FELLOWSHIP TRAINING PROGRAM
ADULT CARDIOVASCULAR MEDICINE AND RESEARCH

Department of Medicine
Division of Cardiovascular Medicine

Lisa A. Mendes, MD
Associate Professor of Medicine
Director, Cardiovascular Medicine Fellowship Training Program

Julie B. Damp, M.D.
Assistant Professor of Medicine
Associate Director, Cardiovascular Medicine Fellowship Training Program

Linda H. Selfridge
Fellowship Coordinator

Vanderbilt Medical Center
Division of Cardiovascular Medicine
383 PRB, 2220 Pierce Avenue
Nashville, Tennessee  37232-6300
SECTION I
MISSION STATEMENT

Our mission is to train superb Cardiovascular Physicians and Scientists who will become leaders in Cardiovascular Medicine. We do this by devoting our time, talents, and energy to:

- Patient Care
- Research
- Teaching

Our Vision is to create a training program in Cardiovascular Medicine that nurtures the development of Fellows who have the potential to:

- Assume leadership roles in academic medicine
- Provide exemplary patient care
- Contribute to medical knowledge through research
- Continue this tradition of excellence by teaching others

We value in our Faculty and Fellows:

- Clinical excellence
- Scholarship
- Academic achievement
- Dedication
- Integrity
- Service
SECTION II
PROGRAM DESCRIPTION

Adult Cardiovascular Medicine is an increasingly complex and expanding discipline. The training program at Vanderbilt continually evolves to meet current training requirements. Our program is designed to provide training and experience in the evaluation and management of a wide spectrum of patients with acute and chronic cardiac conditions. The mandated clinical experience conforms to the American College of Graduate Medical Education guidelines (www.acgme.org).

All Cardiovascular Medicine Fellows will participate in clinical activities for at least 24 months during the 3-year training period as outlined by the ACGME and ABIM. This allows fellows to develop appropriate levels of clinical competence in Adult Cardiovascular Medicine to start their careers in academia or in practice. Fellows wishing to pursue clinical (level 2) or basic science research (level 3) require a minimum of two dedicated research-training years (COCATS, www.acc.org). The training program also actively participates in physician-scientist training via the ABIM research pathway and adheres to the guidelines outlined by the ABIM (www.abim.org). The total amount of clinical training will be individually determined to best meet the career goals of Fellows. Outlined in this section are the major hospital and clinic based experiences designed to meet the stated expectations for fellowship. Details of the learning objectives, responsibilities, and curriculum for each rotation are available on the fellowship website.

The level of competency a fellow achieves during their training is based on the American College of Cardiology Core Cardiology in Adult Cardiovascular Medicine (COCATS) requirements, which delineate the exact number of procedures and months of training necessary to be considered trained in a particular area of cardiology. Level 1 training is the minimum training level needed in an area for a trainee to graduate cardiology fellowship. Level 2 training allows a fellow to apply their training in a particular area in clinical practice. Level 3 training allows a fellow to become an expert in an area and to teach this specialty to others after graduation. At the end of cardiology fellowship, trainees receive letters from the supervising heads of cardiology specialties attesting to their degree of training. To document their level of competency, fellows are asked to keep a personal log of their procedures, as well as the number of months completed in specialty. These requirements are summarized below.

<table>
<thead>
<tr>
<th>Area</th>
<th>Level</th>
<th>Total # of Procedures</th>
<th>Total Training Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Cardiology</td>
<td>1</td>
<td></td>
<td>36</td>
</tr>
<tr>
<td>Electrocardiography</td>
<td>1</td>
<td>150</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>225</td>
<td>8</td>
</tr>
<tr>
<td>Ambulatory Monitoring</td>
<td>1</td>
<td>200</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>300</td>
<td>8</td>
</tr>
<tr>
<td>Exercise Testing</td>
<td>1</td>
<td>100</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>300</td>
<td>8</td>
</tr>
<tr>
<td>Diagnostic Catheterization</td>
<td>1</td>
<td>150/75</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>300 /150</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>750/300</td>
<td>12</td>
</tr>
<tr>
<td>Interventional Catheterization</td>
<td>3</td>
<td>250</td>
<td>20</td>
</tr>
<tr>
<td>Echocardiography</td>
<td>1</td>
<td>Read/Performed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>150/75</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>300 /150</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>750/300</td>
<td>12</td>
</tr>
<tr>
<td>Nuclear Cardiology</td>
<td>1</td>
<td>100</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>300</td>
<td>4-6</td>
</tr>
</tbody>
</table>

