

ARRHYTHMIA ROTATION

CARDIOLOGY RESIDENCY PROGRAM

McMASTER UNIVERSITY

ROTATION SUPERVISOR: DR. SYAM DIVAKARAMENON

OVERVIEW

The Hamilton Health Sciences' Arrhythmia service is a centre of excellence that provides comprehensive electrophysiology services to LHIN 4. Based at the Hamilton General Hospital, a multidisciplinary team of electrophysiologists, clinical fellows, nurse clinicians and registered nurses and support staff provide inpatient and outpatient care for patients with cardiac rhythm disorders. Complementing the clinical service is a world-class research program that has made seminal advancements in arrhythmia therapy.

The cardiology trainee will rotate on the arrhythmia ward and consult service and attend a number of ambulatory clinics during the rotation. Inpatient responsibilities will focus on providing consultations on patients referred to the arrhythmia service. The trainee will be exposed to a wide spectrum of rhythm disturbances including bradycardias, supraventricular and ventricular dysrhythmias. Trainees will also participate in the performance and interpretation of diagnostic invasive electrophysiology studies, as well as therapeutic (ablative) procedures. Participation in non-invasive EP testing, particularly in the autonomic lab, is also encouraged during the rotation. Exposure to device therapy will occur through active participation in permanent pacemaker and defibrillator implantation and follow-up. This rotation will also be used to read and review a large number of diagnostic 12 lead electrocardiograms and ambulatory EKG recordings to develop proficiency and expertise in these areas.

GOALS AND OBJECTIVES

The goals and objectives for the arrhythmia rotation at the HGH 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:

PGY 4:

The resident:

- Understands the clinical presentation, natural history and prognosis of the cardiac arrhythmias and conduction disorders
- Demonstrates expertise in the interpretation of 12 lead electrocardiograms and ambulatory EKG recordings.
- Demonstrates competence in the evaluation and management of atrial fibrillation and SVT.
- Demonstrates competence in the assessment of the thromboembolic risk in atrial fibrillation and selects the appropriate oral anticoagulation strategy.
- Demonstrates competence in the assessment and risk-stratification of patients with syncope and can identify high-risk cases.
- Understands the concepts of defibrillation and cardioversion, identifies cases requiring cardioversion, and performs the procedure.
- Demonstrates an approach to the ECG diagnosis of wide complex tachycardia.
- Demonstrates competence in the treatment of VT and electrical storm in the acute setting.
- Demonstrates competence in the immediate management of symptomatic brady-arrhythmias and is able to insert a temporary pacemaker when indicated.

PGY 5:

The resident builds on the previous skill set and:

- Understands the pharmacology of anti-arrhythmic drugs and demonstrates a thoughtful approach to the selection of AAD in a given situation.
- Is able to identify pacemaker malfunction from the 12 lead ECG
- Understands the mechanisms of SVT from the ECG.
- Understands the functioning of pacemakers and ICDs and performs basic programming of pacemakers/ICDs.

- Demonstrates competence in interpreting ambulatory ECG recordings.

PGY 6:

The resident develops core consultant level skills and:

- Demonstrates competence in performing more advanced ICD/pacemaker troubleshooting and programming.
- Can describe the indications and perform and interpret Tilt Table tests.
- Demonstrates competence in interpreting and reporting ambulatory ECGs.
- Understands the indications for EP study and can interpret an EP report.
- Demonstrates competence in the evaluation and management of genetic/inherited arrhythmia syndromes.
- Demonstrates competence in performing diagnostic EP studies/Pacemaker implantations under supervision (**optional**).
- Demonstrates a basic understanding of CRM device interrogation and interpretation of recordings and programming solutions for CRM problems

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 the cardiac arrhythmias and conduction disorders.
- 2 Know the immediate care of atrial fibrillation, SVT, VT, ventricular fibrillation, and other arrhythmic emergencies.
- 3 Understand the mechanisms and long-term management of paroxysmal SVT, atrial fibrillation and flutter.
- 4 Be able to determine the mechanism of SVT from ECG recordings, and be able to differentiate wide QRS tachycardias from the ECG.
- 5 Know the diagnostic work up and management of patients with VT (nonsustained and sustained) and ventricular fibrillation/cardiac arrest.
- 6 Know the immediate management of symptomatic bradyarrhythmias and be able to insert a temporary pacemaker when indicated.
- 7 Know the indications for an appropriate follow-up of pacemakers and anti-tachycardia devices.
- 8 Know the diagnostic work up and management of patients with syncope.
- 9 Gain expertise in the interpretation of 12 lead electrocardiograms and ambulatory EKG recordings.
- 10 Understand the indications for electrophysiology study, and be able to interpret EP results.

