

**CHILDREN'S MEDICAL CENTER DALLAS
UNIVERSITY OF TEXAS SOUTHWESTERN
MEDICAL CENTER at DALLAS**

PEDIATRIC RADIOLOGY

**FELLOWSHIP TRAINING
GOALS AND OBJECTIVES**

OVERALL GOALS

These goals and objectives are provided to each CMC pediatric radiology fellow as a reference to be used throughout the pediatric fellowship year. These guidelines establish objectives for fellows who would like to pursue a career in pediatric radiology.

The overall goal of the fellowship is to provide a one-year, supervised experience in the pediatric applications and interpretation of radiography, computed tomography, ultrasonography, angiography, interventional techniques, nuclear radiology, magnetic resonance, and any other imaging modality customarily included within the specialty of diagnostic radiology.

The fellowship is structured to enhance substantially the fellow's knowledge of the applications of all forms of diagnostic imaging to the unique clinical/pathophysiological problems of the newborn, infant, child, and adolescent. The fundamentals of radiobiology, radiological physics, and radiation protection as they relate to the infant, child, and adolescent are to be reviewed during the pediatric radiology training experience. The recognition of normal imaging findings and variants will be stressed. The fellowship provides direct and progressively responsible experience in pediatric imaging as they advance through training. This training must culminate in sufficiently independent responsibility for clinical decision making such that the program is assured that the graduating fellow has achieved the ability to execute sound clinical judgment, and practice competently and independently.

The goals and objectives of each rotation are intended to ensure that the fellow achieves the six core competencies established by the ACGME: Patient Care, Medical Knowledge, Interpersonal and Communication Skills, Professionalism, Practice-Based Learning and Improvement, and Systems-Based Practice.

Description of Educational Experience

The clinical and academic educational experience incorporated into the Pediatric Radiology fellowship program at Children's Medical Center/UT Southwestern includes formal clinical rotation on pediatric radiology services, formal faculty directed and self directed didactic and individual study and participation in multidisciplinary conferences. The pediatric radiology fellow will rotate through the diagnostic radiology services at Children's Medical Center of Dallas (CMC) to include plain films, fluoroscopy, sonography, nuclear medicine, CT and MR, and interventional radiology. Nine months will be spent at CMC and 3 month elective which may be taken at CMC, Parkland, or at another children's hospital. The purpose of these elective rotations will be to provide additional sub-specialized experience in the specialty. Fellows will learn to perform and interpret basic CT and MRI examinations of the body, heart, brain, spine, and head and neck performed on pediatric patients with faculty supervision. They will have an opportunity to participate in diagnostic angiographic and basic interventional procedures and they will have didactic presentations on radiation, contrast and MR safety, performance and interpretation of fluoroscopy and sonography, and optimization and interpretation of pediatric CT and MRI. Specific ongoing instruction will include differences in image protocol for CT and MR studies, anatomic development at different ages, appearances of pathology specific to children. Additionally, the fellows are required to attend rounds in the various clinical and didactic conferences at Children's Medical Center of Dallas. The fellow will also be required to participate in a research project and encouraged to publish a paper in a peer reviewed journal or present at a national meeting during their fellowship.

Patient Care

Goal

Pediatric radiology fellows must be able to provide patient care related to evaluation and treatment of diseases of the fetus, neonate, infant and child that is compassionate, appropriate, and effective for the diagnosis and treatment of these conditions and the promotion of health.

Fellows are expected to:

Competencies

Clinical competency goals for this curriculum include:

1. Knowledge of the indications and contraindications for contrast administration (MR and CT) in the pediatric patient.
2. Knowledge of appropriate indications for imaging studies in a pediatric patient.
3. Ability to perform preliminary evaluation of pediatric patients requiring imaging evaluation and protocol imaging studies in order to maximize diagnostic potential.
4. Ability to perform a targeted and procedure appropriate history.
5. Ability to render appropriate management of certain physiological considerations including drug/contrast reactions/premedication.
6. Ability to identify emergent cases requiring urgent intervention and provide immediate referring faculty notification.
7. Ability to modify an exam to reduce radiation exposure.
8. Ability to relay information to parents and patients, when appropriate.
9. Ability to understand the concepts of magnetic resonance safety