Cardiovascular Medicine
Fellowship Training Program
The fellowship program is based upon a 28-day cycle for all of the clinical rotations comprising the fellowship program. Each 28-day block rotation requires fellows to switch on a staggered cycle from Attendings and Housestaff and we believe this improves the continuity of care provided to our patients. This cycle allows:

- An increase in the number of rotations in a calendar year;
- A more equitable distribution of rotations throughout the calendar year;
- More elective-based experiences for Senior Fellows.

**Medicine Core Competencies**

The Fellowship Director or Associate Director will meet with all fellows at least twice each year to review evaluations, discuss strengths, remedy weaknesses, and help tailor the training program to best fit individual career goals. A 360 degree evaluation is performed by faculty, peers, residents and medical students, nursing staff and patients. Fellows also complete regular self assessments which are discussed with the faculty with whom they have been working. Fellows are evaluated on the following competencies, which are further explained in Section VII. Sub-specialty program directors also utilize the same evaluation criteria.

Cardiovascular Medicine

<table>
<thead>
<tr>
<th>Area</th>
<th>Level</th>
<th>Total # of Procedures</th>
<th>Total Training Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart Failure/Transplant</td>
<td>1</td>
<td>40 caths</td>
<td>Core Lectures</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>300 TTE</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>50 TEE</td>
<td>24</td>
</tr>
<tr>
<td>Congenital Heart</td>
<td>1</td>
<td>100 peripheral angiograms</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>50 angioplasties/stents</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>10 peripheral lytics/thrombectomy</td>
<td>20</td>
</tr>
<tr>
<td>Vascular Medicine</td>
<td>1</td>
<td>500 non-invasive cases</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>100 peripheral angiograms</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>50 angioplasties/stents</td>
<td>12</td>
</tr>
<tr>
<td>Cardiovascular Magnetic Resonance</td>
<td>1</td>
<td>25</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>150</td>
<td>3-6</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>300</td>
<td>12</td>
</tr>
<tr>
<td>Computed Tomography</td>
<td>1</td>
<td>50 CTAs</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>150 CTAs</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>300 CTAs</td>
<td>6</td>
</tr>
</tbody>
</table>

(www.asnc.org/imageuploads/COCATS3_TaskForces.pdf)
- **Patient Care** that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health.
- **Medical Knowledge** about established and evolving biomedical, clinical, and cognate (e.g. epidemiological and social-behavioral) sciences and the application of this knowledge to patient care.
- **Practice-Based Learning and Improvement** that involves investigation and evaluation of their own patient care, appraisal and assimilation of scientific evidence, and improvements in patient care.
- **Systems-based practice through the** awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care.
- **Interpersonal and Communication Skills** that result in effective information exchange and teaming with patients, their families, and other health professionals.
- **Professionalism**, as manifested through a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.
SECTION III
PROGRAM SPECIFICATIONS

Please see the cardiology fellowship website for more detailed descriptions of the rotation responsibilities, learning objectives, and curriculum
http://www.vanderbilthealth.com/cardiovascular/29924?previewsession=1

AMBULATORY CARDIOLOGY EXPERIENCE

1. Outpatient Clinic Description

Fellows are involved in longitudinal care of patients in the ambulatory setting throughout their 3-year fellowship required by ACGME. These activities take place at the Vanderbilt Heart and Vascular Institute (VHVI), in the outpatient clinic of the Raphael Smith Cardiology Center at the Nashville Veteran’s Affairs Medical Center (VA) or at Nashville General Hospital at Meharry Medical College (Meharry) to ensure exposure to a broad mix of patients and cardiovascular diseases. The ambulatory experience will teach Fellows to be competent in managing the full range of cardiovascular diseases seen in ambulatory patients. Didactic instruction in risk factors and epidemiology is conducted as part of the ambulatory experience through an outpatient case conference conducted at the VA once per month. Fellows are encouraged to function autonomously while faculty supervision and consultation are readily available.

