

## COMPETENCY STATEMENT

# 2020 ACC Clinical Competencies for Nurse Practitioners and Physician Assistants in Adult Cardiovascular Medicine

A Report of the ACC Competency Management Committee

Endorsed by the American Academy of Physician Assistants, American Association of Heart Failure Nurses, American Heart Association, Association of Physician Assistants in Cardiology, Heart Rhythm Society, Physician Assistant Education Association, Preventive Cardiovascular Nurses Association, and the Society for Cardiovascular Angiography and Interventions

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**PREAMBLE**

Since the 1995 publication of its Core Cardiovascular Training Statement (COCATS) (1), the American College of Cardiology (ACC) has played a central role in defining the knowledge, experiences, skills, and behaviors expected of all clinical cardiologists upon completion of training. Subsequent updates have incorporated major advances and revisions—both in content and structure—including a further move toward competency-based training, and the use of the 6-domain competency structure promulgated by the Accreditation Council for Graduate Medical Education and the American Board of Medical Specialties, and endorsed by the American Board of Internal Medicine. A similar structure has been used by the ACC to describe the aligned general cardiology lifelong learning competencies that all practicing cardiologists are expected to maintain. Many hospital systems also now use the 6-domain structure as part of medical staff privileging and peer-review professional competence assessments.

The ACC Competency Management Committee oversees development of competency statements for cardiovascular specialists covering the entire career spectrum. In 2016, the ACC's Cardiovascular Team Council approached the Competency Management Committee to develop a competency statement for members of the cardiovascular care team. One impetus for this request was the 2015 ACC Health Policy Statement on Cardiovascular Team-Based Care and the Role of Advanced Practice Providers (2) that highlighted the importance of team-based delivery of cardiovascular care and advocated for development of a nationally-recognized set of core competencies. The statement emphasized the important collaboration between cardiologists, nurse practitioners (NPs), physician assistants (PAs), and other cardiovascular team members in the care of patients. Also noted was the lack of formal postgraduate training programs for NPs and PAs such that most cardiovascular knowledge and skills are learned through practice experience from more experienced and tenured clinicians on the team. To fill this educational gap, the Cardiovascular Team Section Leadership Council requested that the Competency Management Committee commission a competency statement. This resulting document

describes the key anticipated competencies for cardiovascular NPs and PAs, including those in general cardiovascular practices and those in focused areas of cardiovascular medicine. It also identifies aspects of cardiovascular medicine that exceed core expectations and may be maintained or achieved by some specialized NPs and PAs, depending on their expertise, skills, practice agreements, and licensure. This document is not intended to describe independent practice for a particular discipline or outline training standards. Rather, it is intended to delineate those competencies relevant to services that cardiovascular NPs and PAs provide to patients within the care delivery system of a cardiovascular practice.

A key feature of competency-based training and performance is an outcome-based evaluation system. All ACC competence and training statements, therefore, include examples of tools that can be used to assess achievement of the individual components of competency (see [Section 1.2.2.](#)). Recommendations in these statements are based on available evidence and, where evidence is lacking, reflect the consensus of expert opinion. The writing committees reflect the diversity of cardiovascular medicine, including content experts, general cardiology and sub-specialty practitioners in both academic and private practice settings, and early, mid-, and later-career representatives. All documents are subject to rigorous peer review and public comment.

The work of the writing committee was supported exclusively by the ACC without commercial support. Writing committee members volunteered their time to this effort. Conference calls of the writing committee were confidential, and only committee members attended. To avoid actual, potential, or perceived conflict of interest resulting from relationships with industry or other entities (RWI), writing committee members and peer reviewers were required to disclose all current healthcare-related relationships. The ACC Competency Management Committee determined that RWI are not relevant to the creation of a general cardiology competence statement but provided employment and affiliation information for authors and peer reviewers in [Appendixes 1 and 2](#), respectively, along with disclosure reporting categories. To ensure transparency, comprehensive healthcare-related disclosure information, for [authors](#) and [peer reviewers](#) has been posted online. Disclosure information for the ACC Competency Management Committee is available online, [online](#), as is the [ACC disclosure policy for document development](#).

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## 1. INTRODUCTION

### 1.1. Document Development Process

#### 1.1.1. Writing Committee Organization

The writing committee consisted of a broad range of members selected by the ACC, including an equal number of cardiovascular NPs and PAs with expertise in the following clinical areas: acute coronary syndromes, adult congenital heart disease, ambulatory and consultative care cardiology, cardiac arrhythmias and electrophysiology, cardiovascular disease prevention, critical care cardiology, heart failure, pericardial disease, stable ischemic heart disease, valvular heart disease, and vascular medicine. Committee members represented a diversity of geographic location; urban, suburban, and rural practice settings; academic and community-based practice settings; institution size; gender; ethnicity; and stage in career (early, mid, and later), as well as those who exemplified practice acumen and team model care expertise. Although no members participated in a formal representational role from other professional societies, the writing committee is composed of authors who are engaged in NP, PA, and cardiovascular specialty organizations. In addition to the NP and PA members of the committee, 3 cardiologists with expertise in team model care and competency development participated in the writing, review, and revision of the document. The writing committee met the College's disclosure requirements for RWI as described in the Preamble.

#### 1.1.2. Document Development and Approval

The steering committee convened to plan the writing effort, determine the document framework, and initiate preliminary competency table development and project plans. Authors were then selected to address the criteria specified in [Section 1.1.1](#). The writing committee convened by conference call and e-mail to finalize the document outline, develop the initial draft, revise the draft based on committee feedback, and ultimately approve the document for external peer review.

The document was reviewed by 4 official representatives from the ACC and 25 reviewers representing the following organizations: the Accreditation Review Commission on Education for the Physician Assistant, American Academy of Physician Assistants, American Association of Heart Failure Nurses, American Association of Nurse Practitioners, American Heart Association, American Nurses Credentialing Center, Association of Physician Assistants in Cardiology, Heart Failure Society of America, Heart Rhythm Society, National Organization of Nurse Practitioner Faculties, Physician Assistant Education Association, Preventive Cardiovascular Nurses

Association, and the Society for Cardiovascular Angiography and Interventions. In addition, 56 content reviewers participated in peer review representing cardiologists, NPs, and PAs with expertise in the clinical topics addressed in this document as well as diversity across stage in career, practice setting, and geographic location, resulting in over 1,000 peer review comments. The list of peer reviewers, employment information, and affiliations for the review process is included in [Appendix 2](#). The document was simultaneously posted for public comment from September 9, 2019, to September 30, 2019, resulting in 185 additional comments. The writing committee reviewed and addressed all comments. A member of the ACC Competency Management Committee served as lead reviewer to ensure a fair and balanced peer review resolution process. Both the writing committee and the ACC Competency Management Committee approved the final document to be sent for organizational approval. The ACC approved the document for publication with endorsement from the American Academy of Physician Assistants, American Association of Heart Failure Nurses, American Heart Association, Association of Physician Assistants in Cardiology, Heart Rhythm Society, Physician Assistant Education Association, Preventive Cardiovascular Nurses Association, and the Society for Cardiovascular Angiography and Interventions. This document is considered current until the ACC Competency Management Committee revises or withdraws it from publication.

### 1.2. Background and Scope

NPs and PAs are integral members of the cardiovascular care team in diagnosis and management of patients with cardiovascular disease, both in general and specialty cardiovascular practices. Prerequisite education, training, experience, and demonstrated competency provide a foundation to function in a collaborative team environment with significant autonomy, extending the capabilities of the general or subspecialty cardiologist and the entire cardiovascular team. When practicing at the full scope of education, training, and licensure, NPs and PAs improve access to care and provide comprehensive clinical care, including diagnosis, management, test ordering and interpretation, procedure participation, patient education, and care coordination. Most clinical care teams that utilize NPs and PAs report enhanced practice performance, physician efficiency, revenue generation, improved clinical outcomes, and enhanced patient satisfaction (2-9).

Model cardiovascular teams are composed of members including but not limited to cardiologists, NPs, PAs, behavioral scientists, cardiovascular technologists,

clinical nurse specialists, data/informatics professionals, exercise physiologists, genetic counselors, nurses, occupational therapists, pharmacists, physical therapists, registered dietitians, and social workers. High-performing cardiovascular care teams aspire for each member to practice at the top of his or her education, training, licensure, and experience with clearly defined roles. This document identifies competencies for the NP and PA members of the cardiovascular care team.

The overarching goal in competency statements is to provide a framework by which educational initiatives and clinical competencies can be coordinated to improve the overall delivery of care to cardiovascular patients. This competency document identifies the knowledge and skills important for NPs and PAs working in general cardiovascular medicine and cardiac subspecialty areas, thereby assisting NPs and PAs in identifying learning needs and opportunities for professional growth. It also helps to increase awareness of the roles that NPs and PAs have within the cardiovascular team. Such efforts will promote and enhance collaborative, high-quality, patient-centered care teams.

Acquisition of the competencies described in this document can come from a variety of sources, including learning from more experienced cardiovascular care team members, educational programs, workshops, and self-directed reading and study. The general cardiovascular competencies for NPs and PAs provide a foundation for practice, given individual learning needs, practice setting, and baseline knowledge. However, after months and years of clinical experience, one would anticipate aspirational development into deeper knowledge and specialty skills based on practice area and model.

It is important to recognize that some NPs and PAs acquire exceptional clinical acumen and a high level of expertise and technical proficiency in advanced skills such as emergency response systems, inserting temporary pacemakers, and performing pericardiocentesis, depending on their level of experience and training, state licensure, and institutional privileging. This document does not delineate these highly specialized competencies but rather focuses on the NP and PA competencies that typically apply in most practice settings.

### 1.2.1. Cardiovascular NP and PA Competencies

The cardiovascular competencies, organized in a topic format, identify the competencies for clinical cardiovascular NPs and PAs, as well as aspects of cardiovascular medicine that exceed core expectations and may be maintained or achieved by some cardiovascular NPs and PAs depending on their background and practice focus (see [Table 1](#)). Given the document design, the competencies that define an individual's practice may overlap with multiple topic areas even for highly specialized practitioners.

**TABLE 1**

### Competency Framework for Nurse Practitioners and Physician Assistants in Adult Cardiovascular Medicine

- Core Competencies
- Acute Coronary Syndromes
- Adult Congenital Heart Disease
- Ambulatory and Consultative Care Cardiology
- Cardiac Arrhythmias and Electrophysiology
- Cardiovascular Disease Prevention
- Critical Care Cardiology
- Heart Failure
- Pericardial Disease
- Stable Ischemic Heart Disease
- Valvular Heart Disease
- Vascular Medicine

The competencies for cardiovascular NPs and PAs are organized using the 6 domains promulgated by Accreditation Council for Graduate Medical Education/American Board of Medical Specialties and endorsed by American Board of Internal Medicine (see [Table 2](#)) to align with ACC's physician-based competencies. Core competencies that pertain to all clinical areas, describing competencies for systems-based practice, practice-based learning and improvement, interpersonal and communication skills, and professionalism, are found in [Table 3](#). [Tables 4 to 14](#) encompass the medical knowledge and patient care and procedural skill competencies related to the 11 clinical areas identified in [Table 1](#). These competencies are unique to each of the clinical areas identified in [Table 1](#).

#### 1.2.1.1. Distinction Between Competencies Generally Expected of All Cardiovascular NPs and PAs and Those Based on the Focus of Practice

All tables distinguish competencies generally expected of all cardiovascular NPs and PAs (left column) from those generally expected of selected cardiovascular NPs and

**TABLE 2**

### ACGME Core Competencies

- **Patient Care** that is compassionate, appropriate, and effective for treating health problems and promoting 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 involve investigation and evaluation of their own patient care, self-appraisal, assimilation of scientific evidence, and improvements in patient care.
- **Interpersonal and Communication Skills** that result in effective information exchange and teaming with patients, their families, and other health professionals.
- **Professionalism** as manifested by a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.
- **Systems-Based Practice** as manifested by actions that demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value.

