

Rotation: Cardiac Intensive Care Unit at Bayview (CICU)

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Rotation Hours: Mon - Fri, 8am to 7 pm; 2 weekends off; Sat and Sun, 8 am to 7 pm.

A. Coronary Intensive Care Unit: Patient Care

	Principal Educational Goals	Learning Activities	Evaluation Methods
1.	Take a complete medical history and perform a careful and accurate physical examination with a cardiology focus.	DPC, AR	AE
2.	Ability to recognize the physical findings of chronic congestive heart failure, acute pulmonary edema, mitral regurgitation, mitral stenosis, aortic stenosis, aortic regurgitation, and tricuspid regurgitation.	DPC, AR, FS	AE
3.	Write concise, accurate and informative histories, physical examinations and progress notes with a cardiology focus.	DPC, AR	AE
4.	Ability to formulate comprehensive and accurate problem lists, differential diagnoses and plans of management for patients with acute cardiac illness.	DPC, AR, CC	AE
5.	Effectively evaluate and manage patients with acute cardiac illness; particularly acute coronary syndromes, acute myocardial infarction, congestive heart failure, pulmonary edema, and acute valvular heart disease.	DPC, AR, CAC	AE
6.	Effectively manage patients with undiagnosed chest pain, including the appropriate use of diagnostic testing.	DPC, AR	AE
7.	Ability to perform and recognize major abnormalities of cardiac stress tests, cardiac Echo and coronary angiograms.	DPC, DSP, EC	AE, DSP
8.	Ability to interpret complex electrocardiograms and rhythm strips.	DPC, AR, ECG, EP	AE
9.	Effectively evaluate and manage patients who have undergone interventional procedures.	DPC, AR, CAC	AE
10.	Ability to perform basic ventilator management.	DPC, AR	AE
11.	Ability to place and manage pulmonary artery (Swan-Ganz) catheters and temporary pacemakers.	DPC, AR, DSP, EP	AE, DSP
12.	Ability to administer emergency thrombolytic treatment.	DPC, DSP, AR	AE
13.	Ability to perform CPR and advanced cardiac life support.	DPC, DSP, PC	AE
14.	Willingness and ability to help patients undertake basic strategies for prevention of cardiovascular disease, including modifications of diet and physical activity, and cessation of use of tobacco.	DPC, AR	AE
15.	Participation in and later leading of discussion of end-of-life issues with families.	DPC, AR	AE
16.	Insert central venous lines and arterial lines with proper technique.	DPC, DSP, AR	AE
17.	Ability to perform endotracheal intubation and transthoracic echo	DPC, DSP, AR, IL	AE

B. Coronary Intensive Care Unit: Medical Knowledge

	Principal Educational Goals	Learning Activities	Evaluation Methods
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1	Expand clinically applicable knowledge base of the basic and clinical sciences underlying the care of patients with chest pain and acute cardiac disease.	DPC, AR	AE
2	Access and critically evaluate current medical information and scientific evidence relevant to acute cardiac care.	DPC, AR	AE
3	Understand indications for aggressive anticoagulant and antiplatelet therapy as well as the mechanisms of action of the various agents.	DPC, AR	AE
4	Understand the physiologic and pathophysiologic principles of invasive hemodynamic monitoring including indications.	DPC, AR, CAC	AE
5	Develop and demonstrate in-depth knowledge of the pathophysiology, clinical manifestations, diagnosis and management of cardiac diseases, as seen in a Coronary Intensive Care unit.	DPC, AR	AE
6	Develop and demonstrate in-depth knowledge of the principles of diagnosis and management of essential hypertension; ischemic heart disease including unstable angina pectoris and myocardial infarction; congestive heart failure; cardiac arrhythmias especially atrial fibrillation, supraventricular tachycardia, and ventricular arrhythmias; rheumatic heart disease, and congenital heart disease.	DPC, AR, EP	AE
7	Develop and demonstrate in-depth knowledge of the indications for, principles, complications, and interpretation of ECG, inpatient rhythm monitoring, exercise and chemical stress tests, electrophysiologic studies, transthoracic and transesophageal ECHO, nuclear cardiac imaging, right and left heart catheterization, coronary angiography, and percutaneous interventions.	DPC, DSP, AR, HC	AE, DSP
8	Fully understand principles of assessment of lifetime cardiovascular risk & cardiovascular risk prevention.	DPC, AR, PCF	AE
9	Develop in-depth knowledge of the strategies for cessation of use of tobacco.	DPC, AR	AE