2. Subspecialty Clinic Description

Fellows obtain additional outpatient experience during certain rotations, as well as in 6 month blocks during the second and third years of training, in subspecialty fields, including Heart Failure/Transplant, Vascular Medicine, Adult Congenital Heart Disease, Lipid Management, and Arrhythmia.

INPATIENT CARDIOVASCULAR SERVICES

1. Arrhythmia Inpatient Consultation Description

The Heart Rhythm Service provides consultation to the VUMC inpatient and ER services. This includes appropriate and timely evaluation of implanted pacemakers, defibrillators and loop recorders with the assistance of device nurses and technicians. There is also an opportunity to see arrhythmia patients in the outpatient setting and to spend time in the Electrophysiology Laboratory participating in procedures.

2. Chronic Heart Failure Inpatient Service

The Heart Failure Program (HFP) is designed to provide comprehensive care to patients with advanced heart failure and cardiac transplant. The general cardiology fellow is responsible for participating in daily inpatient rounds and defining treatment plans. In addition, the fellow will evaluate and follow heart failure consults, participate in pre- and post-transplant care, and ventricular assist device management. Fellows will also have the opportunity to see outpatients with chronic heart failure and to gain experience with hemodynamic exercise testing and cardiopulmonary exercise testing.

3. Cardiovascular Intensive Care Unit Rotation

The Cardiovascular Intensive Care Unit (CVICU) at Vanderbilt is a 27-bed ICU for cardiology and cardiac surgery patients. The CVICU rotation for Fellows entails supervision of residents in the, care for critically ill cardiology patients. Complex management is provided including the use of intra-aortic
balloon pumps and various mechanical assist devices. The fellow on this rotation is responsible for rounding with the team, participating in patient management decisions, interpretation of diagnostic testing, performance and supervision of invasive procedures, and teaching the Housestaff assigned to this rotation. The Fellows assigned to this rotation will follow only the cardiology patients within the CVICU. The CVICU is staffed 24 hours by two fellows with overlapping 13-hour shifts six days a week. The seventh day of the week is staffed by senior fellows rotating on other rotations.

4. Vanderbilt University Hospital Consults
The Vanderbilt University Hospital (VUH) consult service performs cardiovascular consultation for the noncardiology inpatient ward services and for the Emergency Department (as needed based on availability of coverage by the ER Liaison attending).

5. Vascular Medicine Service
Senior fellows have the opportunity to rotate on the Vascular Medicine Service. On this service, the fellow provides inpatient consultative services with one of our cardiologists who specializes in vascular and interventional vascular medicine. The fellow also sees patients with vascular disease in the outpatient vascular surgery and general cardiology clinics and has the opportunity to interpret noninvasive vascular studies. An opportunity to participate in specialty clinics other than cardiovascular medicine during this rotation are also available including pulmonary hypertension, hematology and vasculitis clinics.

6. Veterans’ Affairs Medical Center Rotations
The Veterans’ Affairs Medical Center (VA) in Nashville on the Vanderbilt campus consists of a 233-bed general hospital and an ambulatory care, education, and research facility. VA beneficiaries have a high prevalence of geriatric cardiovascular disease and VHVI plays a major role in providing state-of-the-art care. Three Fellows are assigned to cover cardiovascular services at the VA; the CCU Fellow, the Consult Fellow, and the Cath Fellow. During the 4-week rotation the Fellows assigned to VA rotations will alternate covering VA CCU and consults on weekends until 2:00 PM.

- **VA CCU:** The VA CCU attending and fellow round daily with the internal medicine housestaff covering both CCU and MICU patients. The CCU fellow participates in daily management decisions and teaching of housestaff. The fellow also has the opportunity to perform Trans-Esophageal Echocardiography (TEE) on both inpatients and outpatients, under the supervision of the VA TEE Attending.
- **VA Consults:** The VA consult service rounds daily to provide consultative services to VA inpatients.
- **VA Cath Lab:** The VA cath lab fellow performs cardiac catheterization procedures on inpatients and outpatients referred to the VA cath lab under the supervision of the VA cath attending.

7. Nashville General Hospital at Meharry
Nashville General is the public hospital for Nashville and Davidson County. As such it is the primary source of healthcare delivery for the underserved and indigent population in this region, and provides a diverse clinical experience for Fellows. This rotation focuses on an integrated mixture of inpatient consults, nuclear cardiology, cardiac catheterization, TEE’s, ECG and Echo interpretation. The rotation entails 3 tracks: (1) Cardiac catheterization track (2) Non-invasive imaging track and (3) Clinical management track. The roles of the fellows in each track are outlined in the rotation description on the fellowship website.

CARDIOVASCULAR LABORATORY ROTATIONS

1. Cardiac Catheterization Laboratory
Vanderbilt's cardiac catheterization laboratory is a state-of-the-art facility that performs more than 3000 catheterizations and 1500 interventions annually, drawing upon an extensive referral base throughout middle Tennessee. The cath lab also utilizes the nation’s first hybrid OR/cath lab to enable “completion angiography” of surgical revascularization and complex hybrid percutaneous and surgical revascularization. Vanderbilt's catheterization lab provides an ideal environment for cutting-edge procedural training.
2. Echocardiography Laboratory
The Echocardiography Laboratory (Echo Lab) is a state-of-the-art facility housed within VHVI with separate suites for transthoracic echocardiography, transesophageal echocardiography (TEE), and stress echocardiography. Training requirements for Fellows in surface echocardiography follow the American College of Cardiology Task Force recommendations (COCATS 2008). TEE training is based on those of the American Society of Echocardiography (JASE 5:187-94, 1992), as is stress echo training (JASE 11:95-6, 1998). The fellows have the opportunity to perform, supervise, and interpret transthoracic and stress echocardiography daily, and senior fellows perform inpatient and outpatient TEE.

3. Cardiovascular MRI Laboratory
Fellows rotate through our state-of-the-art Cardiovascular MRI Laboratory during their Imaging rotation, which is a combined month with Outpatient Nuclear Cardiology. During this rotation, Fellows are instructed on MRI safety procedures, and encouraged to be present to observe individual patient image acquisition for both cardiac MRI and vascular MRA studies. These studies are then reviewed with the Attending physician. Fellows can expect exposure to a wide variety of cardiac and vascular conditions, which involve various methods of image processing, manipulation, and calculation. Fellows also receive a didactic lecture series on MRI physics, image acquisition, indications, and interpretation.

4. Nuclear Cardiology
Nuclear cardiology training occurs through joint effort between the Division of Cardiovascular Medicine and the Division of Nuclear Medicine in the Department of Radiology and Radiological Sciences. Exposure to outpatient-based nuclear cardiology testing is achieved during the VU Imaging rotation at VHVI, and exposure to nuclear cardiology applied to the management of inpatients is achieved during the VU Nuclear rotation. While in the nuclear radiology department the Cardiology Fellows and the nuclear radiology fellow are in charge of overseeing and performing exercise and pharmacological stress testing.

Policy on Planned Absences
Absence from a service for academic or personal reasons will only be allowed under extraordinary circumstances or with pre-authorization. Written authorization from the Fellowship Program Director, Chief Fellow, and on-service Attending should be obtained 2 weeks in advance if circumstances allow. Each Fellow is required to arrange coverage for his/her absence.
SECTION IV
ADVANCED TRAINING

Cardiac Transplantation/Advanced Heart Failure
The cardiac transplant service provides training for one fellow who has completed basic cardiovascular medicine training. This 4th year position is designed to provide comprehensive training in the management of patients with advanced heart failure and the evaluation and identification of candidates for cardiac transplantation. The Fellow is also an integral member of the Cardiac Heart Failure/Transplant Service, and is involved in early and late medical management of transplant recipients, both in hospital and in the ambulatory setting.

Heart Failure and Device Training Program
The heart failure and device fellowship training program allows for 1 year of training in cellular therapeutics and device therapy. The model has been developed to provide equal exposure to management of complex heart failure patients and hands-on experience with defibrillator implantation and optimization of biventricular devices.

