

Internal Medicine Residency Program Rotation Curriculum

I. Rotation Sites and Supervision

Rotation Name:	UCI Advanced Heart Failure
Divisional Sponsor:	Department of Cardiology
Site(s):	UCIMC
Rotation Faculty Director:	Dr. Dawn Lombardo
Rotation Staff Coordinator:	Stephanie Horn
Phone Number:	714-456-7945
Email:	horns@hs.uci.edu
Key Faculty Participating in the Rotation:	Dr. Dawn Lombardo, Dr. Irmina Gradus-Pizlo

II. General Description of the Rotation: Site & Setting; Types of Patients; Mix of Diseases; Types of Clinical Encounters; General Description of the Educational Environment, Specific Teaching Methods, Conferences & Tools

The heart failure rotation will take place at UCIMC. The rotation will consist of 1-4 weeks of elective time and will be predominantly oriented toward the inpatient service. The resident, alongside heart failure nurse practitioners (NPs) and cardiology fellows, will have the opportunity to take care of inpatient manifestations of heart failure. This includes routine patients admitted to the advanced heart failure service with either acute exacerbations of chronic failure or transfers for evaluation of new manifestations of heart failure. The resident will also interact with critically ill heart failure patients in the cardiac care unit. In general, the resident will be expected to participate in consults, examine patients, make clinical recommendations, and work alongside the cardiology faculty and advanced practitioners. Additionally, the resident will have the opportunity to evaluate inpatients pre-operatively and post-operatively recovering from durable left ventricular assist device (LVAD) implant surgery or LVAD readmissions. If time permits, the resident is encouraged to attend general heart failure clinic each week with the faculty. The inpatient rotation will consist of direct participation with the heart failure team on morning rounds Monday through Friday.

III. Daily Schedule, Including Conferences, Rounds, & Clinics

8am: Meet with fellow and NPs to review new consults
8am-12pm: See assigned consults
12-1pm: Lunch (attend cardiology noon conference on Wednesday)
1pm: Meet with attending, NPs, and fellow to staff patients
1pm-3pm: Round and review consults with HF attending
3pm-5pm: Communicate final plan to primary teams, finish notes, see any afternoon consults to staff the following day

If time permits, resident can attend morning half day clinic with the heart failure attending.

IV. General Goals of the Rotation

- Gain experience in the clinical management of patients with advanced heart failure
- Gain experience in the management of acute decompensated heart failure in the inpatient setting
- Gain experience in selecting patients for LVAD and following patients post-LVAD placement

V. Specific Objectives of the Rotation

Applies to all PGY levels:

- Recognize, diagnose, and treat heart failure with evidence based medical therapy
- Understand the characteristic history and physical exam findings of a patient with advanced heart failure
- Appropriately order and interpret ECG, CXR, lab data, echocardiographic imaging for patients with heart failure
- Identify reversible causes of heart failure
- Understand how to risk stratify patients with advanced heart failure
- Diagnose and treat acutely decompensated heart failure in the inpatient setting
- Know the indications, contraindications, and pharmacology of drugs commonly used for treating heart failure
- Understand the indications, contraindications, and clinical pharmacology of intravenous therapy for heart failure patients in severe failure and cardiogenic shock
- Understand the effect of other end organ damage associated with heart failure
- Understand the role of cardiac arrhythmias and risk of sudden death in patients with heart failure and the indications for the use of rhythm regulating devices
- Recognize candidates who would benefit from biventricular pacing and implantation of an automatic implantable defibrillator
- Identify appropriate patients for percutaneous ventricular assist devices and implantable ventricular assist devices as a bridge to recovery and/or transplantation
- Understand the associated medical and pharmacologic management of patients with mechanical circulatory support
- Know the indications for referral and evaluation of patients for cardiac transplantation

VI. Levels of Responsibility

Faculty/Attendings: Lead rounds and didactics, staff patients with team

Fellows: Serve as point of contact for consults, assign consults amongst residents and NPs, provide bedside teaching, supervise procedures

Residents: Assist in consults with the fellow, create management recommendations and plan for consults with direct supervision from the fellow, staff patients with attending, participate in didactics