C. Coronary Intensive Care Unit: Interpersonal Skills and Communication

	Principal Educational Goals	Learning Activities	Evaluation Methods
1.	Communicate effectively with patients and families in a stressful critical care environment.	DPC, AR	AE, ECR
2.	Communicate effectively with physician colleagues and members of other health care professions to assure timely, comprehensive patient care.	DPC, AR	AE, PR, ECR
3.	Communicate effectively with colleagues when signing out DPC or turning over care to another service.	DPC, AR	AE, PR, ECR

D. Coronary Intensive Care Unit: Professionalism

	Principal Educational Goals	Learning Activities	Evaluation Methods
1.	Interact professionally toward patients, families, colleagues, and all members of the health care team.	DPC	AE, PR, ECR
2.	Interacting with patients and families in a professionally appropriate manner.	DPC, PC	AE, ECR
3.	Acceptance of professional responsibility as the primary care physician for patients under his/her care.	DPC, PC	AE, ECR
4.	Appreciation of the social context of illness.	DPC	AE, ECR
5.	Effective utilization of ethics knowledge and consultants. This includes guidelines for CPR and DNR and end of life cardiac care.	DPC, ET	AE, PR, ECR

E. Coronary Intensive Care Unit: Practice-Based Learning and Improvement

	Principal Educational Goals	Learning Activities	Evaluation Methods
1.	Identify and acknowledge gaps in personal knowledge and skills in care of acute cardiac patients.	DPC, CC, ECR	AE
2.	Develop real-time strategies for filling knowledge gaps that will benefit patients in the Coronary Intensive Care unit.	DPC	AE
3.	Commitment to professional scholarship, including systematic and critical perusal of relevant print and electronic literature, with emphasis on integration of basic science with clinical medicine, and evaluation of information in light of the principles of evidence-based medicine.	DPC, FS	AE

F. Coronary Intensive Care Unit: Systems-Based Practice

	Principal Educational Goals	Learning Activities	Evaluation Methods
1.	Understand and utilize the multidisciplinary resources necessary to care optimally for acutely ill cardiac patients.	DPC, PC	AE
2.	Collaborate with other members of the health care team to assure comprehensive Coronary Intensive Care.	DPC, PC	AE
3.	Use evidence-based, cost-conscious strategies in the care of patients with chest pain and other acute cardiac disease.	DPC	AE
4.	Knowing when to ask for help and advice from senior fellows and attending physicians.	DPC	AE, PR
5.	Effective professional collaboration with residents, other fellows, and faculty consultants from other disciplines such as Radiology and Surgery.	DPC, PC	AE, ECR
6.	Learning by participation in ward rounds, teaching conferences and other educational activities.	DPC, AR	AE
7.	Effective collaboration with other members of the health care team, including residents, medical students, nurses, clinical pharmacists, occupational therapists, physical therapists, nutrition specialists, patient educators, speech pathologists, respiratory therapists, enterostomy nurses, social workers, case managers, discharge planners, and providers of home health services.	DPC, PC	AE, ECR
8.	Effective utilization of ethics consultants, including knowing when and how to request consultation, and how best to utilize the advice provided.	DPC, PC	AE
9.	Consideration of the cost-effectiveness of diagnostic and treatment strategies.	DPC, ACS	AE
10.	Ability to lead team, including medical students, residents, nurses, clinical pharmacist, case manager, and social worker.	DPC, ACS	AE, ECR
11.	Willingness and ability to teach medical students and residents.	DPC	AE, PR

Objectives and expectations on this rotation

- The goal of the Cardiac Intensive Care Unit/Cardiac Progressive Care Unit (CICU/PCU) rotation is to provide the fellow with a comprehensive learning experience in the care and management of acutely ill patients with cardiovascular disease.

