

# **Curriculum**

## **Cardiac Catheterization**

### **Description of Rotation or Educational Experience**

The goals of this rotation are for the cardiology fellow to develop effective technical skills in the performance of diagnostic and therapeutic catheter-based procedures to learn the indications, risks, and benefits of these procedures and to develop a comprehensive understanding of the role of these procedures in the management of patients with cardiovascular disease.

Specific educational goals for this rotation include acquiring and developing skills in the:

- Technical performance of angiographic procedures, including:
  - Coronary angiography
  - Right heart catheterization
  - Cardiovascular hemodynamics
  - Endomyocardial biopsy
  - Pericardiocentesis
  - Placement of temporary pacemaker wires
  - Peripheral angiography
- Understanding of catheter-based interventions, including:
  - Coronary angioplasty/stenting
  - Septal ablation
  - Peripheral vascular stenting
  - Closure of patent foramen ovalae (PFOs)
- Evaluation of patients for whom procedures have been requested, with an emphasis on the indication for the procedure and the potential risks to this individual.
- Management of common peri-procedural conditions and complications including:
  - Renal dysfunction before and following the procedure
  - Retroperitoneal bleeding
  - Vascular complications of angiography
- Preparation of concise and accurate procedural reports.

### **Progressive Education**

The initial cardiac cath lab rotations will focus on early technical tasks such as safe vascular access, double flushing of catheters, use of the manifold, hemodynamic interpretation, and simple catheter manipulation. Progression of technical skills is largely a function of experience as well as individual learning curves. As fellows become competent with their cath lab techniques, they will be instructed in more complex maneuvers such as selective engagement of coronary arteries and bypass grafts, moving the table and setting up the appropriate views. Senior cath fellows who have acquired the requisite skills also participate in percutaneous coronary interventions at the VA Hospital. By the end of their clinical training, the expectation is that fellows will be well trained and be capable of independently and safely performing diagnostic cardiac catheterization.

### **Patient Care**

#### **Goal**

Fellows must be able to identify whether a procedure is appropriate for the patient referred, recognize risks and benefits of planned procedures, provide patients with necessary information to give a valid informed consent to the procedure, and follow patients following the procedure to ensure optimal management of any procedural complications.

Fellows are expected to:

### **Competencies**

- Develop skills necessary to perform procedures under supervision of the attending physician.
- Evaluate whether the procedure is appropriate for the patient
- Prepare a concise, accurate report of the procedure which was performed.
- Evaluate patients following procedures to assess whether there have been any complications.

### **Objectives**

- Each patient's history, physical exam laboratory data and additional data are reviewed with the faculty before the procedure is done.
- During each procedure, the attending closely monitors the fellow's skills, judgment, and access and intervenes directly when necessary.
- Procedural reports are reviewed by the attending faculty for accuracy and completeness

## **Medical Knowledge**

### **Goal**

Fellows must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. Fellows are expected to demonstrate:

### **Competencies**

- Knowledge of cardiovascular anatomy with emphasis on the vascular structures needed for access
- Understanding of cardiovascular hemodynamics
- Ability to evaluate patient's medical condition and prior diagnostic evaluations to provide appropriate risk/benefit analysis.
- Technical skills for catheter placement and manipulation
- Knowledge of indications for procedures and guidelines for patient management

### **Objectives**

- Knowledge about the indications and risks of the procedure are reviewed by an attending prior to each procedure.
- Fellows present cases at weekly interdisciplinary cardiology rounds and review all relevant data at that time

## **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 :

### **Competencies**

- Identify strengths, deficiencies and limits in one's knowledge and expertise;
- Systematically analyze practice, using quality improvement methods, and implement changes with the goal of practice improvement
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### **Objectives**

- Fellows receive direct feedback on technique during the performance of each procedure and are performance improvement is closely monitored by attending physicians.

- Cases are presented at the regular quality assurance meetings for the cath lab

### **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. Fellows are expected to:

#### **Competencies**

- Incorporate considerations of cost awareness and risk-benefit analysis in patient care
- Work in interprofessional teams to enhance patient safety and improve patient care quality
- Participate in identifying systems errors and in implementing potential systems solutions

#### **Objectives**

- Each procedure is reviewed by the attending for the risks and benefits before it is performed.
- Working in the catheterization laboratory requires co-ordination of care between a numbers of services. Feedback on the fellow's proficiency is obtained from all these sources.
- Cases are presented at the regular quality assurance meetings for the cath lab.

### **Professionalism**

#### **Goal**

Fellows must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. Fellows are expected to demonstrate:

#### **Competencies**

- Responsiveness to patient needs that supersedes self-interest
- Respect for patient privacy and autonomy

#### **Objectives**

- Attentiveness and responsiveness to patient concerns and needs are monitored not only by the attending physician, but all by nursing and cath lab staff.
- Feedback is provided to the attending physician by the nursing staff, technicians, and cath lab staff.

### **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**

- Communicate effectively with patients and families across a broad range of socioeconomic and cultural backgrounds
- Work effectively as a member or leader of a health care team or other professional group

#### **Objectives**

- Patients from across a broad range of socioeconomic and cultural backgrounds need to be approached and need to establish an understanding of the risks and benefits of the planned procedures, as well as understanding the outcome of the procedure.

- Optimizing a cardiac catheterization involves co-ordinating not only the cath lab staff, but also the nursing staff on the wards and often additional resources, such as imaging.

**Teaching Methods**

Educational methods include, but are not limited to:

- Ad hoc discussions of issues relevant to the cases being performed.
- A weekly multidisciplinary (cardiology, cardiovascular surgery, cardiovascular imaging, cardiovascular anesthesia) conference is mandatory for fellows on the cardiac catheterization rotation.
- Monthly quality assurance meetings are held for the cath lab.

**Assessment Method (fellows)**

Fellows are given immediate feedback on whether their assessment and plan is appropriate at the time of presentation, and are given direct feedback during performance of the procedure.

In addition, fellows are given individual, oral feedback at the end of the rotation. Written evaluations are entered into MedHub. Performance of the fellows in the program is reviewed on a semiannual basis with input from attendings on all the services. This cumulative feedback is then provided to the fellow by the fellowship director.

<b>Assessment Method (Program Evaluation)</b>
At the end of the rotation, fellows are asked to provide anonymous written feedback, as well as participating in semiannual meeting of all the cardiovascular fellows to evaluate the program.
<b>Level of Supervision</b>
Direct faculty supervision is provided to each fellow during each procedure Procedure reports are reviewed and signed by the faculty member who did the procedure.
<b>Educational Resources</b>
WEBSITES for cardiovascular guidelines: <ul style="list-style-type: none"> <li>- American Heart Association: <a href="http://www.americanheart.org">www.americanheart.org</a> (search guidelines with site search function)</li> <li>- American College of Cardiology: <a href="http://www.acc.org">www.acc.org</a> (quality and science tab)</li> </ul> Other resources: