NMMC Cardiovascular Fellowship | PGY4 Expectations

Cath Lab Rotation Expectations

Month 1

1. Know the indications, risks, and benefits of cardiac catheterization
2. Review pre-procedure laboratory data and non-invasive studies
3. Identify possible contraindications for angiography and catheterization
4. Obtain informed consent and discuss alternatives with patients
5. Understands sites of vascular access, and anatomy along the way to the heart
6. Understand procedural pharmacotherapy and conscious sedation
7. Understand appropriate selection of catheters and devices
8. Obtain appropriate angiographic views
9. Understand hemodynamic assessment and normal values

Week 1

1. Fill out pre-cath work sheet on all elective patients
2. Learn how to scrub — watch what the tech does
3. Learn table set up/draping
4. Learn the flow of the manifold
5. Learn how to wipe/coil a wire

Week 2

1. Assume role of the tech
2. Learn basics of vascular access

Week 3-4

1. Get vascular access
2. Continue in role of the tech

Week 5

1. Begin to perform cath/pan table

Month 2–3

1. Accurate interpretation of angiograms
2. Learn ultrasound imaging to aid in vascular access
3. Safely perform uncomplicated coronary angiography

4. Recognize complications or potential complications
5. Recognize normal vascular variants
6. Appropriately apply the cath lab information to the clinical management of the patient
7. Participate in Cath Lab QI projects
8. Develop accurate and timely cath reports
9. Communicates cath results effectively to referring providers, patient and family
10. Demonstrate an understanding of the indications and contraindications for various other types of procedures, including hemodynamic invasive monitoring with Swan-Ganz catheters, arterial catheter monitoring, intra-aortic balloon pump, mechanical circulatory support, and percutaneous and surgical revascularization.

Non-Invasive Rotation Expectations

Echocardiology

Month 1-2

1. Understand the indications and limitations of trans-thoracic echocardiography
2. Learn echo views and anatomy demonstrated
3. Spend time with sonographers and perform trans-thoracic echoes (minimal 75 needed)
4. Understand indications of doppler, tissue doppler, color flow and strain imaging and their interpretation
5. Efficiently and effectively document in writing the interpretations, observations, measurements, conclusions and suggestions that will be entered into the medical record
6. Participate in discussions of patient care and management in relation to echocardiography uses and findings with other medical disciplines and specialties

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Week 1-3

1. Transduce with echo techs

Month 3-4

1. Demonstrate the ability to distinguish artifacts from clinically important findings and to begin getting experience in technical aspects of performing studies to better recognize potential difficulties associated with acquisition which may influence the interpretation of studies.

2. Demonstrate competency in performing stress echocardiography, recognizing indications and contraindications and have skill in performing the stress portion of the test.
3. Demonstrate the ability to independently perform transthoracic echocardiograms of a diagnostic quality.

Stress Testing

Month 1-2

1. Understand the indications for exercise ECG testing
2. Understand the limitations and contraindications to exercise ECG testing
3. Understand the accurate interpretation of exercise ECG testing — including ECG changes, hemodynamics, and clinical response
4. Perform 50 stress ECG tests
5. Apply the exercise stress test results to the clinical management of the patient

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Week 1-4

1. Supervise stress tests for total of 50

Stress Echo Testing

Month 2-4

1. Understand the indications for stress echo imaging.
2. Understand the limitations and contraindications to exercise stress echo testing
3. Understand the limitations and contraindications to pharmacologic stress echo testing
4. Understand the acquisition of stress echo images
5. Understand the accurate interpretation of stress echocardiology testing — including ECG changes, hemodynamics and clinical response as well as wall motion analysis
6. Understand the value of stress echocardiology for assessment of valvular heart disease
7. Understand the value of stress echocardiology for assessment of myocardial viability
8. Perform 100 stress echo tests
9. Apply the stress echo test results to the clinical management of the patient

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Stress Radionuclide Testing

Month 2-4

1. Understand the indications for stress radionuclide imaging
2. Understand the limitations and contraindications to exercise stress radionuclide testing
3. Understand the limitations and contraindications to pharmacologic stress radionuclide testing
4. Understand the acquisition of stress radionuclide images
5. Understand the accurate interpretation of stress radionuclide testing — including ECG changes, hemodynamics and clinical response as well as perfusion, FFR and wall motion analysis
6. Perform 100 stress radionuclide tests
7. Apply the exercise stress radionuclide test results to the clinical management of the patient
8. Understand the differences between PET and Cardiolite imaging.

