

## TRAINING STATEMENT

# COCATS 4 Task Force 1: Training in Ambulatory, Consultative, and Longitudinal Cardiovascular Care



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## 1. INTRODUCTION

### 1.1. Document Development Process

#### 1.1.1. Writing Committee Organization

The writing committee was selected to represent the American College of Cardiology (ACC) and included a cardiovascular training program director; a member of the ACC Competency Management Committee; a cardiologist early in his career; specialists representing both the academic and community-based practice settings; as well as physicians, including a staff physician from the American Board on Internal Medicine (ABIM), experienced in defining and applying training standards according to the 6 general competency domains promulgated by the Accreditation Council for Graduate Medical Education (ACGME) and American Board of Medical Specialties (ABMS), and endorsed by the ABIM. The ACC determined that relationships with industry or other entities were not relevant to the creation of this general cardiology training statement. Employment and affiliation information for authors and peer reviewers is provided in [Appendixes 1](#) and [2](#), respectively, along with disclosure reporting categories. Comprehensive disclosure information for all authors, including relationships with industry and other entities, is available as an [online supplement](#) to this document.

#### 1.1.2. Document Development and Approval

The writing committee developed the document, approved it for review by individuals selected by the ACC and representing the ABIM, and addressed the comments. The document was revised and posted for public comment from December 20, 2014, to January 6, 2015. Authors addressed additional comments to complete the document. A member of the ACC Competency Management Committee served as lead reviewer. The final document was approved by the Task Force, COCATS Steering Committee, and ACC Competency Management Committee and was ratified by the ACC Board of Trustees in March 2015. This document is considered current until the ACC Competency Management Committee revises or withdraws it.

### 1.2. Background and Scope

The Task Force was charged with updating previously published standards for training fellows in general clinical cardiology enrolled in ACGME-accredited fellowships (1) on the basis of the following factors: 1) changes that have occurred in the field since 2008 and as part of a broader effort to establish consistent training criteria across all aspects of cardiology; and 2) the evolving framework of competency-based medical education described by the ACGME Outcomes Project and the 6 general competencies endorsed by the ACGME and ABMS. This document does not provide specific guidelines for training in advanced cardiovascular subspecialty areas but, where appropriate, identifies opportunities to obtain advanced training.

The background and overarching principles governing fellowship training are provided in the COCATS 4 Introduction, and readers should become familiar with this foundation before considering the details of training in ambulatory, consultative, and longitudinal cardiovascular care. The Steering

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Committee and Task Force recognize that implementation of these changes in training requirements will occur incrementally over time.

For most areas of adult cardiovascular medicine, 3 levels of training are delineated:

- **Level I training**, the basic training required of trainees to become competent consultant cardiologists, is required of all fellows in cardiology and can be accomplished during a standard 3-year training program in general cardiology.
- **Level II training** refers to the additional training in 1 or more areas that enables some cardiologists to perform or interpret specific diagnostic tests and procedures or render more specialized care for specific patients and conditions. This level of training is recognized for those areas in which an accepted instrument or benchmark, such as a qualifying examination, is available to measure specific knowledge, skills, or competence. Level II training in selected areas may be achieved by some trainees during the standard 3-year general cardiology fellowship, depending on the trainees' career goals and use of elective rotations.
- **Level III training** requires additional experience beyond the general cardiology fellowship to acquire specialized knowledge and competencies in performing, interpreting, and training others to perform specific procedures and rendering advanced, specialized care at a high level of skill. Level III training typically requires training beyond the standard 3-year general cardiology fellowship.

Most cardiac care occurs in the ambulatory setting. Although hospital-based care is increasingly directed at patients who are acutely ill or are undergoing invasive procedures, the importance of training and competence in the longitudinal care of ambulatory patients, including in disease prevention and management, has been increasingly emphasized. Anticipating reallocation of health resources toward ambulatory care, an expanded commitment to training in outpatient care for all cardiology trainees is required, regardless of a trainee's field of interest or subspecialization. Training in ambulatory, consultative, and longitudinal care is a bedrock of cardiovascular fellowship upon which all subspecialized, advanced, and procedure-oriented training is based. Accordingly, a single level of training is delineated for this aspect of cardiology fellowship, with the expectation that the principles delineated in this report should pervade all other aspects of cardiovascular training. The approximate numbers of cases, procedures, and experiences recommended are based on published guidelines, competency statements, and the opinions of the members of the writing group. Training should be directed by appropriately prepared mentors in an ACGME-accredited

program, and satisfactory completion of training must be documented by the program director on the recommendation of a competency committee. The variety and types of encounters and the scope of training required by the typical fellow are summarized in [Section 4](#).

Training to become a general or specialized physician should prepare the trainee to provide high-quality care, which the Institute of Medicine defines as effective, efficient, equitable, safe, timely, and patient-centered (2). The specific training necessary to become a competent cardiovascular specialist should address prevention of adverse events such as myocardial infarction, stroke, or premature death from disease of the heart or blood vessels. Training should facilitate cardiovascular health and foster well-being across the lifespan, healthy aging, and event- and intervention-free survival. Hence, a key attribute of this aspect of training is the establishment of relationships with patients that span several years.

Experience in ambulatory, consultative, and longitudinal care should incorporate 3 general approaches: 1) acquisition of key skills through practical exposure and clinical practice; 2) participation in consultative cardiology; and 3) a formal curriculum that emphasizes the pathophysiological mechanisms and core knowledge of cardiovascular diseases. Cardiologists should embrace novel and evolving areas such as clinical applications of genetics, mechanical cardiac assist devices, remote monitoring, and transplantation and immunotherapy; become facile in managing or comanaging patients with congenital heart disease, pulmonary hypertension, age-related disorders, and dementia; and apply preventive strategies that promote health and longevity.

As a highly trained medical subspecialist, the modern cardiologist must serve as an effective member of the professional healthcare team. In many cases, the cardiologist will assume the role of team leader. At other times, the delivery of high-quality, patient-centered care will require that the cardiologist defer to the expertise of other members of the team. Negotiating these multiple roles requires skill as a communicator, competence with emerging technology, and effective collaboration with all healthcare professionals. On an interpersonal level, the cardiologist must acknowledge mistakes when they occur, learn from them and redirect a course of action to optimize outcomes, engender trust by exhibiting benevolence, avoid or divulge material conflicts, and motivate and inspire patients and colleagues. A lifelong commitment to mastery and maintenance of these skills and to learning is essential to both providing high-quality, patient-centric, ambulatory, consultative, and longitudinal care and assuming a leadership role in directing cardiovascular patient management.

## 2. GENERAL STANDARDS

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In published guidelines for ambulatory, consultative, and longitudinal cardiovascular care that are organized around individual disease states or cardiovascular procedures, the ACC and American Heart Association have promulgated congruent recommendations that address faculty, facility requirements, emerging technologies, and practice. We also recommend strongly that candidates for certification in cardiovascular diseases review the specific requirements of the ABIM.

### 2.1. Faculty

Faculty should include specialists who are able to provide integrated assessment of cardiovascular risk and are knowledgeable and skilled in the principles of bedside clinical examination; differential diagnosis; electrocardiography; chest x-ray; echocardiography; stress testing; ambulatory rhythm and electrophysiological monitoring; cardiovascular development and aging; hypertension evaluation and management; dyslipidemia; abnormalities of glucose metabolism; congenital and valvular heart disease; evaluation, staging, and management of cardiac failure; cardiac arrhythmia diagnosis and management; and clinical applications of genetics and cardiovascular pharmacology. Faculty must also have a thorough understanding of the attitudes and proficiencies required of trainees to ensure acquisition of the additional ACGME/ABMS general competencies of systems-based practice, practice-based learning and improvement, interpersonal and communication skills, and professionalism as they pertain to the delivery of cardiovascular care. A minimum of 2 key clinical faculty members, including the program director, must be board-certified in cardiovascular disease or possess equivalent qualifications based on training in a similar environment for a similar length of time, and they must have expertise in the requisite skills and at least 5 years of clinical experience beyond fellowship training. Programs must also maintain at least a 1:1.5 ratio of qualified faculty to enrolled trainees.