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 Write appropriate progress and transfer notes and dictate discharge summaries.
- 2 Demonstrate appropriate and understandable communication to establish therapeutic relationships with patients and family members.
- 3 Prepare final EP study reports that contain the key findings.

C COLLABORATOR

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

- 1 Collaborate effectively and constructively with the patient's health care team, including community based health care providers, in the exchange of patient level health information.

- 2 Collaborate with the general cardiology service and/or the cardiac surgical service to provide effective and efficient patient care.
- 3 Develop a collaborative relationship with referring physicians and medical colleagues, including consultants to provide excellent and efficient patient care.
- 4 Develop a collaborative relationship with allied health professionals to allow for a seamless transition to the ambulatory care setting.

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 Demonstrate the ability to effectively manage the arrhythmia consult service, delegate work, and provide teaching to junior learners.
- 2 Set priorities and manage time to develop effective practice patterns.
- 3 Display appropriate use of EP bed resources to maintain patient flow and bed availability for new patients.
- 4 Develop strategies to facilitate patient discharge.
- 5 Contribute to quality improvement and patient safety rounds to implement system change to improve patient safety.

E HEALTH ADVOCATE

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

- 1 Identify patients with or at risk for arrhythmia/device-related complications and effectively apply knowledge regarding risk management to minimize these risks.
- 2 Ensure patients have access to appropriate social and financial supports, information, and community services to maintain care as they transition to the community.
- 3 Recognize opportunities for advocacy, health promotion and disease prevention in EP patients and access local health professionals/resources to promote a healthy lifestyle.

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 Engage in self-directed learning by the development and implementation of a personal learning plan to enhance professional practice.
- 2 Attend and contributes to arrhythmia rounds and other learning opportunities.
- 3 Demonstrate ability to critically appraise the medical literature and integrate best available evidence into practice.
- 4 Contribute to the dissemination of knowledge by educating junior medical staff and other health professionals.

G PROFESSIONAL

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

- 1 Exhibit appropriate professional behaviours and relationships in all aspects of practice, demonstrating honesty, integrity, humility, commitment, compassion, respect, altruism, respect for diversity, and maintenance of confidentiality.
- 2 Demonstrate awareness of personal limitations and ability to seek assistance or consultation when appropriate.
- 3 Understand the nature of professional interpersonal relationships and boundaries with patients, junior medical staff and allied health staff.
- 4 Understand and apply basic principles of medical ethics including: informed consent, advanced directives, research ethics, patient autonomy and justice.

Demonstrates competence in the immediate management of symptomatic brady-arrhythmias and is able to insert a temporary pacemaker when indicated.

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Communicator

	Unsatisfactory 1	Provisional Satisfactory 2	Satisfactory 3	Very Good 4	Outstanding 5	N/A
Writes appropriate progress and transfer notes and dictates discharge summaries to ensure continuity of care.	0	0	0	0	0	0
Demonstrates appropriate and understandable communication to establish therapeutic relationships with patients and family members.	0	0	0	0	0	0
Prepares final EP study reports that contain the key findings.	0	0	0	0	0	0

Collaborator

	Unsatisfactory 1	Provisional Satisfactory 2	Satisfactory 3	Very Good 4	Outstanding 5	N/A
Collaborates effectively and constructively with the patient's health care team, including community based health care providers, in the exchange of patient level health information.	0	0	0	0	0	0
Collaborates with the general cardiology service and/or the cardiac surgical service to provide effective and efficient patient care.	0	0	0	0	0	0