- Fellows will achieve a level of proficiency that will enable them to perform in an independent leadership role. Under the close direction of the attending physicians, fellows will learn an evidence-based approach to the care of patients with a variety of acute cardiovascular illnesses including, but not limited to, acute coronary syndromes, congestive heart failure, and arrhythmias.
- Fellows will learn cardiovascular disease in a variety of settings, both ambulatory and inpatient, in order to master the comprehensive care of patients with CAD, and under the guidance of the Attending Physician, will oversee, and direct optimal patient care for critically ill patients.

Learning objectives

- Fellows will acquire the skills necessary to provide effective and professional consultation, to other physicians and to health care professionals who seek the guidance of the CICU/PCU team and/or transfer their patient to the CICU/PCU service.
- Fellows will be given increasingly independent responsibilities commensurate with their level of training and expertise. Fellows will also learn the importance of providing patient care that is compassionate and that demonstrates knowledge of established and evolving biomedical, clinical and social sciences.

Content and methods

CONTENT: Up-to-date information in cardiovascular medicine is provided to the fellows in a series of morning didactic lectures led by the cardiology faculty and occasionally by the cardiology fellows themselves, which takes place in the CICU. The fellow will learn how to manage patients guided by the results of randomized controlled trials or, when these are not available, on the results of consensus guideline recommendations.

Course content is listed below and will enable fellows to acquire expertise in the following areas:

- The cardiovascular history, including, but not limited to risk factors for coronary artery disease, chest pain or discomfort, (especially its differential diagnosis), dyspnea, palpitations, syncope, edema, cough/hemoptysis.
- The cardiovascular exam, including: General appearance, jugular venous pressure, arterial pulse, heart sounds and murmurs and edema.
- The chest X-ray: Indications and interpretation (heart size chamber enlargement, CHF)
- The electrocardiogram (ECG): indications, how to record/position chest leads, specialty lead systems (15,18 lead EKGs, Lewis Leads), interpretation

Acute myocardial infarction including:

- Primary angioplasty (indications/risks)
- Thrombolytic therapy (indications/risks)
- Acute non-thrombolytic therapy, including glycoprotein IIb/IIIa receptor
- Inhibitors
- Importance of antiplatelet therapy, heparin, and early beta blocker therapy
- Killip classification and relation to mortality
- Recognize mechanical complications of acute MI
- Clinical recognition and importance of right ventricular MI
- Importance of early lipid-lowering therapy, glycemic control, smoking cessation
- Importance of post-discharge cardiac rehabilitation

Chronic coronary artery disease:

- Medical therapy
- Indications for revascularization (PTCA/CABG)
- Follow-up

CHF/cardiomyopathy

- Clinical symptoms and NYHA classification
- Major etiologies (systolic vs. diastolic)

- Evaluation
- Medical therapy, especially the importance of guideline medication and evidence-based therapy for patients with left ventricular systolic dysfunction

Arrhythmia:

- Management of atrial fibrillation
- Differential diagnosis of narrow-complex Tachycardia (SVT)
- Differential diagnosis of wide-complex tachycardia (SVT vs. VT)
- Major classes of anti-arrhythmic therapy
- Effects and side effects of major anti-arrhythmic drugs
- Role of electrophysiology (EP) testing and radio frequency catheter ablation
- Use of telemetry, Holter monitoring, and event recorders
- Use of adenosine in the acute setting
- ACLS protocols

Pericardial disease:

- Difference between pericardial effusion and pericardial tamponade
- Constrictive pericarditis

Cardiac pacemakers and AICDs:

- Indications for each
- Types of pacemakers and nomenclature

Syncope:

- Differential diagnosis
- Role of electrophysiology and tilt table testing

Diseases of the aorta:

- Aortic dissection
- Aortic aneurysm
- Marfan syndrome

Congenital heart disease in adults:

- Atrial septal defect
- Ventricular septal defect
- Bicuspid aortic valve

Evaluating cardiac risk in patients undergoing non-cardiac surgery

- Assessment of patient risk
- Anesthesia and the operation
- Role of noninvasive testing or coronary angiography
- Application of AHA/ACC Guidelines

Cardiac risk factor modification and cardiac rehabilitation

- Role of diet and exercise
- Major lipoprotein phenotypes
- Indications for screening for hyperlipidemia
- Pharmacologic therapy for hyperlipidemia

- Smoking Cessation
- Development of a phase I, II, III exercise program.