Clinical Cardiac Electrophysiology Training Program
The Clinical Electrophysiology Fellowship Training Program 1-2 years in duration, qualifying Fellows for subspecialty board certification in Clinical Cardiac Electrophysiology. Complete training is provided in the diagnosis and management of complex cardiac rhythm disturbances, the performance and interpretation of standard electrophysiology studies; the performance of radiofrequency catheter ablation procedures; and the evaluation and implantation of permanent pacemakers and implantable cardioverter defibrillator and biventricular pacing device systems. It is anticipated that the EP Fellows will actively participate in clinical and/or basic research projects as part of sub-specialty training.

Interventional Cardiology Training Program
The Interventional Cardiology Fellowship Training Program provides the opportunity for physicians to become certified as a primary operator in invasive and interventional cardiovascular medicine according to the standards set forth by the American College of Cardiology. The opportunity is extended to individuals who have successfully completed a Cardiovascular Medicine Fellowship at an approved institution and who are board eligible in Internal Medicine and Cardiovascular Diseases.

Peripheral Vascular and Structural Heart Disease Training Program
After completion of one year of advanced training in Interventional Cardiology an additional year of training is available in peripheral vascular interventions and structural heart disease. It is possible to gain advanced training in the percutaneous management of carotid stenosis, patent foramen ovale/ASD, HOCM, valvular disease, complex peripheral vascular disease and circulatory failure.
SECTION V
EDUCATIONAL CURRICULUM AND CONFERENCES

Conferences are an important means of teaching fundamental elements of our Cardiovascular Medicine curriculum. The greater objective of our educational curriculum is to complement clinical and research experiences, while providing structured instruction in many areas including cardiovascular pathology, anatomy, genetics, epidemiology, molecular biology, physiology, and pharmacology. Fellows will obtain a working knowledge of these important curricular components to allow application to clinical and/or research practice, and to successfully pass the ABIM board examination in Cardiovascular Diseases.

1. Mandatory Weekly Conferences

   a. **Cardiology Grand Rounds** is a one-hour lecture presented by experts on a wide variety of cardiovascular diseases at both the clinical and basic science level. Topics vary from week-to-week but all sessions are designed to enhance basic understanding of disease processes, diagnosis and therapeutics. All fellows are directly responsible for giving Cardiology Grand Rounds at least once during their training period.

   b. **Clinical Management Conference** is a one-hour weekly conference designed to address common management problems in cardiovascular medicine and discuss diagnostic and treatment options using a case-based approach. It highlights the best evidence-based practices in the approach to managing common cardiovascular conditions. In addition, once monthly this forum is used for **Morbidity and Mortality Conference**, an educational series that allows staff and trainees to learn from medical errors, complications, and unanticipated outcomes in a supportive and educational format.

2. **Subspecialty Conferences**: These conferences are dedicated to provide the trainee with a more intensive educational experience in a wide range of cardiovascular subspecialties. Although attendance is not mandatory at all of these conferences, fellows currently participating in these rotations are strongly encouraged to attend.

   a. Echocardiography
   b. Adult Congenital
   c. Arrhythmia
   d. Cardiac Catheterization and Nuclear Medicine Correlation
   e. Interventional
   f. Heart Failure
   g. Nuclear Medicine

3. **Research**: A wide variety of basic and clinical research experiences are available to the fellow within the Division of Cardiovascular Medicine and in related areas and we expect that during training, each fellow will participate in a research project to gain expertise in one or more research techniques. To assist the trainee in this endeavor, lectures are given throughout the year to introduce the fellow to different topics pertinent to being successful. Representative topics included in this series are "Select a Mentor", "Basic Statistics", "Submitting an IRB Proposal", and "Grant Writing".

4. **Journal Club**: This is a topic directed series that pairs a junior fellow with a faculty member to analyze and present a recently published report that has had a major effect on clinical cardiovascular practice.

5. **Boot Camp**: This is an intensive series of lectures given the first two months of cardiovascular training to introduce the Fellow to areas of cardiology he or she will likely encounter during their initial months of training and on-call duties.

In addition, Fellows will be educated in the following areas:

   a. recognition and management of fatigue and sleep deprivation
   b. structured hand-over process to facilitate continuity of care and patient safety
   c. appropriate methods of obtaining informed consent
   d. conscious sedation
   e. reporting of duty hours
   f. trainee supervision
   e. resources for trainees within the division and Vanderbilt community

Cardiovascular Medicine
Fellowship Training Program

Page 10
Effective 7/1/2009
6. **Transition to Practice (T2P):** This is a biannual seminar that introduces the trainee to some of the challenges he or she may encounter as they transition from trainee to independent cardiologist in an academic or private practice setting.