Objectives

The fellow will complete the following during the rotations to effect attainment of the above competencies, all under direct supervision of pediatric radiology faculty:

1. Review pertinent patient history, physical findings and any antecedent imaging studies to determine that the requested examination/procedure is appropriate, and if not, take appropriate steps to contact the ordering physician.
2. Protocol a study to ensure a diagnosis with specific attention to potential radiation exposure, sequence and overall time.
3. Obtain procedural informed consent where appropriate.
4. Provide appropriate post procedure counseling regarding follow-up with referring physician.
5. Communicate critical findings to appropriate referring physicians in a timely manner.
6. Able to meet with parents/patients to discuss results of sensitive procedures (fetal MR).
7. Successfully complete a MR safety course and attend lectures in radiation dose limitation.

Assessment Methods:

1. Global faculty evaluations (to include evaluation knowledge about safety issues such as radiation dose, MRI safety, correct patient exam-site verification, use of standard abbreviations)
2. Case/procedure logs (to be included in the fellow's learning portfolio)
3. Direct observation of selected procedures and other clinical processes (such as obtaining informed consent)
4. Attendance documented for safety courses.

Medical Knowledge

Goal

Fellows must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences as they pertain to pediatric imaging, as well as the application of this knowledge to patient care. In pediatric imaging, this competency has technical and cognitive components. Fellows are expected to:

Competencies

Technical and cognitive competency goals for this curriculum include:

Technical Knowledge:

1. Understanding the hazards of radiation exposure in the child and how to reduce that risk for all techniques utilizing ionizing radiation.
2. Ability to recognize pertinent anatomy on cranial, body, and extremity ultrasounds and recognize abnormalities.
3. Ability to perform fluoroscopic procedures obtaining high quality images while minimizing radiation exposure and patient discomfort.
4. Ability to protocol CT studies and determine the need for and contraindications to contrast administration.
5. Ability to apply basic principles of image acquisition and reconstruction for multi-planar CT and CT angiography, as well as save those reconstructions in the PACs archive.
6. Ability to protocol CT and MR studies for common indications in children at differing ages and to recognize contraindications to CT and MRI
7. Ability to independently perform image reconstructions, editing, and saving of images to archive for MR angiography acquisitions.
8. Ability to assist in the performance of interventional procedures.
9. Ability to determine if a child potentially needs sedation and if contraindications to anesthesia exist.
10. Ability to protocol cardiac MR studies and perform simple post-processing.
11. Ability to actively protocol fetal MR studies.

Cognitive Knowledge:

1. Know the indications for performing different diagnostic procedures and contraindications for those procedures.
2. Be familiar with the anatomy and pathology for the various diagnostic modalities.
3. Using all modalities, know how to diagnose common congenital, traumatic, iatrogenic, and neoplastic conditions.
4. Know age related changes on sonography, CT, and MRI including maturation changes and normal variations.
5. Know how to perform pediatric contrast fluoroscopy studies and be cognizant of radiation dose.
6. Optimally use last image hold during fluoroscopic procedures.
7. Recognize time limits when scanning a sedated pediatric patient and be able to optimize protocols accordingly.
8. Recognize when additional MR imaging planes, sequences or studies are needed.
9. Know the appropriate coil to use in order to optimize MR images.
10. Recognize and relate to a referring physician findings seen in common pediatric conditions including; new or progressive tumor, stroke, intracranial hemorrhage, and unstable spine injury.

11. Know the lists of critical results and how to communicate and document critical results.
12. Recognize and relate to a referring physician any critical test or finding and document that discussion properly in the radiology report.
13. Understand artifacts and other factors that alter image quality and accuracy.
14. Know the anatomy of the common and begin to understand the complicated congenital heart malformations on plain films and MR.
15. Know the common fetal anomalies, which are evaluated with fetal MR.

