# Heart Failure In-Patient Service Cardiology Fellow Core Curriculum Penn State Heart and Vascular Institute

## **OVERVIEW**

The cardiovascular fellow on the inpatient service will be responsible for the triage, evaluation, continuing care and disposition of patients admitted to the Heart Failure/Transplant service. Specific responsibilities include:

- Respond promptly to the emergency department for evaluation and triage of patients to the HF service. Work collegially with the fellow on the consult service to resolve patient management and continuing care.
- Evaluate all new patients admitted to the HF/Transplant service. Review and confirm patient
  assessments performed by medicine residents and fellow coverage from night and weekend
  admissions. Supplement and document as needed an interim assessment note.
- On patients who are admitted, a history and physical examination is performed to supplement the admitting resident comprehensive history and physical examination. Essential components are:
  - Document the indication for admission.
  - Obtain a cardiovascular disease focused history with pertinent multisystem elements, for example a history of diabetes, renal insufficiency and contrast allergy.
  - Perform a cardiovascular examination.
  - Review and document, by independent interpretation (when appropriate), all relevant current and historical diagnostic information including ECG's, images including chest x-rays, CT scans, echo-Doppler data, nuclear images, MRI scans, catheterization lab images and/or hemodynamic data.
  - Review and document relevant biochemical lab data
- Develop a diagnostic and management plan and discuss with the cardiovascular in-patient team.
  Review and define a plan for expeditious inpatient care, including testing and treatment.
  Estimate the length of stay for completion of plan. Incorporate patient social issues and situations that may impact on expeditious discharge. Initiate resolution with appropriate care coordinator.
  - As appropriate, develop evidence-based recommendations for testing and treatment based on current ACC/AHA guidelines when pertinent. Use evidence-based guidelines to develop an individualized treatment plan when alternate or divergent strategies are present. With patient approval, involve family members as appropriate. Discuss indications for treatment and testing and document reasons for withholding standard treatment or providing an alternative to recommended strategies.
- Present the history, physical examination and testing and/or treatment plans to the attending
  physician; if the presentation is given by a medical student or resident, be able to provide
  supplementary information as necessary.

- Communicate and discuss with the patient, and when appropriate the family, the provisional diagnosis recommended initial evaluation and treatment plan.
  - Discuss indications, complications and alternate strategies as appropriate.
  - Promptly notify the patient of the test results and implications to diagnosis and management
- Education of the patient
  - As appropriate about the disease(s)/diagnose(s)
  - Preventive health measures (such as diet, weight loss, cessation of smoking)
- Cardiology Service Team Leader
  - Serve as role model and team leader for the HF/Transplant service team
  - Review patient care plans and directly supervise residents and medical students
  - Attend, supervise or perform invasive bedside procedures based on skill level of medical housestaff team members
  - Provide education to the residents and medical students on the service
  - Review and make recommendations to attending physician on performance and grade
- Heart failure/Transplant consultations
  - Serve as consultant to other services who are providing care for patients with heart failure.
  - Assist in the management of patients who have underdone cardiac transplantation either in the remote or recent past. In this capacity the fellow would be expected to work closely with the transplant coordinator on a daily basis.

### EDUCATIONAL GOALS

Cardiovascular fellows will acquire the necessary skills to competently formulate a provisional diagnosis and treatment plan for a broad spectrum of cardiovascular symptoms and pathophysiology. This will include patients with coronary artery disease, valvular heart disease, diseases of the myocardium, diseases of the pericardium and congenital heart disease, cardiac arrhythmias, conduction disorders and syncope.

Fellows will develop cardiology skills with emphasis on focused and expeditious cardiac history acquisition and physical examination. These skills will include evaluation of normal and abnormal heart sounds, evaluation of heart murmurs, including provocative maneuvers that accentuate or decrease intensity of murmurs. The fellow will acquire the necessary skills to recognize the peripheral manifestations of cardiac dysfunctions. The fellow will learn the indications and contraindications for performing diagnostic studies. Adherence to published "appropriateness criteria" for diagnostic tests is expected. In addition, the fellow will become proficient in analyzing diagnostic data to establish a cardiovascular diagnosis and treatment plan. The fellow will acquire experience in the clinical analysis of surface and intracardiac ECG recordings, chest radiographs, stress echo and nuclear images, CT scans, M-mode and 2-D echocardiograms, Doppler and catheter

hemodynamics, coronary angiography, and contrast ventriculography. Opportunities to review new imaging modalities including cardiac MRI and 3-D echo will be encouraged.

The fellow will develop and mature mentorship and educational skills participating in the departmental structure for education of residents and medical students. This will be achieved with for formal lecture and didactic sessions, preceptorship in bedside clinical skills, and informal spontaneous sessions during the course of patient evaluation.