Topics covered in this lecture series include:
- a. CV/Resume building
- b. Job Search
- c. Evolving Cardiovascular Practice Models
- d. Career Tracks in Academics
- e. Negotiation and Contractual Issues
- f. Maintaining Work/Life Balance

7. **Professionalism Series/Book Club:** This is an informal evening gathering of fellows and faculty to review pertinent articles and books related to meeting professional responsibilities in a rapidly changing and challenging field. Examples of books reviewed include "Complications" by Atul Gawande, "Miracle of Mindfulness" by Thich Nhat Hanh and "Man's Search for Meaning" by Viktor E. Frankl.

8. **Board Review:** This is a twice monthly, fellow organized conference that is directed at reviewing topics relevant to the trainee preparing for the ABIM certifying examination in Cardiovascular Medicine.

9. **Monthly Fellows' Meeting:** This is a forum for the Program Director, Associate Program Director and chief fellows to update the trainees on events in the program. This meeting also allows the fellows an opportunity to air concerns and grievances in a supportive and nonjudgmental environment.
SECTION VI

RESEARCH OPPORTUNITIES

A wide variety of basic and clinical research experiences are available to the fellow within the Division of Cardiovascular Medicine and in related areas. We expect that during training, each Fellow will participate in a research project to gain expertise in one or more research techniques. Please see the Research Curriculum outlined on the fellowship website for further details. It is expected that by the end of fellowship a fellow will learn how to acquire and analyze data, understand its significance, and how to present it clearly.

Each 1st year fellow will meet with the Research Director(s) of research in July to discuss his/her research interests. Fellows are paired with a faculty mentors during their first year to promote personal and academic growth. During the first year, we expect fellows to decide on a general area or theme he/she would like to explore, e.g., vascular biology, ventricular function, heart failure, integrated cardiovascular physiology, hypertension, electrophysiology, etc. Fellows are encouraged to thoroughly explore all options for research and mentorship throughout the Vanderbilt campus. For a complete outline of our research curriculum, please see the fellowship website.

Division and faculty mentor funds support all fellows engaged in research training during clinical fellowship. All fellows committing to dedicated research training are fully supported by our NIH Training Grant (T32, HL#007411-26), or by faculty related funding. We expect these fellows will require at least 2 dedicated research years in addition to their clinical training. During the first year of dedicated research training, we encourage all of our research fellows to gain experience in grantsmanship by helping them write for independent support available for fellow research training through the NIH, ACCF, AHA, HRS, HFSA etc..

Fellows who anticipate joining a faculty at the completion of research training are mentored through the preparation of a proposal for early investigator funding, such as NIH K08 or K23 awards, or similar awards supported by the AHA, ACCF, or Industry. Preparing a research proposal serves as a stimulus to organize reading and thinking, and is an important part of the training process for an academic career. Fellows entering the training program as Harrison Society Scholars through the Department of Medicine Physician-Scientist Training Program are obligated to three years of research training, the last of which can take place as a Junior Faculty member provided that 80% of their time is related to research (www.abim.org). Mentoring of these fellows takes place as we have outlined, and through close collaboration with Physician-Scientist Training Program Director in the Department of Medicine. Throughout the research training years, Fellows are only required to maintain a 1/2 day clinic per week, as required by the ACGME/ABIM, but are otherwise completely free of any clinical duties.
SECTION VII

QUALITY IMPROVEMENT CURRICULUM

Participation in a longitudinal quality improvement project is an integral part of the fellowship training program. Our quality improvement curriculum is based on practice metrics improvement. The 1st and 2nd year fellows receive didactic training in development and implementation of quality improvement projects. Each 2nd year fellow is responsible for completing a QI project with the help of the 1st year fellows and a QI mentor. The 2nd year fellows can work in groups of 2 (maximum). It will be expected that the current 1st year fellows will lead their own quality project during their second year.

Steps in creating a QI project (based off a Plan Do Study Act cycle):
1. Identify a problem.
2. Identify metrics that help define the problem.
4. Implement a solution.
5. Using a quantifiable metric, evaluate whether your solution was successful.
6. Refine the solution.
7. Evaluate whether the solution was successful.

