
  - Scrotal, Right Upper Quadrant, Abdominal modules