Florida Hospital Diagnostic Radiology Residency
Pediatric Imaging Goals and Objectives
Training Locations: Orlando

Many of the goals and objectives apply to all rotations and are listed below. Those goals that are more specific to a particular rotation are listed separately.

**Pediatric Imaging Curriculum**

The educational curriculum in Pediatric Imaging is comprised primarily of the rotations through the Pediatric Imaging Section at FH Orlando where the Faculty provides direct training and supervision; as well as a comprehensive series of lectures and conferences in Pediatric Imaging. Correlation is made on a case-by-case basis with other imaging modalities, facilitated by the PACS system. A series of interdepartmental conferences, grand rounds, Journal Clubs, meetings and other venues are expected to enhance the residents’ knowledge of Pediatric Imaging.

Because a full outline of disease entities and conditions is provided under each organ system elsewhere in the Radiology Residency Curriculum, a summarized curriculum for the Pediatric Imaging Section follows:

- A review of the principles of physics and instrumentation/technology
- A review of the normal anatomy, physiology, pathology and clinical conditions that are evaluated
- The indications, limitations, contraindications and optimal protocols for the various studies, diseases, conditions, as well as, the optimal sequencing of various imaging studies is reviewed.
- The ACR appropriateness criteria and the economic implications for the health care system and patient of various diagnostic pathways are reviewed as appropriate.

**Training using the ACGME Six-Core Competencies:**

**Year 1: Pediatric Radiology**
**General Imaging and Emergent Conditions**

1) **Patient Care:** By the end of the rotation, you should be able to:
   - Perform fluoroscopic studies using low dose techniques and meticulous technique.
   - Perform basic fluoroscopic studies with indirect attending radiologist oversight including: VCUG and upper GI series.
   - Recognize and manage complications of these basic procedures.
   - Protocol pediatric CT scans with attending oversight.
   - Perform ultrasound studies with indirect supervision by the sonographer or radiology attending.
   - Access Electronic Health Record to obtain relevant clinical information

**Education:**
- Attend Disney Pavilion On-boarding Session
• Utilize the Image Gently website for updated information on low dose pediatric imaging
  http://www.pedrad.org/associations/5364/ig/
• Visit the website above and take the Image Gently Pledge
• Utilize established imaging guidelines such as ACR Appropriateness Criteria
• Required readings – see Medical Knowledge section below
• Online Modules (https://www.cchs.net/onlinelearning/default.asp?) see Medical Knowledge section below

Milestones included in the above educational plan:
• Use of established evidence based guidelines such as ACR appropriateness criteria
• Appropriate use of the electronic health record to obtain relevant clinical information
• Competent performance of basic fluoroscopy studies under indirect supervision
• Recognition and management of complications of basic procedures

2) Medical Knowledge: By the end of the rotation, you should be able to:
• Differentiate normal from abnormal in radiographic imaging of the infant and child.
• Make core observations and formulate differential diagnoses on cases interpreted.
• Discuss radiation reduction techniques used in pediatric patients
• Select appropriate protocol and contrast agent for basic fluoroscopy imaging studies including: VCUG, UGI, contrast enema.
• Understand appropriate protocol for pediatric ultrasound studies.
• Correctly identify position and malposition of lines and catheters in the newborn.
• Discuss the correct work-up of patients who present with the following clinical signs or symptoms:
  o Vomiting infant
  o Vomiting child
  o Urinary tract infection
  o Urinary tract obstruction
  o Right lower quadrant pain
  o Acute scrotal pain
  o Acute pelvic pain
• Recognize the imaging characteristics of common and emergent pediatric conditions including:
  o Misplaced supportive equipment
  o Pneumothorax
  o Pneumomediastinum
  o Pneumoperitoneum
  o Pneumonia
  o Appendicitis
  o Malrotation and midgut volvulus
  o Necrotizing enterocolitis
  o Testicular torsion
  o Ovarian torsion
  o Fractures

Education:
• Required Daily Reading Minimum
  o On all rotations, it is recommended that residents read at least 25 cases per day
• **Required** readings:
  o Week 1-4:
    ▪ Read *Pediatric Imaging: the Fundamentals* by L. Donnelly

• **Required** Exam:
  o Complete Weekly RADPrimer Exam

• **Required** NetLearning Module:
  o *Fetal Heart 4-CH and Outflow Tract Review CBL on NetLearning.*

• **Required** Online Modules ([https://www.cchs.net/onlinelearning/default.asp?](https://www.cchs.net/onlinelearning/default.asp?)):
  o Go to Recommended Courses Tab → Junior Radiology Curriculum and complete one module per day:
    ▪ **Introduction to the Pediatric Knowledge Techniques**
      ● Lines and Catheters
      ● Radiation Safety
    ▪ ACGME General Competencies
      ● Patient Care
    ▪ Chest
      ● Childhood Pneumonia
      ● Neonatal Chest
      ● Pulmonary Edema
    ▪ Esophagus and Airway
      ● Esophageal Atresia
      ● Esophageal Foreign Body
      ● Gastroesophageal Reflux
    ▪ GI
      ● Congenital Duodenal Obstruction
      ● Hypertrophic Pyloric Stenosis
      ● Intussusception
      ● Malrotation and Midgut Volvulus
      ● Pneumoperitoneum
    ▪ GU
      ● Duplication of the Collecting System/Ureters
      ● Posterior Urethral Valves
      ● Ureteropelvic Junction Obstruction
      ● Vesicoureteral Reflux
    ▪ Musculoskeletal
      ● Childhood Fractures
    ▪ Neuroradiology
      ● Newborn Cranial Ultrasound

    ▪ **Complete Lines and Catheters, Radiation Safety& Patient Care as soon as possible**
    ▪ **Submit certificate of completion to Patti Horvath for all 20 modules at the completion of the rotation.**

• Optional Cases:
o Complete all “Opening Round” cases (pgs 1-93) in the Pediatric Imaging: Case Review Series (copy located in Patti Horvath’s office).

- Participation in Journal Club

Milestones included in the above educational plan:

- Selection of appropriate protocol and contrast agent/dose for basic fluoroscopy and CT procedures
- Making core observations
- Formulating differential diagnoses
- Recognizing critical findings
- Differentiating normal from abnormal

3) Practice-Based Learning and Improvement: By the end of the rotation, you should be able to:

- Review all cases and dictate a preliminary report. Then review your interpretation with faculty and then correct report as needed before sending it to the faculty members report queue
- Share good learning cases and missed diagnosis with others in the department
- Recognize and manage contrast reactions
- Understand the risks of radiation.
- Understand the ALARA principle of decreasing radiation dose.
- Understand the risks of MRI.
- Develop an annual learning plan.