Leader

	Unsatisfactory 1	Provisional Satisfactory 2	Satisfactory 3	Very Good 4	Outstanding 5	N/A
Demonstrates the ability to effectively manage the arrhythmia consult service, delegate work, and provide teaching to junior leaders.	0	0	0	0	0	0
Displays appropriate use of EP bed resources to maintain patient flow and bed availability for new patients.	0	0	0	0	0	0

Health Advocate

	Unsatisfactory 1	Provisional Satisfactory 2	Satisfactory 3	Very Good 4	Outstanding 5	N/A
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Identifies patients with or at risk for arrhythmia/device-related complications and effectively applies knowledge regarding risk management to minimize these risks.	0	0	0	0	0	0
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Ensures that patients have access to appropriate social and financial supports, information, and community services to maintain care as they transition to the community.	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 regarding patient problems and develop strategies to fill the gap through reading and consulting other members of the health care team.	0	0	0	0	0	0
Attends and contributes to arrhythmia rounds and other learning opportunities.	0	0	0	0	0	0
Demonstrates ability to critically appraise the medical literature and integrate the best available evidence into practice.	0	0	0	0	0	0
Contributes to the dissemination of knowledge by educating junior medical staff and other health professionals.	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
Understands the professional, legal and ethical codes to which physicians are bound.	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	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Was input sought from other faculty, allied health professionals, or patients and their family members? <i>(If yes, please please specify in the comment box provided immediately below)</i>	<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)



PG ITER - Cardiology/Internal Medicine

Rotation: Arrhythmia
Level: PGY5

1. 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 1	Provisional Satisfactory 2	Satisfactory 3	Very Good 4	Outstanding 5	N/A
Understands the pharmacology of anti-arrhythmic drugs and demonstrates a thoughtful approach to the selection of AAD in a given situation.	0	0	0	0	0	0
Is able to identify pacemaker malfunction from the 12 lead ECG.	0	0	0	0	0	0
Understands the mechanisms of SVT from the ECG.	0	0	0	0	0	0
Understands the functioning of pacemakers and ICDs and performs basic programming of pacemakers/ICDs.	0	0	0	0	0	0
Demonstrates competence in interpreting ambulatory ECG recordings.	0	0	0	0	0	0

Communicator

	Unsatisfactory 1	Provisional Satisfactory 2	Satisfactory 3	Very Good 4	Outstanding 5	N/A
Writes appropriate progress and transfer notes and dictates discharge summaries to ensure continuity of care.	0	0	0	0	0	0
Demonstrates appropriate and understandable communication to establish therapeutic relationships with patients and family members.	0	0	0	0	0	0

Prepares final EP study reports that contain the key findings.	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 effectively and constructively with the patient's health care team, including community based health care providers, in the exchange of patient level health information.	0	0	0	0	0	0
Collaborates with the general cardiology service and/or the cardiac surgical service to provide effective and efficient patient care.	0	0	0	0	0	0

Leader

	Unsatisfactory 1	Provisional Satisfactory 2	Satisfactory 3	Very Good 4	Outstanding 5	N/A
Demonstrates the ability to effectively manage the arrhythmia consult service, delegate work, and provide teaching to junior leaders.	0	0	0	0	0	0
Displays appropriate use of EP bed resources to maintain patient flow and bed availability for new patients.	0	0	0	0	0	0

Health Advocate

	Unsatisfactory 1	Provisional Satisfactory 2	Satisfactory 3	Very Good 4	Outstanding 5	N/A
Identifies patients with or at risk for arrhythmia/device-related complications and effectively applies knowledge regarding risk management to minimize these risks.	0	0	0	0	0	0
Ensures that patients have access to appropriate social and financial supports, information, and community services to maintain care as they transition to the community.	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 regarding patient problems and develop strategies to fill the gap through reading and consulting other members of the health care team.	0	0	0	0	0	0

Attends and contributes to arrhythmia rounds and other learning opportunities.	0	0	0	0	0	0
Demonstrates ability to critically appraise the medical literature and integrate the best available evidence into practice.	0	0	0	0	0	0
Contributes to the dissemination of knowledge by educating junior medical staff and other health professionals.	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
Understands the professional, legal and ethical codes to which physicians are bound.	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? <i>(If yes, please please specify in the comment box provided immediately below)</i>	<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)



