Director: Dr. Ronald Zolty  
Teaching Faculty: Drs. Adam Burdorf, Brian Lowes, Eugenia Raichlin and Ronald Zolty

Objectives:
The fellow will play a key role in the inpatient and out-patient heart failure and transplant service and will gain experience in evaluation and management of patients with acute and chronic heart failure of various etiologies, mechanical circulatory support including left ventricular assist devices, pre-transplantation candidates, post-transplant patients, palliative and comfort care of end-stage heart failure patients.

This rotation aims to develop the core competencies that include patient care that is compassionate, appropriate and effective, medical knowledge based on evidence based learning, practice based learning and improvement. Given the complexity and multidisciplinary nature of care needed for these patients, the fellow will develop his interpersonal and communication skills that result in effective information exchange with patients, their families and professional associates. The fellow is expected to participate in research that advances the field. Opportunities are available in clinical trials, outcomes research and the basic sciences.

Specific Learning Objectives:

1. The diagnosis of acute and chronic heart failure, including history taking, physical examination, differential diagnosis and efficient use of appropriate diagnostic tests/imaging modalities.
2. Understand normal cardiac physiology and the derangements in heart failure
3. Understand the pathophysiology of heart failure (HF with reduced EF (HFrEF) and HF with preserved LVEF (HFpEF)).
4. Diagnosis and management of patients with acute decompensated heart failure/ cardiogenic shock.
5. Evaluation and treatment of RV dysfunction
6. Pharmacology and pharmacotherapy of various meds used in heart failure
7. Impact and treatment of comorbidities in heart failure
8. Exercise and rehabilitation in patients with heart failure
9. Surgical approaches to chronic heart failure, including mechanical assist devices, heart transplantation.
11. Gaining insights into the timing and work-up for cardiac transplantation.
12. Understand basic heart transplant physiology.
13. Understand immunosuppression therapy, pharmacology and drug interactions.
16. Diagnosis and treatment of uncommon entities like myocarditis, infiltrative cardiomyopathies, constrictive and restrictive cardiomyopathy, HCM.
17. End-of-life considerations.

**Teaching Strategies:**

1. The Congestive Heart Failure (CHF) Service consists of one Cardiology teaching attending, one advanced heart failure fellow (PGY7), two clinical cardiology fellows and one heart failure/heart transplant nurse coordinator.

2. The scope of potential learning opportunities is extremely broad, and includes all of the challenges that can be brought to bear in the care of patients with acute and chronic ischemic and non-ischemic heart disease, valvular heart disease, cardiomyopathies, and acute and chronic rhythm disorders.

3. In order to meet the demands of the patients, we incorporate all potential teaching opportunities, including:
   a. Structured attending rounds for at least two hours per day to allow detailed presentation of new patients, review of old patients, and a detailed, patient-oriented discussion and examination by the attending.
   b. Patient management and care is oriented towards a team approach, and all members of the team will critically review and discuss the results of non-invasive and invasive diagnostic and therapeutic modalities.
c. All patients will be seen and examined by the attending physician and at least one other member of the team, and salient points of the history and physical examination will be emphasized at the bedside.

d. The cardiology fellow will gain experience as the team leader, under direct supervision of the attending. As such, the fellow will have considerable independence in patient evaluations, family meetings, working with nursing and ancillary staff, ordering noninvasive studies, requesting consultations from other medical and surgical services.

e. Participation in all required Cardiology conferences.

f. The Fellow is expected to review and implement appropriate guidelines for care and treatment of all heart failure problems. Formal guidelines from ACC, AHA, HFSA, ISHLT, etc. are available from web-based resources in the McGoogan Library. Other web-based resources are excellent sources for self-study, and include Cardiosource, UpToDate, and MDConsult.

Attending Responsibilities:

1. The attending must see each patient.

2. Provide guidance on the indications, implications, complications, and limitations of non-invasive and invasive techniques.

3. Conduct daily morning rounds (9:30 am) for the CHF Service. To the extent possible, these rounds should focus on teaching and education, rather than “work rounds”.

4. The attending is expected to make the CHF Service activities a top priority and is encouraged to cancel other responsibilities including clinics and echo interpretation, etc.

5. The CHF Service attending will meet with the fellow at the beginning of the rotation to verbally review the goals, objectives and responsibilities for the upcoming month.

6. The CHF Service attending will meet with the fellow at the end of the monthly rotation to verbally review the fellow’s written evaluation and performance. The attending will also complete a formal evaluation of the fellow using New Innovations.

Fellow Responsibilities:

1. The Advanced Heart Failure and Transplant fellow will evaluate and admit (as deemed appropriate in discussion with the service attending) advanced heart failure patients, LVAD patients being admitted for medical reasons or after hours/weekend, pre- and post-transplant patients.
2. Will conduct daily in-patient rounds with the attending staff and team and will present and discuss patient’s hospital course and be actively involved in patient care.

3. Interact with LVAD team/transplant coordinator.

4. Participate in decision making on biopsy results and laboratory values, immunosuppression, heart failure and mechanical circulatory support (MCS) management under supervision.