We have quarterly QI meetings so we can keep the fellows accountable and see how their projects are progressing. The curriculum wraps up during the final sessions of Clinical Management Conference in June where the fellows will present their projects to the whole department.
SECTION VIII
EVALUATION AND SUPERVISION

Mutual evaluation between Faculty and Fellows is an important component for measuring the ongoing efficiency of our training mission. All Fellows and Faculty are required to electronically complete evaluation forms after each month. Faculty are expected to meet with Fellows to discuss evaluations at the end of each rotation, and such formative discussion is also facilitated with our rotation specific rotations that the fellow and faculty are expected to complete together during or at the end of each rotation. Less formal and more frequent evaluations are also important and take place throughout the training program. Furthermore, Fellows are given the opportunity to comprehensively review the training program on an annual basis with their commentary helping address the broad needs of Fellows. A monthly Fellows’ meeting is conducted by the Fellowship Director and Chief Fellow to enable more regular communication and resolution of issues pertinent to training.

The Fellowship Director will meet with all Fellows at least twice each year to review written evaluations, discuss strengths, remedy weaknesses, and to help sculpt the training program to best fit individual Fellow’s career goals. Fellows are evaluated on the following competencies as outlined by the ACGME:

- **Patient Care** that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health.
- **Medical Knowledge** about established and evolving biomedical, clinical, and cognate (e.g. epidemiological and social-behavioral) sciences and the application of this knowledge to patient care.
- **Practice-Based Learning and Improvement** that involves investigation and evaluation of their own patient care, appraisal and assimilation of scientific evidence, and improvements in patient care.
- **Systems-based practice through the** awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care.
- **Interpersonal and Communication Skills** that result in effective information exchange and teaming with patients, their families, and other health professionals.
- **Professionalism**, as manifested through a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.

Fellows take a medical knowledge in training exam twice during fellowship.

Our training program recognizes the importance of adequate supervision to prevent medical errors and ensure patient safety and to ensure that trainees learn appropriate clinical decision making. This supervision must be given in a structure that allows appropriate trainee autonomy, and the exact degree of guidance provided in each specific situation is influenced by patient safety, severity and complexity of the situation, the PGY level of the fellow, and the demonstrated skill and knowledge of the fellow. The outline of supervision provided to our fellows is described below:

**Direct Supervision:** Direct supervision (the attending physician is physically present with the fellow and the patient) is provided at all times for:

- The cardiac catheterization laboratory, including left heart catheterizations, coronary and peripheral angiography, percutaneous interventions, structural heart disease interventions, intraaortic balloon pump placement, and pericardiocentesis.
- The electrophysiology laboratory for all ablations, permanent device placements, and routine temporary transvenous pacemakers.
- The echocardiography laboratory for all transesophageal echocardiograms and direct current cardioversions.
**Indirect Supervision:** Indirect supervision with direct supervision immediately available (the attending is available immediately and located within the confines of the site of patient care) is provided for:

- All clinical rotations not described above.

Indirect supervision with direct supervision available (the attending is immediately available by phone and is available to arrive within a reasonable period of time to provide direct supervision) is provided for:

- All on call periods and includes procedures performed on call such as central line placement, pulmonary artery catheter placement, and emergency temporary transvenous pacemaker placement.

Our program encourages and expects open communication from both the attendings and the fellows that will facilitate the appropriate level of supervision for any given situation. We encourage the SUPERB/SAFETY model of effective strategies for supervision (Farnan, JM, Strategies for Effective On-Call Supervision for Internal Medicine Residents, *JGME*, March 2010: 46-51).

On each rotation or call night, **the attending should**

- Set expectations for when to be notified, including when the fellow is uncertain about a clinical decision
- Plan a time to be in contact with the fellow and be easily available at all times
- Create an environment that allows the fellow to be unafraid to call and balances supervision with autonomy for the fellow

**The fellows should**

- Seek attending input early, especially when uncertain about clinical decisions or when there are active clinical decisions occurring
- Notify attendings in all cases of the following: patient death, cardiac arrest, end of life discussions, a patient leaving against medical advice, a patient being transferred to a higher level of care or being discharged, and a significant change in a patient’s clinical status (including the need for escalation of hemodynamic support, need for intubation, and need for invasive procedures).
- Call when assistance is needed navigating the health care system to provide appropriate patient care
SECTION IX
WORK HOUR STANDARDS

Duty Hours
Duty hours are defined as all clinical and academic activities related to the residency program, i.e., patient care (both inpatient and outpatient), administrative duties related to patient care, the provision for transfer of patient care, time spent in-house during call activities, and scheduled academic activities such as conferences. Duty hours do not include reading and preparation time spent away from the duty site.

