

## **INTERVENTIONAL RADIOLOGY**

*H. Lee Moffitt Cancer Center and Research Institute*

**Rotation Director:** Junsung (JC) Choi, M.D.

**General Goals:** On this rotation, the resident will learn interventional radiology procedures primarily used in the diagnosis and treatment of cancer patients and their related illnesses. The experience will include aspects of abdominal, peripheral vascular, pulmonary and neurological diagnostic angiography, percutaneous biopsy and drainage techniques, as well as non-vascular biliary and genitourinary interventions.

### **Daily Work:**

- Availability from 8:00 a.m. until 5:00 p.m. or until all cases are completed.
- Visit each prospective inpatient case during the preceding afternoon, clarify the indication for the procedure, and evaluate the justification. Assemble and review all relevant imaging studies before contemplating any exam or procedure. Review the chart, write orders, and obtain informed consent. Place a pre-procedure note in the patient's chart indicating the (1) reason for the examination, (2) relevant past medical history, medications, and allergies, (3) laboratory values, (4) status of the lower and/or upper extremity pulses, (4) the risks, benefits, and alternatives that were explained to the patient. Endeavor to consent patients in the presence of any available family members. Always bring questions or problems to the attention of the attending interventional radiologist.
- Participate in the performance of the angiogram or procedure under direct attending supervision. The level of resident participation is at the discretion of the attending radiologist.
- Write a post-procedure note and post-procedure orders in the patient's chart as directed by the attending.
- Attend angiographic and interventional procedure read-out sessions. Resident dictation of reports is at the discretion of the attending radiologist.
- Participate in post-procedure patient evaluation and management in close consultation with the attending interventional radiologist.

### **Suggested Reading:**

Kandarpa, K, Aruny J, Handbook of Interventional Radiologic Procedures

## **Educational Goals and Objectives:**

Level of performance for each of the criteria is expected to vary based on experience. Fulfillment of expected level performance will be categorized as introductory, familiarity, competency, or mastery. At all levels, achievement of performance criteria for previous levels is subsumed. Definitions of these categories are given below:

**Introductory:** the resident has observed at least one of the procedures, and has seen or assisted another person performing the task

**Familiarity:** the resident has seen the task performed enough times to accurately describe technical factors necessary for performance of the task, and may have performed the task with supervision

**Competency:** the resident has observed and performed the task with supervision enough times to be capable of performing the task with direct or indirect supervision, but without explicit direction

**Mastery:** the resident has observed and performed the task with supervision enough times to be capable of performing the task without direct or indirect supervision

### *First Year Residents*

#### Patient care:

- Accurately perform a history and physical examination.
- Reliably handle daily requirements of the inpatients in cooperation with other residents and fellows under staff supervision.
- Understand endpoints for treatment of inpatients
- Formulate and execute patient care plans.
- Diligently review relevant clinical data, e.g., chart, outpatient record, labs, prior imaging exams.
- Acquire familiarity with the role of first and second assistant for major diagnostic and interventional procedures.
- Achieve competency with minor invasive procedures, such as myelography, arthrography, and tube maintenance.
- Gain an introduction to vascular access techniques.

#### Medical Knowledge:

- Understand the physiology and clinical impact of noninvasive procedures such as ankle brachial indices, pulsed volume recording, opening pressure, recirculation times, etc.
- Discuss the technical skills required for independent performance of minor procedures, such as arthrograms and drainage catheter checks.
- Describe the clinical relevance of catheter checks, including the need for preliminary films.
- Participate in daily readout.

#### Interpersonal Communication Skills:

- Provide concise and accurate patient presentations.
- Appropriately obtain informed consent.

- Produce radiologic reports that are accurate, concise, and grammatically correct.
- Effectively teach medical students.
- Communicate effectively with technical and nursing staff in the section.

#### Practice-Based Learning and Improvement:

- Learn to address each problem individually, tailoring the performance of the diagnostic test to fit the clinical needs.
- Pursue opportunities for procedural observation and performance, aggressively organize readout and other educational opportunities.
- Efficiently use the electronic medical record and the radiology information system.
- Attend weekly Moffitt Tuesday morning resident conference (IR conference 3<sup>rd</sup> Tuesdays of the month)

#### Professionalism:

- Demonstrate respect for patients and all members of the healthcare team.
- Serve as a role model for junior residents and medical students.
- Respect patient confidentiality.
- Present one's self as a professional in appearance and communication.
- Demonstrate initiative by being available and volunteering services during procedures and between cases.
- Demonstrate willingness to perform additional duties that contribute to the overall patient care and academic interests of the section.

#### Systems-Based Practice:

- Demonstrate knowledge of cost effectiveness of procedures such as prophylactic filter placement, endovascular treatment of aneurysms, and peripheral vascular disease vs. surgical intervention

### *Second Year Residents*

#### Patient Care:

- Demonstrate accurate clinical assessment of the patient, particularly those with vascular disease.
- Further clinical and patient assessment skills.
- Improve the ability to tailor diagnostic and therapeutic procedures to suit individual needs.
- Formulate a treatment plan based on a synthesis of clinical presentation, natural history of disease, and invasive findings.
- Improve performance of minor procedures.
- Knowledgeable in performing as first assistant in major interventions.
- Acquire familiarity with first order selective catheterizations below the diaphragm.

#### Medical Knowledge:

- Develop a working knowledge of the natural history, prognosis and need for therapy in patients with vascular disease.
- Discuss fluid dynamics and the physiology of noninvasive tests such as ankle-brachial indexes, exercise testing, pulsed-volume recordings.

- Accurate interpretation of angiograms and pressure measurements.

#### Interpersonal and Communication Skills:

- Appropriately obtain informed consent
- Appropriately communicate and document in the patient record urgent or unexpected radiologic findings.
- Produce radiologic reports that are accurate, concise and grammatically correct.
- Communicate effectively with nurses and technologists in the VIR section.

