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 radiologist practice all of them, including neuro and nuclear medicine. On behalf of the other attendings, we welcome you. We love what we do and hope that you will enjoy your rotation in our department.

Faculty Educational Liaison: Paul Thacker, MD

Other Faculty in Pediatric Radiology:

Jeanne Hill, MD (Director, Division of Pediatric Radiology)
Anil Rao, MBBS
Paul Keslar, 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. Pediatric Fractures and Child Abuse
2. Acute Abdomen in the Older Child
3. Pediatric Airway
4. Congenital Urinary Tract Anomalies
5. Imaging of the Child with Urinary Tract Infection
6. Benign and Malignant Pediatric Bone Lesions
7. Abdominal Masses
8. Emergent Pediatric Procedures: Lecture/Lab
9. Chest Masses
10. Pediatric Congenital Heart Disease
11. Journal Club

Year 2
1. Neonatal Respiratory Distress – Medical Causes
2. Neonatal Respiratory Distress – Surgical Causes
3. Inflammatory Diseases of the Chest
4. Pediatric Musculoskeletal MR
5. Pediatric Abdominal MR
6. Acute Abdomen in the Neonate
7. Pediatric MSK – Demystifying dysplasias, Blount’s, Osteochondritides, the Foot
8. Pediatric Hip
9. Neonatal Cranial and Spinal Sonography
10. Radiation Safety and Pediatric Imaging
11. Benign and Malignant Hepatic Masses
12. Pediatric Vascular Malformations and Tumors

Interdisciplinary Lectures/Conferences:

1. Pediatric Hematology Oncology Tumor Boards - Weekly on Wednesday at 4pm
2. SCAN team - Weekly on Wednesday at 1 pm
3. Surgery Radiology Conference - Weekly on Thursday at 4 pm
4. Pediatric Radiology Urology Conference- Monthly on the Second Tuesday at 7 am
5. Pediatric Radiology Gastroenterology Conference - Monthly on the fourth Tuesday at 12 pm

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, resident performance should 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.
Goals and Objectives:

I. **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.

II. **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 vs. abnormal skeletal structures.

   D. Be aware of the ALARA principle and basic dose-reduction techniques in the performance of fluoroscopic procedures.

   E. Describe the proper procedure for fluoroscopy of an infant/older child.

   F. Be able to perform the following routine fluoroscopic procedures under direct supervision:

      1. VCUG
      2. Esophagram
      3. Modified barium swallow
      4. UGI
      5. BE
      6. Feeding tube placement

   G. Make preliminary review of outpatient and pediatric ICU films and discuss findings with the radiologist, then dictate as directed.

   H. Assist the technologist in preparation of the patient for fluoroscopic examinations.
I. Be aware of the common indications for pediatric sonographic procedures

J. Be able to perform the following sonographic procedures:
   1. Renal sonography
   2. Cranial sonography
   3. Hypertrophic pyloric stenosis
   4. Fluid localization in the chest and abdomen

K. Residents must complete 27 of the required RadPrimer modules prior to completion of the month. Completion is to be documented by taking both the pre- and post-tests. The post test will be compared with peers to establish relative fund of knowledge. The following modules are required.

   1. Airway:
      i. Approach to the pediatric airway
      ii. Croup
      iii. Epiglottis
      iv. Retropharyngeal abscess

   2. Chest
      i. Approach to Pediatric Chest
      ii. Viral lung infection
      iii. Pneumomediastinum

   3. Neonatal and Congenital Chest Abnormalities
      i. Meconium aspiration syndrome
      ii. Neonatal pneumonia
      iii. Pulmonary interstitial emphysema
      iv. Surfactant deficiency disease
      v. Umbilical catheter complications

   4. 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

   5. Neonatal GI Abnormalities
      i. Midgut Volvulus
      ii. Necrotizing enterocolitis

   6. Genitourinary
      i. Approach to the pediatric genitourinary tract
      ii. Ovarian torsion
      iii. Trauma, testicles
      iv. Testicular torsion
7. Musculoskeletal
   i. Approach to the pediatric musculoskeletal system
   ii. Child abuse, rib fractures