- Duty hours must be limited to 80 hours per week, averaged over a 4-week period, inclusive of all in-house call activities.
- Fellows must be provided with 1 day in 7 free from all educational and clinical responsibilities, averaged over a 4-week period, inclusive of call. One day is defined as one continuous 24-hour period free from all clinical, educational and administrative activities.
- Adequate time for rest and personal activities must be provided. This should consist of a 10-hour time period provided between all daily duty periods and after in-house call.

Fellows are provided with annual training on the recognition and management of fatigue and sleep deprivation.

In the event that a fellow is unable to perform his/her duties, the Chief Fellows and Program Directors arrange coverage to ensure continuity of patient care.

On-Call Activities
The objective of on-call activities is to provide Fellows with continuity of patient care experiences throughout a 24-hour period. In-house call is defined as those duty hours beyond the normal work day when Fellows are required to be immediately available in the assigned institution.

- In-house call must occur no more frequently than every third night, averaged over a 4-week period. There is no required in-house call for Fellows.
- Continuous on-site duty, including in-house call, must not exceed 24 consecutive hours. Fellows may remain on duty for up to four additional hours to participate in didactic activities, transfer care of patients, conduct outpatient clinics, and maintain continuity of medical and surgical care as defined in Specialty and Subspecialty Program Requirements.
- No new patients, as defined in Specialty and Subspecialty Program Requirements, may be accepted after 24 hours of continuous duty.
- At-home call (pager call) is defined as call taken from outside the assigned institution.
  - The frequency of at-home call is not subject to the every third night limitation. However, at home call must not be so frequent as to preclude rest and reasonable personal time for each Fellow. Fellows taking at-home call must be provided with 1 day in 7 completely free from all educational and clinical responsibilities, averaged over a 4-week period.
  - When Fellows are called into the hospital from home, the hours Fellows spend in-house are counted toward the 80-hour limit.
  - The program director and the faculty must monitor the demands of at-home call in their programs and make scheduling adjustments as necessary to mitigate excessive service demands and/or fatigue.

Moonlighting
- Because fellowship training is a full-time endeavor, the Program Director must ensure that moonlighting does not interfere with the ability of the Fellows to achieve the goals and objectives of the educational program.
- The Program Director must comply with the sponsoring institution’s written policies and procedures regarding moonlighting.
- Moonlighting (both internal and external) must be counted toward the 80-hour weekly limit on-duty hours.
Health and Wellness

The Department of Health and Wellness offers a variety of integrated services to support fellows as part of the Vanderbilt house staff. The programs include:
- The Vanderbilt Occupational Health Clinic (VOHC)
- Health Plus
- The Work/Life Connections-EAP, including the Faculty and Physician Wellness
- The Vanderbilt Child and Family Center
SECTION X

SUPPLEMENTAL INFORMATION

Equal Opportunity/Affirmative Action
In compliance with federal law, including the provisions of Title IX of the Education Amendments of 1972 and Sections 503 and 504 of the Rehabilitation Act of 1973, Vanderbilt University does not discriminate on the basis of race, sex, religion, color, national or ethnic origin, age, handicap, or military service in its administration of educational policies, programs, or activities; its admissions policies; scholarship and loan programs; athletic or other University-administered programs; or employment. Inquiries or complaints should be directed to the Opportunity Development Officer, Franklin Building, West Side Row, PO Box 1809, Station B, Nashville, Tennessee 37235. Telephone (615) 322-4705.

House Staff Manual
The Cardiovascular Fellowship Training Program adheres to policies as outlined in the Vanderbilt House Staff Manual. Please see this manual for additional information.
http://www.mc.vanderbilt.edu/root/vumc.php?site=gme