These minimum general competencies were endorsed by the ACGME in February 1999 ([www.acgme.org](http://www.acgme.org)) and all Residency Review Committees and Institutional Review Committees were to include this minimum language in their respective Program and Institutional Requirements by June 2001. The definitions are available at <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3043418/>.

ACGME = Accreditation Council for Graduate Medical Education.

PAs based on background, specialized knowledge, skills, experience, and practice focus (right column). Therefore, the left column reflects the competencies expected of most NPs and PAs practicing within adult cardiovascular medicine. It is anticipated, however, that not all cardiovascular NPs and PAs will acquire or retain all core left-column competencies, due to differences in training and prolonged time and experience in practice-focused specialization.

### 1.2.2. Assessment Tools

There are several ways cardiovascular NPs and PAs can maintain competency and expand lifelong learning in practice (ensuring currency with the evolving art and science of the field) and assess their own professional needs for education and performance improvement. Objective evaluation of clinical competence in the practice setting can be challenging and sometimes overlooked. Clinical competencies for NPs and PAs are designed to promote a framework for educational initiatives and practice performance. These competencies may be assessed by the review of one's individual practice, by review of hospital data, or through performance assessments or practice improvement initiatives. Continuing education for NPs and PAs is important for ensuring high-quality care, fostering practice collaboration, sharing best practices, and providing an opportunity for self-

assessment and reflection. For procedural or diagnostic laboratory activities, assessment tools may include registry and/or hospital data, appropriate use criteria, and metrics developed by professional organizations. Patient surveys and multisource (360) evaluations in hospital or practice environments can provide information about outcomes, communication skills, and professionalism.

### 1.2.3. Research and Scholarly Activity

The topic areas in [Table 1](#) define the clinical competencies for practicing cardiovascular NPs and PAs. Scholarly activity and clinical research are also important in lifelong learning and professional competency. All cardiovascular NPs and PAs should have the skills to assess new research findings and appropriately incorporate new diagnostic and treatment modalities in patient care. A scholarly approach to literature review is required to evaluate evidence, address clinical questions, and enhance outcomes. Knowledge should be maintained and enhanced through regular review of journals and other sources of reliable information and through participation in scholarly scientific meetings, continuing professional education activities, and professional congresses. Review and referral of patients for consideration and participation in clinical trials should be considered for both academic and nonacademic clinicians, including cardiologists, NPs, and PAs.

## 2. CLINICAL COMPETENCIES

**TABLE 3** Core Competencies for Cardiovascular Nurse Practitioners and Physician Assistants

SYSTEMS-BASED PRACTICE		All CV Nurse Practitioners and Physician Assistants
1.	Identify cost, resource utilization, and value when caring for patients with cardiovascular disease.	X
2.	Identify and address socioeconomic barriers impacting cardiovascular care and refer to other team members as needed.	X
3.	Maintain continuity of care with efficient and effective handoffs throughout transitions of care.	X
4.	Collaborate in screening patients for investigational therapies and clinical trials, as applicable.	X
5.	Participate in practice-based and regional systems of care for urgent and emergent cardiovascular conditions.	X
6.	Refer patients who are facing advanced and end-stage cardiovascular disease to appropriate specialists.	X
7.	Collaborate with all team members to reduce preventable hospitalizations for patients with cardiovascular disease.	X
8.	Collaborate with healthcare professionals in other disciplines to optimize the care of patients with complex and multisystem disease.	X
9.	Use information technology and informatics literacy to enhance professional practice.	X
10.	Contribute to the design and implementation of information systems to enhance safety, quality, and cost effectiveness.	X
11.	Advocate for quality patient care and assist patients and families in dealing with system complexities and limited resources.	X
12.	Promote patient and family access to community resources and interdisciplinary care services/providers to enhance effective self-care behaviors and promote well-being.	X

**TABLE 3 Core Competencies for Cardiovascular Nurse Practitioners, continued**

SYSTEMS-BASED PRACTICE		All CV Nurse Practitioners and Physician Assistants
13.	Participate in activities to promote a safe environment for patients, families, and healthcare professionals.	X
14.	Identify barriers to learning and prioritize education for patients with cardiovascular disease.	X
15.	Develop, implement, and evaluate individualized, patient-centered educational strategies.	X
16.	Use information technology to support patient care decisions and patient education.	X
17.	Educate healthcare professionals about diagnosis and management of patients with a condition in one's area of expertise.	X
PRACTICE-BASED LEARNING AND IMPROVEMENT		All CV Nurse Practitioners and Physician Assistants
1.	Identify personal knowledge gaps and seek educational training opportunities to improve knowledge, skills, and performance.	X
2.	Utilize clinical practice guidelines, appropriate use criteria, and point-of-care tools to improve clinical decision-making.	X
3.	Conduct literature searches, interpret findings, and apply evidence-based results to clinical care.	X
4.	Participate in clinical conferences and team-based meetings to enhance communication and care of patients with cardiovascular disease.	X
5.	Solicit and incorporate feedback from patients, colleagues, and healthcare professionals to improve clinical performance.	X
6.	Use practice data to assess appropriateness, quality, and safety of cardiovascular care.	X
7.	Participate in practice-based continuous quality improvement and safety initiatives.	X
8.	Develop the practice of lifelong learning, including regular review of journals and practice guidelines, appropriate use criteria, consensus statements, and participation in scientific and continuing professional education meetings.	X
9.	Promote the nurse practitioner or physician assistant profession by participation in interprofessional education and research.	X
PROFESSIONALISM		All CV Nurse Practitioners and Physician Assistants
1.	Demonstrate mutual respect, consideration, and empathy for patients, families, and the healthcare team.	X
2.	Practice within organization bylaws and state and federal regulations governing nurse practitioner and physician assistant practice.	X
3.	Practice within the scope of personal expertise, training, and technical skills.	X
4.	Attain and maintain nurse practitioner and/or physician assistant certification per respective credentialing organizations.	X
5.	Appropriately seek and integrate advice from consultants in a timely manner.	X
6.	Demonstrate critical reasoning skills to promote optimal outcomes for patients with cardiovascular disease.	X
7.	Identify, disclose, and manage relationships with industry and other entities to minimize bias and undue influence on clinical decision-making.	X
8.	Demonstrate high ethical standards in personal and professional conduct.	X
9.	Assume responsibility and follow through on professional commitments and obligations in a timely fashion.	X
10.	Identify potential for impaired professional performance in oneself and colleagues and take action to mitigate in order to ensure a culture of safety.	X
11.	Attend to one's own health, well-being, and abilities in order to maximize personal and professional performance.	X

**TABLE 3** Core Competencies for Cardiovascular Nurse Practitioners, continued

INTERPERSONAL AND COMMUNICATION SKILLS		All CV Nurse Practitioners and Physician Assistants
1.	Assess for and manage human responses exhibited by individuals with cardiovascular disease (e.g., depression, spiritual distress, nonadherence, decisional conflict).	X
2.	Communicate with patients, families, and healthcare professionals in an effective, timely, and culturally-competent manner.	X
3.	Engage patients in shared decision-making based upon balanced presentations of risks, benefits, and alternatives, factoring in patients' values and preferences.	X
4.	Utilize the concepts of motivational interviewing when counseling patients.	X
5.	Review medical records, complete documentation, and communicate diagnostic findings and management strategies to patients and collaborating healthcare professionals in a timely manner.	X
6.	Respectfully participate in interdisciplinary care teams and consider opposing viewpoints for management.	X
7.	Discuss sensitive/difficult topics, including end-of-life care and/or palliative care within the confines of the patient's belief system.	X
8.	Provide emotional support to patients, families, and caregivers.	X

**TABLE 4** Acute Coronary Syndromes Competencies for Cardiovascular Nurse Practitioners and Physician Assistants

MEDICAL KNOWLEDGE		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
1.	Know the epidemiology, etiology, pathogenesis, and natural history of acute coronary syndromes, including the roles of plaque rupture, erosion, platelet activation, vasospasm, and thrombosis.	X	
2.	Know the typical and atypical presentations of angina, including disorders that can simulate or mask acute coronary syndromes.	X	
3.	Know the prognostic features for patients with acute coronary syndromes and corresponding management strategies.	X	
4.	Know the risks, benefits, indications, and timing for diagnostic coronary angiography.	X	
5.	Know revascularization strategies for patients with acute coronary syndromes.	X	
6.	Know pharmacotherapy for the management of patients with acute coronary syndromes.	X	
7.	Know secondary prevention strategies for patients with acute coronary syndromes.	X	
8.	Know the complications associated with contrast agents.	X	
9.	Know the risk factors, signs, and symptoms associated with access site bleeding in patients with acute coronary syndromes.	X	
10.	Know the indications, contraindications, and appropriate use for vascular closure devices for patients with acute coronary syndromes.		X
<b>ST Elevation Myocardial Infarction (STEMI)</b>			
11.	Know the symptoms, physical findings, ECG patterns, and biomarker findings in patients with STEMI.	X	
12.	Know the effects and time course of ischemic injury on ventricular function and remodeling in patients with STEMI.	X	
13.	Know the hemodynamic and mechanical complications in patients with STEMI.	X	
14.	Know the arrhythmia and conduction complications associated with STEMI.	X	
15.	Know the clinical findings and complications of right ventricular infarction.	X	

**TABLE 4** Acute Coronary Syndromes Competencies, continued

MEDICAL KNOWLEDGE		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
16.	Know the supplemental ECG leads to obtain in patients suspected of having right ventricular dysfunction.	X	
17.	Know the indications and contraindications of reperfusion therapies in patients with STEMI.	X	
18.	Know the indications and contraindications of primary percutaneous coronary intervention as initial reperfusion strategies.	X	
19.	Know the indications, contraindications, and risks for P2Y <sub>12</sub> receptor inhibitors in patients with STEMI.	X	
20.	Know the indications, contraindications, and risks for coronary angiography and revascularization in patients with STEMI.	X	
<b>Non-ST-Elevation Acute Coronary Syndromes (NSTEMI-ACS)</b>			
21.	Know the differential diagnosis, clinical presentation, ECG changes, and imaging and biomarker features for diagnosis and risk stratification of patients with NSTEMI-ACS and other nonischemic causes of myocardial injury.	X	
22.	Know the risks, benefits, and importance of timing of an invasive versus noninvasive strategy for the management of patients with NSTEMI-ACS.	X	
23.	Know the indications, contraindications, and risks for P2Y <sub>12</sub> receptor inhibitors and glycoprotein IIb/IIIa inhibitors in patients with NSTEMI-ACS.	X	
PATIENT CARE AND PROCEDURAL SKILLS		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
1.	Skill to obtain a history and physical examination as clinically indicated in patients with suspected acute coronary syndromes.	X	
2.	Skills to recognize and manage angina.	X	
3.	Skill to recognize ECG changes suggestive of myocardial ischemia and/or infarction.	X	
4.	Skill to recognize ST-segment changes on continuous ECG monitoring suggestive of acute coronary syndromes.	X	
5.	Skill to recognize cardiac biomarker abnormalities to aid in the diagnosis of acute coronary syndromes.	X	
6.	Skill to initiate reperfusion therapy in collaboration with the interventional team.		X
7.	Skills to initiate and manage dual antiplatelet therapy and/or anticoagulants in patients with acute coronary syndromes.	X	
8.	Skills to identify and initiate management for hemodynamic instability/compromise in patients with acute coronary syndromes.	X	
9.	Skills to identify and participate in the management of arrhythmias and conduction disturbances in patients with acute coronary syndromes.	X	
10.	Skill to recognize mechanical complications in patients with acute coronary syndromes.	X	
11.	Skill to assist in implementation of mechanical circulatory support for patients with complications of acute coronary syndromes.		X
12.	Skills to recognize and manage patients with right ventricular infarction and/or right ventricular dysfunction.	X	
13.	Skill to integrate assessment of left ventricular function into the management of patients with acute coronary syndromes.	X	
14.	Skill to determine a noninvasive versus invasive treatment strategy for patients with acute coronary syndromes.	X	