8. Brain, Head, and Neck
   i. Germinal matrix hemorrhage

III. 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 on-line medical information, and for self-directed learning

IV. 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 radiological report.

V. 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

VI. Systems-Based Practice

A. Understand how medical decisions affect patient care within the larger system
Rotation 1 Reading List

  - Read 3 times during your residency
- Pediatric Radiology Curriculum Online Modules – https://www.cchs.net/pediatricradiology/
Pediatric Radiology – Rotation 2

Goals and Objectives:

I. 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.

II. Medical Knowledge

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:
   1. Intussusception reduction
   2. Gastrojejunostomy tube replacement

D. Have increasing involvement in more complex sonographic procedures such as:
   1. Duplex evaluations of abdominal vasculature
   2. Transplant evaluation
   3. Spine sonography
   4. Hip sonography and hip aspiration

E. Add to knowledge base in chest radiology and congenital heart diseases through continued reading of films and case reviews.

F. Residents must complete 28 of the required RadPrimer modules prior to completion of the month. Completion is to be documented by taking both the pre- and post-tests. The post test will be compared with peers to establish relative fund of knowledge. The following modules are required:
   1. Airway:
      a. Exudative tracheitis
   2. Chest
      a. Round pneumonia
   3. Neonatal and Congenital Chest Abnormalities
      a. Congenital diaphragmatic hernia
      b. Congenital pulmonary airway malformations
      c. Congenital lobar emphysema
      d. Transient tachypnea of the newborn
      e. Bronchopulmonary dysplasia
4. Cardiac
   a. Approach to the pediatric heart
5. Gastrointestinal
   a. Appendicitis
   b. Small bowel intussusception
   c. Pancreatitis
   d. Pneumatosis in older children
6. Neonatal GI Abnormalities
   a. Duodenal atresia or stenosis
   b. Duodenal web
   c. Jejunoileal atresia
   d. Hirschsprung disease
   e. Meconium ileus
   f. Meconium plug syndrome
7. Genitourinary
   a. Posterior urethral valves
   b. Ureteropelvic junction obstruction renal
   c. Pyelonephritis
   d. Epididymoorchitis
8. Musculoskeletal
   a. Child abuse, metaphyseal fracture
   b. Physeal fractures
   c. Supracondylar fractures
   d. Slipped capital femoral epiphysis
9. Spine
   a. Approach to pediatric spine
   b. Tethered spinal cord

III. 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 on-line medical
      information, and for self-directed learning

IV. 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 radiological report.

V. 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

VI. Systems-Based Practice
   A. Understand how medical decisions affect patient care within the larger system
Rotation 2 Reading List

  - Read 3 times during your residency
- Pediatric Radiology Curriculum Online Modules – [https://www.cchs.net/pediatricradiology/](https://www.cchs.net/pediatricradiology/)
  - Read head, hip, spine and pyloric chapters as needed
  - Read either a pediatric chapter from an adult nuclear medicine text, or read the GU, bone, and tumor imaging chapters from a pediatric nuclear medicine textbook.
Goals and Objectives:

I. 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.

II. Medical Knowledge:

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 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.

E. Residents must complete 25 RadPrimer modules prior to completion of the month. Completion is to be documented by taking both the pre- and post-tests. The post test will be compared with peers to establish relative fund of knowledge. The following 16 modules are required. All other modules are optional and left to the resident to select. However, 9 optional modules must be completed.

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

2. 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
3. Genitourinary
   i. Wilms tumor

4. Musculoskeletal
   i. Legg-Calve-Perthes Disease
   ii. Juvenile tillaux fracture (intermediate)
   iii. Triplane fracture (intermediate)

5. Brain, Head, and Neck
   i. Germinal matrix hemorrhage

III. Practice Based Learning and Improvement
   A. Facilitate 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

IV. 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

V. 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

VI. Systems-Based Practice
   A. Practice cost-effective evaluation of pediatric patients requiring imaging that does not compromise patient safety or quality of care
Rotation 3 Reading List

  - Read 3 times during your residency
- Pediatric Radiology Curriculum Online Modules – https://www.cchs.net/pediatricradiology/