

Heart Failure and Cardiac Transplantation Clinical Cardiology Service (1 months)

During this rotation, the Cardiovascular Diseases (CD) fellow will gain insight into the management of patients with advanced heart failure. Patients will be seen both in the inpatient service and the outpatient clinics. The subspecialty trainee will be exposed to all aspects of heart failure from asymptomatic patients to shock patients. Fellows will receive training in medical management with invasive hemodynamic monitoring and tailored medical therapy; electrophysiological therapies including biventricular pacing and automatic implantable defibrillators; and surgical therapies including ventricular reduction surgery, ventricular assist devices, and cardiac transplantation. While the fellow is expected to attain competence in the diagnosis and management of heart failure in both outpatients and hospitalized patients, the rotation places an emphasis on patients with acute illnesses or decompensation requiring intensive diagnostic evaluation and therapeutic intervention:

- 1) Recognition, diagnosis, and treatment of heart failure with evidence based medical therapy including identification of reversible causes of heart failure. Risk assessment of patients with advanced heart failure
- 2) Diagnosis and treatment of acutely decompensated heart failure in hospitalized patients.
- 3) Recognition of candidates who would benefit from biventricular pacing and implantation of an automatic implantable defibrillator.
- 4) Identification of indications, contraindications, and risk factors for cardiac transplantation. Recognition, diagnosis, and management of cardiac rejection and coronary artery vasculopathy as well as opportunistic infections in cardiac transplant patients.
- 5) Identification of appropriate patients for percutaneous ventricular assist devices and implantable ventricular assist devices as a bridge to recovery, bridge to transplantation, or destination therapy. Understand the utility of risk assessment of patients being considered for ventricular assist device implantation.
- 6) Recognition, diagnosis, and management of pulmonary hypertension, right heart failure, and multi-organ failure. To facilitate in the care of these patients, be able to perform and accurately interpret hemodynamic studies for the assessment of heart failure, pulmonary hypertension, valvular disease, and pericardial disease.
- 7) Recognition of atrial dysrhythmias and ventricular dysrhythmia including: (a) polymorphic ventricular tachycardia (VT); (b) Torsades de Pointe; (c) Monomorphic VT complicating ischemic heart disease; (d) Monomorphic VT complicating non-ischemic heart disease; (e) VT syndromes with LVADs; (f) VF syndromes with LVADs
- 8) Appropriate ordering and interpretation of ECG, plain radiographic films, laboratory, echocardiographic imaging, computerized tomography imaging, magnetic resonance imaging, positron emission tomography scans, and cardiac catheterization..
- 9) Recognition of the role of cardiac cachexia and the importance of aggressive nutritional resuscitation.
- 10) Enlist the role of palliative care for the end-stage heart failure patient.

The CD fellow will develop expertise in the recognition, diagnosis and management of the spectrum of diseases that occur in an advanced heart failure patient population. The CD fellow will become proficient in the performance of a focused cardiovascular disease history and physical examination. The CD fellow will develop expertise in recognizing the mode of presentation, clinical features, and differential diagnosis of vascular, myopathic, valvular, and rhythm abnormalities along with the proper use of clinical electrophysiological, imaging tests and other laboratory modalities to facilitate diagnoses.

The CD fellow will dedicate the majority of the time to patient care responsibilities, and will be actively and directly involved in diagnostic and therapeutic decision-making. Although assigned to a hospital service, the CD fellow will also see outpatients at his/her assigned continuity clinic.

In addition, CD fellows will actively participate in scheduled teaching conferences through the week that include the Noon Cardiology Conference, the core curriculum seminars, Transplant/VAD Morbidity and Mortality case presentations, Heart Failure and Transplant Cardiology Journal Clubs, and research conferences. Moreover, the CD fellows will be encouraged to participate, when possible, in the Cardiac Support Conference, Cardiac Pathology Conferences, Transplant Medical Review Board, VAD Conference, and Flowsheet Rounds as well as regular literature reviews and read about cardiovascular disease entities exhibited by the cases seen on the service.

The CD fellow attends morning rounds at 6:30am with the attending physicians on each specific rotation. Under the guidance of supervising faculty, CD fellows are responsible for evaluating assigned patients on the service during initial and follow-up care over the course of their hospitalization. The average daily census is typically 20-40 patients with 3-5 new consults each weekday. In the event that the service population exceeds the capacity of the CD fellows, patients will be assigned a non-teaching status and cared for by the attending physician.