Fellows training will include an integrated in patient clinical experience, lectures and assigned reading. Fellow training will include a several month rotation in the CICU/PCU at Bayview, in one monthly period, during the period of the fellowship. Under close Attending Physician supervision, the fellow will be mentored to acquire the skills outlined above.

Fellows have the option, during their training, to also centralize their out patient clinical experience at Bayview. Those who so choose then acquire the opportunity to provide long-term consultative care for several of the inpatients that they care for acutely.

An integral in the fellowship training in the CCU is a series of lectures and conferences. Lectures consist of a Cardiology Conference held for one hour each week, generally lead by a fellow, a morning conference in the CICU held for one-half hour, and cardiology lectures in the Grand Rounds series. Reading material consists of a file of references in the CICU, as well as the general textbooks of cardiovascular diseases in the Cardiology Division Library. Fellows will also have access to computer-based learning with a slide/teaching file developed by the faculty and available on computer workstations in the CICU physicians' office.

METHODS:

A. Clinical Experience

CICU/PCU

- The CICU/PCU experience at Bayview is the most important clinical experience for the fellow in learning the management of cardiovascular disease in the acute setting with limited availability of tertiary care resources. During the period of the CICU rotation several months are spent in the CICU on a one monthly basis. In the CICU, the fellow learns the longitudinal management of acute cardiovascular illness, from the Emergency Room through discharge and also possibly following discharge. The attending cardiologist provides one-on-one teaching with the fellows for all patients admitted to the CICU and Cardiac Progressive Care Unit.
- All patients are diagnosed and managed by the House staff directed by the fellow with a cardiologist in close supervision. Morning rounds in the CICU provide the format for case management teaching and interpretation of electrocardiograms. In addition, these rounds provide the necessary teaching to provide the fellows with the skills to manage patients with acute ischemic syndromes, congestive heart failure, arrhythmia, hemodynamic instability, acute and chronic valvular disease, and other problems requiring CICU admission. This format also helps the fellow acquire CICU management and triage skills. Didactic lectures provide insights into cardiovascular topics, not necessarily seen in the CICU.
- Afternoon teaching rounds provides the experience of reading non-invasive tests (echocardiograms, EKGs, Holter monitors, stress tests, thallium stress tests) as well as the results of cardiac catheterization.
- The fellow is encouraged to read from the file of references in the CICU during their month in training. In addition, they are encouraged to pursue the specific cardiovascular illness of their patient with further literature review.
- The fellow directs and performs routine procedures required in the CICU, supervised by the attending cardiology faculty. These procedures include insertion of temporary pacemakers and central venous lines from the subclavian, internal jugular, and femoral approaches. In addition, supervised by the fellow, the housestaff are responsible for the placement of arterial catheters for pressure monitoring. The fellow has the opportunity to learn the placement and reading of pulmonary artery (Swan-Ganz) catheters for hemodynamic monitoring. The fellow also trains in the insertion of intra-aortic balloon pumps. The fellow thus learns the rationale as well as the need for intra-aortic balloon pump therapy.

B. Lectures

Weekly Cardiology Conference

The weekly Cardiology Conference is led by the Johns Hopkins Bayview Medical Center Cardiology faculty and a fellow and by invited lecturers. The topics generally include clinical problems in Cardiology. Once a month, the division discusses its Morbidity and Mortality report, in which the patients admitted to the Cardiology service are discussed in detail, emphasizing instructive cases and quality issues that could be improved to result in better care of

patients and/or avoidance of medical errors. There is in-depth discussion of current topics important to the Cardiology consultant. In addition, topics of current research are also discussed. These lectures provide in-depth insights for the house staff in topics of current importance in cardiovascular illness.