Education:

- Participate in Journal Club, clinical conferences, and independent learning
- Active participation in quality control and quality assurance activities
- Training in research design and statistical methods

Milestones included in the above educational plan:

- Recognizing and managing contrast reactions
- Describing the mechanism of radiation injury and the ALARA concept
- Documenting training in critical thinking skills and research design

4) Interpersonal and Communication Skills: By the end of the rotation, you should be able to:

- Provide a clear and accurate report
- Provide direct communication to referring physicians or their appropriate representative, and in routine, uncomplicated circumstances and documents communication in report for emergent or important unexpected findings.
- Demonstrate the verbal and non-verbal skills necessary for face to face communication with physicians, families, and support personnel

Education:

- Participation as an active member of the radiology team by communicating with clinicians face to face, providing consults, answering phones, problem solving and decision-making
- Practical experience in dictating radiological reports
Milestones included in the above educational plan:

- Communicating information about imaging and examination results in routine, uncomplicated cases
- Obtaining informed consent
- Adhering to transfer of care policies
- Generating accurate reports with appropriate elements for coding
- Communicating urgent and unexpected findings according to RSF policy

5) Professionalism: By the end of the rotation, you should be able to:

- Recognize limitations in personal knowledge and skills, being careful to not make decisions beyond the level of personal competence
- Demonstrate altruism
- Demonstrate compassion (be understanding and respectful of patient, their families, and medical colleagues)
- Demonstrate excellence: perform responsibilities at the highest level and continue active learning throughout one’s career
- Demonstrate honesty with patients and staff
- Demonstrate honor and integrity: avoid conflict of interests when accepting gifts from patients and vendors
- Demonstrate sensitivity without prejudice on the basis of religious, ethnic, sexual or educational differences, and without employing sexual or other types of harassment
- Demonstrate knowledge of issues of impairment
- Demonstrate the broad principles of biomedical ethics
- Demonstrate principles of confidentiality with all information transmitted during a patient encounter
- Demonstrate ability to teach medical students
- Respond appropriately to constructive criticism

Education:

- Completion of the Professionalism online module – see Medical Knowledge section above
- Discussion of above issues during daily clinical work

Milestones included in the above educational plan:

- Recognizing the importance and priority of patient care and advocating for patient interests
- Fulfilling work related responsibilities
- Recognizing personal limitations and seeking help when appropriate
- Responding appropriately to constructive criticism
- Maintaining patient confidentiality
- Attending required meetings

6) Systems-Based Practice: By the end of the rotation, you should be able to:

- Demonstrate ability to design cost-effective care plans
- Describe departmental QI initiatives
- Describe the departmental QA reporting system.
- Describe the mechanism for reimbursement, including payor types.
Education:
- Required readings
- Discussions with faculty about cost-effective care plans and regulation
- ACR/APDR Initiative for Residents in Diagnostic Radiology Modules

Milestones included in the above educational plan:
- Demonstrate ability to design cost-effective care plans
- Describe departmental QI initiatives
- Describe the departmental QA reporting system.
- Describe the mechanism for reimbursement, including payor types.
1) **Patient Care:** By the end of the rotation, you should be able to:
   - Perform fluoroscopic studies using low dose techniques
   - Perform basic and intermediate fluoroscopic studies with graduated independence using meticulous technique including: VCUG, contrast enema, upper GI series, esophogram, fistulogram.
   - Recognize and manage complications of intermediate procedures.
   - Perform ultrasound studies with graduated independence.
   - Protocol pediatric CT scans and MRI with graduated independence.
   - Recommend appropriate imaging of common conditions independently.

**Education:**
   - **Required** Daily Reading Minimum
     a. On all rotations, it is recommended that residents read at least 25 cases per day
   - **Required** readings – see Medical Knowledge section below
   - Online Modules (https://www.cchs.net/onlinelearning/default.asp?) see Medical Knowledge section below

Milestones included in the above educational plan:
   - Recommending appropriate imaging of common conditions independently
   - Competently performing intermediate procedures (as noted above)
   - Recognizing and managing complications of intermediate procedures

2) **Medical Knowledge:** By the end of the rotation, you should be able to:
   - Select appropriate protocol and contrast for CT scans.
   - Make secondary observations, narrow differential diagnosis, and describe management options for cases interpreted.
   - Discuss the correct method for image guided reduction of intussusceptions.
   - Understand the normal sequence of osseous development.
   - Discuss the correct work-up of patients who present with the following clinical signs or symptoms:
     o Acute shortness of breath
     o Acute onset of wheezing
     o Respiratory distress in the newborn
     o Neonatal chest mass
     o Bilious vomiting
     o Projectile vomiting
     o Newborn bowel obstruction
     o Newborn abdominal mass
     o Newborn jaundice
     o Childhood bowel obstruction
     o Prenatal hydronephrosis
     o Neonatal adrenal mass
     o Urinary tract infection
     o Bladder outlet obstruction
- Pelvic mass
- Stridor
- Limp
- Hip Pain

**Education:**

- Create age-related differential diagnoses related to diseases of the chest, airway, GI, GU, and MSK systems including:
  - Pulmonary mass
  - Mediastinal mass
  - Chest wall mass
  - Liver mass
  - Renal mass
  - Adrenal mass
  - Scrotal mass
  - Ovarian mass
  - Mesenteric mass
  - Childhood intestinal obstruction
  - High intestinal obstruction of newborn
  - Low intestinal obstruction of newborn
  - Aggressive bone lesions
  - Non-aggressive bone lesions
  - Metabolic disease of bone
  - Airway obstruction
  - Soft-tissue masses
  - Aggressive bone lesions
  - Non-aggressive bone lesions
  - Metabolic disease of bone
  - Joint centered processes

- Understand the imaging characteristics of pediatric conditions of the chest, airway, GI, GU, and MSK systems including:
  - Pneumonia
  - Pulmonary edema
  - Cystic fibrosis
  - Acute chest syndrome
  - Chest trauma
  - Esophageal atresia and TEF
  - Appendicitis
  - Hypertrophic pyloric stenosis
  - Intussusception
  - Bowel atresia
  - Liver masses
  - Necrotizing enterocolitis
  - Blunt abdominal trauma
  - Hypovolemic shock
  - UPJ obstruction
  - Vesicoureteral reflux
  - Duplication of the renal collecting system
Education:
- **Required** Daily Reading Minimum
  - On all rotations, it is recommended that residents read at least 25 cases per day
- **Required** Readings:
  - Week 1-4:
    - Read the Pediatric Section of *Core Radiology* by Jacob Mandel
- **Required** Online Modules ([https://www.cchs.net/onlinelearning/default.asp?](https://www.cchs.net/onlinelearning/default.asp?):)
  - Go to Recommended Courses Tab → Junior Radiology Curriculum and Senior Radiology Curriculum. Complete one module per day:
    - GI
      - Appendicitis
      - Blunt Abdominal Trauma
      - Jejunal and Ileal Stenosis/Atresia
      - Newborn Low Intestinal Obstruction
      - Omphalocele, Gastrochisis & Diaphragmatic Hernia
    - GU
      - Multicystic Dysplastic Kidney
      - Testicular Torsion
    - Musculoskeletal
      - Child Abuse: Skeletal Trauma
      - Legg-Calvé-Perthes Disease
      - Septic Arthritis and Toxic Synovitis
      - Slipped Capital Femoral Epiphysis
    - Neuroradiology
      - Child Abuse: Cerebral Trauma
    - Introduction to the Pediatric Knowledge Techniques
      - Radiation Safety
- Chest
  - Bronchopulmonary Foregut Malformations
  - Mediastinal Masses

- GU
  - Neuroblastoma, Ganglioneuroblastoma, Ganglioneuroma
  - Scrotal Neoplasms
  - Wilms and Other Renal Tumors

- Musculoskeletal
  - Child Abuse: Skeletal Trauma
  - Developmental Dysplasia of the Hip

- Submit certificate of completion for all 20 modules to Patti Horvath at the completion of the rotation.