The CD fellow will have the opportunity to participate in procedures for inpatients and outpatients who undergo left and right heart catheterizations, endomyocardial biopsies, intra-aortic balloon pump placement, Tandem Heart implantation, pericardiocentesis, temporary pacemaker insertion, Quinton line placement, or arterial line placement. It is not uncommon during the rotation to have patients develop cardiopulmonary arrest and require resuscitation. The CD fellow will be expected to actively participate in the resuscitative efforts of patients on the service.

Legend for Learning Activities	
AR/FS – Attending Rounds/Faculty Supervision	JC – Journal Club
CC – Core Curriculum conferences	LR – Literature Review (independent)
DPC – Direct Patient Care	RC – Research Conference
MM – Morbidity and Mortality Conference	CR – Cath Rotation

Legend for Evaluation Methods for Fellows	
AE – Attending Evaluations	360° – 360° Evaluation
PDR – Program Director’s Review (twice annually)	

Principal Educational Goals by Relevant Competency

The educational goals and objectives for the CD fellow on this rotation are indicated for each of the six ACGME competencies in the tables below. The first column describes whether the objective is knowledge, skill and/or attitude. The third column lists the most relevant learning activities for that objective, and the fourth column indicates the evaluation methods for that objective.

A. Patient Care

Goal: CD fellows must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of Cardiovascular diseases.

Knowledge, Skills, Attitude	Objectives – Fellows will demonstrate the:	Learning Activities	Evaluation Methods
Knowledge, Skills	Ability to take a complete medical history and perform a careful and accurate physical examination with a cardiovascular disease focus	DPC, AR/FS	AE
Knowledge, Skills	Ability to write concise, accurate and informative histories, physical examinations and progress notes with a cardiovascular disease focus	DPC, AR/FS	AE
Knowledge, Skills	Ability to formulate comprehensive and accurate problem lists, differential diagnoses and diagnostic & therapeutic plans	DPC, AR/FS, CC, LR	AE, PDR
Knowledge, Skills	Ability to properly order and interpret results in diagnostic testing, including laboratory, electrocardiography, testing, radiographic, echo, MRI and pathology.	DPC, AR/FS, LR, CC, JC, CR	AE
Knowledge, Skills	Ability to prescribe and appropriately utilize medical therapy for the prevention & treatment of cardiovascular disease in hospitalized patients, understanding the proper dosing and potential related adverse events and interactions	DPC, AR/FS, LR, CC, JC	AE

B. Medical Knowledge

Goal: CD fellows must demonstrate knowledge about established principles and evolving basic and clinical science of cardiovascular diseases as well as demonstrate growing familiarity with advanced concepts and rare diseases.

Knowledge, Skills, Attitude	Objectives – Fellows will:	Learning Activities	Evaluation Methods
Knowledge	Diagnose and treat heart failure, recognize reversible causes, and risk assessment of patients	AR/FS, CC, DPC, JC, LR,	AE, PDR
Knowledge	Diagnosis and treatment of hospitalized patients with acutely decompensated heart failure.	AR/FS, CC, DPC, JC,	AE, PDR

		LR, RC	
Knowledge	Demonstrate knowledge of appropriate referral for biventricular pacing and automatic implantable cardiac defibrillator	AR/FS, CC, DPC, JC, LR, RC, CR	AE, PDR
Knowledge	Appropriate selection of patients for cardiac transplantation, diagnosis and treatment of cardiac rejection and coronary artery vasculopathy as well as opportunistic infections.	AR/FS, CC, DPC, JC, LR, RC	AE, PDR
Knowledge	Recognize and risk assessment of patients who are candidates for percutaneous or implantable ventricular assist devices as a bridge to recovery, bridge to transplant, and destination therapy..	AR/FS, CC, DPC, JC, LR, MM	AE, PDR
Knowledge	Recognize and manage patients with pulmonary hypertension, right heart failure, and multi-organ failure. Perform and accurately interpret hemodynamics studies in the care of patients with pulmonary hypertension, heart failure, and valvular disease, and pericardial disease	AR/FS, ICC, CC, DPC, MLR, JC, CPC	AE, PDR
Knowledge	Recognize the role of dysrhythmias in exacerbating heart failure and the differences in treatment strategies for arrhythmias in patients who have LVADs.	AR/FS, CC, DPC, JC, LR, RC, CR	AE, PDR
Knowledge	Be capable of appropriate ordering and initial interpretation of radiographic, echo, nuclear, hemodynamic and angiographic examinations.	AR/FS, CC, DPC, LR, CR, RC	AE, PDR

C. Interpersonal Skills and Communication

Goal: CD fellows must demonstrate the knowledge, skills and attitudes necessary to develop and maintain appropriate interpersonal relationships and to communicate effectively with patients, families, colleagues and the public.