**TABLE 4** Acute Coronary Syndromes Competencies, continued

PATIENT CARE AND PROCEDURAL SKILLS		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
15.	Skill to integrate invasive hemodynamic data and angiographic findings in the management of patients with acute coronary syndromes.		X
16.	Skill to interpret coronary angiography report findings for patients with acute coronary syndromes.	X	
17.	Skills to prevent, identify, and initiate therapies in a bleeding emergency or a vascular access site complication.	X	
18.	Skills to prevent and manage complications associated with contrast agents.	X	
19.	Skill to facilitate timely referral to cardiac rehabilitation following acute coronary syndromes.	X	
20.	Skill to participate in diagnostic and interventional procedures.		X

**TABLE 5** Adult Congenital Heart Disease Competencies for Cardiovascular Nurse Practitioners and Physician Assistants

MEDICAL KNOWLEDGE		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
1.	Know the indications for comanagement and referral of adults with congenital heart disease to a congenital heart disease center.	X	
2.	Know basic and pathological cardiac embryology and epidemiological influences on the development of congenital heart disease.		X
3.	Know the physical examination findings of repaired and unrepaired forms of congenital heart disease in adults.		X
4.	Know the genetic syndromes and corresponding pathophysiology associated with congenital heart disease.		X
5.	Know the potential for neurocognitive and psychological issues in adults with congenital heart disease.	X	
6.	Know the risks associated with noncardiac surgery in adults with congenital heart disease.		X
7.	Know the pathophysiology and risks of thrombosis and thromboembolism in adults with congenital heart disease.		X
8.	Know the pharmacological agents and nonpharmacological therapies for preventing and treating thrombotic complications in adults with congenital heart disease.		X
9.	Know the indications for endocarditis prophylaxis in adults with congenital heart disease.	X	
10.	Know the risks, preventive measures, and treatments for acquired heart disease in the congenital heart disease population.		X
<b>Adults with Simple Congenital Heart Disease (Atrial Septal Defects, Ventricular Septal Defects, Patent Ductus Arteriosus, Pulmonary Stenosis, Bicuspid Aortic Valve, Coarctation)</b>			
11.	Know the basic anatomy, pathophysiology, presenting symptoms, and differential diagnosis of simple congenital heart disease in adults.	X	
12.	Know the natural history of simple congenital heart disease.	X	
13.	Know the indications and recommendations for initial testing for known or suspected simple congenital heart disease in adults.	X	
14.	Know the indications for cardiac catheterization for adults with simple congenital heart disease.	X	

**TABLE 5** Adult Congenital Heart Disease Competencies, continued

MEDICAL KNOWLEDGE		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
15.	Know the pathophysiology and clinical findings of heart failure in adults with simple congenital heart disease.	X	
16.	Know the indications, contraindications, and monitoring implications of medications used in management of adults with simple congenital heart disease.		X
17.	Know the pathophysiology of comorbidities in adults with simple congenital heart disease.		X
18.	Know the risks and benefits of exercise in adults with simple congenital heart disease.	X	
19.	Know the interventions and surgeries generally performed for simple congenital heart defects.	X	
20.	Know the impact of pregnancy in women with simple congenital heart disease.		X
21.	Know the contraceptive methods considered safe and efficacious for women with simple congenital heart disease.		X
22.	Know the arrhythmias common in adults with simple congenital heart disease and referral indications to electrophysiologists with expertise in congenital heart disease.		X
<b>Adults with Complex Congenital Heart Disease (Ebstein's Anomaly, Tetralogy of Fallot, Complex Cyanotic Congenital Heart Disease, Transposition of the Great Arteries, Single-Ventricle Physiology/Fontan)</b>			
23.	Know the anatomy, pathophysiology, and presenting symptoms of adults with complex congenital heart disease.		X
24.	Know the natural history of complex congenital heart disease.		X
25.	Know the indications for diagnostic testing for adults with complex congenital heart disease.		X
26.	Know the indications for hemodynamic catheterization in adults with complex congenital heart disease.		X
27.	Know the pathophysiology and clinical findings of heart failure in adults with complex congenital heart disease.		X
28.	Know the indications, contraindications, and monitoring implications of medications used in adults with complex congenital heart disease.		X
29.	Know the risks and benefits of exercise in adults with complex congenital heart disease, including those with associated pulmonary hypertension.		X
30.	Know the interventions and surgeries performed for complex congenital heart disease.		X
31.	Know the impact of pregnancy in women with complex congenital heart disease, including those with associated pulmonary hypertension.		X
32.	Know the contraceptive methods considered safe and efficacious for women with complex congenital heart disease.		X
33.	Know the arrhythmias common in complex congenital heart disease and indications for referral to electrophysiologists with expertise in congenital heart disease.		X
PATIENT CARE AND PROCEDURAL SKILLS		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
1.	Skill to integrate history and physical findings to develop a differential diagnosis in adults with congenital heart disease.	X	
2.	Skill to identify genetic syndromes in adults with congenital heart disease.		X
3.	Skill to counsel adults with congenital heart disease on exercise modalities.		X
4.	Skill to facilitate shared decision making regarding reproductive options and family planning for men and women with congenital heart disease.		X

**TABLE 5** Adult Congenital Heart Disease Competencies, continued

PATIENT CARE AND PROCEDURAL SKILLS		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
5.	Skills to educate patients and family members on congenital heart defect anatomy and physiology and promote lifelong heart healthy self-care behaviors.		X
6.	Skill to perform pre-pregnancy risk assessment and peripartum coordination with obstetric colleagues for women with congenital heart disease.		X
7.	Skills to recognize cardiac arrhythmias in adults with congenital heart disease and refer to electrophysiologists with expertise in congenital heart disease.	X	
8.	Skills to recognize and participate in the management of adults with neurocognitive disorders and congenital heart disease.		X
9.	Skills to identify, evaluate, and participate in the management of cyanosis and associated end-organ hyperviscosity issues associated with congenital heart disease shunting and pulmonary hypertension.		X
10.	Skill to educate adult patients with congenital heart disease on prevention of thrombosis, thromboembolism, endocarditis, and on optimal oral health practices.		X
11.	Skills to assess and participate in the management of adults with infective endocarditis associated with congenital heart disease.		X
12.	Skill to coordinate care transitions across the lifespan for individuals with congenital heart disease.		X
13.	Skill to discuss advance care planning with patients with congenital heart disease and their families.		X

**TABLE 6** Ambulatory and Consultative Care Competencies for Cardiovascular Nurse Practitioners and Physician Assistants

MEDICAL KNOWLEDGE		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
1.	Know the differential diagnoses of chest pain, palpitations, fatigue, lightheadedness, syncope, dyspnea, and peripheral edema.	X	
2.	Know the differential diagnoses and distinguishing characteristics of heart murmurs and sounds, vascular bruits, and peripheral pulses.	X	
3.	Know the pharmacology of commonly used cardiovascular medications in diverse patient populations.	X	
4.	Know the cardiovascular toxicity, drug interactions, and side effects of the major classes of medications used for common noncardiac conditions.	X	
5.	Know the comorbidities that contribute to cardiovascular disease.	X	
6.	Know the major cardiovascular risk stratification tools and principles of primary and secondary prevention of cardiovascular disease.	X	
7.	Know the methods to evaluate and manage hypertension, diabetes, and dyslipidemia in diverse patient populations.	X	
8.	Know the methods to assess preoperative risk for patients with known or suspected cardiovascular disease undergoing noncardiac surgery.	X	
9.	Know the common cardiovascular complications of noncardiac surgery.	X	
10.	Know the common complications of cardiac surgery and procedures.	X	
11.	Know the effects of fever, pain, electrolyte disturbances, hypoxia, and hypotension on hemodynamics, cardiac rhythm, and perfusion in patients with or at risk of cardiovascular disease.	X	

**TABLE 6** Ambulatory and Consultative Care Competencies, continued

MEDICAL KNOWLEDGE		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
12.	Know the effects of age on cardiovascular function, response to medications, and risks of diagnostic and therapeutic procedures.	X	
13.	Know the epidemiology of cardiovascular conditions, including incidence, prevalence, age, gender, and ethnicity, and the implications for diagnostics, management, and surveillance recommendations.	X	
14.	Know the genetic implications of family history and environmental and lifestyle factors in the development and clinical course of cardiovascular disease.	X	
15.	Know the effects of lifestyle, activity level, body mass, nutrition, tobacco, alcohol, and recreational drug use in patients with and at risk of cardiovascular disease.	X	
16.	Know the effects of stress, anxiety, and depression in patients with known or suspected cardiovascular disease.	X	
17.	Know the principles of and indications for palliative care in patients with heart disease.	X	
PATIENT CARE AND PROCEDURAL SKILLS		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
1.	Skill to perform a cardiovascular consultation.	X	
2.	Skills to recognize and document distinguishing characteristics of heart murmurs and sounds, vascular bruits, and peripheral pulses.	X	
3.	Skill to distinguish causes of chest pain, palpitations, fatigue, lightheadedness, syncope, dyspnea, and edema through patient history, physical examination findings, and appropriate testing.	X	
4.	Skill to utilize diagnostic testing for initial diagnosis and follow-up care of patients with cardiovascular disease.	X	
5.	Skill to integrate clinical information and test results to assess risk, establish diagnosis, formulate treatment, and manage follow-up for patients with cardiovascular disease.	X	
6.	Skill to identify patients with acute cardiovascular disorders or high-risk conditions who require immediate treatment, specialty consultation, and/or hospitalization.	X	
7.	Skills to initiate management of urgent or emergent cardiovascular conditions and prioritize management of patients with multicomponent illness.	X	
8.	Skill to monitor for side effects, intolerance, or nonadherence to cardiovascular treatment.	X	
9.	Skill to assess the cardiovascular risks associated with recreational and/or competitive sports, physically demanding occupations, and other vigorous physical activities.	X	
10.	Skill to counsel patients about levels of physical activity appropriate to their cardiovascular health status.	X	
11.	Skill to counsel patients about cardiovascular disease prevention strategies.	X	
12.	Skill to manage patients with chronic ischemic heart disease and associated risk factors.	X	
13.	Skill to provide preoperative risk assessment for patients with cardiovascular disease undergoing noncardiac surgery.	X	
14.	Skill to recognize ECG and rhythm strip abnormalities.	X	
15.	Skills to interpret exercise and pharmacological stress test reports with or without imaging and apply results to clinical decision making.	X	
16.	Skill to supervise exercise and pharmacological stress tests with or without imaging, including cardiopulmonary exercise tests.		X
17.	Skill to obtain point-of-care echocardiographic images, including those for assessment of left ventricular function, pericardial effusion, central venous pressure estimation, aortic dimensions, and significant valvular dysfunction.		X

**TABLE 6 Ambulatory and Consultative Care Competencies, continued**

PATIENT CARE AND PROCEDURAL SKILLS		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
18.	Skill to recognize common cardiovascular findings on chest x-ray.	X	
19.	Skills to interpret cardiovascular imaging reports and apply results to clinical decision making.	X	
20.	Skill to triage patients by phone or in person according to their presenting symptoms and medical urgency.	X	

**TABLE 7 Cardiac Arrhythmias and Electrophysiology Competencies for Cardiovascular Nurse Practitioners and Physician Assistants**