- Optional Cases:
  - Complete all “Fair Game” cases in the Pediatric Imaging: Case Review Series (copy located in Administrative office bookshelf).

- Required Exam: Complete RADPrimer Exam
- Participation in Journal Club

Milestones included in the above educational plan:
- Selecting appropriate protocols and contrast agent/dose for intermediate imaging like basic MR
- Making secondary observations
- Narrowing differential diagnosis
- Describing management options

3) **Practice-Based Learning and Improvement:** By the end of the rotation, you should be able to:
- Review all cases and dictate a preliminary report. Then review your interpretation with faculty and then correct report as needed before sending it to the faculty members report queue
- Share good learning cases and missed diagnosis with others in the department
- Demonstrate recognition and management of contrast reactions.
- Access exam specific radiation doses.
- Access resources to determine safety of implanted devices and retained metal in MRI
- Continue refining the individual learning plan
- Work with faculty to identify scholarly projects

**Education**
- Participate in Journal Club, clinical conferences, and independent learning
- Active participation in quality control and quality assurance activities

Milestones included in the above educational plan:
- Re-demonstrating recognition and management of contrast reactions
- Accessing resources to determine exam specific average radiation dose info
- Accessing resources to determine safety of implanted devices and retained metal
- Working with faculty mentors to identify potential scholarly projects
4) **Interpersonal and Communication:** By the end of the rotation, you should be able to:

- Provide a clear and accurate report that does not require substantive correction by faculty in routine cases.
- Provide clear and concise communication to referring physicians or their appropriate representative in challenging circumstances with direct supervision.
- Communicate difficult information such as errors, complications, etc under direct supervision.
- Document communication in report for emergent or important unexpected findings.
- Demonstrate the verbal and non-verbal skills necessary for face to face communication with physicians, families, and support personnel.

**Education:**

- Participation as an active member of the radiology team by communicating with clinicians face to face, providing consults, answering phones, problem solving and decision making.
- Practical experience in dictating radiological reports.

Milestones included in the above educational plan:

- Communicating under direct supervision in challenging circumstances.
- Communicating under direct supervision difficult information such as errors, complications, adverse events, and bad news.
- Effortlessly generating clear and concise reports that do not require substantive faculty member correction on routine cases.
- Communicating findings and recommendations clearly and concisely.

5) **Professionalism:** By the end of the rotation, you should be able to:

- Recognize limitations in personal knowledge and skills, being careful to not make decisions beyond the level of personal competence.
- Demonstrate altruism.
- Demonstrate compassion (being understanding and respectful of patient, their families, and medical colleagues).
- Demonstrate excellence: perform responsibilities at the highest level and continue active learning throughout one’s career.
- Demonstrate honesty with patients and staff.
- Demonstrate honor and integrity: avoid conflict of interests when accepting gifts from patients and vendors.
- Demonstrate sensitivity without prejudice on the basis of religious, ethnic, sexual or educational differences, and without employing sexual or other types of harassment.
- Demonstrate knowledge of issues of impairment.
- Demonstrate positive work habits, including punctuality and professional appearance.
- Demonstrate the broad principles of biomedical ethics.
- Demonstrate principles of confidentiality with all information transmitted during a patient encounter.
- Demonstrate ability to teach medical students.
- Act as an effective health care team member.

**Education:**
• Discussion of above issues during daily clinical work

Milestones included in the above educational plan:
• Becoming an effective health care team member
• Continuing to demonstrate professional behaviors described under year 1

6) Systems-Based Practice: By the end of the rotation, you should be able to:
• Demonstrate ability to design cost-effective care plans
• Incorporate QI into clinical practice.
• Participate in departmental QA process.
• State relative costs of common procedures.

Education:
• Required readings
• Discussions with faculty about cost-effective care plans and regulation
• ACR/APDR Initiative for Residents in Diagnostic Radiology Modules

Milestones included in the above educational plan:
• Demonstrate ability to design cost-effective care plans
• Incorporate QI into clinical practice.
• Participate in departmental QA process.
• State relative costs of common procedures.
Year 3 and 4: Pediatric Radiology
Cardiac, Neurologic, Spine, and Head and Neck Imaging

1) Patient Care: By the end of the rotation, you should be able to:
   • Perform fluoroscopic studies using low dose techniques
   • Perform intermediate and advanced fluoroscopic studies with graduated independence using meticulous technique including: esophogram, fistulogram, and therapeutic reduction enema.
   • Recognize and manage complication of advanced procedures, particularly complications of therapeutic reduction enema.
   • Perform pediatric ultrasound studies independently.
   • Protocol pediatric CT scans and MRI independently.
   • Assume primary responsibility for cases in the department, with appropriate guidance and assistance from the Pediatric Radiologist for more complex or unusual cases.
   • Recommend appropriate imaging in uncommon conditions independently.
   • Integrate approach to imaging recommendations using current research and guidelines, with consideration of cost effectiveness and risk-benefit analysis.

Education
   • Required readings – see Medical Knowledge section below
   • Online Modules (https://www.cchs.net/onlinelearning/default.asp?) see Medical Knowledge section below

Milestones included in the above educational plan:
   • Recommending appropriate imaging of uncommon conditions independently
   • Integrating current research and literature with guidelines, taking into consideration cost effectiveness and risk benefit analysis, to recommend imaging
   • Competently performing advanced procedures
   • Recognizing and managing complications of advanced procedures
   • Independently performing fluoroscopy studies

2) Medical Knowledge: By the end of the rotation, you should be able to:
   • Select appropriate protocol and contrast agent for pediatric MRI.
   • Modify imaging protocols according to clinical circumstance.
   • Apply principles to optimize image quality.
   • Provide accurate and focused interpretations.
   • Prioritize differential diagnoses and recommend management.
   • Integrate current research with guidelines to recommend management.
   • Understand the normal myelination patterns of the developing brain.
   • Understand the common surgical procedures for congenital cardiac disease.
   • Discuss the correct work-up of patients who present with the following clinical signs or symptoms:
     o Cyanosis
     o Cardiac murmur
     o Macrocrania
     o Sacral dimple
     o Seizure
• Create age-related differential diagnoses related to diseases of the cardiac, neurologic, spine, and head and neck systems including:
  - Cyanotic heart disease
  - Acyanotic heart disease
  - Vasculitis
  - Cardiac masses
  - Masses of the neurologic system
  - Neurologic cysts
  - Head and neck masses
  - Brain malformations
  - Hydrocephalus
• Understand the imaging characteristics of conditions of the cardiac, neurologic, spine, and head and neck systems including:
  - Congenital cardiac disease
  - Coarctation of the aorta
  - Scoliosis
  - Tethered cord
  - Developmental abnormalities of the brain
  - Neurocutaneous syndromes
  - Intracranial infection
  - CNS tumors
  - Head and neck masses
  - Head and neck infection
  - Intracranial trauma
  - Spinal masses