### 2.2. Facilities

Facilities should be sufficient to ensure an environment suitable for safe and effective ambulatory patient care and include a patient reception area; clean, orderly, private examination rooms with sinks; examination gowns; gloves; sphygmomanometers; ophthalmoscopes and related equipment; consultation rooms with seating for the physician, patient, and at least 1 additional person such as a member of the patient's family, which can be used for or in addition to a place for case review and discussion between the trainee and faculty preceptor; and workstations with computer terminals for access to

the Internet and medical records. In addition, there should be accessible facilities for outpatient laboratory evaluations, including blood specimen collection for transmittal to a certified clinical laboratory and the standard and specialized equipment for performing the routine diagnostic procedures delineated in [Section 2.3](#). The facility should be capable of accommodating common cardiovascular emergencies either onsite or at a nearby institutional facility to which a patient in distress can be readily transported under direct and continuous physician or nursing supervision.

### 2.3. Equipment

Clinic or ambulatory care facilities require equipment for measuring blood pressure and transcutaneous oxygen saturation and for electrocardiography, with access to chest x-ray, echocardiography, ambulatory cardiac rhythm monitoring, and exercise stress testing. An electronic or paper-based medical record system must be available that meets federal data security requirements yet that can be accessed by authorized caregivers at all times for the purposes of both data entry and retrieval at—but not limited to—the point of care.

### 2.4. Ancillary Support

Ancillary support should be available to facilitate appointment scheduling and follow-up; manage clinical and financial records; retrieve laboratory and other clinical reports; enable telephone communications between patients and providers (e-mailing optional); provide clean, prepared examining and consultation rooms; and properly contain, control, and remove medical waste.

## 3. TRAINING COMPONENTS

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### 3.1. Didactic Program

Didactic instruction may take place in a variety of formats, including but not limited to lectures, conferences, journal clubs, grand rounds, clinical case presentations, and patient safety or quality improvement conferences. A formal curriculum should include, in addition to the evaluation and management of patients across the full spectrum of cardiovascular diseases, relevant non-cardiovascular disease topics commonly complicated by cardiovascular disease to which the trainee might otherwise have been less exposed. Among the topics to consider are acute and chronic pulmonary disease; sleep-disordered breathing; malignancies and the cardiovascular effects of cancer chemotherapy; hematologic disorders including thrombophilia; diabetes mellitus; kidney disease; acute and chronic dialysis; intracranial and extracranial cerebrovascular disease; and stroke.

### 3.2. Clinical Experience

Rotation on cardiology consultation services is an essential component of training in clinical cardiology. The training required to achieve this Level I competency requires firsthand experiences as a consultant in both the inpatient and outpatient settings. It is important that the cardiology consultation service expose the trainee to a broad array of patients with disease of varied acuity and a range of comorbidities. During the required rotations on the consultation service, trainees should conduct several initial patient evaluations daily in addition to providing follow-up care after the initial consultation. Often, transition of care between inpatient and outpatient settings is an important component of care. In addition to the inpatient consultation experience, trainees should obtain robust clinical experiences in an outpatient setting that promotes continuity of patient care over the course of the fellowship. Current recommendations include that fellows should be responsible, on average, for 4 to 8 patients per half-day session. In each clinical setting, trainees should gain hands-on experience under the supervision of a faculty mentor or preceptor in a fashion that emphasizes patient-centered education in all aspects of cardiovascular management. It is important that, in these experiences, the trainee assume the role of a consultant responsible for communication with the patient, family members, referring physicians, pharmacists, nurses, and other healthcare personnel.

### 3.3. Teaching Others

An important aspect of subspecialty training is the ability to educate trainees, such as medical students, residents, or fellows in other fields, on such topics as the cardiovascular physical examination, pharmacology, electrocardiography, and cardiac imaging, at a level commensurate with their training and experience. This applies to peer-to-peer education through topic reviews, journal clubs, clinical case presentations, quality assurance programs, and preparation of case reports for publication. The objectives include enhancement of communication skills, consolidation of knowledge in core topic areas, development of enduring educational materials (e.g., syllabi, lecture slides, or web-based tools), and nurturing a commitment to lifelong learning and maintenance of competency.

## 4. SUMMARY OF TRAINING REQUIREMENTS

### 4.1. Development and Evaluation of Core Competencies

Training and requirements in cardiovascular disease address the 6 general competencies promulgated by the ACGME/ABMS and endorsed by the ABIM. These

competency domains are: medical knowledge, patient care and procedural skills, practice-based learning and improvement, systems-based practice, interpersonal and communication skills, and professionalism. The ACC has used this structure to define and depict the components of the core clinical competencies for cardiology. The curricular milestones for each competency and domain also provide a developmental roadmap for fellows as they progress through various levels of training and serve as an underpinning for the ACGME/ABIM reporting milestones. The ACC has adopted this format for its competency and training statements, career milestones, lifelong learning, and educational programs. Additionally, the ACC has developed tools to assist physicians in assessing, enhancing, and documenting these competencies.

**Table 1** delineates each of the 6 competency domains as well as the associated curricular milestones for training in ambulatory, consultative, and longitudinal cardiovascular care. The milestones indicate the stage of fellowship training (12, 24, or 36 months, and additional time points) by which the typical cardiovascular trainee should achieve the designated level. Given that programs may vary with respect to the sequence of clinical experiences provided to trainees, the milestones at which various competencies are reached may vary as well. Level I competencies may be achieved at earlier or later time points. The table also describes examples of evaluation tools suitable for assessment of competence in each domain. It is also important to emphasize that although the table delineates key competency components for ambulatory, consultative, and longitudinal care, it is not comprehensive. Additional competency components required of a consultant cardiologist (Level I) are described in the other COCATS 4 Task Force reports.

### 4.2. Duration and Structure of Training

The specific competencies for training are delineated in **Table 1**. Continuity of longitudinal patient care is fundamental to training in ambulatory and consultative cardiovascular care. Hence, although it is expected that all trainees will engage in this activity for no less than 1 half-day weekly for at least 40 weeks of each year of training during the general 3-year cardiovascular fellowship, attendance in weekly clinic sessions alone is not sufficient to satisfy this training requirement. Longitudinal care implies not only continuity in the ambulatory setting, but also a commitment to: 1) following patients in the event of hospitalization; 2) telephone contacts or other communication with and about the patient; 3) interactions with family members, collaborating physicians, and other members of the

**TABLE 1** Core Competency Components and Curricular Milestones for Training in Ambulatory, Consultative, and Longitudinal Cardiovascular Care