MEDICAL KNOWLEDGE		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
1.	Know the anatomy and physiology of the cardiac conduction system.	X	
2.	Know the normal physiological function of the autonomic nervous system.	X	
3.	Know the pathophysiology, differential diagnosis, and management of atrial fibrillation, atrial flutter, and atrial tachycardias.	X	
4.	Know the pathophysiology, differential diagnosis, and management of atrioventricular nodal re-entrant tachycardias and accessory pathways.	X	
5.	Know the pathophysiology, differential diagnosis, and management of ventricular arrhythmias.	X	
6.	Know the pathophysiology, differential diagnosis, and management of cardiac conduction disturbances.	X	
7.	Know the pathophysiology, differential diagnosis, and management strategies for patients with syncope.	X	
8.	Know the indications for insertion of implantable loop recorders.	X	
9.	Know the indications for implantation of permanent pacemakers.	X	
10.	Know the indications for selection of pacemaker systems and cardiac resynchronization therapy.		X
11.	Know the indications for insertion of implantable cardioverter-defibrillators.	X	
12.	Know the indications for selection of transvenous versus subcutaneous defibrillators.		X
13.	Know the psychosocial impact of cardiac device therapies.	X	
14.	Know the inherited arrhythmia syndromes and indications for genetic testing and counseling for patients and family members.		X
15.	Know the indications, risks and benefits, and optimal timing for pharmacological and electrical cardioversion.	X	
16.	Know the indications, risks and benefits, and surveillance for anticoagulation and bridging in patients with atrial arrhythmias.	X	
17.	Know the impact of lifestyle factors on the development and prevalence of arrhythmias and best practices for counseling.	X	
18.	Know the management of arrhythmias in pregnancy and women of childbearing age.		X
19.	Know the risk of arrhythmias and sudden death in patients with congenital or acquired structural heart disease.		X

**TABLE 7 Cardiac Arrhythmias and Electrophysiology Competencies, continued**

MEDICAL KNOWLEDGE		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
20.	Know the pharmacology, indications, contraindications, and side effects of antiarrhythmic medications.	X	
21.	Know the common medications that may cause QT prolongation.	X	
22.	Know the indications, risks, and benefits for electrophysiology studies and catheter ablations.		X
23.	Know the indications for interrogation of cardiac implantable electronic devices.	X	
24.	Know the indications for wearable devices.	X	
25.	Know the indications, risks, and complications of device extraction.		X
26.	Know the postprocedure complications of catheter ablation in patients with atrial fibrillation, atrial flutter, supraventricular tachycardia, and ventricular tachycardia.		X
27.	Know the indications, contraindications, and adverse effects of anticoagulants in patients with atrial fibrillation and flutter.	X	
28.	Know the indications for and risks of left atrial appendage occlusion/exclusion devices and procedures.		X
29.	Know the exercise recommendations for patients at increased risk for arrhythmias.		X
30.	Know the indications for and limitations of ambulatory arrhythmia monitoring.	X	

  

PATIENT CARE AND PROCEDURAL SKILL		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
1.	Skills to evaluate and manage patients with palpitations.	X	
2.	Skills to evaluate and manage patients with syncope.	X	
3.	Skills to evaluate and manage hospitalized survivors of cardiac arrest.		X
4.	Skill to recognize normal/abnormal 12-lead ECGs and rhythm strips.	X	
5.	Skills to recognize and manage abnormal findings in ambulatory rhythm monitoring.	X	
6.	Skills to recognize and manage abnormalities in remote monitoring of implanted cardiac devices.		X
7.	Skills to monitor, recognize, and manage arrhythmias during exercise testing.	X	
8.	Skills to evaluate and manage atrial arrhythmias, including rate control, rhythm control, and anticoagulation.	X	
9.	Skills to evaluate and manage patients with supraventricular tachyarrhythmias.	X	
10.	Skills to recognize and medically manage specific supraventricular arrhythmias (e.g., atrioventricular nodal re-entrant tachycardia, atrioventricular re-entrant tachycardia).		X
11.	Skills to evaluate and manage patients with ventricular arrhythmias.	X	
12.	Skills to recognize and medically manage specific wide complex tachycardias (e.g., monomorphic and polymorphic ventricular tachycardia).		X
13.	Skills to evaluate and manage patients with bradyarrhythmias and heart block.	X	
14.	Skills to identify, evaluate, and manage patients at high risk for sudden cardiac death.		X
15.	Skill to risk stratify patients with atrial fibrillation and flutter for embolic stroke.	X	
16.	Skill to risk stratify patients for potential bleeding risk on anticoagulation.	X	
17.	Skill to participate in advanced cardiac life support, emergent defibrillation, transcutaneous pacing, and cardioversion.	X	
18.	Skills to participate in elective cardioversion and manage risks and complications.		X

**TABLE 7** Cardiac Arrhythmias and Electrophysiology Competencies, continued

PATIENT CARE AND PROCEDURAL SKILL		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
19.	Skills to recognize and manage patients with postural orthostatic tachycardia syndrome, inappropriate sinus tachycardia, and neurocardiogenic syncope.		X
20.	Skill to participate in tilt table testing.		X
21.	Skill to participate in the insertion of implantable loop recorders.		X
22.	Skill to participate in the insertion of permanent pacemakers, internal cardiac defibrillators, or cardiac resynchronization devices.		X
23.	Skill to participate in invasive electrophysiology procedures, including catheter ablation.		X
24.	Skills to interrogate, troubleshoot, program, and monitor performance of implanted cardiac devices.		X
25.	Skill to recognize the type of cardiovascular implantable electronic device, lead location, and lead condition based on chest x-ray findings.		X
26.	Skill to use an evidence-based, shared decision-making tool to counsel patients at risk for sudden cardiac death who are undergoing primary prevention implantable cardioverter-defibrillator implantation.		X
27.	Skill to provide perioperative care to patients receiving cardiac implantable electronic devices.		X
28.	Skill to manage patients following catheter ablation of atrial fibrillation and atrial flutter, supraventricular tachycardias, and ventricular arrhythmias.		X
29.	Skill to recognize cardiac devices that are designated magnetic resonance imaging conditional.		X
30.	Skill to care for patients with cardiac devices receiving ionizing radiation.		X
31.	Skill to identify needs of individuals and families with inherited arrhythmia disorders.		X
32.	Skill to recognize cardiac device system infection.	X	
33.	Skill to identify individuals who may be considered for device system extraction.		X
34.	Skill to identify needs of patients when current management goals are no longer effective (e.g., long-term needs such as palliative care and termination of device therapy).		X

**TABLE 8** Cardiovascular Disease Prevention Competencies for Cardiovascular Nurse Practitioners and Physician Assistants

MEDICAL KNOWLEDGE		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
1.	Know the structure of normal arteries and basic vascular biology of atherosclerosis.	X	
2.	Know the indications for genetic screening of premature atherosclerotic disease.	X	
3.	Know the epidemiology of cardiovascular disease.	X	
4.	Know the primary prevention application of various cardiovascular risk assessment tools (e.g., atherosclerotic cardiovascular disease risk).	X	
5.	Know the effects of diabetes mellitus, obesity, hypertension, lipid disorders, physical inactivity, obstructive sleep apnea, psychological stress, diet, and tobacco use on the development and progression of atherosclerosis and corresponding management strategies.	X	
6.	Know the noninvasive diagnostic studies and indications to assess for subclinical atherosclerosis (e.g., exercise testing, coronary calcium scoring).	X	
7.	Know the role of local and systemic inflammation on the development and progression of atherosclerotic disease.	X	

**TABLE 8 Cardiovascular Disease Prevention Competencies, continued**

MEDICAL KNOWLEDGE		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
8.	Know the psychosocial factors that contribute to cardiovascular disease and principles of management.	X	
9.	Know the strategies for promoting behavioral change and treatment adherence in primary prevention of atherosclerosis.	X	
10.	Know the risk reduction strategies for populations at increased risk for cardiovascular disease.	X	
11.	Know the principles of exercise physiology and guidelines for physical activity in patients with cardiovascular disease.	X	
12.	Know the indications for cardiac rehabilitation.	X	
13.	Know the noninvasive diagnostic studies and indications for vascular screening for carotid artery disease, abdominal aortic aneurysm, and peripheral artery disease.	X	
14.	Know the pharmacology, classes, indications, contraindications, risks, and interactions of medications commonly used for prevention and treatment of cardiovascular disease.	X	
15.	Know the principles of adult learning theories to plan and deliver education for atherosclerotic cardiovascular disease risk reduction.	X	
<b>Lipid Management</b>			
16.	Know basic lipoprotein biochemistry and metabolism.	X	
17.	Know which medications, genetics, and/or disease conditions increase the risk for lipid abnormalities.	X	
18.	Know the comorbidities associated with lipid disorders.	X	
19.	Know the laboratory testing to obtain at various stages of lipid management.	X	
20.	Know the pharmacology, classes, indications, contraindications, risks, and interactions of medications commonly used for lipid management.	X	
21.	Know the pharmacological and lifestyle interventions for the treatment of lipid disorders for primary and secondary prevention.	X	
22.	Know the clinical presentation and diagnostic findings of statin-induced myopathies.	X	
23.	Know the management of complex lipid abnormalities (e.g., familial hypercholesterolemia).	X	
24.	Know the indications for advanced lipid therapies (e.g., PCSK9 [proprotein convertase subtilisin kexin 9] inhibitors).	X	
<b>Hypertension Management</b>			
25.	Know epidemiology, prevalence, and categories of hypertension.	X	
26.	Know factors that may affect accuracy of blood pressure measurement.	X	
27.	Know the mechanisms and clinical implications of essential, secondary, masked, white-coat, and resistant hypertension.	X	
28.	Know the definition, characteristics, prognosis, diagnostic recommendations, and evidence-based treatment options for management of hypertension.	X	
29.	Know the definition, pathophysiology, clinical implications, and treatment of hypertensive urgency and emergency.	X	
30.	Know blood pressure thresholds and goals for nonpharmacological and pharmacological therapies.	X	
31.	Know the key components for evaluation and diagnostic workup for patients with hypertension.	X	
32.	Know the pharmacology, classes, indications, contraindications, risks, and interactions of medications commonly used for hypertension management.	X	
33.	Know the diagnostic studies recommended for monitoring during titration of antihypertensive medications.	X	

**TABLE 8 Cardiovascular Disease Prevention Competencies, continued**

MEDICAL KNOWLEDGE		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
34.	Know the nonpharmacological interventions for the treatment of elevated blood pressure and hypertension.	X	
35.	Know the treatment of hypertension in special populations (e.g., patients with ischemic heart disease, heart failure, diabetes, chronic kidney disease, cerebral vascular disease; minorities, elderly).	X	
36.	Know the pharmacological agents that may interfere with blood pressure control (e.g., nonsteroidal anti-inflammatory drugs).	X	
37.	Know the indications for performing home blood pressure monitoring.	X	
38.	Know the indications for ambulatory blood pressure monitoring.	X	
PATIENT CARE AND PROCEDURAL SKILL		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
1.	Skills to perform a cardiovascular risk assessment and to develop an evidence-based treatment plan.	X	
2.	Skills to obtain a cardiovascular family history and to recommend family screening as indicated.	X	
3.	Skill to recognize patients with common inflammatory disorders or systemic diseases that may adversely impact cardiovascular disease risk.	X	
4.	Skills to develop, implement, and evaluate lifestyle interventions for prevention and treatment of patients with cardiovascular risk and/or comorbidities.	X	
5.	Skill to utilize concepts of behavioral change models and lifestyle interventions to assist patients with cardiovascular disease.	X	
6.	Skill to utilize shared decision-making when recommending pharmacological, therapeutic, and lifestyle interventions in patients with cardiovascular disease.	X	
7.	Skill to provide age appropriate, culturally-sensitive education regarding lifestyle modification to patients with cardiovascular disease and their family members.	X	
8.	Skill to educate patients with cardiovascular disease on a heart healthy diet regimen.	X	
9.	Skill to prescribe exercise recommendations for patients with cardiovascular disease.	X	
<b>Lipid Management</b>			
10.	Skill to perform a physical assessment and examination for patients with lipid disorders.	X	
11.	Skills to develop, implement, manage, and evaluate an evidence-based, age-appropriate plan of care for patients with lipid disorders.	X	
12.	Skill to recognize genetic, medication, or disease conditions that may cause lipid disorders.	X	
13.	Skills to calculate global atherosclerotic cardiovascular disease risk for primary prevention and plan an appropriate treatment plan based on risk level.	X	
14.	Skills to initiate and manage pharmacological and nonpharmacological interventions for patients with lipid disorders.	X	
15.	Skills to order and assess laboratory testing at various stages of lipid management.	X	
16.	Skills to assess and manage statin-associated muscle symptoms.	X	
<b>Hypertension Management</b>			
17.	Skill to obtain an accurate blood pressure in the clinical setting.	X	
18.	Skill to obtain a history and physical examination for patients with elevated blood pressure and hypertension.	X	
19.	Skills to initiate and monitor diagnostic testing indicated for patients with elevated blood pressure and hypertension.	X	