The CICU Morning Conference

The CICU morning conference discusses topics important to the patient entering the CICU. These small group lectures are designed for extensive dialogue between the cardiologist, the fellow and the house staff to provide a better understanding of cardiovascular illnesses presenting to the CICU.

Cardiology Topics in the Grand Rounds Format

These discussions focus on broad topics and topics of current interest in cardiovascular diseases. They expose the fellows to reviews of current literature and broad management issues of cardiovascular diseases.

Fellows are encouraged to read and review the relevant literature. The following is a partial recommend reference material:

GENERAL REFERENCES

Braunwald, E., Heart Disease: A Textbook of Cardiovascular Medicine. 4th ed., Philadelphia, W.B. Saunders Company, 1992.

Parmley, W.W. and Chatterjee, K. Cardiology: Philadelphia, J.B. Lippincott Company, 1989.

Schlant, R.C., Alexander R.W.: Hurst S. The Heart, 8th ed. New York, McGraw-Hill Inc., 1994.

Marriott, H.J.L.: Practical Electrocardiography. 8th ed. Baltimore, Williams and Wilkins, 1988.

Feigenbaum H., Echocardiography. 5th ed., Philadelphia, Lea & Febiger, 1994.

Chandra-Strobos, N. Angina Pectoris. In Principles of Ambulatory Medicine. L.R. Barker, J.R. Burton, P.D. Zieve (eds). Williams & Wilkins. Baltimore, 1999 p. 721-744.

Vaitkevicius P.V., and Stewart K.J. Postmyocardial Infarction Care, Cardiac Rehabilitation, and Physical Conditioning. In Principles of Ambulatory Medicine. L.R. Barker, J.R. Burton, P.D. Zieve (eds). Williams & Wilkins. Baltimore, 1999 p. 744-767.

Gottlieb, S.H., and Calkins H. Arrhythmias. In Principles of Ambulatory Medicine. L.R. Barker, J.R. Burton, P.D. Zieve (eds). Williams & Wilkins. Baltimore, 1999 p. 768-798.

Shapiro E.P. Common Cardiac Disorders Revealed by Auscultation of the Heart. In Principles of Ambulatory Medicine. L.R. Barker, J.R. Burton, P.D. Zieve (eds). Williams & Wilkins. Baltimore, 1999 p. 799-821.

Gottlieb S.H. Heart Failure. In Principles of Ambulatory Medicine. L.R. Barker, J.R. Burton, P.D. Zieve (eds). Williams & Wilkins. Baltimore, 1999 p. 821-843.

Supervision.

At all times the fellow works closely with and is supervised by the teaching attending physician.

Evaluation Process (*fellows will be evaluated on each rotation using a competency-based system on E-Value*).

- Fellows are evaluated throughout their CICU/PCU, experiences. After each rotation in cardiovascular medicine, the attending physician submits a written evaluation about each fellow. The evaluations assess the

fellow's medical knowledge (both in internal medicine and in cardiovascular disease), patient care, interpersonal and communication skills, and professionalism.

- The faculty also evaluate fellow in their ability to understand, access and utilize the resources (e.g. medical literature), providers (e.g. case managers, nursing staff, home nursing, physical and occupational therapists, dietitians), and systems (e.g. cardiac rehabilitation) necessary to provide optimal care to the patient with cardiovascular disease.
- Fellows are also assessed with respect to their ability to apply evidence-based strategies to prevent, diagnose and manage cardiovascular disease.
- The faculty assess the fellow's ability to appreciate the importance of the cost of specific diagnostic and treatment strategies (both to the health system and to the patient), as well as the limitations of specific diagnostic tests and therapies. The faculty will also evaluate the fellow's ability to analyze and evaluate his/her practice and to develop and demonstrate a willingness to learn from and use errors to improve the care of patients.
- Most importantly, fellows receive constant feedback through one-on-one discussions with the Cardiology attending.
- There is constant evaluation of the fellow's medical knowledge by the attending cardiologist, and lectures and discussions are tailored to enhance the fellow knowledge of cardiovascular illness.