Competency Component		Milestones (Months)			
MEDICAL KNOWLEDGE		12	24	36	Add
1	Know the major cardiovascular risk stratification tools and the principles of primary and secondary cardiovascular disease prevention.	I			
2	Know the roles of genetics, family history, and the environmental and lifestyle factors in the development and clinical course of cardiovascular disease.		I		
3	Know the effects of age on cardiovascular function, on response to medications, and in the risks of diagnostic and therapeutic procedures.		I		
4	Know the differential diagnosis of chest pain and the distinguishing features of the various etiologies.	I			
5	Know the cardinal findings and differential diagnosis of palpitations, lightheadedness, and syncope, and the distinguishing features of the various etiologies.	I			
6	Know the cardinal findings and differential diagnosis of dyspnea.	I			
7	Know the differential diagnosis of peripheral edema and the distinguishing clinical features of the various etiologies.	I			
8	Know the roles of kidney, hepatic, pulmonary, hematologic, rheumatologic, and endocrine disorders in the development, manifestations, and responses to treatment in patients with cardiovascular disease.		I		
9	Know the clinical pharmacology of cardiovascular medications, and drug-drug interactions of cardiac and noncardiac medications, including in special populations and in patients with relevant comorbidities.		I		
10	Know the roles of lifestyle, activity level, body mass, nutrition, alcohol, and/or drug use in cardiovascular risk and disease.	I			
11	Know the potential cardiovascular toxicity and side effects of major classes of drugs used for the management of patients with common medical conditions, including antimicrobial agents, immune system modulators, chemotherapeutic agents, and antiparkinson drugs.			I	
12	Know the roles of stress, anxiety, and depression in patients with suspected cardiovascular disease.	I			
13	Know the guideline recommendations for blood pressure, blood glucose, and lipid management in diverse patient populations with and without cardiovascular disease.		I		
14	Know the appropriate use indications for cardiovascular screening studies, including carotid and abdominal ultrasound (or other imaging) modalities.		I		
15	Know the differential diagnosis and distinguishing characteristics of heart murmurs and bruits.		I		
16	Know the characteristic clinical manifestations, differential diagnosis, and appropriate testing for peripheral vascular disease.		I		
17	Know the mechanisms and cardinal symptoms and findings of stroke, transient cerebral ischemia, and dementia.		I		
18	Know the principles, modalities, and appropriate indications for palliative care.	I			
<b>EVALUATION TOOLS:</b> chart-stimulated recall, conference presentation, direct observation, and in-training examination.					
PATIENT CARE AND PROCEDURAL SKILLS		12	24	36	Add
1	Skill to effectively and efficiently perform an initial outpatient cardiovascular consultation and establish a differential diagnosis.	I			
2	Skill to appropriately utilize diagnostic testing—both for initial diagnosis and for follow-up care.		I		
3	Skill to integrate clinical and testing results to establish diagnosis, assess cardiovascular risk, and formulate treatment and follow-up plans.		I		
4	Skill to appropriately obtain and integrate consultations from other healthcare professionals in a timely manner.		I		
5	Skill to recognize acute cardiovascular disorders or high-risk states that require immediate treatment and/or hospitalization and prioritize management steps in patients with complex or multicomponent illness.		I		
6	Skill to establish an effective medical regimen and monitor for side-effects, intolerance or noncompliance, and patient safety.		I		

**TABLE 1 Core Competency Components, continued**

Competency Component		Milestones (Months)			
		12	24	36	Add
<b>PATIENT CARE AND PROCEDURAL SKILLS</b>					
7	Skill to assess the cardiovascular risks associated with recreational and/or competitive sports for individual patients and to counsel patients about levels of physical activity appropriate to their cardiovascular health in the context of disease prevention; rehabilitation; and promotion of longevity, functional capacity, and quality of life.		I		
8	Skill to effectively carry out chronic disease management in patients with chronic ischemic heart disease, hypertension, heart failure, and peripheral vascular disease.		I		
9	Skill to coordinate ambulatory and longitudinal follow-up care.			I	
10	Skill to effectively facilitate transition of care from hospital to ambulatory or intermediate-care settings.		I		
11	Skill to perform preoperative assessments for noncardiac procedures in patients with cardiovascular disease.	I			
<b>EVALUATION TOOLS:</b> chart-stimulated recall, conference presentation, and direct observation.					
<b>SYSTEMS-BASED PRACTICE</b>					
1	Effectively lead or participate in team-based care in patients with or at risk of developing cardiovascular disease.		I		
2	Effectively facilitate transitions of care.	I			
3	Effectively utilize electronic medical record systems, including clinical protocols and treatment/evaluation prompts.	I			
4	Effectively and appropriately use remote communication tools in the care of patients.	I			
5	Appropriately utilize and work with cardiac rehabilitation and intermediate care facilities.		I		
6	Recognize and address social, cultural, and financial barriers to patient compliance.	I			
<b>EVALUATION TOOLS:</b> direct observation and multisource evaluation.					
<b>PRACTICE-BASED LEARNING AND IMPROVEMENT</b>					
1	Utilize point-of-care electronic resources to provide up-to-date clinical information and guideline-driven evaluation and treatment.	I			
2	Identify gaps and carry out personalized education activities to address them.		I		
3	Integrate validated performance and patient satisfaction measures into clinical practice to foster continuous quality improvement.		I		
<b>EVALUATION TOOLS:</b> chart-stimulated recall, direct observation, and reflection and self-assessment.					
<b>PROFESSIONALISM</b>					
1	Practice patient-centered care with shared decision-making and appreciation of patients' values and preferences.	I			
2	Incorporate appropriate use criteria and risk-benefit considerations in treatment decisions.		I		
3	Practice in a manner that fosters patient benefit above self-interest and avoids conflict of interest.	I			
4	Interact respectfully with patients, families, and all members of the healthcare team, including ancillary and support staff.	I			
<b>EVALUATION TOOLS:</b> chart-stimulated recall, direct observation, and multisource evaluation.					
<b>INTERPERSONAL AND COMMUNICATION SKILLS</b>					
1	Communicate effectively with patients and families across a broad spectrum of ethnic, social, cultural, socioeconomic, and religious backgrounds.	I			
2	Exhibit sensitivity and empathy in dealing with life-threatening and end-of-life issues.	I			
3	Communicate effectively and in a timely manner with primary care and other referring or collaborating members of the healthcare team.		I		
<b>EVALUATION TOOLS:</b> direct observation and multisource evaluation.					

Add = additional months beyond the 3-year cardiovascular fellowship.

healthcare team; and 4) general availability to address whatever cardiovascular or related issues or conditions might arise in the course of long-term clinical management.

#### 4.2.1. Acquisition of Key Skills

The ultimate goal of fellowship training is the integration of a sound foundation of knowledge and understanding of cardiac systems and the roles of testing and technology, on the one hand, with the ability to manage difficult and challenging situations, on the other hand. These goals require the effective integration of the ACGME 6 general competencies into the delivery of safe and effective patient care. The cardiologist must accept responsibility; identify, acknowledge, and overcome gaps in knowledge; maintain flexibility and adjust direction; think creatively; keep an open mind; incorporate humanism; and employ discipline and organization to follow through with plans, motivate patients, and inspire others on the healthcare team. Although the ambulatory care or outpatient setting represents an ideal environment for initial acquisition of these skills through teaching, mentoring, and example, mastery cannot be achieved without years of experience and a commitment to lifelong learning.

##### 4.2.1.1. Medical Knowledge, Clinical Decision-Making, and Skills in Transitional Care

The ambulatory patient often presents less obvious evidence of disease than the hospitalized patient. Therefore, outpatient training is directed at acquiring knowledge, enhancing judgment, and sharpening skills in effectively transitioning patient care.

###### 4.2.1.1.1. Medical Knowledge and Clinical Evaluation

The trainee should routinely question why the patient has developed a given condition or problem and address the underlying etiology to guide diagnostic testing and treatment.

1. The cardiologist must be alert to life-threatening conditions that cannot be overlooked, while also recognizing the most likely causes of symptoms or asymptomatic conditions and maintaining awareness of rare possible causes. He/she should learn to distinguish urgent situations from those that can be addressed more methodically.
2. It is valuable to understand the controversies and/or complexities that surround the evaluation or management of particular cardiovascular diseases or conditions, including comorbidities; the influences of genetics and aging; variations in drug metabolism and interactions; the impact of renal or hepatic dysfunction; fluid balance; and the patient's lifestyle

and the influence of diet, exercise, alcohol, or recreational or illicit drugs. It is also essential to understand the roles of stress, anxiety, and depression in exacerbating hypertension, chest pain, cardiac arrhythmias, heart failure, and other conditions.