Objectives

The fellow will complete the following during the rotations to effect attainment of the above competencies, all under direct supervision of pediatric radiology faculty:

1. Review a sufficient number of ultrasounds under faculty supervision.
2. Review and dictate a sufficient number of pediatric CT and MR studies under faculty supervision to attain technical and cognitive competency. This would include studies of the chest, abdomen, pelvis, extremities, heart, brain, head and neck, and spine.
3. Interpret a sufficient number of pediatric ultrasound, CT MPR, MR angiographic studies and CT angiographic studies to attain technical and cognitive competency, including 3-D volume rendered analysis on the Vitrea or comparable workstation in pediatric patients.
4. Perform preliminary review of all exams to determine clinical and technical adequacy.
5. Monitor and participate in pediatric interventional procedures.
6. Attend pediatric conferences with radiology participation including hematology-oncology, trauma, pediatric surgery, urology, GI, neuro-oncology tumor board, pediatric epilepsy clinical conference, and pediatric neurology conference.
7. Attend didactic lectures on pediatric radiology given by the pediatric radiology attendings.
8. Attend pediatric radiology lectures at UT southwestern.
9. Attend daily interpretation sessions with pediatric radiology faculty involving review of the appropriate findings.
10. Prepare radiologic reports on all studies performed on the service.
11. Complete self directed study of recommended references.
12. Attend echo conference, cardiac MR readout and cardiothoracic conference.
13. Readout a sufficient number of fetal MR cases.

ASSESSMENT METHODS:

1. Daily Interaction
2. Global faculty evaluations (which includes the 6 competencies)
3. Resident learning portfolio (including documentation of conferences and courses attended, self-assessments modules completed, etc.)
4. Literature Review to evaluate skills in accessing, interpreting and applying best evidence in the radiology literature to patient care.
5. Active participation in journal club.

Practice- Based Learning and Improvement

Goal

Fellows must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life long learning. Fellows are expected to develop skills and habits to be able to achieve competencies to:

- Incorporate formative evaluation feedback into daily practice
- Use information technology to optimize learning

Objectives

Obtain evaluations from faculty, technologists, nurses and patients' parents; identify weakness as perceived by those providing the evaluations, and be re-evaluated after.

ASSESSMENT METHODS:

1. Global faculty evaluation (which includes the 6 competencies)
2. Fellow learning portfolio (including presentations, teaching files and case conferences).
3. Direct observation of clinical research and literature evaluation.
4. Patient evaluations.
5. Technologist evaluations.
6. Review of preliminary report scores.

Professionalism

Goal

The fellow must remember that they represent the University of Texas Southwestern Medical Center, Department of Radiology with all of their actions and communications while on this rotation. The highest standards of professionalism must be maintained at all times, especially in interactions with patients or with other physicians. The fellow will be responsible for tracking duty hours and reporting them to the supervisory attending. Competence in professionalism will be assessed by supervisory attending, as well as by the 360-degree evaluation. Fellows must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.

Competencies

- Responsiveness to patient needs that supersedes self-interest.
 - Accountability to patients, society, and the profession.
- These are considered essential to the profession practice of radiology.

Objectives

1. Responsiveness to patient needs will be assessed by evaluations given to parents.
2. Accountability will be assessed by evaluations of resident performance by the radiologic technologists.

ASSESSMENT METHODS:

1. Global faculty evaluation
2. 360 degree evaluations
3. Verify status of medical license, if appropriate
4. Documentation of compliance with institutional and departmental policies (e.g., conference attendance, HIPPA, JCAHO, dress code)
- 5.

Interpersonal and Communication Skills

Goal

Fellows must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates. Fellows are expected to:

Competencies

Presenting findings, differential diagnosis, most likely diagnosis, and clinical significance of findings succinctly and completely, and communicating clearly with other fellows, staff, and affiliated colleagues is necessary. Competence in communication will be assessed by supervisory attendings, as well as by the 360-degree evaluation.