Education:
• **Required** Daily Reading Minimum
  - On all rotations, it is recommended that residents read at least 25 cases per day
• **Required** readings:
  - Week 1-4:
    - Review:
      - *Pediatric Imaging: the Fundamentals* by L. Donnelly
      - The Pediatric Section of *Core Radiology* by Jacob Mandel
• **Required Online Modules** ([https://www.cchs.net/onlinelearning/default.asp?](https://www.cchs.net/onlinelearning/default.asp?)):
  - Go to Recommended Courses Tab → Senior Radiology Curriculum. Complete one module per day:
    - GI
      - [Newborn Jaundice](#)
    - Musculoskeletal
      - [Ewings Sarcoma](#)
      - [Langerhans Cell Histiocytosis](#)
      - [Osteogenic Sarcoma](#)
      - [Rickets](#)
    - Cardiac
      - [Acyanotic Congenital Heart Disease](#)
      - [Coarctation of the Aorta and Hypoplastic Left Heart](#)
- Cyanotic Congenital Heart Disease

- Neuroradiology
  - Chiari Malformations
  - Child Abuse: Cerebral Trauma
  - Childhood Stroke
  - Congenital Anomalies of the Pediatric Face
  - Hydrocephalus
  - Malformations of Cortical Development
  - Pediatric Brain Tumors
  - Pediatric Neck Masses
  - Spine: The Sacral Dimple
  - The Holoprosencephalies
  - The Orbit
  - TORCH Infections

- Syndrome
  - Trisomy 21

- Systemic Conditions
  - Leukemia and Lymphoma
  - Sickle Cell Disease

- Submit certificate of completion for all 20 modules to Patti Horvath at the completion of the rotation.

- Optional Cases:
  - Complete all “Challenge” cases in the Pediatric Imaging: Case Review Series (copy located in Administrative office bookshelf).

- Required Exam: Complete RADPrimer Exam

Milestones included in the above educational plan:
- Selecting appropriate protocols and contrast agent/dose for advanced imaging, especially pediatric MRI
- Demonstrating knowledge of physical principles to optimize imaging quality
- Independently modifying protocols as determined by clinical circumstances
- Providing accurate, focused, and efficient interpretations
- Prioritizing differential diagnoses and recommends management
- Making subtle observations
- Suggesting a single diagnosis when appropriate
- Integrating current research and literature with guidelines to recommend management
- Describe measurements of productivity (RVUs)

3) Practice-Based Learning and Improvement: By the end of the rotation, you should be able to:
- Review all cases and dictate a preliminary report. Then review your interpretation with faculty and then correct report as needed before sending it to the faculty members report queue
- Share good learning cases and missed diagnosis with others in the department
- Recognize and manage contrast reactions.
- Communicate risk of radiation exposure and MR safety of common implants and foreign bodies to patients and practitioners.
- Apply principles of *Image Gently* to decrease radiation dose.
- Apply principles of MR safety including adherence to zones and screening.
- Begin a scholarly project to be completed and presented by the end of training.

**Education**

- Participate in Journal Club, clinical conferences, and independent learning
- Active participation in quality control and quality assurance activities

Milestones included in the above educational plan:
- Re-demonstrating recognition and management of contrast reactions
- Communicating the relative risk of exam specific radiation exposure to patients and practitioners, applying principles of *Image Gently*.
- Communicating MR safety of common implants and retained foreign bodies to patients and practitioners

4) **Interpersonal and Communication Skills:** By the end of the rotation, you should be able to:
- Provide a clear and accurate report that does not require substantive correction by faculty.
- Communicate effectively and professionally in all situations.
- Provide direct communication to referring physicians or their appropriate representative in challenging circumstances with indirect supervision.
- Communicate difficult information such as errors, complications, etc under indirect supervision.
- Documents communication in report for emergent or important unexpected findings.
- Demonstrate the verbal and non-verbal skills necessary for face to face communication with physicians, families, and support personnel.

**Education**

- Participation as an active member of the radiology team by communicating with clinicians face to face, providing consults, answering phones, problem solving and decision-making
- Practical experience in dictating radiological reports

Milestones included in the above educational plan:
- Communicating without supervision in challenging circumstances
- Efficiently generating clear and concise reports that do not require substantive faculty member correction
- Communicating appropriately under stressful situations

5) **Professionalism:** By the end of the rotation, you should be able to:
- Recognize limitations in personal knowledge and skills, being careful to not make decisions beyond the level of personal competence
- Demonstrate altruism
- Demonstrate compassion (be understanding and respectful of patient, their families, and medical colleagues)
• Demonstrate excellence: perform responsibilities at the highest level and continue active learning throughout one’s career
• Demonstrate honesty with patients and staff
• Demonstrate honor and integrity: avoid conflict of interests when accepting gifts from patients and vendors
• Demonstrate sensitivity without prejudice on the basis of religious, ethnic, sexual or educational differences, and without employing sexual or other types of harassment
• Demonstrate knowledge of issues of impairment
• Demonstrate positive work habits, including punctuality and professional appearance
• Demonstrate the broad principles of biomedical ethics
• Demonstrate principles of confidentiality with all information transmitted during a patient encounter
• Demonstrate ability to teach medical students
• Act as an effective health care team leader.
• Serve as a role model for professional behavior.

Education
• Discussion of above issues during daily clinical work

Milestones included in the above educational plan:
• Acting as an effective team leader promoting patient welfare, patient autonomy, and social justice
• Serving as a role model for professional behavior

6) Systems-Based Practice: By the end of the rotation, you should be able to:
• Identify and begin a systems based practice project incorporating QI methods, completing the project by the end of training as required by the ACGME.
• Identify national radiology quality programs.
• Describe technical and professional components of imaging costs.
• Describe measurements of productivity (RVUs)

Education
• Identify and begin a systems based practice project incorporating QI methods, completing the project by the end of training as required by the ACGME.
• Identify national radiology quality programs.
• Describe technical and professional components of imaging costs.
• Describe measurements of productivity (RVUs)

Milestones included in the above educational plan:
• Identify and begin a systems based practice project incorporating QI methods, completing the project by the end of training as required by the ACGME.
• Identify national radiology quality programs.
• Describe technical and professional components of imaging costs.