3. In formulating and executing an effective clinical management plan, the trainee should understand the cumulative burden of multiorgan dysfunction. Rarely does a physician encounter a purely cardiac patient. As the population ages, a panoply of conditions converge, and an appreciation of the interplay between individual patient characteristics and the natural history of disease enables the clinician to anticipate outcomes and complications, which is key to successful management. The cardiologist must balance emerging concepts and traditional strategies. Reliance on secondhand data should be avoided in favor of direct interaction with and examination of the patient, as well as direct review of prior testing data from both within and outside of one's own facility to enable comprehensive and insightful evaluation of a given problem in the context of the individual.

###### 4.2.1.1.2. Clinical Decision-Making

Although clinical judgment is acquired through experience over time, strategies facilitating the development of clinical judgment can be taught and honed. Specific clinical examples (patient-specific teachable moments) help convey the art of medicine. Here, the timing of tests, procedures, or interventions is vital, matching the intensity of action to the level of risk and severity of the condition. An example is to prefer initiation or adjustment of 1 drug at a time in nonurgent situations and proceed in logical sequence, rather than changing multiple aspects of a regimen concurrently. Clinical decision-making regarding testing and/or therapeutic decisions should also consider the balance of risk and benefit for the individual patient. In applying management recommendations from resources such as clinical practice guidelines, cardiovascular trainees must take into account the needs of special populations and appreciate the impact of comorbidities, particularly in older patients with cardiovascular disease who typically have multiple concurrent medical conditions that influence outcomes.

###### 4.2.1.1.3. Effective Translation of Clinical Information

It is not sufficient to perform only an initial consultation and outline recommendations; specific instructions should be individualized and written down. Follow-up at timely intervals to assess and measure responses and outcomes on the basis of symptoms, functional status, weight, blood pressure, and heart rate form the

foundation for gauging clinical progress. The clinical problem, plan, rationale, potential risks or adverse effects, and specific directions given to the patient require careful documentation. Systematic quality assurance requires recording and quantifying both successful and unsuccessful outcomes.

#### **4.2.1.2. Interpersonal and Communication Skills**

##### **4.2.1.2.1. Communication Skills**

An important objective of office- or clinic-based clinical training is to develop a rapport and communicate effectively with the patient; convey understanding of the clinical condition and prognosis; and deliver this information in a respectful, empathetic, and caring manner. Outpatient encounters provide opportunities to heighten a physician's sensitivity to patient needs, values, and preferences, thus establishing the foundation for a relationship based on compassion and trust.

To develop the ability to communicate with patients across a range of cultural, ethnic, and socioeconomic backgrounds, the trainee must be sensitive to financial, cultural, and social barriers to diagnostic and treatment recommendations. Effective communication may require a qualified language translator. It also requires empathetic understanding of the emotional impact of and response to disease. Ultimately, the cardiologist must employ psychological insight to address the patient's hopes, fears, and desires and then leverage these to promote healthy behavior. Appreciation of differences between men and women, young and old, working, retired, indigent, middle-class, wealthy, educated, informed, urban versus rural dwelling, and other demographic variables is necessary to modulate and individualize medical decision-making and discussion.

##### **4.2.1.2.1.1. Communication With Other Providers**

As a consultant to other physicians, the trainee should develop communication and practice management skills necessary to manage patients with other providers, as noted in the following text.

##### **4.2.1.2.1.2. Communication With Referring Physicians**

Timely communication with referring physicians, referral of patients with unusual or complex conditions when appropriate, and close interaction with surgical and interventional colleagues are essential to shared, informed decision-making and successful outcomes.

##### **4.2.1.2.2. Interpersonal Skills**

Successful clinicians share a common asset: interpersonal skills. This is among the most difficult skills to teach because it is highly dependent on personality, but

attending physicians can often have a more substantial educational impact in the outpatient environment than in the acute care hospital setting. The requisite skills include the ability to interpret cues from body language, including recognition of fear, anxiety, depression, and denial of illness, and to inspire, motivate, encourage, coach, and openly discuss goals of care and end-of-life issues. It is important to identify and overcome defensive or passive-aggressive attitudes and behavior. The cardiologist must enlist the support of spouses, children, and others with personal relationships to the patient as well as aides, companions, and nurses in the patient's interest. Interactions with ancillary staff may provide helpful insight into patient care issues, including identifying and overcoming barriers to effective care (e.g., home situation, insurance coverage). Interpersonal skills are essential for meaningful professional communication with physician colleagues; fellowship training in the ambulatory setting provides a prime opportunity to develop and master these skills.

##### **4.2.1.3. Patient Care and Procedural Skills in Transitional Care**

The trainee should recognize the challenges at the interfaces between hospital admission, inpatient management, and discharge. Such challenges include the need for early outpatient follow-up in select circumstances (e.g., following hospitalization for heart failure), the need for strategies to minimize adverse outcomes and avoid or delay readmission, deployment of ancillary resources to maintain surveillance of the patient's condition at home, and understanding indications for and components of cardiac rehabilitation and health maintenance. Similarly, in the longitudinal care of hospital inpatients, the cardiologist must ensure continuity during transitions of care to and from the intensive care unit and less acute settings and before and after invasive cardiovascular procedures or surgery.

Beyond standard communication skills, the cardiologist must be technologically proficient in the use of electronic health records and information systems and incorporate automatic reminders, callbacks, test and procedure result tracking, laboratory flow sheets, and surveillance to ensure timely scheduling of interventions and surveillance. Trainees must also know and adhere to the requirements and precautions regarding the confidentiality of medical information.

##### **4.2.1.3.1. Remote Communication Tools**

The appropriate use of electronic communication and cost-effective use of technology, such as remote monitoring with ambulatory telemetry, point-of-care international normalized ratio systems for patient self-testing, and downloading readouts from implanted cardiac arrhythmia devices, is essential.



#### 4.2.1.3.2. Remote Interaction Systems

Real-time interaction with emergency care facilities, clinics, other physicians, rehabilitation centers, and ancillary caregivers by telephone, fax, or electronic record messaging avoids redundancy of care, reduces the risk of error, and helps control cost. Examples are avoiding adverse drug interactions through access to lists of concurrent medications and unnecessarily repeating tests or procedures through access to prior results.

#### 4.2.1.3.3. Access to Internet Data

Within the context of the patient's condition, information that is widely accessible on the Internet may provide valuable insight, but caution is needed to avoid incorporating misinformation and inferences. Information must be validated through searches of primary sources, trustworthy textbooks, or recommendations from evidence-based practice guidelines. The trainee should become familiar with the array of electronic medical record systems and information technology resources that facilitate systems-based practice.

#### 4.2.1.4. Practice-Based Learning

##### 4.2.1.4.1. Adherence to Accepted Algorithms

Disease-specific algorithms for clinical decision-making and patient management provide foundations for individualizing delivery of care for patients with cardiac conditions. Integration of personnel and electronic systems for organized follow-through based on target endpoints should emphasize the collaborative management of patients undergoing cardiac surgery or invasive procedures and an integrated approach to team-based patient care.

##### 4.2.1.4.2. Appropriate Use Criteria

The trainee should incorporate relevant appropriate use criteria into decision making in the ambulatory setting. Outpatient training should offer a venue in which to practice evidence- and guideline-based care.

##### 4.2.1.4.3. Performance Measures and Practice Improvement

The clinical trainee should gain exposure to his/her relevant, individual performance metrics through periodic reviews, including systematic updating and re-evaluation of patient charts as a means of performance assessment. Trainees should also identify opportunities for focused improvement; establish a pattern of enhancing competency; and ensure continuous quality improvement. These activities should be conducted at least twice annually throughout the fellowship as integral to the ambulatory care experience and be subject to both self-assessment and review by faculty mentors, including

verbal feedback to the trainee and reporting to the Clinical Competency Committee and program director.