5. Participate in clinical/basic research project under supervision. Help with patient evaluation and selection for new heart failure therapies.

Fellow Requirements:

1. Recognize various presentations of heart failure syndrome.

2. Perform a detailed history and a thorough physical examination for patients suspected of heart failure.

3. Develop an appropriate differential diagnosis and order appropriate laboratory and imaging studies.

4. Discuss appropriate invasive studies with the attending and arrange accordingly.

5. Address the comorbidities appropriately and consult the appropriate services.

6. Learn the basics of mechanical circulatory support and cardiac transplantation and actively seek information from the attending about these advanced therapies.

7. Recognize when to seek immediate help from other members of the team.

8. Become more familiar and proficient in the interpretation and performance of diagnostic modalities:
   a. Right heart catheterization.
   b. Hemodynamic studies.
   c. Right ventricular endomyocardial biopsies.

9. Understand the appropriate timing to refer patients with advanced heart failure to a center that offers expertise in the care and management of advanced heart failure.

10. Knowledge of advanced therapies available to patients with advanced heart failure.
    a. AICD ± CRT: Indications, effectiveness and limitations.
b. Mechanical Circulatory Support (IABP, ECMO, RVAD, LVADs as BTT & DT) - able to interrogate the devices and perform basic interpretation recognizing the range of normal (and discuss with attending for troubleshooting), interpretation of imaging studies in patients with MCS.

c. Cardiac transplantation (indications, contraindications, outcomes and limitations.

d. Combined cardiac & renal transplantation (indications, limitations).

11. Understand the care and management of the heart transplant patient.
   a. Perioperative (emphasis on immunosuppression).
   b. Early postoperative (both cellular and humoral rejection).
   c. Active participation in management of immunosuppression, interpretation of biopsy results, imaging studies, infectious disease management, need for prophylaxis and appropriate prophylactic agents.
   d. Late post-operative (rejection and malignancy).

**Patient Care:**

1. Distribute daily patient assignments among the fellows. The fellows should work with the Nurse Practitioners to ensure that the responsibilities and patient assignments are not ambiguous, and that all patients are seen in a timely fashion.

2. Write or dictate a formal cardiology evaluation, a thorough history and physical examination, develop a care plan that is cost-effective and review it with the attending physician.

3. Discuss the care plan and progress on each patient during attending rounds. The fellow is responsible for writing daily progress notes on his patients.

4. Respond appropriately to nursing staff in dealing with issues related to patient care.

5. Recognize the need to address psychosocial and financial issues, and enlist the support of appropriate hospital resources.

6. Obtain consultations from other medical and surgical services when indicated.
7. The fellow is responsible for ensuring the efficient and effective operation of the CHF Service, under the supervision of the attending physician.

8. The fellow is expected to be available from 7:00 am to 5:00 pm to respond to the clinical needs of the patients on the Service.

Medical Knowledge:

1. The knowledge base for management of the CHF Service is huge. The fellow is expected to demonstrate understanding of the principles of heart failure as stated in the learning objectives.

Practice-based Learning:

1. Participate in daily rounds with the CHF Service team.
2. Attend all mandatory cardiology conferences.
3. Attend all transplant selection meetings.

Interpersonal and Communication Skills:

1. Daily communication with the patient and family (more frequently if needed) to keep them apprised of patient progress.
2. Interact with the LVAD team, nursing staff, and attending physician to strengthen the “team” approach, and to identify and resolve any problems that arise.
3. Urgent matters require immediate communication between the fellow and attending to ensure timely medical care and decision making.

System-based Practice:

1. The fellow is expected to utilize a broad approach to expanding their educational goals, and while excellent resources are readily available among the teaching faculty, the fellow is expected to review and implement appropriate guidelines for care and treatment of all heart failure problems. Formal guidelines from ACC, AHA, HFSA, ISHLT, etc. are available from web-based resources in the McGoogan Library. Other web-based resources are excellent sources for self-study, and include Cardiosource, UpToDate, and MDConsult.

Professionalism:

1. Always maintain a positive and professional attitude towards the patient, family, and referring physician.
2. Maintain regular and professional interaction with the LVAD team, nursing staff and attending physician. It is important to try to incorporate the nursing staff into important decision-making, since nurses often have the most insight into the patient’s needs.

3. Special attention needs to be paid to patients and their families when dealing with end-of-life issues. It is important to ensure that patients are treated with compassion, respect, and honor, and that they and their families do not feel abandoned. Many hospital resources are available, and patients and families should be encouraged to use them.

**Evaluations:**

1. Each fellow is to be evaluated on a monthly basis at the end of the CHF Service rotation. A formal evaluation will be completed by the CHF Service attending using New Innovations and the content of the evaluation will be reviewed verbally with the fellow. **All evaluations must be discussed face to face with the fellow and the Program Director must be notified if any remedial actions are needed.** A monthly evaluation will also be completed by the heart transplant nurse coordinators on the service.

2. The fellow will complete a written evaluation of the CHF Service attending each month using New Innovations. This evaluation will be reviewed on an annual basis with the Program Director and Chief of Cardiology.