

# CARDIAC CATHETERIZATION AND IMAGING

CARDIOLOGY RESIDENCY PROGRAM

McMASTER UNIVERSITY

## ROTATION SUPERVISORS

CARDIAC CATHETERIZATION: DR. MATT SIBBALD

CARDIAC IMAGING: DR. VIKAS TANDON (CT)/ DR. JAVIER GANAME (MRI)

## OVERVIEW

The Cardiac Catheterization rotation is a lab-based rotation located in the Heart Investigation Unit (HIU) at the Hamilton General Hospital. As the highest-volume centre in the province with expertise in complex coronary interventions, structural heart disease, and cardiac hemodynamics, the HIU provides the resident exposure to a wide spectrum of invasive diagnostic and therapeutic interventions. The focus of the rotation is on the management of patients referred for cardiac catheterization for the investigation and treatment of a variety of cardiac disorders, including acute and chronic ischemic heart disease, valvular heart disease, cardiomyopathy, adult congenital heart disease, and pulmonary vascular disease. Emphasis is on the assessment of patients scheduled to undergo catheterization, the technical execution of the procedure, and the interpretation of the hemodynamic and angiographic data. The cardiology resident will be primarily involved in the assessment of patients undergoing left and/or right heart catheterization and will be encouraged to scrub in for all diagnostic studies; interventional procedures will be performed by the interventional cardiology fellow.

Exposure to one block of advanced imaging in cardiac CT and cardiac MR is incorporated in the rotation and occurs longitudinally with two days per week dedicated to the acquisition and interpretation of cardiac CT and MR images. Please refer to the respective documents below for rotation specific goals and objectives for cardiac CT and MR. Dedicated cardiologists with experience in cardiac imaging supervise the residents. This component of the rotation is based in the diagnostic imaging department at the Hamilton General Hospital and JHCC.

## GOALS AND OBJECTIVES – CARDIAC CATHETERIZATION

The goals and objectives for the cardiac catheterization and imaging rotation at Hamilton General Hospital have been formulated to guide cardiology residents in identifying and acquiring the key competencies required to succeed as a consultant cardiologist and are based on the CanMEDS 2015 framework of the Royal College of Physicians and Surgeons of Canada. These key competencies include: medical expert, communicator, collaborator, leader, health advocate, scholar and professional. The rotation provides graded responsibility in achieving these objectives based on the resident's level of training and previous cardiac catheterization experience.

### PGY 4/5:

The resident is able to:

1. Perform a thorough pre-procedural assessment and obtain informed consent.
2. Reliably obtain vascular access and effectively ensure vascular hemostasis.
3. Gain a thorough understanding of coronary anatomy.
4. Understand the indications for the medical, percutaneous, or surgical treatment of patients undergoing cardiac catheterization.
5. Understand normal cardiac hemodynamics and be able to interpret hemodynamic data in dilated, restrictive and hypertrophic cardiomyopathy, valvular heart disease, pericardial disease, adult congenital heart disease and pulmonary hypertension.
6. Know the possible complications of cardiac catheterization and strategies to minimize these risks.
7. Understand basic radiation physics and the technical aspects of image acquisition.
8. Understand the potential occupational hazards associated with ionizing radiation and incorporate strategies to minimize exposure for patients and staff.

### PGY 6:

The resident builds on the previous skill set and is also able to:

1. Engage the coronary arteries and obtain full diagnostic images with minimal assistance.

2. Understand the angiographic views and completely describe the coronary anatomy.
3. Perform right heart catheterization, obtain the appropriate hemodynamic measurements, and interpret the results including all calculations as necessary to quantify cardiac output, valve area, vascular resistance and shunt fraction.
4. Integrate the clinical presentation with the angiographic and hemodynamic data to establish a diagnosis and define a management strategy.
5. Communicate the results of the procedure to patients and referring physicians with a clearly defined assessment and management plan.

## **CANMEDS COMPETENCIES**

### **A MEDICAL EXPERT**

***Global Objective: To acquire the medical knowledge and clinical skills necessary to provide high quality and safe patient-centered care.***

1. Understand the clinical presentation, natural history and prognosis of acute and chronic ischemic heart disease.
2. Understand the clinical presentations, natural histories and prognoses of the various forms of valvular heart disease, cardiomyopathies, pericardial disease, and adult congenital heart disease and know the indications for cardiac catheterization in these conditions.
3. Know the indications for right and/or left heart catheterization and cardiac CT in ischemic and non-ischemic heart disease.
4. Know the rationale for medical therapy, percutaneous coronary intervention, and surgical revascularization in acute and chronic ischemic heart disease.
5. Gain competence in obtaining vascular access and hemostasis and in managing the complications of vascular access.
6. Develop competence in interpreting coronary and cardiac CT angiograms.
7. Develop competence in performing right heart catheterization and in interpreting hemodynamic data.
8. Gain an understanding of radiation exposure and techniques to minimize exposure dose.