**TABLE 8 Cardiovascular Disease Prevention Competencies, continued**

PATIENT CARE AND PROCEDURAL SKILL		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
20.	Skills to recognize and initiate evaluation of secondary causes of hypertension.	X	
21.	Skills to develop, implement, manage, and evaluate a plan of care for patients with elevated blood pressure and hypertension.	X	
22.	Skills to develop, implement, manage, and evaluate a plan of care for patients with hypertensive urgency and emergency.	X	
23.	Skill to select antihypertensive drugs based on comorbidities, age, gender, or ethnic background.	X	
24.	Skill to recognize adverse effects of antihypertensive medications.	X	
25.	Skill to educate patients and their families on the technique of performing home blood pressure monitoring and target goals.	X	

**TABLE 9 Critical Care Cardiology Competencies for Cardiovascular Nurse Practitioners and Physician Assistants**

MEDICAL KNOWLEDGE		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
1.	Know admission criteria for the critical care unit.	X	
2.	Know discharge criteria for the critical care unit.		X
3.	Know the components of temporary, transvenous, and epicardial lead pacing systems and complications, including failure to capture, sense, and pace.		X
4.	Know the indications for, contraindications to, and pharmacology of vasoactive and inotropic medications used to treat patients with heart failure, hypotension, or shock.		X
5.	Know the indications for, contraindications to, and pharmacology of anticoagulant, antithrombin, and antiplatelet agents, and their reversal agents.	X	
6.	Know the indications for, contraindications to, and pharmacology of fibrinolytic agents and glycoprotein IIb/IIIa inhibitors.		X
7.	Know the findings associated with pulmonary embolism, aortic dissection, pericardial tamponade, acute decompensated heart failure, and myocardial infarction.	X	
8.	Know the indications for oxygen supplementation.	X	
9.	Know normal arterial blood gas values and clinical implications of abnormal findings.	X	
10.	Know the findings associated with mechanical complications of myocardial infarction.		X
11.	Know the types of, indications for, and contraindications to mechanical circulatory support, including intra-aortic balloon counterpulsation, percutaneous and surgical ventricular assist devices, and extracorporeal membrane oxygenation.		X
12.	Know the prognostic factors used to assess patients with acute coronary syndromes and advanced heart failure.	X	
13.	Know the postoperative complications of patients admitted to the critical care unit following cardiac surgery or catheter-based interventions.		X
<b>Hemodynamic/Arterial/Central Venous Monitoring</b>			
14.	Know the indications, contraindications, complications, and components of invasive and hemodynamic monitoring.		X
15.	Know the correlation between hemodynamic waveforms and patient physiology.		X
16.	Know invasive methods of calculating cardiac output, including Fick and thermodilution methods.		X

**TABLE 9** Critical Care Cardiology Competencies, continued

MEDICAL KNOWLEDGE		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
17.	Know normal and abnormal hemodynamic values and factors affecting cardiac output.	X	
18.	Know the clinical conditions that affect central venous, direct arterial, and hemodynamic waveform configuration, including arrhythmias, blood pressure changes, and fluid status.		X
19.	Know the pharmacological effects, risks, and benefits of vasoactive and inotropic agents.		X
20.	Know management strategies for patients with arterial compression devices and arterial sheaths.		X
21.	Know the management interventions for patients experiencing complications of arterial catheterization.		X
<b>Mechanical Ventilation</b>			
22.	Know the indications for noninvasive ventilation, endotracheal intubation, and mechanical ventilatory support for patients with hypoxia and/or respiratory failure.		X
23.	Know the indications for extubation from mechanical ventilation.		X
24.	Know general concepts and modes of mechanical ventilation (e.g., tidal volume, fraction of inspired oxygen, positive end-expiratory pressure).		X
25.	Know the indications, contraindications, adverse effects, and proper dosing of sedating medications for patients receiving mechanical ventilator support and essential safety measures.		X
26.	Know the nutritional needs of patients on mechanical ventilation and appropriate nutritional supplementation in conjunction with the nutritional support team.		X
<b>Acute Heart Failure/Cardiogenic Shock</b>			
27.	Know the pathophysiology of acute right, left, and biventricular heart failure.		X
28.	Know the pathophysiology, differential diagnosis, clinical signs, and symptoms in patients with shock, systemic inflammatory response syndrome, and acute respiratory distress syndrome.		X
29.	Know the evidence-based pharmacological and nonpharmacological interventions to manage a critically ill patient with heart failure or cardiogenic shock.		X
30.	Know the differential diagnosis of heart failure or shock following cardiac transplantation.		X
31.	Know the indications and management of hypothermia in cardiac arrest survivors.		X
32.	Know the pathophysiology of acute heart failure in peripartum and postpartum women.		X
33.	Know interventions to reduce risk of deterioration of physical and mental functioning in patients with acute heart failure.	X	
<b>PATIENT CARE AND PROCEDURAL SKILLS</b>			
1.	Skill to perform basic and advanced cardiac life support.	X	
2.	Skill to participate in the insertion of temporary transvenous pacemakers, measure pacing and sensing device thresholds, and monitor pacemaker function.		X
3.	Skill to manage vascular access sites and complications.		X
4.	Skill to assist with or remove vascular access sheaths postintervention.		X
5.	Skill to manage hemodynamically unstable patients.		X
6.	Skill to manage patients with acute myocardial infarction and associated complications.		X
7.	Skills to manage and coordinate care for postoperative patients admitted to the critical care unit following surgery or catheter-based intervention.		X
8.	Skills to recognize and manage noncardiac medical conditions that may affect patients in the cardiovascular critical care setting.		X

**TABLE 9 Critical Care Cardiology Competencies, continued**

PATIENT CARE AND PROCEDURAL SKILLS		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
<b>Hemodynamic/Arterial/Central Venous Monitoring</b>			
9.	Skill to care for patients with direct arterial catheters, central venous catheters, and/or hemodynamic monitoring systems.		X
10.	Skill to participate in insertion of an invasive and/or hemodynamic monitoring vascular access catheter.		X
11.	Skills to perform zero referencing and troubleshoot hemodynamic monitoring systems.		X
12.	Skills to recognize and manage complications of central venous pressure, invasive arterial, and/or hemodynamic monitoring systems.		X
13.	Skill to assist with or remove central venous or arterial catheters and hemodynamic monitoring systems.		X
14.	Skills to recognize and manage central line infection.		X
15.	Skill to manage pain and sedation for patients in the critical care setting.		X
16.	Skill to participate in the management of sedation and hemodynamics during procedures in the critical care setting.		X
<b>Acute Heart Failure/Cardiogenic Shock</b>			
17.	Skill to perform clinical assessments for patients in acute heart failure.	X	
18.	Skill to perform clinical assessments for patients in all forms of shock.	X	
19.	Skill to utilize vasoactive and inotropic medications in the treatment of hypotension, heart failure, and shock.		X
<b>Mechanical Ventilatory Support</b>			
20.	Skill to manage patients on mechanical ventilator support.		X
21.	Skills to determine nutritional needs of patients receiving ventilatory support and order appropriate nutritional supplementation.		X
22.	Skills to manage appropriate pain and/or sedating agents and monitor therapeutic effects for patients receiving mechanical ventilatory support.		X
23.	Skill to participate in intubation and extubation of patients from mechanical ventilatory support.		X

**TABLE 10 Heart Failure Competencies for Cardiovascular Nurse Practitioners and Physician Assistants**

MEDICAL KNOWLEDGE		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
1.	Know the New York Heart Association functional classes (I, II, III, and IV) and stages (A, B, C, and D) of heart failure.	X	
2.	Know the epidemiology, pathophysiology, stages, and natural history of heart failure.	X	
3.	Know the differential diagnoses of symptoms commonly associated with heart failure.	X	
4.	Know the history and physical examination findings and their limitations in the evaluation of patients with heart failure.	X	
5.	Know the objective and subjective methods to assess volume status in patients with heart failure.	X	
6.	Know the diagnostic testing for patients with heart failure.	X	
7.	Know the effects of heart failure on perfusion, organ function, nutrition, and energy metabolism.	X	

**TABLE 10** Heart Failure Competencies, continued

MEDICAL KNOWLEDGE		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
8.	Know the role of neurohormonal activation and left ventricular remodeling in heart failure progression.	X	
9.	Know the management strategies and corresponding contraindications for patients with heart failure, including pharmacotherapy and interventional options.	X	
10.	Know the management strategies for patients with advanced and end-stage heart failure.	X	
11.	Know the management and diagnostic strategies for patients with nonischemic heart failure, including strategies associated with pregnancy and chemotherapy.		X
12.	Know the indications for right and left heart catheterization in patients with heart failure.		X
13.	Know the normal and abnormal findings in patients with heart failure with preserved and reduced ejection fraction who undergo hemodynamic catheterization.		X
14.	Know the pathophysiology and clinical findings of pulmonary arterial hypertension.	X	
15.	Know the indications for, contraindications to, pharmacology, and adverse effects of drugs used to treat patients with heart failure.	X	
16.	Know the effect of arrhythmias on heart failure status, initial treatment of arrhythmias, and referral for patients with arrhythmias.	X	
17.	Know the indications for referring patients for evaluation of endomyocardial biopsy.		X
18.	Know the indications for pulmonary artery pressure monitoring devices for heart failure patients.		X
19.	Know the indications for referring patients to heart failure clinics for advanced therapies, including mechanical circulatory support and/or heart transplant.	X	
20.	Know the transitional and outpatient strategies to avoid preventable hospitalizations in patients recently discharged with heart failure.	X	
21.	Know the nutritional and fluid recommendations and importance of daily weight for patients with heart failure.	X	
22.	Know the clinical signs and symptoms of end-stage heart failure and the indications for referring patients for palliative care and hospice.		X
23.	Know the utility of biomarkers in the management of patients with heart failure.	X	
24.	Know the indications for implantable devices in patients with heart failure.		X
25.	Know the management strategies for patients in refractory heart failure requiring intravenous inotropic support.		X
26.	Know palliative care management strategies in patients with refractory heart failure.		X
27.	Know the management strategies for patients post-heart transplantation.		X
28.	Know the indications, contraindications, and management strategies for mechanical circulatory support in patients with heart failure.		X
29.	Know the indications and contraindications for advanced cardiac imaging in patients with heart failure.		X
30.	Know the indications for genetic testing and counseling in patients with inherited cardiomyopathy syndromes.		X
31.	Know the appropriate timing to refer patients with heart failure for cardiac resynchronization therapy, invasive monitoring, invasive support, and/or transplant.		X
PATIENT CARE AND PROCEDURAL SKILLS		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
1.	Skills to obtain clinical history and physical examination to determine functional capacity and volume status in patients with heart failure.	X	