Objectives

The measurable objective for this competency is:

1. Evaluation of quality of reports.

ASSESSMENT METHODS:

1. Global faculty evaluation (which includes the 6 competencies)
2. Direct observation of selected procedures and other critical processes (such as obtaining informed consent).
3. 360 degree evaluations.
4. Resident lecture evaluations.

Systems Based Practice

Goal

Fellows must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care. Residents are expected to:

- Work effectively in various health care delivery settings and systems relevant to their clinical specialty
- Work in inter-professional teams to enhance patient safety and improve patient care quality

Objectives

1. Faculty evaluation documenting achievement of competency
2. 360 degree evaluation
3. Attendance at multi-disciplinary conferences and peer review meetings.

ASSESSMENT METHODS:

1. Global faculty evaluation
2. Documentation of fellow participation in peer review meetings.
3. Documentation of active participation in multi-disciplinary conferences.

Fellowship program and faculty evaluations are submitted electronically with anonymity.

The pediatric radiology program will be evaluated annually. A committee consisting of the Program Director, at least 3 faculty members, and the fellow will review the program goals and objectives and their effectiveness. The committee will utilize written comments of faculty, the Internal Review report, and the fellow/residents confidential written evaluation. Fellow performance and outcome assessment will help in the evaluation of the program effectiveness.

Teaching Methods

Fellows will learn through active participation under the direct supervision of faculty members and through electronic on-line resources accessed to further understanding and knowledge base. Didactic conferences/teaching are also given cover the multiple subspecialty areas of pediatric radiology (core curriculum).

Assessment Method

The fellow's performance on this rotation or educational experience will be measured by:

1. Faculty, technologist, and patient evaluations of residents professionalism as well as perceptive, deductive, and diagnostic skills
2. The fellow will meet with the program director quarterly to evaluate progress. A written summation will be generated and kept in the fellows records.

Assessment Method (Program Evaluation)

The effectiveness of this educational experience is measured by the residents evaluate the rotation on a competency based evaluation. The rotation as well as individual faculty is evaluated and feed back provided to the program director and faculty.

Level of Supervision

All formal interpretations of non-invasive studies and the performance of all invasive studies are done under direct supervision of a faculty member.

Educational Resources

1. Caffey's Essentials of Pediatric Radiology
2. Donnelly, Fundamentals of Pediatric Radiology
3. Barkovich, Pediatric Neuroimaging
4. Tortori-Donati, Pediatric Neuroradiology Brain
5. Cleveland clinic online tutorial (www.pediatricradiology.ccf.org)
6. Pediatric radiology journal – free 6 month subscription to fellows

DEFINITIONS

Interpersonal and Communication Skills

Results in the effective exchange of information and collaboration with patients, their families, and other health professionals;

Patient Care

Provide patient care through safe, efficient, appropriately utilized, quality-controlled diagnostic and/or interventional radiology techniques and effectively communicate results to the referring physician and/or other appropriate individuals in a timely manner.

Medical Knowledge

Engage in continuous learning using up to date evidence and apply appropriate state of the art diagnostic and/or interventional radiology techniques to meet the imaging needs of patients, referring physicians and the health care system.

Practice-Based Learning and Improvement

This involves the investigation and evaluation of care for their patients, the appraisal and assimilation of scientific evidence, and improvements in patient care.

Professionalism

Commit to high standards of professional conduct, demonstrating altruism, compassion, honesty and integrity. Follow principles of ethics and confidentiality and consider religious, ethnic, gender, educational and other differences in interacting with patients and other members of the health care team

System-Based Practice

Understand how the components of the local and national healthcare system function interdependently and how changes to improve the system involve group and individual efforts. Optimize coordination of patient care both within one's own practice and within the healthcare system. Consult with other healthcare professionals, and educate healthcare consumers, regarding the most appropriate utilization of imaging resources

ACKNOWLEDGEMENT:

I have read and understand the goals and objectives of the UT Southwestern / Children's Medical Center Dallas Pediatric Radiology Fellowship Program.

I have / have not (circle) had an opportunity to discuss issues and concerns with the appropriate faculty or staff.

Signature

Date

Printed Name