Assessment Tools for all Pediatric Radiology Rotations:
• Global Competency ratings by faculty
• 360 degree review by supervisory technologists
• ACR in-service exam
• Transcript of completed Cleveland Clinics online courses
• Results of RADPrimer online examinations
• Resident performance discussing unknown cases in conference
• Placing cases in teaching file
• Conference attendance logs
• Fluoroscopy time log submitted by physicist to Program Director
• Evaluation of teaching by medical students
Pediatric Imaging Curriculum based off the ABR Core Exam

1) General Pediatric Imaging: Basic Knowledge/Competency with:
   i) National patient safety goals as they apply to pediatric imaging
   ii) Contrast reactions in children (features, prevention, and treatment)
   iii) General knowledge of practice-based imaging guidelines and appropriateness criteria (ACR Appropriateness Criteria and Practice Guidelines and Technical Standards)
   iv) ALARA principles (e.g., Image Gently Campaign) for modalities using ionizing radiation
   v) Age-related development and normal anatomy
   vi) Appropriate appearance of surgical devices and support apparatus
   vii) Communication of urgent/emergent findings (1) List of urgent/emergent findings in children
   viii) Unique considerations for modalities:
       (1) Indications
           (a) General for each
           (b) US
               (i) Hips (effusion, CHD)
               (ii) Spine
               (iii) Brain
               (iv) Chest/mediastinum
               (v) Neck
               (vi) Imperforate anus (level of pouch)
               (vii) Intussusceptions
               (viii) Appendicitis
               (ix) Pyloric stenosis
               (x) Diaphragm motion (infant)
               (xi) Interventional guidance
           (c) CT urography
           (d) MR urography, MRCP
       (2) Limitations
   (3) General techniques
       (a) Radiography
           (i) Collimation
           (ii) Settings
           (iii) Numbers of views
       (b) Fluoroscopy/angiography
(i) Pulsed fluoroscopy
(ii) Other fluoroscopy settings
(iii) Shielding
(iv) Dose reduction techniques
(c) Special contrast use/considerations CT: dose reduction techniques, contrast doses
(d) MRI: coil optimization; contrast types and dose
(e) RNI: see nuclear medicine study guide

(4) Risks

2) Brain, Head and Neck, Spine
a) Skull
   i) Congenital
      (1) Synostoses
      (2) Congenital dermal sinus
      (3) Dermoid/epidermoid
   ii) Inflammatory
      (1) Osteomyelitis
   iii) Trauma
      (1) Caput succedaneum
      (2) Subgaleal hemorrhage
      (3) Cephalohematoma
      (4) Fractures (especially non-accidental injury/abuse)
   iv) Basic temporal bone anatomy
      (a) Mondini malformation
      (b) Michele malformation
   v) Inflammatory disorders
      (1) Cholesteatoma
      (2) Mastoiditis
   vi) Variants
      (1) Lückenschädel
      (2) Wormian bones
      (3) Parietal foramina
b) Vertebral column
   i) Congenital
      (1) Absence or hypoplasia of odontoid
      (2) Os odontoideum
      (3) Segementation 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)
ii) Inflammatory
   (1) Discitis
   (2) Infectious spondylitis (TB)

iii) Neoplasms
   (1) Ewing sarcoma
   (2) Aneurysmal bone cyst
   (3) Osteoblastoma
   (4) Osteoid osteoma
   (5) Langerhans cell histiocytosis
   (6) Metastases (including leukemia and lymphoma)

iv) Trauma
   (1) Fractures/dislocations
   (2) Atlanto-dens and atlanto-occipital injuries
   (3) Spondylolysis/spondylolisthesis
   (4) Insufficiency fracture (and etiologies)

v) Miscellaneous

vi) Dysplasia/syndromes
   (1) Mucopolysaccharidoses
   (2) Spondylometaphyseal dysplasia

vii) Scheuermann disease

viii) Scoliosis (repair and hardware complications)

   c) Brain
   i) 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
         Aqueductal stenosis
         Syndromic
         Masses

ii) Inflammatory
   (1) Bacterial infections
      Meningitis
      Cerebritis
Abscess
(2) Tuberculosis infections
(3) Viral infections (encephalitis) (a) TORCH infections

iii) Neoplasms
iv) Posterior fossa
(1) Medulloblastoma
(2) Ependymoma
(3) Brainstem glioma
(4) Astrocytoma

v) Supratentorial
(1) Pineal region tumors
(2) Craniopharyngioma
(3) Astrocytoma
(4) Oligodendroglioma
(5) PNET
(6) Choroid plexus tumors

vi) 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
   (a) vascular borderzone infarctions
   (b) multicystic encephalomalacia

vii) Trauma (including nonaccidental injuries)
(1) Cerebral injury (including shearing injuries and concussion)
(2) Subdural hematoma
(3) Epidural hematoma
(4) Subarachnoid hemorrhage

viii) Syndromic/systemic
(1) Neurocutaneous syndromes
(2) Chiari malformation types I and II

ix) Vascular
(1) AV malformations, congenital “aneurysms” (vein of Galen)

x) Metabolic brain disorders
(1) Leukodystrophies
d) Spinal cord

i) Congenital
(1) Myelomeningocele/meningocele
(2) Lipomyelomeningocele
(3) Diastematomyelia
(4) Tethered cord
(5) Dermal sinus
(6) Intradural lipoma
(7) Hydrosyringomyelia
(8) Neurenteric cysts

ii) Tumors
(1) Neurofibroma
(2) Astrocytoma
(3) Ependymoma
(4) Metastases
(5) Neuroblastoma, ganglioneuroblastoma, ganglioglioma

iii) Sacrococcygeal masses
(1) Germ cell tumors (i.e., teratoma)
(2) Neuroblastoma
(3) Lymphoma
(4) Rhabdomyosarcoma

iv) Other
(1) Infections
(2) Demyelinating disorders
(3) Trauma
(4) Vascular malformations

e) Neck
i) Congenital
(1) Fibromatosis colli
(2) Lymphatic malformations
(3) Branchial cleft cysts
(4) Thyroglossal duct cysts

ii) Neoplasms
(1) Lymphoma
(2) Neuroblastoma
(3) Rhabdomyosarcoma
(4) Nasopharyngeal carcinoma
(5) Hemangiomas

iii) Infectious/inflammatory
(1) Adenitis
(2) Retropharyngeal abscess

iv) Thyroid disorders
(1) Absence/hypoplasia/ectopic
(2) Thyroiditis
(3) Thyroid masses
(4) Goiter

f) Head/face
i) Congenital
(1) Vascular malformations
(2) PHPV  
(3) Coloboma  

ii) Inflammatory  
(1) Orbital masses  
(2) Ocular masses  
(3) Orbital cellulitis  
(4) Sinusitis  

iii) Neoplastic/mass like  
(1) Retinoblastoma  
(2) Nasopharyngeal masses  
(3) Carcinoma  
(4) Juvenile angiofibroma  
(5) Sinus masses  

iv) Trauma  
(1) Facial fracture (Le Fort classification)  