**TABLE 10 Heart Failure Competencies, continued**

PATIENT CARE AND PROCEDURAL SKILLS		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
2.	Skills to obtain and follow laboratory testing and imaging studies in patients with heart failure.	X	
3.	Skills to evaluate and manage patients with new-onset, chronic, and acutely decompensated heart failure.	X	
4.	Skills to utilize and titrate medical therapy for patients with heart failure in both the hospital and outpatient care settings.	X	
5.	Skill to develop a plan of care for patients with heart failure.	X	
6.	Skills to develop, implement, and evaluate patient-centric education plans for patients with heart failure.	X	
7.	Skill to participate in hemodynamic catheterizations in patients with heart failure.		X
8.	Skill to manage patients with heart failure with implantable hemodynamic monitoring (e.g., pulmonary artery pressure monitoring systems), including changes in volume status.		X
9.	Skills to recognize cardiac arrhythmias and initiate treatment and/or referral for patients with heart failure.	X	
10.	Skill to assess biological, psychosocial, and cultural factors that influence learning of patients with heart failure.	X	
11.	Skills to assess and manage patients in refractory heart failure requiring intravenous inotropic support.		X
12.	Skills to assess and manage patients with a heart transplant.		X
13.	Skills to assess and manage patients with mechanical circulatory support.		X
14.	Skill to provide palliative care for patients with refractory heart failure.		X
15.	Skill to develop a plan for lifestyle interventions in patients with heart failure.	X	
16.	Skills to assess and manage patients with pulmonary arterial hypertension.		X

**TABLE 11 Pericardial Disease Competencies for Cardiovascular Nurse Practitioners and Physician Assistants**

MEDICAL KNOWLEDGE		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
1.	Know the pathophysiology, differential diagnosis, and natural history of pericarditis, pericardial effusion/tamponade, and constrictive pericarditis.	X	
2.	Know the symptoms, physical findings, and evaluation of acute pericarditis, pericardial effusion/tamponade, and constrictive pericarditis.	X	
3.	Know the indications for and potential complications of pericardiocentesis.	X	
4.	Know advanced therapies for pericardial disease.		X
5.	Know the indications for and contraindications to pharmacological agents for treatment of acute and relapsing pericarditis.	X	
6.	Know the indications for and characteristic findings of imaging studies used to evaluate patients with pericardial diseases.	X	

**TABLE 11 Pericardial Disease Competencies, continued**

MEDICAL KNOWLEDGE		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
7.	Know the indications for, expected outcomes of, and complications of surgery in patients with pericardial diseases.	X	
8.	Know the clinical, imaging, and hemodynamic characteristics that are useful in distinguishing restrictive cardiomyopathy from constrictive pericarditis.		X

  

PATIENT CARE AND PROCEDURAL SKILLS		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
1.	Skills to clinically evaluate and manage patients with acute and relapsing pericarditis.	X	
2.	Skill to identify physical findings of pericardial effusion, tamponade, and chronic constrictive pericarditis.	X	
3.	Skills to identify physical findings, evaluate, and manage patients with constrictive pericarditis.	X	
4.	Skill to refine the therapeutic plan of care of patients with pericardial disease based on laboratory and diagnostic test results.	X	
5.	Skills to identify and refer patients with pericardial disease who are candidates for intervention.	X	
6.	Skill to participate in pericardiocentesis.		X
7.	Skill to remove pericardial drains.		X
8.	Skill to identify patients with pericardial disease who are candidates for cardiac catheterization.	X	

**TABLE 12 Stable Ischemic Heart Disease Competencies for Cardiovascular Nurse Practitioners and Physician Assistants**

MEDICAL KNOWLEDGE		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
<b>Stable Ischemic Heart Disease, Variant Angina, Post-Coronary Bypass Graft, Post-Percutaneous Coronary Intervention, Post-Myocardial Infarction</b>			
1.	Know the epidemiology and pathophysiology of coronary artery disease.	X	
2.	Know the determinants of coronary blood flow and myocardial oxygen consumption.	X	
3.	Know the differential diagnosis and clinical features of patients with typical angina, variant angina, and noncardiac chest discomfort.	X	
4.	Know the diagnostic criteria of stable versus unstable angina pectoris.	X	
5.	Know causes of angina pectoris not related to coronary artery disease.	X	
6.	Know the functional classification of angina pectoris.	X	
7.	Know ECG features associated with myocardial ischemia and baseline ECG abnormalities that may impact exercise ECG interpretation.	X	
8.	Know the indications for and contraindications to noninvasive and invasive testing in the evaluation of patients with stable ischemic heart disease, variant angina, post-coronary artery bypass graft, post-percutaneous coronary intervention, and post-myocardial infarction.	X	
9.	Know the noninvasive and invasive diagnostic findings that identify high-risk coronary artery disease patients.	X	
10.	Know the medical, interventional, and surgical management strategies for patients with stable ischemic heart disease, variant angina, post-coronary artery bypass graft, post-percutaneous coronary intervention, and post-myocardial infarction.	X	

**TABLE 12** Stable Ischemic Heart Disease Competencies, continued

MEDICAL KNOWLEDGE		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
11.	Know the indications for and contraindications to pharmacological agents for management of patients with stable ischemic heart disease, variant angina, post-coronary artery bypass graft, post-percutaneous coronary intervention, and post-myocardial infarction.	X	
12.	Know the cardiovascular risks of nonsteroidal anti-inflammatory drug use in patients with ischemic heart disease and recommendations for musculoskeletal pain management.	X	
13.	Know the clinical implications of ventricular systolic and diastolic function in the management of patients with stable ischemic heart disease.	X	
14.	Know lifestyle interventions for management of patients with stable ischemic heart disease, variant angina, post-coronary artery bypass graft, post-percutaneous coronary intervention, and post-myocardial infarction.	X	
<b>Cardiac Rehabilitation</b>			
15.	Know the phases of cardiac rehabilitation and indications for referral.	X	
16.	Know the cardiovascular benefits of aerobic and resistance exercise.	X	
17.	Know the entrance testing requirements for a cardiac rehabilitation phase II program and methods for developing a management plan.		X
18.	Know the hemodynamic changes and musculoskeletal limitations that may require modifications to exercise intensity during cardiac rehabilitation sessions.		X
19.	Know the characteristics of patients likely to have difficulty adhering to cardiac rehabilitation and corresponding management strategies.		X
PATIENT CARE AND PROCEDURAL SKILLS		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
<b>Stable Ischemic Heart Disease, Variant Angina, Post-Coronary Bypass Graft, Post-Percutaneous Coronary Intervention, Post-Myocardial Infarction</b>			
1.	Skill to obtain a problem-focused history and physical examination in patients with coronary artery disease and variant angina.	X	
2.	Skill to distinguish stable from unstable coronary syndromes.	X	
3.	Skill to recognize symptoms and ECG changes suggestive of ischemic heart disease and variant angina.	X	
4.	Skill to recognize causes of angina pectoris not related to coronary artery disease.	X	
5.	Skill to classify angina pectoris using a functional classification system.		X
6.	Skill to select the appropriate noninvasive or invasive diagnostic study for patients with known or suspected coronary artery disease.	X	
7.	Skill to select evidence-based pharmacological therapy for patients with stable ischemic heart disease.	X	
8.	Skill to recognize signs and symptoms of ventricular systolic and diastolic dysfunction.	X	
9.	Skill to recommend lifestyle interventions for patients with stable coronary artery disease.	X	
<b>Cardiac Rehabilitation</b>			
10.	Skills to obtain and interpret a problem-focused history and physical examination for patients entering cardiac rehabilitation.		X
11.	Skills to order and assess diagnostic and/or laboratory studies for patients entering cardiac rehabilitation.		X
12.	Skills to recognize and manage musculoskeletal limitations during cardiac rehabilitation sessions.		X
13.	Skills to prescribe and/or modify exercise prescriptions for patients participating in cardiac rehabilitation.		X

**TABLE 12** Stable Ischemic Heart Disease Competencies, continued

PATIENT CARE AND PROCEDURAL SKILLS		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
14.	Skills to recognize and manage cardiac arrhythmias during cardiac rehabilitation sessions.		X
15.	Skills to recognize and manage signs and symptoms that indicate an adverse response to exercise during cardiac rehabilitation sessions.		X
16.	Skills to recognize and mitigate factors associated with nonadherence rates in cardiac rehabilitation.		X

**TABLE 13** Valvular Heart Disease Competencies for Cardiovascular Nurse Practitioners and Physician Assistants

MEDICAL KNOWLEDGE		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
1.	Know the indications for surveillance imaging in patients with stable valvular heart disease.	X	
2.	Know the indications for referral of patients with advanced or complex valvular heart disease to a multidisciplinary heart team.	X	
3.	Know the indications for catheter- and surgical-based interventions in patients with valvular heart disease.	X	
4.	Know the differences in etiology, evaluation, and management of primary versus secondary mitral regurgitation.	X	
5.	Know the pathophysiology and management of bicuspid aortic valve and associated aortopathy.	X	
6.	Know the advantages and disadvantages of various transcatheter and surgical options for patients with valvular heart disease, including replacement with mechanical or biological prostheses and valve repair.		X
7.	Know prosthetic valve complications.		X
8.	Know the recommendations for antithrombotic therapy for patients with valvular heart disease or prosthetic heart valves.	X	
9.	Know the indications for antibiotics for infective endocarditis prophylaxis in patients with valvular heart disease.	X	
10.	Know the common cardiac arrhythmias in patients with valvular heart disease and treatment strategies.		X
11.	Know the management of valvular heart disease in pregnancy and women of childbearing age.		X
12.	Know the diagnostic testing and clinical evaluation indicated prior to surgical or transcatheter intervention for valvular heart disease.		X

  

PATIENT CARE AND PROCEDURAL SKILLS		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
1.	Skills to evaluate and collaboratively manage patients with valvular heart disease.	X	
2.	Skill to refine the therapeutic plan of care of patients with valvular heart disease based on laboratory and diagnostic test results.		X

**TABLE 13** Valvular Heart Disease Competencies, continued

PATIENT CARE AND PROCEDURAL SKILLS		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
3.	Skill to manage patients with valvular heart disease with complex comorbid conditions.		X
4.	Skill to assist in surgical or percutaneous interventions.		X
5.	Skill to manage perioperative patients following surgical and percutaneous valvular heart disease procedures.		X
6.	Skill to recognize cardiac arrhythmias and perioperative complications in patients with valvular heart disease.	X	
7.	Skill to manage cardiac arrhythmias and perioperative complications in patients with valvular heart procedures.		X
8.	Skills to recognize and manage prosthetic valve complications.		X

**TABLE 14** Vascular Medicine Competencies for Cardiovascular Nurse Practitioners and Physician Assistants

MEDICAL KNOWLEDGE		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
1.	Know the causes, pathophysiology, and natural history of aortic, carotid, renal, mesenteric, and extremity peripheral artery diseases.	X	
2.	Know the clinical manifestations, differential diagnosis, evaluation, and management of aortic, carotid, renal, mesenteric, and extremity peripheral artery diseases.	X	
3.	Know the indications for duplex ultrasonography of the aortic, carotid, renal, mesenteric, and extremity arteries; arterial bypass grafts and stents; aortic endografts; and intracranial vessels.		X
4.	Know the indications for and contraindications to computed tomographic angiography, magnetic resonance angiography, and invasive angiography in patients with known or suspected venous and arterial disease.		X
5.	Know the indications to refer patients with peripheral artery disease; aortic, renal, and mesenteric artery disease; and carotid disease for medical, surgical, and endovascular therapies.	X	
6.	Know the complications of vascular access.	X	
7.	Know the clinical findings of common connective tissue conditions that can affect the peripheral circulation.	X	
8.	Know the noninvasive imaging studies indicated for screening family members at risk for connective tissue disorders.	X	
9.	Know the clinical manifestations of acute aortic syndromes, including dissection, intramural hematoma, and penetrating ulcer.	X	
10.	Know the noninvasive imaging studies indicated for screening and surveillance of patients at risk for thoracic and/or abdominal aortic aneurysm.	X	
11.	Know the indications, risks, and expected outcomes of surgical and endovascular interventions for patients with thoracic and/or abdominal aortic aneurysm.		X
12.	Know the indications for genetic testing and counseling in patients with known or suspected inherited thoracic aortic syndromes.	X	
13.	Know the causes, pathophysiology, and natural history of coagulopathies that increase patient risk for deep vein thrombosis and pulmonary emboli.		X