Cardiac CTA Imaging

Month 2-4

1. Understand the indications for CCTA imaging
2. Understand the limitations and contraindications to CCTA testing
3. Understand the acquisition of CCTA images
4. Understand the accurate interpretation of CCTA — including perfusion, FFR, and wall motion analysis
5. Understand extra-cardiac structure interpretation with CCTA
6. Perform 100 CCTA tests
7. Apply the CCTA test results to the clinical management of the patient

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Carotid Imaging

Month 2-4

1. Understand the indications for Carotid Duplex imaging
2. Understand the limitations and contraindications to Carotid Duplex testing
3. Understand the acquisition of Carotid Duplex images
4. Understand the accurate interpretation of Carotid Duplex — including color flow, gray scale, and plaque imaging
5. Understand extra-cardiac structure interpretation with Carotid Duplex
6. Perform 100 Carotid Duplex tests

7. Apply the Carotid Duplex test results to the clinical management of the patient

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Peripheral Arterial Vascular Imaging (including AAA)

Month 2-4

1. Understand the indications for Peripheral Arterial Vascular Imaging
2. Understand the limitations and contraindications to Peripheral Arterial Vascular Imaging testing
3. Understand the acquisition of Peripheral Arterial Vascular Imaging images
4. Understand the accurate interpretation of Peripheral Arterial Vascular Imaging — including color flow, gray scale, and plaque imaging
5. Understand extra-cardiac structure interpretation with Peripheral Arterial Vascular Imaging
6. Perform 100 Peripheral Arterial Vascular Imaging tests
7. Apply the Peripheral Arterial Vascular Imaging test results to the clinical management of the patient

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Venous Duplex Imaging

Month 2-4

1. Understand the indications for Venous Duplex Imaging
2. Understand the limitations and contraindications to Venous Duplex Imaging testing
3. Understand the acquisition of Venous Duplex Imaging images
4. Understand the accurate interpretation of Venous Duplex Imaging — including color flow, gray scale, compression and plaque imaging
5. Understand extra-cardiac structure interpretation with Venous Duplex Imaging
6. Perform 100 Venous Duplex Imaging tests
7. Apply the Venous Duplex Imaging test results to the clinical management of the patient

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Electrophysiology Rotation Expectations

Month 1-2

1. Develop a strong understanding and expertise in electrocardiography and Holter monitor reading
2. Acquire the medical knowledge to understand the indications for the medical necessity of a diagnostic electrophysiology study, acquire knowledge for

interpretation of basic intracardiac electrograms, evaluation of patients with complex ventricular arrhythmias, trouble-shoot and program various types of devices, and understanding patient selection and indications for the need of an electrophysiology study and device implantation

3. Acquire quality assessment improvement in evaluating and performing basic procedure understanding in electrophysiology
4. Foster an attitude of life-long learning critical thinking skills that will be gained by experience and incorporating new developments
5. Review pre-procedure laboratory and non-invasive studies
6. Identify possible contra-indication for an electrophysiology study and/or device implantation
7. Introduction to the interpretation of intracardiac electrograms
8. Acquire knowledge on how to handle life-threatening complications from an arrhythmia point
9. Effectively communicate with the patient, their families, and referring physicians for an appropriate plan of care of arrhythmias
10. **Attend device interrogation educational meeting**

Consultation/CCU Service Expectations

1. Demonstrate competency in advanced history taking and physical diagnosis as they relate to common and uncommon cardiac diseases and cardiovascular complications of non-cardiac diseases and procedures
2. Formulate a differential diagnosis and outline a plan for evaluating and managing patients as a member of a multidisciplinary team
3. Demonstrate organizational skills necessary to care for the patient with pre-existing cardiovascular diseases or cardiovascular complications of medical, surgical or obstetrical conditions, including development of a problem list and the use of information technology
4. Demonstrate an open, analytical approach to the acquisition and application of knowledge to patient care by performing patient-specific literature review
5. Efficiently and effectively document in writing on initial consultation assessment, conclusions and recommendations; chart daily progress notes in the medical record
6. Demonstrate effective communication with patients, families, consulting providers, other consultants and staff
7. Learn how to apply evidence-based, cost-conscious strategies to diagnose and manage hospitalized patients
8. Fellows will be proficient in the diagnosis and initial management of the following complaints/disorders:

- Chest pain and acute coronary syndromes (Unstable angina, NSTEMI and STEMI)
- Acute myocardial infarction including indications for acute reperfusion therapy with thrombolytics and/oracute angioplasty
- Decompensated heart failure (systolic and diastolic) including indications for hemodynamic monitoring, inotropic support or mechanical circulatory support
- Tachyarrhythmias including both supraventricular (atrial fibrillation, atrial flutter, atrial tachycardiac, AVNRT, AVRT, etc.) and ventricular (VT, VF, etc.)
- Bradyarrhythmias including indications for temporary pacing
- Acute valvular heart disease or decompensation of chronic valvular disease
- Pulmonary emboli
- Aortic dissection
- Pericardial disease (tamponade, acute pericarditis, etc.) including indications and techniques for percutaneous drainage of pericardial effusion in the emergent setting

9. Fellows will develop proficiency in the interpretation of EKGs with the following conditions:
    - Acute MI, atrial fibrillation, supraventricular tachycardia, ventricular tachycardia, AV blocks (1st, 2nd, 3rd degree), pericarditis, LVH, etc.
10. Fellows will appropriately order and understand the indications and contraindications, as well as complications associated with the following tests/procedures:
    - Central line placement
    - Arterial line placement
    - Cardiac catheterization
    - Intra-aortic balloon pump
    - Swan-Ganz catheter
    - Temporary transvenous pacemakers
    - Emergency pericardiocentesis