### **B COMMUNICATOR**

***Global Objective: To develop relationships with patients, families, and health professionals which facilitate the gathering and sharing of information essential for effective health care***

1. Develop expertise in obtaining and synthesizing the relevant history from patients and families and obtaining informed consent.
2. Gain experience in providing transfer of care to colleagues for patients being admitted to hospital.
3. Be able to accurately and efficiently communicate the results of the study and any treatment recommendations to the referring physician.

### **C COLLABORATOR**

***Global Objective: To work effectively with other health care professionals to provide safe, high quality, patient-centered care***

1. Collaborate with the charge nurse to triage patients based on medical urgency.
2. Provide timely and complete physician-to-physician transfer of care for patients being admitted to hospital from the cardiac catheterization lab.

### **D LEADER**

***Global Objective: To develop a vision of a high quality health care system and take responsibility for effecting change to move the system toward the achievement of that vision***

1. Contribute to quality improvement by understanding the risks of cardiac catheterization and developing strategies to minimize these risks.

2. Develop an understanding of the health care costs of cardiac catheterization and intervention and use best evidence to provide cost-appropriate care.
3. Develop effective time management skills.

## **E** HEALTH ADVOCATE

***Global Objective: To develop a partnership with patients, their families, and support agencies to influence health determinants***

1. Incorporate disease prevention, health promotion, and health surveillance into interactions with individual patients.
2. Recognize personal, cultural, and socio-economic impediments to care and propose strategies to overcome these barriers.

## **F** SCHOLAR

***Global Objective: To demonstrate a lifelong commitment to excellence in practice through continuous learning, the teaching of others, the evaluation of evidence, and contributions to scholarship***

1. Recognize gaps in knowledge and develop strategies to fill these gaps through reading and consulting other members of the health care team.
2. Demonstrate the ability to critically appraise the medical literature and integrate best available evidence into practice.
3. Attend and contribute to cardiac catheterization rounds.

## **G** PROFESSIONAL

***Global Objective: To demonstrate ethical practice, high personal standards of behavior, dedication to the profession and maintenance of personal health***

1. Deliver care with integrity, honesty and compassion.
2. Adhere to the professional and ethical codes, standards of practice, and laws governing practice.
3. Develop self-awareness of personal limitations and seek assistance when appropriate.



## PG ITER - Cardiology/Internal Medicine

Rotation: Cardiac Catheterization  
Level: PGY4, PGY5

### Legend:

N/A - Non Applicable

- 1 - **Unsatisfactory**: Performs significantly lower than level of training
- 2 - **Provisional Satisfactory**: Performs lower than level of training
- 3 - **Satisfactory**: Meets expectations at level of training
- 4 - **Very Good**: Exceeds expectations for level of training
- 5 - **Outstanding**: Significantly exceeds expectations for level of training

NOTE: If the learner functions at their training level, then the learner should obtain a score of Satisfactory.

### Medical Expert

	Unsatisfactory	Provisional Satisfactory	Satisfactory	Very Good	Outstanding	N/A
	1	2	3	4	5	
Is able to perform a thorough pre-procedural assessment and obtain informed consent.	0	0	0	0	0	0
Is able to reliably obtain vascular access and effectively ensure vascular hemostasis.	0	0	0	0	0	0
Demonstrates a thorough understanding of coronary anatomy.	0	0	0	0	0	0
Understands the indications for the medical, percutaneous, or surgical treatment of patients undergoing cardiac catheterization	0	0	0	0	0	0
Understands normal cardiac hemodynamics and is able to interpret hemodynamic data in dilated, restrictive and hypertrophic cardiomyopathy, valvular heart disease, pericardial disease, adult congenital heart disease and pulmonary hypertension.	0	0	0	0	0	0
Knows the possible complications of cardiac catheterization and strategies to minimize these risks.	0	0	0	0	0	0
Understands basic radiation physics and the technical aspects of image acquisition.	0	0	0	0	0	0

Understands the potential occupational hazards associated with ionizing radiation and incorporates strategies to minimize exposure for patients and staff.	0	0	0	0	0	0
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## Communicator

	Unsatisfactory 1	Provisional Satisfactory 2	Satisfactory 3	Very Good 4	Outstanding 5	N/A
Provides appropriate transfer of care to colleagues for patients being admitted from the cath lab.	0	0	0	0	0	0
Dictates appropriate consultation letters to referring physicians.	0	0	0	0	0	0

## Collaborator

	Unsatisfactory 1	Provisional Satisfactory 2	Satisfactory 3	Very Good 4	Outstanding 5	N/A
Collaborates with the nursing staff to provide efficient patient flow and triage based on medical urgency.	0	0	0	0	0	0
Provides timely and complete physician-to-physician transfer of care for patients being admitted to hospital from the cardiac catheterization lab.	0	0	0	0	0	0

## Leader

	Unsatisfactory 1	Provisional Satisfactory 2	Satisfactory 3	Very Good 4	Outstanding 5	N/A
Contributes to quality improvement by understanding the risks of cardiac catheterization and adopting strategies to minimize these risks.	0	0	0	0	0	0
Develop an understanding of the health care costs of cardiac catheterization and intervention and use best evidence to provide cost-appropriate care.	0	0	0	0	0	0
Displays effective time management skills.	0	0	0	0	0	0