3) Chest and Airway  

a) Upper Airway  
  i) Congenital  
    (1) Tracheomalacia/bronchomalacia/laryngomalacia  
    (2) Laryngeal stenosis, web, cleft  
    (3) Choanal atresia  
    (4) Masses: hemangioma  
  ii) Inflammatory  
    (1) Tonsillar enlargement/adenoidal hypertrophy  
    (2) Croup  
    (3) Epiglottitis  
    (4) Tracheitis  
    (5) Retropharyngeal abscess  
  iii) Neoplasm  
    (1) Juvenile angiofibroma  
    (2) Subglottic hemangioma  
    (3) Laryngeal papilloma  
  iv) Trauma  
    (1) Foreign body  
    (2) Acquired subglottic stenosis  

b) Chest  
  i) Congenital  
    (1) Agenesis/hypoplasia  
    (2) Venolobar syndrome  
    (3) Bronchial atresia  
    (4) Bronchopulmonary foregut malformations  
      (a) Sequestration  
      (b) Bronchogenic cyst
(c) Congenital pulmonary airway malformation (CPAM)/cystic adenomatoid malformation (CCAM)
(d) Congenital lobar emphysema
(e) Hybrid lesions
(5) Tracheal bronchus
(6) Tracheoesophageal fistula
(7) Lymphangieectasia

ii) Inflammatory

(1) Infections

(a) Bacterial pneumonia
   (i) Streptococcus
   (ii) Staphylococcus
   (iii) Pertussis
   (iv) Chlamydia
   (v) Mycoplasma
   (vi) H. influenza
   (vii) Round pneumonia
   (viii) Abscess
   (ix) Complications
      1. Necrosis
      2. Abscess
      3. Fistulae
      4. Empyema
      5. Pneumatocele

(b) Viral pneumonia
   RSV
   Varicella
   Measles

(c) Tuberculosis

(d) Fungal infections

(e) Other opportunistic infections

(f) Plasma cell granuloma/inflammatory pseudotumor, myofibroblastic inflammatory tumor

(2) Small airways disease

(a) Reactive airways disease

(b) Viral pneumonia

(3) Bronchiectasis: causes

(a) Cystic fibrosis

(b) Immotile cilia syndrome

(c) Chronic infection (primary immune disorders)

(d) Foreign body
(e) Aspiration

iii) Neoplasms /mass-like lesions (1) Mediastinal masses

(a) Anterior
   (i) Lymphoma/leukemia
   (ii) Germ cell tumors
   (iii) Thymoma/carcinoma
   (iv) Other masses: thymic cysts, bronchogenic cysts
   (v) Normal prominent thymus and thymic rebound

(b) Middle
   (i) Adenopathy (lymphoma/mets)
   (ii) Congenital masses: bronchogenic cysts, esophageal duplication cyst, neurenteric cyst
   (iii) Neurogenic tumors

(c) Posterior
   (i) Neurogenic tumors
   (ii) Other masses: bronchogenic cyst, infection, hematoma, adenopathy

(2) Primary lung tumors

(a) Adenoma/carcinoid tumor

(b) Hamartoma

(c) Hemangioma

(d) Mesenchymal sarcoma (and its association with developmental cystic lesions of lung)

(e) Metastatic lung lesions

(3) Chest wall neoplasms/masses

(a) Ewing sarcoma family (including Askin tumor)

(b) Benign rib and spine neoplasms

(c) Vascular malformations

(d) Infections

iv) Trauma

(1) Contusion

(2) Air leak
   (a) Pneumothorax
   (b) Pneumomediastinum
   (c) Bronchopleural fistula

(3) Fracture of tracheobronchial tree

(4) Airway foreign body

(5) Post-traumatic bronchial stenosis

(6) Post-traumatic diaphragmatic hernia

v) Vascular

(1) Pulmonary thromboembolic disease

(2) Other venous thrombosis or occlusion, anomalous vessels

(3) AV malformations

vi) Unique chest problems in neonate
(1) Hyaline membrane disease
(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) Persistent fetal circulation
(8) ECMO therapy and its complications
(9) Air leak in the neonate
   (a) Including pulmonary interstitial emphysema

vii) 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
   (7) Vasculitis (Wegener disease)

4) Cardiovascular: Cardiac
   a) Congenital heart disease
      i) Segmental approach to imaging of congenital heart disease
         (1) Normal segmental anatomy
         (2) Anomalies of visceroatrial situs
             Asplenia
             Polysplenia
             Situs inversus
      ii) Left-to-right shunts
         (1) Ventricular septal defect
         (2) Patent ductus arteriosus
         (3) Atrial septal defect
         (4) Endocardial cushion defect
         (5) Aortopulmonary window
         (6) Partial anomalous pulmonary venous return
      iii) 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
      iv) Intermixing (admixture) states with decreased pulmonary blood flow
         (1) Tetralogy of Fallot
         (2) Pulmonary atresia with VSD
         (3) Single ventricle with RVOT obstruction
v) Left-sided obstruction
   (1) Coarctation
   (2) Hypoplastic left heart syndrome
   (3) Cor triatriatum
   (4) Obstructed TAPVC

vi) Other congenital heart disease
   (1) Pulmonary valve stenosis
   (2) L-transposition of great arteries
   (3) Pulmonary atresia with intact ventricular septum
   (4) Ebstein anomaly
   (5) Congenital absence of the pericardium

vii) Vascular rings and slings
   (1) Right aortic arch with aberrant left subclavian artery
   (2) Double aortic arch and variants
   (3) Circumflex aortic arch
   (4) Pulmonary sling

viii) 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

ix) Systemic venous variants
   (1) Left SVC
   (2) Interrupted IVC with azygos continuation

tax) Late or adult presentations of CHD
   (1) Bicuspid aortic valve, aortic valve stenosis and aortic root dilatation

b) Cardiac masses
   i) Rhabdomyoma, fibroma
   ii) Thrombus

c) Trauma
   i) Hemopericardium

d) Syndromes with congenital heart disease or vascular disease
   i) Marfan syndrome
   ii) Loeys-Dietz syndrome
   iii) Ehlers-Danlos syndrome
   iv) Williams syndrome
   v) Alagille syndrome
   vi) Neurofibromatosis I
   vii) Down syndrome
   viii) Holt Oram syndrome
   ix) Turner syndrome
   x) PHACE syndrome

e) Acquired cardiac disease
   i) Infectious/inflammatory
      (1) Pericarditis
ii) Cardiomyopathies
(1) Hypertrophic
(2) Dilated
(3) Restrictive
(4) ARVD
f) Cardiac operations
i) Postoperative cross-sectional imaging assessment of the following procedures:
(1) Atrial switch for transposition of great arteries
   (Senning and Mustard procedures)
(2) Arterial switch for transposition of great arteries
   (Jatene arterial switch and Lecompte maneuver)
(3) Single ventricle repair: Norwood 1 and Dames-Kaye Stansel anastomosis
(4) Superior cavopulmonary connection, including the bidirectional Glenn procedure
(5) Total cavopulmonary connection: Fontan procedure
(6) Pulmonary blood flow augmentation as initial palliation for CHD, including Blalock-Taussig, Waterston, and Pott’s shunts