#### 4.2.1.5. Professionalism

##### 4.2.1.5.1. Advocacy and Mindset

The trainee should develop the mindset of being the patient's advocate to engender confidence and mutual trust and optimize clinical outcomes. That being said, while maintaining empathy, the trainee should retain sufficient detachment to ensure objectivity, avoid bias, and sustain equanimity. Among the most important features of such a mindset approach are the following:

1. Training in patient-centered care, emphasizing shared decision-making and patient autonomy and eschewing conflicts of interest. Thus, when ordering a test or recommending a course of action, the cardiologist should clearly convey what is in the best interest of the patient. Furthermore, accepting part of the burden of worry and responsibility for the patient in difficult times—and a readiness to credit the patient, family, or caregivers when the outcome is successful—catalyzes trust.
2. Having the equanimity to avoid distress, frustration, or resentment when confronted with noncompliance while managing limited time and multiple obligations.
3. Developing the ability to challenge assumptions, open one's thinking, and seek additional opinions. Acceptance of one's limitations is important in the evolution of a fully-developed physician and can both enhance overall patient care and help prevent physician burnout and cynicism.

##### 4.2.1.5.2. Ability to Delegate

The ability to delegate appropriately to trusted ancillary staff, other physicians, nurses, dietitians, physical therapists, and other healthcare professionals is critical to ensure that sufficient time is available to meet responsibilities to many patients. Micromanaging too many details can lead to exhaustion and increase rather than reduce the risk of error.

##### 4.2.1.5.3. Management Plan

The trainee should be able to formulate a specific plan and present options to the patient, family, and referring physician. He/she should discuss risks and potential adverse outcomes of medications or other interventions or, conversely, the risks of foregoing actions, tests, or treatments in relation to outcome. Furthermore, the cardiology fellow must acquire skills in communicating unfortunate information when there are no remaining options, while conveying hope and open availability for discussion.

#### 4.2.2. Cardiovascular Subspecialty Clinics

Opportunities should be provided to expose trainees to a range of ambulatory patients across a spectrum of cardiovascular diseases and conditions. This may involve a variety of mechanisms depending on the specialty, such as joining senior clinician tutors or attending clinics as a primary cardiovascular physician under the direction of faculty. Exposure to as many of the following specialty experiences as possible is recommended: 1) hospital-based general cardiology clinic; 2) general cardiology in the office of a senior clinician; 3) an obstetrical clinic visited by pregnant patients with heart disease, optimally in the context of an interdisciplinary approach to high-risk pregnancy; 4) a geriatric clinic visited by elderly patients with heart disease, optimally in an interdisciplinary geriatric practice; and 5) prevention and rehabilitation programs or clinics visited by patients with dyslipidemia, diabetes, hypertension, obesity, or other risk factors in both primary and secondary prevention situations. In addition, exposure to patients with pulmonary hypertension, sleep-disordered breathing, advanced heart failure, peripheral vascular diseases, complex arrhythmias, and implanted pacemakers and defibrillators, and to adult patients with congenital heart disease or genetic disorders should occur both in general clinical cardiology practice and, when possible, through participation in organized subspecialty practices or clinics under the direction of Level III-trained specialists in these fields. The overarching objective of these specialized ambulatory care experiences is to expose the trainee to the range of services available in these tertiary care settings and enhance his/her ability to generate timely referrals when indicated, interact appropriately with experts in the care of their own patients, and enhance the overall quality of cardiovascular care available to the population.

#### 4.3. Competency in the Care of Patients With Specific Cardiovascular Conditions

Together, the COCATS 4 Task Force reports form the core curriculum in cardiovascular medicine and describe a wide range of clinical experiences during which general cardiology trainees are expected to achieve competencies in evaluating and managing patients with, or at risk of developing, acute and chronic cardiovascular disorders, in both hospital and outpatient settings. There

are several other key areas of cardiology that are not individually addressed in COCATS 4 via specific Task Force reports. These include stable ischemic heart disease, acute coronary syndromes, valvular heart disease, and pericardial disease. The curricular competency components and milestones for these topics are summarized in **Tables 2 to 5**. Training in many of these areas is carried out in consultative, ambulatory, or longitudinal care experiences. For other topics, such as cardiac tumors, trauma, inflammatory and infectious diseases of the heart, and the evaluation and management of patients with known or suspected cardiovascular disease undergoing cardiac or noncardiac surgery, selected aspects are included in the competency tables of the relevant COCATS 4 Task Force reports.

### 5. EVALUATION OF COMPETENCY

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Evaluation tools in clinical cardiology include direct observation by instructors, in-training examinations, case logbooks, conference and case presentations, multisource evaluations, trainee portfolios, simulation, and reflection and self-assessment. Case management, judgment, interpretive, and bedside skills must be evaluated in every trainee. Quality of care and follow-up; reliability; judgment, decisions, or actions that result in complications; interaction with other physicians, patients, and laboratory support staff; initiative; and the ability to make appropriate decisions independently should be considered. Trainees should maintain records of participation and advancement in the form of a Health Insurance Portability and Accountability Act (HIPAA)-compliant electronic database or logbook that meets ACGME reporting standards and summarizes pertinent clinical information (e.g., number of cases, diversity of referral sources, diagnoses, disease severity, outcomes, and disposition). The faculty, under the aegis of the program director, should record and verify each trainee's experiences, assess performance, and document satisfactory achievement. The program director is responsible for confirming experience and competence and reviewing the overall progress of individual trainees with the Clinical Competency Committee to ensure achievement of selected training milestones and identify areas in which additional focused training may be required.

**TABLE 2 Core Competency Components and Curricular Milestones for Training in Stable Ischemic Heart Disease**

Competency Component		Milestones (Months)			
MEDICAL KNOWLEDGE		12	24	36	Add
1	Know the epidemiology, pathophysiology, and natural history of atherosclerotic vascular disease and the characteristic features of stable and unstable coronary artery plaque.	I			
2	Know the determinants of coronary blood flow and myocardial oxygen consumption.	I			
3	Know the differential diagnosis of chest pain syndromes and the characteristic clinical features of typical angina, atypical angina, and noncardiac chest pain.	I			
4	Know the clinical features and natural history of angina pectoris in special populations: women, the elderly, and patients with diabetes.	I			
5	Know the causes of angina pectoris not related to atherosclerotic coronary disease (including valvular heart disease, hypertrophic cardiomyopathy, cocaine, congenital coronary anomalies, vasculitis, and coronary artery spasm).	I			
6	Know the medical conditions that can provoke or exacerbate angina pectoris.	I			
7	Know the differential diagnosis and prognosis of myocardial ischemia in patients with nonobstructive coronary disease.	I			
8	Know the characteristic electrocardiographic features of ischemia.	I			
9	Know the indications, contraindications, and limitations of noninvasive testing in the context of the pretest likelihood and predictive value for diagnosis of coronary artery disease.	I			
10	Know the role of noninvasive testing in risk-assessment, including the clinical, functional capacity, ECG, and hemodynamic stress test findings indicative of advanced coronary disease or high-risk state.		I		
11	Know the lifestyle, activity, and exercise guidelines and risk factor treatment targets in patients with stable ischemic heart disease.	I			
12	Know the indications, contraindications, and clinical pharmacology of medications used to improve symptoms and/or prognosis in patients with stable ischemic heart disease.	I			
13	Know the role of left ventricular systolic function in clinical decision-making and in estimation of prognosis in patients with ischemia.	I			
14	Know the indications, limitations, and risk of coronary angiography in patients with known or suspected ischemia.	I			
15	Know the anatomic and physiologic catheterization findings indicating significant coronary artery obstruction and the coronary angiographic features indicative of a high-risk state.	I			
16	Know the indications, risks, and benefits of percutaneous or surgical revascularization versus medical therapy in patients with stable ischemic heart disease.		I		
17	Know the treatment options for refractory symptomatic stable ischemic heart disease.		I		
18	Know the indications for noninvasive or invasive evaluation following revascularization procedures.	I			