## Health Advocate

	Unsatisfactory 1	Provisional Satisfactory 2	Satisfactory 3	Very Good 4	Outstanding 5	N/A
Incorporates disease prevention, health promotion, and health surveillance into interactions with individual patients.	0	0	0	0	0	0

Recognizes personal, cultural, and socio-economic impediments to care and proposes strategies to overcome these barriers.	0	0	0	0	0	0
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## Scholar

	Unsatisfactory 1	Provisional Satisfactory 2	Satisfactory 3	Very Good 4	Outstanding 5	N/A
Recognizes gaps in knowledge and develops strategies to fill these gaps through reading and consulting other members of the health care team.	0	0	0	0	0	0
Integrates best available evidence into clinical decision-making.	0	0	0	0	0	0
Contributes to dissemination of knowledge by active participation at cardiac catheterization rounds.	0	0	0	0	0	0

## Professional

	Unsatisfactory 1	Provisional Satisfactory 2	Satisfactory 3	Very Good 4	Outstanding 5	N/A
Delivers care with integrity, honesty and compassion.	0	0	0	0	0	0
Adheres to the professional and ethical codes, standards of practice, and laws governing practice.	0	0	0	0	0	0
Demonstrates self-awareness of personal limitations and seeks assistance when appropriate.	0	0	0	0	0	0

## OVERALL COMPETENCE (FOR LEVEL OF TRAINING)

	Incomplete 1	Unsatisfactory 2	Provisional Satisfactory 3	Satisfactory 4
Please check the appropriate box for the overall competency of this learner's training level	0	0	0	0
Was input sought from other faculty, allied health professionals, or patients and their family members? (If yes, please please specify in the comment box provided immediately below)	<input type="radio"/> Yes <input type="radio"/> No			

Comments

### Summative Comments

(Any item evaluated above or below a 3, must include comments and examples to justify the rating)

**Formative Comments**

*(Please provide 1-2 items for the resident to improve upon in order to progress along the competency continuum)*

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Dictates appropriate consultation letters to referring physicians.	0	0	0	0	0	0
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## Collaborator

	Unsatisfactory 1	Provisional Satisfactory 2	Satisfactory 3	Very Good 4	Outstanding 5	N/A
Collaborates with the nursing staff to provide efficient patient flow and triage based on medical urgency.	0	0	0	0	0	0
Provides timely and complete physician-to-physician transfer of care for patients being admitted to hospital from the cardiac catheterization lab.	0	0	0	0	0	0

## Leader

	Unsatisfactory 1	Provisional Satisfactory 2	Satisfactory 3	Very Good 4	Outstanding 5	N/A
Contributes to quality improvement by understanding the risks of cardiac catheterization and adopting strategies to minimize these risks.	0	0	0	0	0	0
Develop an understanding of the health care costs of cardiac catheterization and intervention and use best evidence to provide cost-appropriate care.	0	0	0	0	0	0
Displays effective time management skills.	0	0	0	0	0	0

## Health Advocate

	Unsatisfactory 1	Provisional Satisfactory 2	Satisfactory 3	Very Good 4	Outstanding 5	N/A
Incorporates disease prevention, health promotion, and health surveillance into interactions with individual patients.	0	0	0	0	0	0
Recognizes personal, cultural, and socio-economic impediments to care and proposes strategies to overcome these barriers.	0	0	0	0	0	0

## Scholar

	Unsatisfactory 1	Provisional Satisfactory 2	Satisfactory 3	Very Good 4	Outstanding 5	N/A
Recognizes gaps in knowledge and develops strategies to fill these gaps through reading and consulting other members of the health care team.	0	0	0	0	0	0
Integrates best available evidence into clinical decision-making.	0	0	0	0	0	0

Contributes to dissemination of knowledge by active participation at cardiac catheterization rounds.	0	0	0	0	0	0
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### Professional

	Unsatisfactory 1	Provisional Satisfactory 2	Satisfactory 3	Very Good 4	Outstanding 5	N/A
Delivers care with integrity, honesty and compassion.	0	0	0	0	0	0
Adheres to the professional and ethical codes, standards of practice, and laws governing practice.	0	0	0	0	0	0
Demonstrates self-awareness of personal limitations and seeks assistance when appropriate.	0	0	0	0	0	0

### OVERALL COMPETENCE (FOR LEVEL OF TRAINING)

	Incomplete 1	Unsatisfactory 2	Provisional Satisfactory 3	Satisfactory 4
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Please check the appropriate box for the overall competency of this learner's training level

1     
 2     
 3     
 4

Was input sought from other faculty, allied health professionals, or patients and their family members?  
*(If yes, please please specify in the comment box provided immediately below)*

Yes     No

Comments

#### Summative Comments

*(Any item evaluated above or below a 3, must include comments and examples to justify the rating)*

#### Formative Comments

*(Please provide 1-2 items for the resident to improve upon in order to progress along the competency continuum)*