Knowledge, Skills, Attitude	Objectives – Fellows will:	Learning Activities	Evaluation Methods
Skill	Communicate sensitively and effectively with hospitalized patients and with their families	DPC, AR/FS	AE
Skill, Attitude	Display a willingness and ability to teach medical students, pharmacy students, medical residents, nurses and ancillary service personnel	DPC, AR/FS	AE, 360°

D. Professionalism

Goal: CD fellows must demonstrate the knowledge, skills, and attitudes necessary to practice professionally responsible, ethical and compassionate care in clinical cardiovascular diseases.

Knowledge, Skills, Attitude	Objectives – Fellows will:	Learning Activities	Evaluation Methods
Knowledge, Skill, Attitude	Interact professionally towards patients, families, colleagues, and all members of the health care team	DPC, AR/FS	AE, PDR, 360°
Attitude	Display an appreciation of the social context of illness especially in hospitalized, critically ill patients	DPC, AR/FS, CC,	AE
Attitude	Provide mentoring and act as a role model for junior members of the care delivery team	DPC	AE
Skill	Participate in the decision for diagnostic test requests or referral for intervention reviewing the ethical aspects of that decision	DPC, AR/FS	AE
Knowledge, skill, Attitude	Fulfill all the requirements to assure the privacy and confidentiality of all the medical information of the patient.	DPC, AR/FS	AE, PDR, 360°

E. Practice-Based Learning and Improvement

Goal: CD fellows must demonstrate the knowledge, skills, and attitudes necessary to initiate self-directed and independent learning. CD fellows must keep abreast of current information and practices relevant to cardiovascular disease.

Knowledge, Skills, Attitude	Objectives – Fellows will:	Learning Activities	Evaluation Methods
Attitude	Demonstrate a commitment to professional scholarship through the systematic and critical perusal of relevant print and electronic medical literature, with an emphasis on the integration of basic science with clinical medicine, and evaluation of information in light of the principles of evidence-based medicine	DPC, AR/FS, LR, CR, CC, JC, RC	AE, PDR
Skill, Attitude	Demonstrate a commitment to learning through participation in research and producing formal presentations and/or publications	CC, CR, JR, RC	PDR
Skill, Attitude	Integrate knowledge learned through participation in ward rounds, teaching conferences and other educational activities into their practice (e.g., observation of long-term outcome of interventions and medical care applying lessons to patients with acute illness)	DPC, AR/FS, JC, RC	AE, PDR

F. Systems-Based Practice

Goal: CD fellows must demonstrate the knowledge, skills, and attitudes necessary to manage effectively in multiple, diverse, complex systems of care to provide effective treatment, consultation and referrals for patients.

Knowledge, Skills, Attitude	Objectives – Fellows will:	Learning Activities	Evaluation Methods
Knowledge, Skill	Demonstrate the ability to work in the outpatient clinic coordinating routine follow-up of chronic illness, evaluation and management of new cardiovascular illness and assisting in system development that ensures appropriate disease management and health maintenance practices	DPC, AR/FS, LR	AE, PDR
Skill, Attitude	Display a willingness and ability to help the requesting physician in a consultative or co-management capacity, according to the needs of the situation	DPC, AR/FS	AE, PDR
Skill, Attitude	Integrate knowledge learned through participation in ward rounds, teaching conferences and other educational activities into their practice	DPC, AR/FS	AE, PDR
Attitude	Participate in refinement of care delivery systems ensuring provision of evidence-based care	DPC, AR/FS, RC	PDR
Attitude	Consider the cost-effectiveness of diagnostic, prevention and treatment modalities when selecting such strategies for patients.	DPC, AR/FS, CR, JC, LR, CC	AE