**EVALUATION TOOLS:** direct observation and in-training examination.

PATIENT CARE AND PROCEDURAL SKILLS		12	24	36	Add
1	Skill to obtain and utilize history, physical examination, and electrocardiogram findings in patients with chest pain syndromes to establish a clinical probability of the presence of symptomatic coronary artery disease.	I			
2	Skill to distinguish stable versus unstable coronary syndromes.	I			
3	Skill to select evidence-based and cost-effective noninvasive testing for diagnosis and/or risk assessment in patients with chest pain syndromes.	I			
4	Skill to interpret and apply results of noninvasive testing in the management of patients with stable ischemic heart disease.		I		
5	Skill to perform and interpret exercise electrocardiographic testing.		I		
6	Skill to establish an effective anti-ischemic medical regimen for patients with ischemia.	I			
7	Skill to identify appropriate candidates for coronary angiography and percutaneous or surgical revascularization.		I		
8	Skill to interpret and integrate diagnostic cardiac catheterization findings into patient management.		I		

**TABLE 2 Core Competency Components, continued**

Competency Component		Milestones (Months)			
		12	24	36	Add
<b>PATIENT CARE AND PROCEDURAL SKILLS</b>					
9	Skill to implement lifestyle, physical activity guidelines, and pharmacologic interventions to safely control and achieve target levels of risk factors.	I			
10	Skill to perform preoperative risk assessment in cardiovascular patients undergoing noncardiac surgery.	I			
11	Skill to perform diagnostic cardiac catheterization.			II	
<b>EVALUATION TOOLS:</b> chart-stimulated recall, conference presentation, direct observation, and logbook.					
<b>SYSTEMS-BASED PRACTICE</b>					
1	Incorporate risk-benefit analysis and cost considerations in treatment decisions.		I		
2	Utilize a multidisciplinary coordinated approach for patient management, including transfer of care and employment-related issues.		I		
<b>EVALUATION TOOLS:</b> chart-stimulated recall, conference presentation, direct observation, and multisource evaluation.					
<b>PRACTICE-BASED LEARNING AND IMPROVEMENT</b>					
1	Utilize decision and support tools for accessing guidelines and pharmacologic information at the point of care.	I			
2	Identify competency gaps and engage in opportunities to achieve focused education and performance improvement.		I		
<b>EVALUATION TOOLS:</b> conference presentation, direct observation, and in-training examination.					
<b>PROFESSIONALISM</b>					
1	Exhibit sensitivity to patient preference and end-of-life issues.		I		
2	Identify and manage conflicts of interest.		I		
3	Practice within the scope of personal expertise or technical skills.		I		
<b>EVALUATION TOOLS:</b> chart-stimulated recall, direct observation, multisource evaluation, and reflection and self-assessment.					
<b>INTERPERSONAL AND COMMUNICATION SKILLS</b>					
1	Communicate with and educate patients and families across a broad range of cultural, ethnic, and socioeconomic backgrounds.		I		
2	Engage in shared decision-making with patients about their condition and the options for diagnosis and treatment.		I		
<b>EVALUATION TOOLS:</b> direct observation and multisource evaluation.					

Add = additional months beyond the 3-year cardiovascular fellowship.

**TABLE 3 Core Competency Components and Curricular Milestones for Training in Acute Coronary Syndromes**

Competency Component		Milestones (Months)			
MEDICAL KNOWLEDGE		12	24	36	Add
1	Know the epidemiology, causes, pathophysiology, and natural history of ACS, including the roles of plaque rupture or erosion, platelet activation, and thrombosis.	I			
2	Know the disorders that can simulate or mask acute coronary syndromes.	I			
3	Know the risk-assessment tools in acute coronary syndromes.	I			
4	Know the indications and clinical pharmacology of antiplatelet, anticoagulant, and other pharmacologic therapies.	I			
5	Know the post-acute coronary syndromes risk assessment, rehabilitation, and secondary prevention measures.	I			
<b>ST-Elevation Myocardial Infarction</b>					
6	Know the characteristic symptoms, physical findings, electrocardiographic patterns, and biomarker findings.	I			
7	Know the effects and time course of ischemic injury on ventricular function and remodeling.	I			
8	Know the characteristic hemodynamic complications (including hypotension, low cardiac output, heart failure, and shock).		I		
9	Know the characteristic arrhythmia and conduction complications.		I		
10	Know the characteristic mechanical complications (including papillary muscle rupture and myocardial rupture).		I		
11	Know the characteristic findings and complications of right ventricular infarction.		I		
12	Know indications, contraindications, and risks of reperfusion therapies and the clinical, electrocardiographic, and angiographic signs of reperfusion.	I			
13	Know the relative benefits and risks of fibrinolysis and primary percutaneous coronary intervention as an initial reperfusion strategy.	I			
14	Know the indications for transfer, angiography, and revascularization in patients who did not receive primary percutaneous coronary intervention (including those who received fibrinolysis or did not receive initial reperfusion therapy).		I		
<b>Non-ST-Elevation Acute Coronary Syndromes</b>					
15	Know the differential diagnosis and the characteristic clinical, electrocardiographic, and biomarker features for diagnosis and risk stratification.		I		
16	Know the relative risks and benefits of an initial invasive versus an ischemia-guided strategy for angiography and revascularization.		I		

**EVALUATION TOOLS:** chart-stimulated recall, conference presentation, direct observation, and in-training examination.

PATIENT CARE AND PROCEDURAL SKILLS		12	24	36	Add
1	Skill to evaluate and diagnose patients with ST-elevation myocardial infarction and initiate appropriate reperfusion therapy within guideline time limits.	I			
2	Skill to employ appropriate antiplatelet, anticoagulant, and other pharmacologic therapies.	I			
3	Skill to recognize and treat hemodynamic disturbances (including hypotension, low cardiac output, heart failure, acute pulmonary edema, and shock) and diagnose the cause.		I		
4	Skill to recognize and treat arrhythmias and conduction disturbances.		I		
5	Skill to recognize and treat mechanical complications (including papillary muscle rupture and myocardial rupture).		I		
6	Skill to recognize and treat patients with right ventricular infarction.		I		
7	Skill to assess ventricular function and utilize in treatment strategy decisions.		I		
8	Skill to interpret invasive hemodynamic data and angiographic findings and apply to treatment strategies.		I		
9	Skill to perform and interpret coronary angiography.			II	
10	Skill to insert intra-arterial and pulmonary artery catheters and interpret the findings.		I		
11	Skill to assess overall risk, identify candidates for invasive evaluation and treatment, and establish optimal medical regimen in non-ST-elevation acute coronary syndromes.		I		