For both patient care and education, cognitive communicate skills will be developed emulating a professionalism and competence.

#### TRAINING OBJECTIVES

Training objectives are designed to develop the fellow into a cardiovascular specialist using evidence based medicine applied to individual patients in a competent and caring manner.

- To develop the knowledge and skills required to obtain a proper cardiac history. Specific areas include characterization of chest pain (including the differential diagnosis of various etiologies of chest pain syndrome based on historical description), dyspnea (with differentiating cardiac from pulmonary causes of dyspnea), exercise capacity and functional class. In addition, special emphasis should be paid to medications, medication compliance, dietary habits, smoking and alcohol consumption as well as other risk factors for cardiac diseases. (Patient Care, Medical Knowledge, Practice-Based Learning, Interpersonal and Communication Skills)
- To become proficient in cardiac physical examination. The complete bedside examination includes palpation of all pulses, recognition of pulse characteristics, and blood pressure examinations in both upper and lower extremities, especially when delayed or absent femoral pulses are obtained. The cardiac fellow should also be able to estimate jugular venous pressure as well as characterize different waves in the neck, detect bruits, examine lung fields, and define the precise location and characterization of left and right ventricular impulses. Proficiency is required for auscultation of heart sounds as it relates to intensity, splitting and additional heart sounds such as murmurs, rubs and clicks. To accurately assess the characterization of murmurs with regard to timing pitch, grade, maximal intensity and radiation and the effect of provocative maneuvers in eliciting the origin of the murmur. To recognize the peripheral manifestations of heart dysfunction such as palpable and/or pulsatile liver, anasarca, ascites, peripheral edema or sacral edema. (Patient Care, Medical Knowledge)
- To accurately assess the presence or absence of congestive heart failure. To evaluate whether murmurs of valvular heart disease such as mitral regurgitation, mitral stenosis, aortic regurgitation and tricuspid regurgitation contribute singularly or in combination to the clinical picture of congestive heart failure. (Patient Care, Medical Knowledge)

- To accurately assess the presence or absence of abdominal aneurysms and the presence or absence of peripheral vascular disease. (Patient Care, Medical Knowledge)
- To learn how to interpret cardiac testing (chest X-ray, ECG, CT, MRI, nuclear, echo, and angiograms) focusing on assessment of heart structure and function. (Patient Care, Medical Knowledge, Practice-Based Learning)
- To learn to interpret laboratory data to assist with risk stratification and treatment. (Patient Care, Medical Knowledge, Systems-Based Practice, Practice-Based Learning)
- To understand the clinical value of different therapeutic interventions including medical, percutaneous, and surgical therapies as well as device therapy in the management of all types of adult cardiovascular disease. (Patient Care, Medical Knowledge, Systems-Based Practice, Practice-Based Learning, Interpersonal and Communication Skills)
- To learn to assess the risk of adverse cardiac events for and to become familiar in the
  management of HF patients in the perioperative period referred for non-cardiac surgery (Patient
  Care, Medical Knowledge, Systems-Based Practice, Practice-Based Learning)
- To learn about the chronicity and long-term characteristics of various cardiac diagnoses, such as
  congestive heart failure, valvar disease (such as aortic stenosis and mitral regurgitation), and
  chronic coronary artery disease. (Patient Care, Medical Knowledge, Practice-Based
  Learning)
- To interact with the patient in a compassionate and caring manner; to demonstrate sensitivity and responsiveness to the gender, age, culture, religion, sexual preference, socioeconomic status, beliefs, behaviors and disabilities of patients and professional colleagues; to adhere to principles of confidentiality, scientific/academic integrity and informed consent. (Patient Care, Communication Skills, Professionalism)
- To interact with the health care team including nurses, physician assistants, technicians, social workers, nutritionists, physical therapists, respiratory therapists as well as other physicians.
   (Patient Care, Medical Knowledge, Systems-Based Practice, Interpersonal and Communication Skills, Professionalism)
- Learn how to utilize hospital and community resources for managing cardiac patients in the outpatient setting. Interact with staff in referring physician's offices, lipid clinics, coumadin clinics, cardiac rehabilitation, visiting nursing services (VNA), the OASIS program, and