5) Cardiovascular: Vascular
a) Congenital
   i) Vascular malformations
b) Variants: Caval anomalies (e.g., left SVC, absent hepatic IVC)
c) Trauma
   i) Acute traumatic aortic injury
   ii) Arterial contrast extravasation
   iii) Pseudoaneurysm
   iv) AV fistulae
   v) Hypoperfusion complex
d) Inflammatory/infectious
   i) Aortitis
   ii) Vasculitides
      (1) Takayasu disease, Kawasaki disease
e) Syndromic/systemic vascular diseases
i) Syndromes
   (1) Ehlers-Danlos
   (2) Marfan
   (3) NF—and other causes of mid-aortic syndrome
   (4) Williams
f) Idiopathic
i) Fibromuscular dysplasia
ii) Mid-aortic syndrome

g) Thrombotic
   i) Deep venous thrombosis
   ii) Catheter-related thrombosis and evaluation

6) Gastrointestinal tract
   a) System biliary system
   i) Congenital
   ii) Biliary atresia
   iii) Neonatal hepatitis
   iv) Choledochal cyst (classification)
   v) Acquired miscellaneous
      (1) Cholelithiasis
      (2) Hydrops of gallbladder
      (3) Cholangitis
   vi) Cholecystitis

b) Liver
   i) Infection
      (1) Abscess
      (2) Hepatitis
   ii) Tumors and tumor-like conditions
      (1) Benign
         (a) Mesenchymal hamartoma
         (b) Hemangioendothelioma
      (2) Malignant
         (a) Hepatoblastoma
         (b) Hepatoma
         (c) Metastases
   iii) Trauma
      (1) Lacerations
      (2) Subcapsular hematoma
      (3) Contusion
   iv) Vascular
      (1) Portal vein thrombosis (a) Cavernous transformation
      (2) Portal hypertension
      (3) Budd Chiari
   v) Transplant complications
   vi) Other: systemic conditions involving liver
      (1) Glycogen storage disease
      (2) Beckwith Wiedemann

c) Spleen
   i) Congenital
      (1) Abnormal visceroatrial situs
      (2) Wandering spleen
   ii) Neoplasms
(1) Infection  
   (a) Fungal abscesses  
(2) Benign  
   (a) Lymphangioma  
(3) Malignant  
   (a) Lymphoma/leukemia  
(4) Trauma  
   (a) Laceration  
   (b) Contusion  
   (c) Subcapsular hematoma  
(5) Splenic infarction (a) Sickle cell disease  
(6) Etiologies for splenomegaly  

d) Pancreas  
   i) Congenital  
     (1) Pancreas divisum  
     (2) Cystic fibrosis  
   ii) Pancreatitis (and pseudocyst)  
      (1) Trauma  
         (a) Non-accidental trauma  
      (2) Choledochal cyst  
      (3) Familial pancreatitis  
      (4) Iatrogenic  
   iii) Fatty replacement (1) CF  
e) Aerodigestive track  
   i) Pharynx and esophagus  
      (1) Congenital and developmental anomalies  
         (a) Esophageal atresia and TE fistula (classification)  
      (2) Inflammatory lesions  
         (a) Retropharyngeal abscess/cellulitis  
         (b) Infectious esophagitis  
      (3) Trauma  
         (a) Foreign bodies  
         (b) Iatrogenic perforation  
      (4) Esophageal stricture (etiologies)  
      (5) GER reflux  
   ii) Stomach  
      (1) Congenital  
         (a) Duplications  
         (b) Antral webs  
         (c) Volvulus  
      (2) Gastric outlet obstruction (a) Acquired  
         (i) Hypertrophic pyloric stenosis  
         (ii) Inflammatory  
         (iii) Corrosive ingestion
(iv) Chronic granulomatous disease

(3) Inflammatory
(a) Eosinophilic enteritis
(b) Peptic diseases
(c) Chronic granulomatous disease

(4) Miscellaneous
(a) Bezoars
(b) Foreign bodies
(c) Spontaneous rupture of stomach

iii) Small Bowel
(1) Congenital
(a) Duodenal webs, stenosis, and other obstructions
(b) Malrotation with/without midgut volvulus
(c) Duodenal, jejunal, and ileal stenosis and/or atresia
(d) Post-inflammatory/infectious or iatrogenic strictures
(e) Meconium ileus
(f) Meconium peritonitis
(g) Mesenteric and omental cysts
(h) Duplication cysts
(i) Meckel diverticula (including other omphalomesenteric anomalies)
(j) Abdominal wall defects
   (i) Omphalocele, gastroschisis
   (ii) Hernias

(2) Neoplasms
(a) Benign
   (i) Polyps, leiomyomas
(b) Malignant (i) Lymphoma

(3) Malabsorption (a) CF

(4) Trauma
(a) Blunt abdominal trauma
(b) Transplant

(5) Miscellaneous
(a) Necrotizing enterocolitis
(b) Ischemic bowel
(c) Intussusception
(d) Henoch-Schonlein purpura
(e) Graft vs host disease

(6) Cause of small bowel obstruction

iv) Colon
(1) Congenital
(a) Imperforate anus / anorectal malformation
(b) Duplications
(c) Colonic atresia
(d) Hirschsprung disease
(e) Meconium plug/neonatal small left colon syndrome

(2) Infectious/inflammatory
(a) Appendicitis
(b) Infectious colitis/typhlitis

(3) Neoplasms
(a) Benign: polyps, leiomyoma
(b) Malignant (i) Lymphoma

(4) Trauma

v) Other
(1) Mesenteric adenitis

7) Genitourinary system
a) Growth and development/normal variants: kidney (echogenic pyramids, lobulation
b) Kidneys
i) Congenital anomalies
   (1) UPJ
   (2) Duplication
   (3) Multicystic dysplasia
   (4) Agenesis
   (5) Hypoplastic kidney
   (6) Horseshoe kidney
   (7) Ectopia
      (a) Ptosis
      (b) Pelvic
      (c) Crossed ectopia
   (8) Relationship of congenital renal anomalies with other congenital anomalies (VATER association, spinal dysraphism, etc.)
ii) Cystic renal disease
   (1) Autosomal recessive
   (2) Autosomal dominant
   (3) Cysts associated with syndromes
   (4) Associated liver disease (fibrosis)
iii) Inflammatory
   (1) Acute pyelonephritis
   (2) Abscess
   (3) Reflux nephropathy
iv) Neoplasms
   (1) Wilms tumor and variants
   (2) Nephrogenic rests
   (3) Mesoblastic nephroma
   (4) Multilocular cystic nephroma
   (5) Leukemia/lymphoma
v) Trauma
   (1) Subcapsular hematoma
   (2) Laceration (including those communicating with collecting system)
   (3) Contusion
   (4) Avulsion of vascular pedicle