Medical Students: Assist resident and/or fellow with consults, participate in didactics to maximize educational experience

Nurse Practitioners: See consults that have a quick turnaround as directed by the fellow

VII. Competencies & Demonstration of Competence

	CEX	Chart Review	Written Exam	PBL Exercise	Oral Report	Video CEX	Patient Satisfaction	Peer review
Knowledge	x				x			
Patient Care	x				x			x
Communication	x				x			x
Practice-based Learning	x				x			
Professionalism	x				x			x
Systems-Based Practice	x				x			

VIII. Specific Topics That Must Be Addressed During this Rotation

- Recognition of advanced heart failure
- Diagnosis and management of advanced heart failure
- Evidence based medical therapy for heart failure
- Inpatient management of decompensated heart failure
- ACC/AHA Stages of heart failure (Stages A-D)
- Classification of heart failure symptoms based on NYHA Functional Classification (I-IV)
- Candidates for biventricular pacing and automatic implantable defibrillator
- Appropriate ordering and interpretation of ECG, CXR, laboratory, echocardiographic imaging, CT imaging, cardiac MRI, and cardiac catheterization
- Identification and management of percutaneous ventricular assist devices
- Diagnosis and management of pulmonary hypertension
- Diagnosis and management of HOCM
- Indications and contraindications for cardiac transplantation

IX. Procedures: Procedures or Lab Tests that the Resident Should be Able to Perform, Order, or Interpret:

- Diagnostic and prognostic utility of serum BNP and N-terminal pro-BNP levels
- CXR to assess for signs of volume overload (cephalization, pulmonary vascular congestion, pleural effusions, cardiomegaly, Kerley B lines)
- ECG (LVH, atrial fibrillation/flutter, ACS)
- Echocardiogram (filling pressures, ejection fraction, systolic and/or diastolic dysfunction)
- Coronary angiograms to assess for ischemic heart disease leading to heart failure
- Right heart catheterizations to assess cardio-pulmonary hemodynamics
- Cardiac MRI to assess for late gadolinium enhancement to evaluate for areas of scarring or fibrosis

X. Evaluation Tools & Policies

- Resident Performance:
 - Faculty provide formative feedback on clinical performance, including documentation, throughout the rotation. Once the rotation is over, the faculty will provide summative feedback by completing web-based electronic resident evaluation forms provided by the Department of Medicine. This evaluation will be shared with residents. The evaluation will become part of the resident file and will be incorporated into the semiannual performance review for directed resident feedback.

- Rotation and Faculty Performance:
 - Upon completion of the rotation, residents will be asked to complete a service evaluation form to provide feedback on faculty and rotation experience. The evaluations will then be sent to the residency office and the rotation coordinator.

XI. Suggested Reading & Study Materials

- Books:
 - Braunwald's Heart Disease: Chapters 24-32
- Articles:
 - Evaluation for Heart Transplantation and LVAD Implantation. JACC Council Perspectives. *J Am Coll Cardiol* 2020;75:1471–87
 - <https://pubmed.ncbi.nlm.nih.gov/32216916/>
 - Left Ventricular Assist Devices for Lifelong Support. *J Am Coll Cardiol* 2017;69:2845-2861.
 - <https://pubmed.ncbi.nlm.nih.gov/28595702/>
 - 2019 ACC Expert Consensus Decision Pathway on Risk Assessment, Management, and Clinical Trajectory of Patients Hospitalized with Heart Failure
 - <https://www.onlinejacc.org/content/74/15/1966>
- Guidelines:
 - ACC/AHA/HFSA Focused Update of the 2013 ACCF/AHA Guideline for the Management of Heart Failure
 - <https://www.onlinejacc.org/content/70/6/776>
 - 2013 ACCF/AHA guideline for the Management of Heart Failure
 - <https://www.onlinejacc.org/content/62/16/e147>
- Others:
 - ACC/AHA Heart Failure Classification:
 - <https://www.healio.com/cardiology/learn-the-heart/cardiology-review/topic-reviews/accha-heart-failure-classification>
 - NYHA Classification of Heart Failure
 - <https://www.heart.org/en/health-topics/heart-failure/what-is-heart-failure/classes-of-heart-failure>