**TABLE 3 Core Competency Components, continued**

Competency Component		Milestones (Months)			
		12	24	36	Add
<b>PATIENT CARE AND PROCEDURAL SKILLS</b>					
12	Skill to identify patients who would benefit from mechanical circulatory support.		I		
13	Skill to achieve risk-factor target levels for secondary prevention.	I			
<b>EVALUATION TOOLS:</b> chart-stimulated recall, conference presentation, direct observation, and simulation.					
<b>SYSTEMS-BASED PRACTICE</b>					
1	Work with emergency medical systems, emergency departments, and hospital teams to establish effective first medical contact strategies for cardiovascular emergencies.		I		
2	Identify and address financial, cultural, and social barriers to diagnostic and treatment recommendations.	I			
3	Utilize a multidisciplinary coordinated approach for patient management, including transfer of care and employment-related issues.		I		
4	Practice in a manner that fosters the balance of appropriate utilization of finite resources with the net clinical benefit for the individual patient.		I		
<b>EVALUATION TOOLS:</b> chart-stimulated recall, conference presentation, direct observation, multisource evaluation, and record review.					
<b>PRACTICE-BASED LEARNING AND IMPROVEMENT</b>					
1	Identify gaps in performance and knowledge and perform appropriate personal learning activities.		I		
2	Utilize decision support tools for accessing guidelines and pharmacologic information at the point of care.	I			
<b>EVALUATION TOOLS:</b> chart-stimulated recall, direct observation, and reflection and self-assessment.					
<b>PROFESSIONALISM</b>					
1	Exhibit sensitivity to patient preference and end-of-life issues.	I			
2	Demonstrate sensitivity and responsiveness to diverse patient populations.	I			
3	Demonstrate a commitment to carry out professional responsibilities, appropriately refer patients, and respond to patient needs in a way that supersedes self-interest.	I			
4	Interact respectfully with patients, families, and all members of the healthcare team, including ancillary and support staff.	I			
<b>EVALUATION TOOLS:</b> direct observation and multisource evaluation.					
<b>INTERPERSONAL AND COMMUNICATION SKILLS</b>					
1	Effectively communicate with acutely ill patients across a broad range of cultural, ethnic, and socioeconomic backgrounds.	I			
2	Communicate with all healthcare providers involved in patient care.	I			
<b>EVALUATION TOOLS:</b> chart-stimulated recall, direct observation, and multisource evaluation.					

Add = additional months beyond the 3-year cardiovascular fellowship.

**TABLE 4 Core Competency Components and Curricular Milestones for Training in Valvular Heart Disease**

Competency Component		Milestones (Months)			
MEDICAL KNOWLEDGE		12	24	36	Add
1	Know the characteristic features and natural history of congenital bicuspid aortic valve disease.	I			
2	Know the etiology, natural history, pathophysiology, and differential diagnosis of acquired aortic, mitral, pulmonic, and tricuspid valve diseases.		I		
3	Know the characteristic features and natural history of rheumatic valvular heart disease.	I			
4	Know the cardinal symptoms and physical findings of aortic and of mitral stenosis and their role in management decisions.	I			
5	Know the cardinal symptoms and physical findings of chronic aortic and chronic mitral regurgitation and their roles in management decisions.		I		
6	Know the causes and distinguishing characteristics of acute versus chronic mitral and aortic regurgitation.		I		
7	Know the natural history, clinical features, and complications of mitral valve prolapse.	I			
8	Know the appropriate indications for, and characteristic findings of, echocardiographic testing for diagnosis and assessment of severity during initial evaluation and upon follow-up.		I		
9	Know the role of stress testing in assessment of valvular heart disease.			I	
10	Know the indications for magnetic resonance imaging and computed tomography in the assessment of valvular heart disease.		I		
11	Know the indications for, and characteristic findings with, cardiac catheterization in patients with valvular heart disease.		I		
12	Know the indications for, and clinical pharmacology of, drugs used for the treatment of native and prosthetic valvular heart disease, including anticoagulation and antibiotic prophylaxis.	I			
13	Know the effects of arrhythmias on the clinical manifestations, risks of complications, and management of valvular heart disease.		I		
14	Know the indications and expected outcomes for surgical therapy in valvular heart disease, including valve selection and repair versus replacement.		I		
15	Know the indications and expected outcomes for transcatheter therapy in valvular heart disease.		I		
16	Know the etiology, natural history, physical findings, differential diagnosis, complications, and treatment of native valve and prosthetic valve endocarditis.		I		
17	Know the effects of pregnancy on the clinical manifestations and management of patients with valvular heart disease (native and prosthetic).		I		

**EVALUATION TOOLS:** chart-stimulated recall, direct observation, and in-training examination.

PATIENT CARE AND PROCEDURAL SKILLS		12	24	36	Add
1	Skill to identify cardinal physical findings and ECG abnormalities in patients with valvular heart disease.		I		
2	Skill to distinguish innocent from pathologic heart murmurs.		I		
3	Skill to manage patients with valvular heart disease and coronary artery disease.		I		
4	Skill to select appropriate testing and integrate results with clinical findings in the evaluation and management of patients with valvular heart disease.		I		
5	Skill to distinguish aortic stenosis from hypertrophic obstructive cardiomyopathy and other causes of left ventricular outflow tract obstruction.	I			
6	Skill to recognize bicuspid aortic valve disease and its associated abnormalities.	I			
7	Skill to recognize impact of ventricular dysfunction on clinical decision-making in valvular heart disease.	I			
8	Skill to recognize the cause and impact of pulmonary hypertension in management of valvular heart disease.		I		
9	Skill to determine candidacy and optimal timing of cardiac surgical or transcatheter treatments in patients with valvular heart disease.		I		
10	Skill to perform and interpret transesophageal echocardiography in patients with valvular heart disease.			II	
11	Skill to perform and interpret diagnostic catheterization in patients with valvular heart disease.			II	

**EVALUATION TOOLS:** chart-stimulated recall, direct observation, logbook, and simulation.

**TABLE 4 Core Competency Components, continued**

Competency Component		Milestones (Months)			
		12	24	36	Add
<b>SYSTEMS-BASED PRACTICE</b>					
1	Participate in interdisciplinary decision-making with regard to surgery and transcatheter therapy.		I		
2	Practice in a manner that fosters the balance of appropriate utilization of finite resources with the net clinical benefit for the individual patient.		I		
<b>EVALUATION TOOLS:</b> chart-stimulated recall, conference presentation, direct observation, and multisource evaluation.					
<b>PRACTICE-BASED LEARNING AND IMPROVEMENT</b>					
1	Identify competency gaps and engage in opportunities to achieve focused education and performance improvement.		I		
2	Utilize decision support tools for accessing guidelines and pharmacologic information at the point of care.		I		
<b>EVALUATION TOOLS:</b> in-training examination and reflection and self-assessment.					
<b>PROFESSIONALISM</b>					
1	Exhibit sensitivity to patient preference and end-of-life issues.		I		
2	Practice within the scope of personal expertise or technical skills.		I		
<b>EVALUATION TOOLS:</b> in-training examination and reflection and self-assessment.					
<b>INTERPERSONAL AND COMMUNICATION SKILLS</b>					
1	Engage in shared decision-making with patients about their condition and the options for diagnosis and treatment.		I		
<b>EVALUATION TOOLS:</b> direct observation and multisource evaluation.					

Abbreviations as in [Table 2](#).