**TABLE 14** Vascular Medicine Competencies, continued

MEDICAL KNOWLEDGE		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
14.	Know the clinical manifestations, differential diagnosis, evaluation, and treatment for common venous disorders.	X	
15.	Know the pharmacology, indications, contraindications, and expected outcomes of antithrombotic medications in patients with peripheral artery disease.	X	
16.	Know the pharmacology, indications, contraindications, and expected outcomes of thrombolytic therapy for venous thromboembolism and pulmonary embolus.	X	
17.	Know the differentiating features of arterial, venous, and neurotrophic leg ulcers.	X	
18.	Know the causes, physical findings, and treatment of lymphedema.		X
19.	Know the causes, symptoms, and indications for diagnostic testing and referral for inherited and acquired forms of thrombophilia.		X
20.	Know the causes, symptoms, and indications for diagnostic testing and referral for inherited and acquired forms of vasculitis.		X
21.	Know the noninvasive studies indicated for critical limb ischemia.		X

  

PATIENT CARE AND PROCEDURAL SKILLS		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
1.	Skills to obtain a clinical history and perform a physical examination of the peripheral circulation.	X	
2.	Skill to utilize noninvasive imaging reports for diagnosis and follow-up care of patients with vascular disease.		X
3.	Skill to initially evaluate patients with extracranial carotid and vertebral artery disease.	X	
4.	Skills to evaluate and manage patients with extracranial carotid and vertebral artery disease.		X
5.	Skill to identify patients at risk for abdominal and thoracic aortic aneurysms.	X	
6.	Skills to evaluate patients with thoracic and abdominal aortic aneurysms and refer for surgical or endovascular intervention.		X
7.	Skills to initiate management of patients with suspected acute aortic syndromes and coordinate care to ensure medical stability.		X
8.	Skill to manage patients with chronic aortic syndromes.		X
9.	Skills to evaluate and coordinate management of patients with peripheral and visceral artery aneurysms and refer candidates for surgical or endovascular intervention.		X
10.	Skills to perform and interpret findings of physical examination for detection of acute and chronic arterial compression syndromes.		X
11.	Skills to evaluate and manage patients with upper and lower extremity peripheral artery disease.	X	
12.	Skill to prescribe an exercise program for patients with intermittent claudication due to peripheral artery disease.		X
13.	Skill to interpret results of an ankle-brachial index test report.	X	
14.	Skill to recognize abnormalities in segmental limb blood pressure measurements, pulse volume recordings, Doppler waveforms, and treadmill exercise test results in patients with known or suspected peripheral artery disease.		X
15.	Skills to evaluate and manage patients with arterial access complications, including arteriovenous fistula and arterial pseudoaneurysm.		X
16.	Skills to perform and evaluate a cardiac risk assessment in patients undergoing vascular procedures.	X	

**TABLE 14** Vascular Medicine Competencies, continued

PATIENT CARE AND PROCEDURAL SKILLS		All CV Nurse Practitioners and Physician Assistants	Selected CV Nurse Practitioners and Physician Assistants Based on Practice Focus
17.	Skills to perform perioperative evaluation and manage patients undergoing vascular procedures.		X
18.	Skills to evaluate and manage patients with venous thromboembolism.	X	
19.	Skills to evaluate and manage patients with venous insufficiency.	X	
20.	Skills to evaluate and manage arterial, venous, and neurotrophic leg ulcers.		X
21.	Skills to evaluate and manage patients with lymphedema.		X
22.	Skills to evaluate and manage patients with inherited and acquired forms of vasculitis.		X
23.	Skills to evaluate and manage patients with inherited and acquired forms of thrombophilia.		X
24.	Skill to identify genetic syndromes associated with inherited thoracic aortic syndromes, including Marfan Syndrome and Loays-Dietz.		X

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**KEY WORDS** ACC Competency Statement, cardiovascular medicine, clinical competency, interpersonal and communication skills, medical knowledge, patient care and procedural skills, practice-based learning and improvement, professionalism, systems-based practice, team-based care

### APPENDIX 1. AUTHOR RELATIONSHIPS WITH INDUSTRY AND OTHER ENTITIES (RELEVANT)—2020 ACC CLINICAL COMPETENCIES FOR NURSE PRACTITIONERS AND PHYSICIAN ASSISTANTS IN ADULT CARDIOVASCULAR MEDICINE

Committee Member	Employment	Consultant	Speakers Bureau	Ownership/ Partnership/ Principal	Personal Research	Institutional, Organizational, or Other Financial Benefit	Expert Witness
George P. Rodgers (Chair)	Seton Heart Institute—Associate Chief of Cardiology for Education; Dell Medical School—Associate Professor of Medicine	None	None	None	None	None	None
Jane A. Linderbaum (Co-Chair)	Mayo Clinic, Department of Cardiovascular Medicine—Associate Professor of Medicine	None	None	None	None	None	None
Dorothy D. Pearson (Co-Chair)	Boston Children's Hospital BACH Cardiology—Physician Assistant	None	None	None	None	None	None
Nancy C. Berg	United Heart and Vascular Clinic, AllinaHealth—Nurse Practitioner-Electrophysiology	None	None	None	None	None	None
Jennifer Day	Baylor Scott & White Health—Nurse Practitioner in Advanced Heart Failure Clinic	None	None	None	None	None	None
David Drajpuch	Penn Medicine, Heart and Vascular Intensive Care Unit—Nurse Practitioner*	None	None	None	None	None	None
Blair Erb Jr	Bozeman Deaconess Cardiology Consultants—Cardiologist	None	None	None	None	None	None
Marci Farquhar-Snow	Mayo Clinic, Department of Cardiovascular Diseases—Nurse Practitioner	None	None	None	None	None	None
Susan M. Fernandes	Lucile S Packard Children's Hospital Stanford—Program Director, ACHD Service; Stanford Hospital and Clinics—Clinical Associate Professor	None	None	None	None	None	None
Susan D. Housholder-Hughes	University of Michigan—Nurse Practitioner, Adjunct Clinical Faculty, School of Nursing	None	None	None	None	None	None
Heather Johnson	Prevea Clinic—Physician Assistant	None	None	None	None	None	None
Patricia Keegan	Emory Healthcare—Director of Strategic and Programmatic Initiatives, Heart and Vascular	None	None	None	None	None	None
Christine Kindler	Einstein Health Network, Greater Philadelphia Region; Bryn Mawr Medical Specialists—Physician Assistant	None	None	None	None	None	None
Rhonda Larsen	Stanford University—Associate Program Director, Clinical Assistant Professor, Cardiology	None	None	None	None	None	None
Viet T. Le	Intermountain Heart Institute, Intermountain Healthcare and Rocky Mountain University of Health Professions Physician Assistant Program—Cardiology Research Physician Assistant	None	None	None	None	None	None
Lisa A. Mendes	Vanderbilt Heart and Vascular Institute—Professor of Medicine, Director, CV Medicine Fellowship Program	None	None	None	None	None	None
Michelle J. Nickolaus	Geisinger Health—Program Manager, ACHD; Nurse Practitioner, Heart Institute;† University of Pennsylvania School of Nursing—Clinical Associate Faculty	None	None	None	None	None	None
Celeste M. Phillips	Rochester Regional Sands, Constellation Heart Institute—Nurse Practitioner	None	None	None	None	None	None
Laura Ross	Park Nicollet Methodist Hospital—Physician Assistant	None	None	None	None	None	None

Continued on the next page

## APPENDIX 1. CONTINUED

Committee Member	Employment	Consultant	Speakers Bureau	Ownership/ Partnership/ Principal	Personal Research	Institutional, Organizational, or Other Financial Benefit	Expert Witness
Sherrie R. Webb	Carolinas HealthCare System (now Atrium Health)/Sanger Heart & Vascular Institute—Retired Physician Assistant	None	None	None	None	None	None
Erica S. Zado	Hospital of the University of Pennsylvania—Physician Assistant-Electrophysiology	None	None	None	None	None	None

This table represents relationships of committee members with industry and other entities that were determined to be relevant to this document. These relationships were reviewed and updated in conjunction with all meetings and/or conference calls of the writing committee during the document development process. The table does not necessarily reflect relationships with industry at the time of publication. A person is deemed to have a significant interest in a business if the interest represents ownership of  $\geq 5\%$  of the voting stock or share of the business entity, or ownership of  $\geq \$5,000$  of the fair market value of the business entity; or if funds received by the person from the business entity exceed 5% of the person's gross income for the previous year. Relationships that exist with no financial benefit are also included for the purpose of transparency. Relationships in this table are modest unless otherwise noted. Please refer to <http://www.acc.org/guidelines/about-guidelines-and-clinical-documents/relationships-with-industry-policy> for definitions of disclosure categories or additional information about the ACC Disclosure Policy for Writing Committees. According to the ACC, a person has a relevant relationship if: a) the relationship or interest relates to the same or similar subject matter, intellectual property or asset, topic, or issue addressed in the document; b) the company/entity (with whom the relationship exists) makes a drug, drug class, or device addressed in the document, or makes a competing drug or device addressed in the document; or c) the person or a member of the person's household, has a reasonable potential for financial, professional or other personal gain or loss as a result of the issues/content addressed in the document.

\*Mr. Drajpuch was employed by the Children's Hospital of Philadelphia as a Nurse Practitioner during most of this writing effort.

†Ms. Nickolaus was employed by the UPMC Susquehanna Heart & Vascular Institute as a Nurse Practitioner during most of this writing effort.

ACHD = adult congenital heart disease; BACH = Boston Adult Congenital Heart; UPMC = University of Pittsburgh Medical Center.

**APPENDIX 2. PEER REVIEWER INFORMATION—2020 ACC CLINICAL COMPETENCIES FOR NURSE PRACTITIONERS AND PHYSICIAN ASSISTANTS IN ADULT CARDIOVASCULAR MEDICINE**