# hospice. (Systems-Based Practice, Practice-Based Learning, Patient Care and Interpersonal and Communication Skills)

- Access and critically evaluate current medical information and scientific evidence. Use
  information technology or other available methodologies to access and manage information,
  support patient care decisions and enhance both patient and physician education. (Patient Care,
  Medical Knowledge, Systems-Based Practice, Practice-Based Learning and Improvement)
- To learn about the process of selection, evaluation, and listing of patients referred for cardiac
  transplantation and to have a basic understanding of pre-transplant management, short and longterm post-transplant management, the immunosuppressive medications used and available for
  treatment, and the potential complications seen throughout the transplant course. Attendance at
  the weekly transplant meeting is expected.
- To learn about the indications for and the evaluation and selection of patients for mechanical circulatory support and ventricular assist devices. To have a basic understanding of pre and post-VAD management and potential complications. There should also be a basic understanding of the different types of assist devices available, their relative advantages and disadvantage, their individual reasons for selection, and appropriate timing of placement. Attendance at the monthly mechanical circulatory support meeting is expected.
- As time permits, the fellow will be expected to spent time in the cardiac catheterization lab
  assisting in right heart catheterization and endomyocardial biopsy procedures in order to
  become more familiar with each procedure and have a better understanding of cardiac
  hemodynamics.
- To review results of endomyocardial biopsies with the transplant attending and coordinator who
  are reviewing specimens obtained on the previous day. To learn the biopsy grading scale for
  rejection.
- To learn about the long-term outpatient management of patients with HF by spending time in the heart failure clinic.

## PRINCIPLE TEACHING METHODS

The attending cardiologist on the Heart Failure/Transplant service will serve as a mentor for the fellow. The mentor–student relationship will be utilized as the main teaching method after the fellow has seen and examined the patient and presented the patient's findings and plans to the attending. The fellow is expected to utilize all available scientific research, published guidelines and expert opinion to assist with decision making and learning.

Discrepant findings on diagnostic data, controversial issues and differences of opinion will be discussed with the attending cardiologists. When appropriate the attending will examine the patient and discuss discrepancies of examination with the fellow.

## **EVALUATION METHODS**

The attending cardiologist will utilize a standardized evaluation process to assess the performance of the cardiology fellow. A written evaluation of the cardiac fellows' performance on the consultative service will be made each six months by the cardiology attendings assigned to the outpatient continuity clinic. The cardiology attending will evaluate each fellow according to the ACGME general competencies including: patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism and systems-based practice. In addition, bedside skills such as obtaining history, physical examination and performance of cardiac procedures will be evaluated. The cardiology teaching attending will meet with each cardiac fellow at the end of each six month rotation to review the written evaluation. Fellows are required to electronically sign each evaluation in the New-Innovations program.

## EDUCATIONAL CONTENT

The Heart Failure/Transplant cardiology service provides acute care for primary patients admitted through the emergency department and transferred by ground or rotorcraft for regional specialty services. The service also provides continuity care for patients referred and managed by the general cardiology, electrophysiology, interventional, and congenital heart disease services. Patient problems include a variety of cardiovascular disorders including coronary artery disease, hypertension, peripheral vascular disease, hyperlipidemia, valvular heart disease, myocardial and peripheral disease, endocarditis, pericardial diseases and congenital heart disease will form the case mix on this service. Adult (18 years of age and older) male and female patients reflect the demographics of central Pennsylvania. Patients are of rural or urban background, from a wide range of socioeconomic groups, and of various ethnic backgrounds.

Fellows develop experience in several acute care hospital services based upon the acuity of the patient and their changing status during admission. Patient admission areas include a general cardiology floor, to intermediate care, and intensive care unit. Fellows are also instructed on expeditious evaluation of patients and integration of clinical information in the clinical decision unit of the emergency department, or CDU.

## Suggested reading

- 1. Hunt SA, Abraham WT, Chin MH, Feldman AM, Francis GS, Ganiats TG, Jessup M, Konstam MA, Mancini DM, Michl K, Oates JA, Rahko PS, Silver MA, Stevenson LW, Yancy CW, Antman EM, Smith SC, Jr., Adams CD, Anderson JL, Faxon DP, Fuster V, Halperin JL, Hiratzka LF, Jacobs AK, Nishimura R, Ornato JP, Page RL, Riegel B, American College of C, American Heart Association Task Force on Practice G, American College of Chest P, International Society for H, Lung T, Heart Rhythm S. ACC/AHA 2005 Guideline Update for the Diagnosis and Management of Chronic Heart Failure in the Adult: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Writing Committee to Update the 2001 Guidelines for the Evaluation and Management of Heart Failure): developed in collaboration with the American College of Chest Physicians and the International Society for Heart and Lung Transplantation: endorsed by the Heart Rhythm Society. Circulation. 2005;112:20.
- 2. Adams KF, Lindenfeld J. HFSA 2006 Comprehensive Heart Failure Practice Guideline. J. Card. Fail. 2006;12:e1-e113.
- 3. Braunwald's Heart Disease, 7<sup>th</sup> Edition, Chapters 19-26.