**TABLE 5 Core Competency Components and Curricular Milestones for Training in Pericardial Disease**

Competency Component		Milestones (Months)			
MEDICAL KNOWLEDGE		12	24	36	Add
1	Know the pathophysiology, differential diagnosis, and natural history of acute and relapsing pericarditis.	I			
2	Know the pathophysiology, differential diagnosis, and natural history of pericardial effusion and pericardial tamponade.	I			
3	Know the pathophysiology, differential diagnosis, and natural history of constrictive pericarditis.		I		
4	Know the cardinal physical findings of acute pericarditis, pericardial tamponade, and constrictive pericarditis.		I		
5	Know the indications for pericardiocentesis.	I			
6	Know the indications for, and clinical pharmacology of, drugs used for the treatment of acute and relapsing pericarditis.	I			
7	Know the effects of pericardial disease on other organ systems.		I		
8	Know pericardial anatomy and structural abnormalities (pericardial cyst and congenital absence of the pericardium).		I		
9	Know the indications for, and characteristic findings in, imaging studies of pericardial diseases.		I		
10	Know the indications for surgical referral in pericardial diseases and the expected outcomes.		I		
<b>EVALUATION TOOLS:</b> chart-stimulated recall, global evaluation, and in-training examination.					
PATIENT CARE AND PROCEDURAL SKILLS		12	24	36	Add
1	Skill to clinically evaluate, diagnose, and manage patients with acute pericarditis and with chronic relapsing pericarditis.		I		
2	Skill to identify cardinal physical findings and evaluate and manage patients with pericardial effusion, including tamponade.		I		
3	Skill to identify cardinal physical findings and evaluate and manage patients with constrictive pericarditis.		I		
4	Skill to appropriately select and incorporate data from laboratory testing and noninvasive imaging in the evaluation and management of patients with pericardial disease.		I		
5	Skill to perform pericardiocentesis.			II	
6	Skill to distinguish constrictive pericarditis from restrictive cardiac disease.		I		
7	Skill to identify patients who should be referred for cardiac catheterization in the evaluation of pericardial disease.		I		
8	Skill to identify patients with constrictive pericarditis who are candidates for referral for consideration of cardiac surgery.		I		
<b>EVALUATION TOOLS:</b> direct observation, global evaluation, logbook, and simulation.					
SYSTEMS-BASED PRACTICE		12	24	36	Add
1	Utilize a multidisciplinary coordinated approach for patient management, including transfer of care and employment-related issues.		I		
2	Incorporate risk-benefit analysis and cost considerations in diagnostic and treatment decisions.		I		
<b>EVALUATION TOOLS:</b> chart-stimulated recall, conference presentation, direct observation, and multisource evaluation.					
PRACTICE-BASED LEARNING AND IMPROVEMENT		12	24	36	Add
1	Identify competency gaps and engage in opportunities to achieve focused education and performance improvement.		I		
<b>EVALUATION TOOLS:</b> chart-stimulated recall, in-training examination, and reflection and self-assessment.					
PROFESSIONALISM		12	24	36	Add
1	Exhibit sensitivity to patient preference and end-of-life issues.		I		
2	Practice within the scope of personal expertise or technical skills.		I		
<b>EVALUATION TOOLS:</b> direct observation, global evaluation, and multisource evaluation.					

**TABLE 5 Core Competency Components, continued**

Competency Component		Milestones (Months)			
		12	24	36	Add
<b>INTERPERSONAL AND COMMUNICATION SKILLS</b>					
1	Communicate with and educate patients and families across a broad range of cultural, ethnic, and socioeconomic backgrounds.		I		
2	Engage in shared decision-making with patients about their condition and the options for diagnosis and treatment.		I		

**EVALUATION TOOLS:** direct observation, global evaluation, and multisource evaluation.

Add = additional months beyond the 3-year cardiovascular fellowship.

**REFERENCE**

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**KEY WORDS** ACC Training Statement, ambulatory care, clinical competence, COCATS, consultative care, fellowship training, longitudinal care

**APPENDIX 1. AUTHOR RELATIONSHIPS WITH INDUSTRY AND OTHER ENTITIES (RELEVANT)—COCATS 4 TASK FORCE 1: TRAINING IN AMBULATORY, CONSULTATIVE, AND LONGITUDINAL CARDIOVASCULAR CARE**

Committee Member	Employment	Consultant	Speakers Bureau	Ownership/ Partnership/ Principal	Personal Research	Institutional/ Organizational or Other Financial Benefit	Expert Witness
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Eric S. Williams (Co-Chair)	Indiana University School of Medicine—Professor (Cardiology) and Associate Dean; Indiana University Health—Cardiology Service Line Leader	None	None	None	None	None	None
Nancy R. Cho	Cardiology and Medicine Associates—Cardiologist	None	None	None	None	None	None
William F. Iobst	The Commonwealth Medical College—Vice President, Academic and Clinical Affairs, Vice Dean; <i>Former employment during writing effort:</i> American Board of Internal Medicine—Vice President, Academic Affairs	None	None	None	None	None	None
Debabrata Mukherjee	Texas Tech University Health Sciences Center—Chief, Cardiovascular Medicine	None	None	None	None	None	None
Prashant Vaishnav	The Icahn School of Medicine at Mount Sinai, Mount Sinai Heart—Director, Quality Assurance; Assistant Professor of Medicine	None	None	None	None	None	None

For the purpose of developing a general cardiology training statement, the ACC determined that no relationships with industry or other entities were relevant. This table reflects authors' employment and reporting categories. To ensure complete transparency, authors' comprehensive healthcare-related disclosure information—including relationships with industry not pertinent to this document—is available in an online data supplement. Please refer to <http://www.acc.org/guidelines/about-guidelines-and-clinical-documents/relationships-with-industry-policy> for definitions of disclosure categories, relevance, or additional information about the ACC Disclosure Policy for Writing Committees.

ACC = American College of Cardiology.

## APPENDIX 2. PEER REVIEWER RELATIONSHIPS WITH INDUSTRY AND OTHER ENTITIES (RELEVANT)— COCATS 4 TASK FORCE 1: TRAINING IN AMBULATORY, CONSULTATIVE, AND LONGITUDINAL CARDIOVASCULAR CARE

Name	Employment	Representation	Consultant	Speakers Bureau	Ownership/ Partnership/ Principal	Personal Research	Institutional/ Organizational or Other Financial Benefit	Expert Witness
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Dhanunjaya Lakkireddy	Kansas University Cardiovascular Research Institute	Official Reviewer, ACC Board of Governors	None	None	None	None	None	None
Howard Weitz	Thomas Jefferson University Hospital—Director, Division of Cardiology; Sidney Kimmel Medical College at Thomas Jefferson University—Professor of Medicine	Official Reviewer, Competency Management Committee Lead Reviewer	None	None	None	None	None	None
Furman McDonald	American Board of Internal Medicine—Vice President Graduate Medical Education, Department of Academic Affairs and Professor, Medicine	Organizational Reviewer, ABIM	None	None	None	None	None	None
Kiran Musunuru	Brigham and Women's Hospital, Harvard University	Organizational Reviewer, AHA	None	None	None	None	None	None
Kenneth Ellenbogen	VCU Medical Center—Director, Clinical Electrophysiology Laboratory	Content Reviewer, Cardiology Training and Workforce Committee	None	None	None	None	None	None
Michael Emery	Greenville Health System	Content Reviewer, Sports and Exercise Cardiology Section Leadership Council	None	None	None	None	None	None
Rosario Freeman	University of Washington—Director, Cardiology Fellowship Programs; Medical Director, Noninvasive Diagnostic Services; Associate Professor of Medicine	Content Reviewer, Competency Management Committee	None	None	None	None	None	None
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Larry Jacobs	Lehigh Valley Health Network, Division of Cardiology; University of South Florida—Professor, Cardiology	Content Reviewer, Cardiology Training and Workforce Committee	None	None	None	None	None	None
Andrew Kates	Washington University School of Medicine	Content Reviewer, Academic Research Council	None	None	None	None	None	None
Chittur A. Sivaram	University of Oklahoma—Vice Chief, Cardiovascular Section	Content Reviewer, Competency Management Committee	None	None	None	None	None	None
David Vorchheimer	Montefiore-Einstein Center for Heart & Vascular Care—Director, Clinical Cardiology; Professor, Clinical Medicine	Content Reviewer, Individual	None	None	None	None	None	None

For the purpose of developing a general cardiology training statement, the ACC determined that no relationships with industry or other entities were relevant. This table reflects peer reviewers' employment, representation in the review process, as well as reporting categories. Names are listed in alphabetical order within each category of review. Please refer to <http://www.acc.org/guidelines/about-guidelines-and-clinical-documents/relationships-with-industry-policy> for definitions of disclosure categories, relevance, or additional information about the ACC Disclosure Policy for Writing Committees.

ABIM = American Board of Internal Medicine; ACC = American College of Cardiology; AHA = American Heart Association; VCU = Virginia Commonwealth University.

### **APPENDIX 3. ABBREVIATION LIST**

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ABIM = American Board of Internal Medicine

ABMS = American Board of Medical Specialties

ACC = American College of Cardiology

ACGME = Accreditation Council for Graduate Medical Education

COCATS = Core Cardiovascular Training Statement

HIPAA = Health Insurance Portability and Accountability Act