#### Practice-based learning and improvement:

- Effectively use electronic medical record and radiology information system to access prior labs and reports.
- Incorporate feedback obtained during morning report and afternoon readout into improved performance.

#### Professionalism:

- Demonstrate initiative by being available and volunteering services during procedures and between cases.
- Demonstrate willingness to perform additional duties that contribute to the overall patient care and academic interests of the section.
- Demonstrate respect for patients and all members of the healthcare team.
- Serve as a role model for junior residents and medical students.
- Respect patient confidentiality.
- Present one's self as a professional in appearance and communication.

#### Systems-Based Practice:

- Attend weekly Moffitt Tuesday morning resident conference (IR conference 3<sup>rd</sup> Tuesdays of the month)
- Demonstrate knowledge of cost effectiveness of procedures such as prophylactic filter placement, endovascular treatment of aneurysms, and peripheral vascular disease vs. surgical intervention

### *Third Year Residents*

#### Patient Care:

- Master understanding the significance of the clinical presentation and its relevance to the planned procedure.
- Assimilate available clinical and verbal history prior to initiating any invasive procedure.

#### Medical Knowledge:

- Master the first assistant role during major interventions.
- Master the understanding of the significance of the clinical presentation and its relevance to the planned procedure.
- Gain competency with basic diagnostic and interventional procedures.
- Gain competency with selective catheterization below the diaphragm.
- Get an introduction to selective catheterization above the diaphragm.

#### Interpersonal Communication Skills:

- Become competent in interdepartmental presentation of diagnostic findings and therapeutic interventions.
- Appropriately obtain informed consent.
- Produce radiologic reports that are accurate, concise, and grammatically correct.
- Effectively teach medical students.
- Communicate effectively with technical and nursing staff in the section.

#### Practice-Based Learning and Improvement:

- Effectively use electronic medical record and radiology information system to access prior labs and reports.
- Incorporate feedback obtained during morning report and afternoon readout into improved performance.

#### Professionalism:

- Demonstrate initiative by being available and volunteering services during procedures and between cases.
- Demonstrate willingness to perform additional duties that contribute to the overall patient care and academic interests of the section.
- Demonstrate respect for patients and all members of the healthcare team.
- Serve as a role model for junior residents and medical students.
- Respect patient confidentiality.
- Present one's self as a professional in appearance and communication.

#### Systems-Based Practice:

- Attend weekly Moffitt Tuesday morning resident conference (IR conference 3<sup>rd</sup> Tuesdays of the month).
- Demonstrate knowledge of cost effectiveness of procedures such as prophylactic filter placement, endovascular treatment of aneurysms, and peripheral vascular disease vs. surgical intervention.

#### *Fourth Year Residents*

##### Patient Care:

- Master clinical skills.
- Properly synthesize data including lab and imaging results prior to initiating any procedure.
- Achieve competency with all invasive diagnostic procedures including first-order selective arteriography, transhepatic cholangiography, antegrade nephrostogram, venography and biliary drainage.
- Acquire familiarity with advanced interventions such as vena cava filter replacement, angioplasty, intravascular stent placement, central venous access.
- Get an introduction to complex state-of-the-art intervention such as TIPS procedures, chemoembolization, and neurointervention.

#### Medical Knowledge:

- Gain a thorough understanding of pathophysiology of vascular disease, noninvasive tests, hemodynamics, and angiograms.
- Read and retain pertinent literature, including research for cases of particular interest.

#### Interpersonal and Communication Skills:

- Achieve mastery in departmental presentation of diagnostic findings and therapeutic options.
- Appropriately obtain informed consent.
- Produce radiologic reports that are accurate, concise, and grammatically correct.
- Effectively teach medical students.
- Communicate effectively with technical and nursing staff in the section.

#### Practice-Based Learning and Improvement:

- Effectively use electronic medical record and radiology information system to access prior labs and reports.
- Incorporate feedback obtained during morning report and afternoon readout into improved performance.

#### Professionalism:

- Demonstrate initiative by being available and volunteering services during procedures and between cases.
- Demonstrate willingness to perform additional duties that contribute to the overall patient care and academic interests of the section.
- Demonstrate respect for patients and all members of the healthcare team.
- Serve as a role model for junior residents and medical students.
- Respect patient confidentiality.
- Present one's self as a professional in appearance and communication.

#### Systems-Based Practice:

- Attend weekly Moffitt Tuesday morning resident conference (IR conference 3<sup>rd</sup> Tuesdays of the month)
- Demonstrate knowledge of cost effectiveness of procedures such as prophylactic filter placement, endovascular treatment of aneurysms, and peripheral vascular disease vs. surgical intervention.
- Be able to discuss the relative merits of endovascular versus surgical approach to oncologic, peripheral vascular and neurovascular diseases; i.e. chemoembolization, cholangiography, port placement, metastatic liver disease, uterine artery fibroids, etc.

**Mechanism of Evaluation:** In addition to the staged expectations for daily performance of the residents depending on level of training, residents' work done outside of the section will be assessed during morning report, during procedures, and at evening readout. Diligent reading of core text books (see reading list) and literature to result in familiarity with concepts of Vascular and Interventional Radiology commensurate with level of training is expected. Reading should be dictated in part by cases scheduled for the next day or another day in the future. At times, patient care may mandate literature review of a particular disease or procedure. Resident evaluations will depend in part on their achievement of these performance criteria. This will be reflected in the global evaluation form included at the end of this document. Medical knowledge in vascular and interventional radiology will be assessed by the ACR in-service examination. All residents are required to maintain a log of their procedures to document the type and number of procedures performed during their residency, as well as the outcome and incidence of their complications.