PG ITER - Cardiology/Internal Medicine

Rotation: Arrhythmia
Level: PGY6

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 1	Provisional Satisfactory 2	Satisfactory 3	Very Good 4	Outstanding 5	N/A
Demonstrates competence in performing more advanced ICD/pacemaker troubleshooting and programming.	0	0	0	0	0	0
Can describe the indications and perform and interpret Tilt Table tests.	0	0	0	0	0	0
Demonstrates competence in interpreting and reporting ambulatory ECGS.	0	0	0	0	0	0
Understands the indications for EP study and can interpret an EP report.	0	0	0	0	0	0
Demonstrates competence in the evaluation and management of genetic/inherited arrhythmia syndromes.	0	0	0	0	0	0
Demonstrates competence in performing diagnostic EP studies/Pacemaker Implantations under supervision (optional)	0	0	0	0	0	0
Demonstrates a basic understanding of CRM device interrogation and interpretation of recordings and programming solutions for CRM problems.	0	0	0	0	0	0

Communicator

	Unsatisfactory 1	Provisional Satisfactory 2	Satisfactory 3	Very Good 4	Outstanding 5	N/A
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Writes appropriate progress and transfer notes and dictates discharge summaries to ensure continuity of care.	0	0	0	0	0	0
Demonstrates appropriate and understandable communication to establish therapeutic relationships with patients and family members.	0	0	0	0	0	0
Prepares final EP study reports that contain the key findings.	0	0	0	0	0	0

Collaborator

	Unsatisfactory 1	Provisional Satisfactory 2	Satisfactory 3	Very Good 4	Outstanding 5	N/A
Collaborates effectively and constructively with the patient's health care team, including community based health care providers, in the exchange of patient level health information.	0	0	0	0	0	0
Collaborates with the general cardiology service and/or the cardiac surgical service to provide effective and efficient patient care.	0	0	0	0	0	0

Leader

	Unsatisfactory 1	Provisional Satisfactory 2	Satisfactory 3	Very Good 4	Outstanding 5	N/A
Demonstrates the ability to effectively manage the arrhythmia consult service, delegate work, and provide teaching to junior leaders.	0	0	0	0	0	0
Displays appropriate use of EP bed resources to maintain patient flow and bed availability for new patients.	0	0	0	0	0	0

Health Advocate

	Unsatisfactory 1	Provisional Satisfactory 2	Satisfactory 3	Very Good 4	Outstanding 5	N/A
Identifies patients with or at risk for arrhythmia/device-related complications and effectively applies knowledge regarding risk management to minimize these risks.	0	0	0	0	0	0
Ensures that patients have access to appropriate social and financial supports, information, and community services to maintain care as they transition to the community.	0	0	0	0	0	0

Scholar

	Unsatisfactory	Provisional Satisfactory	Satisfactory	Very Good	Outstanding	
	1	2	3	4	5	N/A
Recognizes gaps in knowledge regarding patient problems and develop strategies to fill the gap through reading and consulting other members of the health care team.	0	0	0	0	0	0
Attends and contributes to arrhythmia rounds and other learning opportunities.	0	0	0	0	0	0
Demonstrates ability to critically appraise the medical literature and integrate the best available evidence into practice.	0	0	0	0	0	0
Contributes to the dissemination of knowledge by educating junior medical staff and other health professionals.	0	0	0	0	0	0

Professional

	Unsatisfactory	Provisional Satisfactory	Satisfactory	Very Good	Outstanding	
	1	2	3	4	5	N/A
Delivers care with integrity, honesty, and compassion.	0	0	0	0	0	0
Understands the professional, legal and ethical codes to which physicians are bound.	0	0	0	0	0	0

OVERALL COMPETENCE (FOR LEVEL OF TRAINING)

	Incomplete	Unsatisfactory	Provisional Satisfactory	Satisfactory
	1	2	3	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)
 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)