UPJ avulsion or laceration

vi) Vascular
   (1) Arterial stenosis
   (2) Renal vein thrombosis
   (3) Tumor thrombus

vii) Involvement by systemic disorders
   (1) Tuberous sclerosis
   (2) Von Hippel Lindau

viii) Miscellaneous
   (1) Urolithiasis/nephrocalcinosis
   (2) Renal transplantation

c) Adrenal gland
   i) Neoplasms
      (1) Neuroblastoma
      (2) Adrenocortical carcinoma
   ii) Congenital adrenal hyperplasia
   iii) Trauma
      (1) Hemorrhage (neonatal) and adrenal calcification

d) Bladder, Ureters, and Urethra
   i) Congenital
      (1) Posterior urethral valves
      (2) Ureterovesical junction obstruction
      (3) Primary megaureter
      (4) Bladder diverticula
      (5) Ureteral duplication
      (6) Ureterocele
      (7) Urachal abnormalities
      (8) Hypospadias
      (9) Epispadias/exstrophy
      (10) Prune belly syndrome
      (11) Urologic sequela of anorectal anomalies
   ii) Infectious/inflammatory
      (1) Urinary tract infection
      (2) Viral cystitis
      (3) Hemorrhagic cystitis
   iii) Trauma
      (1) Extravasation
   iv) Neoplasms
(1) Rhabdomyosarcoma

v) Miscellaneous
(1) Vesicoureteral reflux
(2) Neurogenic bladder
(3) Dysfunctional voiding

e) Male Genital Tract: scrotal
i) Testicular torsion

ii) Infectious/inflammatory (1) Epididymitis/orchitis

iii) Differential for scrotal fluid collections

iv) Hernia

v) Undescended testis

vi) Microlithiasis

vii) Neoplasms
(1) Germ cell tumors
(2) Stroma cell tumors
(3) Metastases
(4) Leukemia

f) Female genital tracts

i) Congenital
(1) Cloacal anomalies

ii) Ovaries
(1) Torsion
(2) Ovarian cysts (including neonatal physiologic)
(3) Germ cell tumors
(4) Cystic neoplasms
(5) Polycystic ovarian disease

iii) Uterus and vagina
(1) Congenital anomalies: vaginal occlusion (hydrometrocolpos, etc.)
(2) Fusion anomalies of the müllerian duct (uterus didelphys, etc.)
(3) Masses
   Rhabdomyosarcoma
   Clear cell adenocarcinoma

iv) Intersex states
(1) Differential diagnosis
(2) Work-up

v) Other
(1) Prune belly syndrome

8) Musculoskeletal imaging

a) Normal growth and development/variants

b) Congenital
   i) Bone dysplasias osteochondrodysplasias affecting growth of
tubular bones and spine (identifiable at birth)
(1) Thanatophoric dysplasia
(2) Chondrodysplasia punctata
(3) Achondroplasia
(4) Asphyxiating thoracic dystrophy

ii) Osteochondrodysplasias affecting growth of tubular bones and spine (identifiable in later life)
   (1) Metaphyseal chondrodysplasia
   (2) Multiple epiphyseal dysplasia

iii) Osteochondrodysplasias with disorganized development of cartilage and fibrous components of the skeleton
   (1) Multiple cartilaginous exostoses
   (2) Enchondromatosis
   (3) Polyostotic fibrous dysplasia
   (4) Neurofibromatosis

iv) Abnormalities of density of cortical diaphyseal structure and metaphyseal modeling
   (1) Osteogenesis imperfecta
   (2) Osteopetrosis
   (3) Pycnodysostosis
   (4) Diaphyseal dysplasia
   (5) Metaphyseal dysplasia

v) Limb reduction anomalies (including proximal focal femoral deficiency and radial ray anomalies)

vi) Amniotic band syndrome

vii) Congenital bowing deformities and pseudoarthroses

viii) Congenital foot deformities
   (1) Tarsal coalition
   (2) Pes planus
   (3) Talipes equinovarus
   (4) Pescavus
   (5) Metatarsus adductus

ix) Skeletal abnormalities associated with syndromes
   (1) Trisomy 21, Marfan, neurofibromatosis

x) Skeletal abnormalities associated with metabolic disorders
   (1) Mucopolysaccharidoses and mucolipidoses

xi) Developmental dysplasia of hip

xii) Skeletal abnormalities associated with neuromuscular diseases
    (1) Meningomyelocele
    (2) Cerebral palsy
    (3) Muscular dystrophy

c) Infectious inflammatory
   i) Pyogenic osteomyelitis
   ii) Septic arthritis
iii) Toxic synovitis of the hip
iv) Tuberculosis
v) Caffey disease
vi) Multifocal osteomyelitis
vii) Dermatomyositis/polymyositis and other inflammatory myopathies
viii) Arthropathies
   (1) Juvenile rheumatoid arthritis (juvenile idiopathic arthritis)
d) Hemophilic arthropathy
e) Neoplasm
   i) 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
   ii) Malignant
      (a) Ewing sarcoma
      (b) Osteogenic sarcoma
      (c) Metastases (including leukemia/lymphoma)
   iii) Vascular
      (1) Vascular malformations
iv) Trauma
   (1) Fractures
      (a) Accidental trauma (including Salter-Harris, greenstick-bowing, and buckle fractures)
      (b) Non-accidental trauma (battered child syndrome)
v) Growth arrest/bone bar and non union
vi) Toddler’s fracture
vii) Slipped capital femoral epiphysis
f) Endocrine/Metabolic
   i) Rickets
   ii) Renal osteodystrophy
   iii) Hyperparathyroidism
   iv) Hypoparathyroidism
   v) Hypophosphatasia
   vi) Scurvy
   vii) Bone age determination
g) Osteochondroses
i) Legg-Perthes disease
ii) Kohler disease
iii) Freiberg disease
iv) Osteochondritis dissecans
v) Blount disease and physiologic bowing

9) Select general/multiorgan system syndromes with salient imaging findings
   a) Neurocutaneous syndrome
   b) Sturge Weber
   c) Trisomy 21
   d) CHARGE
   e) Marfan
   f) Beckwith Wiedemann
   g) Turner’s
   h) Ehlers-Danlos
   i) DiGeorge
   j) Klippel-Trenaunay-Weber

10) Multisystemic disorders/processes
   a) SLE, other systemic vasculitides
   b) JIA
   c) Wegener disease
   d) Primary immune deficiencies (SCIDS, chronic granulomatous disease, DiGeorge)
   e) Sickle cell anemia
   f) Child abuse
   g) Immunocompromised host (transplant immune suppression, antibiotics, steroids, chemotherapy)
      Includes post-transplant lymphoproliferative syndrome
   h) VATER/VACTERLY
   i) Retained surgical material
   j) VP shunt complications

11) Interventional
   a) Abscess drainage/aspiration
   b) Solid organ soft tissue mass biopsy
      Thyroid, liver, kidney, bone, lymph node, nodule
   c) Thoracentesis/thoracostomy tube placement
   d) Paracentesis
   e) Hip aspirations
   f) Arthrography (diagnostic, therapeutic)
FLORIDA HOSPITAL DIAGNOSTIC RADIOLOGY RESIDENCY PROGRAM

CONFIRMATION OF RECEIPT OF

PEDIATRIC GOALS AND OBJECTIVES

2017-2018

By signing this document, you are confirming that you have received and reviewed, with your preceptor, the pediatric imaging goals and objectives for this academic year.

This receipt will be kept in your personal file.

Resident Name (please print)________________________________________________________

Resident Signature _________________________________________________________________
by signing this – you confirm that you have reviewed the G&O with your preceptor

Date________________________________________________________

Preceptor Signature _________________________________________________________________
by signing this – you confirm that you have reviewed the G&O with the resident

Date________________________________________________________