<b>Name</b>	<b>Employment</b>	<b>Representation in Peer Review Process</b>
Sadiya S. Khan	Northwestern University Feinberg School of Medicine—Assistant Professor of Medicine and Preventive Medicine	Official Reviewer, ACC Competency Management Committee Lead Reviewer
James B. McClurken	Doylestown Hospital—Chief, Thoracic Surgery, Richard A Reif Heart and Vascular Institute; Temple University Lewis Katz School of Medicine—Professor of Surgery Emeritus	Official Reviewer, ACC Lifelong Learning Oversight Committee (also ACC Surgeons Section Leadership Council)
David Wohns	Spectrum Health—Division Chief of Cardiovascular Medicine	Official Reviewer, ACC Board of Governors
Janet Fredal Wyman	Henry Ford Health System—Administrative Director, Structural Heart Clinical Services	Official Reviewer, ACC Lifelong Learning Oversight Committee
Nancy M. Albert	Cleveland Clinic Health System—Associate Chief Nursing Officer, Research and Innovation; Kaufman Center for Heart Failure, Heart and Vascular Institute—Clinical Nurse Specialist	Organizational Reviewer, American Heart Association (also ACC CV HF&T Section Leadership Council)
Sarah M. Baker	CHI Health—Adult Gerontology Acute Care Nurse Practitioner	Organizational Reviewer, American Nurses Credentialing Center
Kathy Berra	The LifeCare Company (RET)—Co-Director; Stanford Prevention Research Center—Cardiovascular Research Nurse	Organizational Reviewer, Preventive Cardiovascular Nurses Association
James C. Blankenship	Geisinger Medical Center—Director, Cardiac Catheterization Laboratory	Organizational Reviewer, Society of Cardiovascular Angiography and Interventions
Margaret T. Bowers	Duke University—Associate Professor, School of Nursing	Organizational Reviewer, American Association of Nurse Practitioners
Linda A. Briggs	George Washington University—Associate Professor, School of Nursing	Organizational Reviewer, The National Organization of Nurse Practitioners Faculties
Darwin Brown	Creighton University—Assistant Professor, Physician Assistant Program	Organizational Reviewer, American Academy of Physician Assistants
Charles M. Bullins II	Carilion Clinic Cardiovascular Institute—Nurse Practitioner	Organizational Reviewer, American Nurses Credentialing Center
Rachel N. Clarke	Tufts Medical Center—Acute Care Nurse Practitioner	Organizational Reviewer, Heart Failure Society of America
Melissa Coffman	Accreditation Review Commission on Education for the Physician Assistant—Assistant Director	Organizational Reviewer, Accreditation Review Commission on Education for the Physician Assistant
Joseph M. Daleo	Farmingville Medicine—Physician Assistant; Touro College—Associate Professor in Physician Assistant Program	Organizational Reviewer, Association of Physician Assistants in Cardiology
Barbara Fletcher	University of North Florida, Brooks College of Health—Clinical Associate Professor, School of Nursing	Organizational Reviewer, Preventive Cardiovascular Nurse Association
Sara E. Fletcher	Physician Assistant Education Association—Interim CEO	Organizational Reviewer, Physician Assistant Education Association
Karen Hills	Physician Assistant Education Association—Chief Educational Development	Organizational Reviewer, Physician Assistant Education Association
Maureen Julien	University of Pennsylvania Health System—Nurse Practitioner	Organizational Reviewer, Society of Cardiovascular Angiography and Interventions
Lyle W. Larson	University of Washington Division of Cardiology, Electrophysiology Section—Teaching Associate of Medicine	Organizational Reviewer, American Academy of Physicians Assistants
Connie M. Lewis	Vanderbilt University Medical Center—Heart Failure Nurse Practitioner	Organizational Reviewer, American Association of Heart Failure Nurses
Robin K. Miller	Providence St. Vincent Medical Center—Advanced Heart Failure Nurse Practitioner	Organizational Reviewer, American Association of Heart Failure Nurses
Kim Newlin	Sutter Health—Director of Cardiovascular Services	Organizational Reviewer, American Heart Association
Bunny Pozehl	University of Nebraska Medical Center—Professor & Dorothy Hodges Olson Endowed Chair in Nursing	Organizational Reviewer, Heart Failure Society of America
Laurie Racenet	Alaska Heart and Vascular Institute—Nurse Practitioner, Cardiac Rhythm and Device Management Clinic	Organizational Reviewer, Heart Rhythm Society
Patti Ragan	Accreditation Review Commission on Education for the Physician Assistant—Assistant Director	Organizational Reviewer, Accreditation Review Commission on Education for the Physician Assistant
Benjamin Schultze	Oregon Health & Science University—Director of the Adult Gerontology Acute Care Nurse Practitioner Program, Assistant Professor of Nursing	Organizational Reviewer, The National Organization of Nurse Practitioner Faculties
Colleen Walsh-Irwin	Department of Veterans Affairs—Program Manager, Evidence-Based Practice	Organizational Reviewer, American Association of Nurse Practitioners
Sarah Ann Worsnick	Geisinger Health System—Physician Assistant	Organizational Reviewer, Heart Rhythm Society

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## APPENDIX 2. CONTINUED

Name	Employment	Representation in Peer Review Process
Brian G. Abbott	Brown University, Lifespan Cardiovascular Institute—Professor of Medicine; Associate Chief of Cardiology, Clinical Excellence and Operations	Content Reviewer, ACC Imaging Section Leadership Council
Jesse E. Adams III	Baptist Health—Medical Chair, Kentuckiana CV Service Line Governance Committee	Content Reviewer, ACC CV Management Section Leadership Council (also Competency Management Expertise)
Mirvat Alasnag	King Fahd Armed Forces Hospital—Director of Catheterization Laboratory	Content Reviewer, ACC Interventional Section Leadership Council
Joseph Alpert	University of Arizona Health Sciences Center—Professor of Medicine	Content Reviewer
Anita M. Arnold	Lee Health—Director Cardio-Oncology	Content Reviewer, ACC Cardio-Oncology Section Leadership Council
Nancy Barker	Boston Children's Hospital—Physician Assistant	Content Reviewer
Brad Biskup	UCONN Health—Cardiology/Cardiovascular Prevention Physician Assistant	Content Reviewer, ACC CV Team Physician Assistant Workgroup
Kristen Bova Campbell	Duke University Hospital—Clinical Pharmacist, Electrophysiology	Content Reviewer, ACC CV Team Section Leadership Council
Lynne T. Braun	Rush University—Professor of Nursing or Medicine, Nurse Practitioner	Content Reviewer, ACC CV Team Section Leadership Council
Petar Breitingner	University of Florida School of Physician Assistant Studies—Assistant Professor of Physician Assistant Studies	Content Reviewer
John E. Brush Jr	Sentara Healthcare—Cardiologist; Eastern Virginia Medical School—Professor of Medicine	Content Reviewer, Chair, 2015 ACC Health Policy Statement on CV Team-Based Care and the Role of Advanced Practice Providers
Lola A. Coke	Grand Valley State University—Associate Professor of Nursing	Content Reviewer
Stephen R. Crumb	Nationwide Children's Hospital—Nurse Practitioner, Coordinator Adult Congenital Heart Disease	Content Reviewer, ACC ACPC Section Leadership Council
Sharon Dickinson	Heart One Associates—Physician Assistant	Content Reviewer, ACC CV Team Physician Assistant Workgroup
Phillip K. Downing	Intermountain Healthcare—Physician Assistant, General Cardiology	Content Reviewer
Camille J. Dyer	Barton Associates—Physician Assistant	Content Reviewer, ACC CV Team Physician Assistant Workgroup
Howard J. Eisen	Pennsylvania State University College of Medicine—Medical Director, Cardiac Transplantation, MCS and Advanced Heart Failure Milton S. Hershey Medical Center—Director, Diagnostic Cardiology	Content Reviewer, ACC Academic Council
Joseph Faiella-Tommasino	Touro College—Vice President, Physician Assistant Program Development and Operations; Chairman, PA Programs NE Division	Content Reviewer, ACC CV Team Physician Assistant Workgroup
M. Casey Flanagan	Walter Reed National Military Medical Center—Director, National Capital Consortium Heart Failure Clinic	Content Reviewer, ACC HF&T Section Leadership Council
John Flesher	WellSpan Cardiology—Lebanon—Physician Assistant	Content Reviewer, ACC CV Team Physician Assistant Workgroup
Rosario V. Freeman	University of Washington—Professor of Medicine; Director, Cardiology Fellowship Programs	Content Reviewer, Competency Management Expertise
Ilaria Gadalla	South University—Program Director, PA Department Chair	Content Reviewer, ACC CV Team Physician Assistant Workgroup
Sarju Ganatra	Lahey Hospital and Medical Center—Director, Cardio-Oncology Program, Division of Cardiovascular Medicine, Department of Medicine	Content Reviewer, ACC Cardio-Oncology Section Leadership Council
Ayana Gates	South Texas Health System—Cardiology Physician Assistant	Content Reviewer, ACC CV Team Physician Assistant Workgroup
Jonathan L. Halperin	Icahn School of Medicine at Mount Sinai—Robert and Harriet Heilbrunn Professor of Medicine (Cardiology)	Content Reviewer, Competency Management Expertise
Elizabeth A. Hoffman	Allina Health—Physician Assistant	Content Reviewer, ACC CV Team Physician Assistant Workgroup
Asma Hussaini	Cedars Sinai Medical Center—Senior Physician Assistant, Interventional Cardiology	Content Reviewer, ACC CV Team Physician Assistant Workgroup
Richard A. Josephson	University Hospitals of Cleveland—Director of Cardiovascular & Pulmonary Rehabilitation; Case Western Reserve University—Professor of Medicine	Content Reviewer, ACC Prevention Section Leadership Council
Neal S. Kleiman	Houston Methodist Hospital—Medical Director, Cardiac Catheterization Laboratory	Content Reviewer, ACC Interventional Section Leadership Council

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## APPENDIX 2. CONTINUED

Name	Employment	Representation in Peer Review Process
Brian M. Lentz	Hospital of the University of Pennsylvania—Physician Assistant	Content Reviewer, ACC CV Team Physician Assistant Workgroup
Jason Lucas	Piedmont Atlanta Hospital Piedmont Heart Institute— Co-Director, PA/NP Fellowship in CV Critical Care	Content Reviewer, ACC CV Team Physician Assistant Workgroup
Matthew W. Martinez	Lehigh Valley Health Network—Associate Professor of Medicine; Associate Chief of Cardiology for Education; Cardiology Fellowship Program Director; Medical Director, Sports Cardiology and Hypertrophic Cardiomyopathy Program; Medical Director, Cardiovascular Imaging	Content Reviewer, ACC Sports & Exercise Section Leadership Council
Jean-Anne McCracken	Cardiology, PC—Physician Assistant	Content Reviewer, ACC CV Team Physician Assistant Workgroup
John McPherson	Vanderbilt University Medical Center—Professor of Medicine	Content Reviewer, Competency Management Expertise
Ashley Moore-Gibbs	Sanger Heart & Vascular Institute, Atrium Health & Center for Advanced Practice—Nurse Practitioner & APP Cardiovascular Fellowship Director	Content Reviewer
Alison Mowery	Geisinger Heart Institute—System Chief, Advanced Practice Providers Cardiology; Director of Nurse Practitioners, Department of Advanced Practice Providers	Content Reviewer
John P. Mulrow	Cardiology Clinic of San Antonio—Cardiologist	Content Reviewer, ACC Geriatric Cardiology Section Leadership Council
Richard E. Murphy	Tufts University School of Medicine—Clinical Associate Professor of Public Health & Community Medicine	Content Reviewer, ACC CV Team Physician Assistant Workgroup
Courtney Nelson	Stanford School of Medicine—Physician Assistant, Clinical Assistant Professor of Medicine	Content Reviewer
Sandra Oliver-McNeil	Wayne State University—Associate (Clinical) Professor of Nursing	Content Reviewer, ACC CV Team Section Leader Council
Andrea Price	Indiana University Health—Director, Quality Databases	Content Reviewer, ACC CV Team Section Leader Council
Heather M. Ross	Arizona Arrhythmia Consultants—Nurse Practitioner; Arizona State University—Clinical Assistant Professor of Nursing	Content Reviewer
Theresa Saia	Boston Children's Hospital—Nurse Manager, Outpatient Cardiology	Content Reviewer, ACC ACPC Section Leadership Council
Teresa H. Sanders	Intermountain Heart Institute—Physician Assistant Cardiology	Content Reviewer
Joshua Schulman-Marcus	Albany Medical College—Assistant Professor of Medicine	Content Reviewer, ACC Early Career Section Leadership Council
Kristine Anne Scordo	Wright State University, College of Nursing—Professor of Nursing; Director, Adult-Gerontology Acute Care Nurse Practitioner Program; Kettering Heart & Vascular Center—Acute Care Nurse Practitioner	Content Reviewer
Amy E. Simone	Marcus Heart Valve Center—Clinical Director	Content Reviewer
Emily Spangler	Park Nicollet - Methodist Hospital—Physician Assistant	Content Reviewer
Ada C. Stefanescu Schmidt	Massachusetts General Hospital—Clinical and Research Fellow	Content Reviewer, FIT Section Leadership Council, ACC Lifelong Learning Oversight Committee
Marty C. Tam	University of Michigan—Assistant Professor of Internal Medicine	Content Reviewer, Competency Management Expertise
Alexander Vasquez-Cariaga	Michigan Medicine: University of Michigan Hospital—Physician Assistant (Interventional Cardiology, Cardiac Procedures Unit)	Content Reviewer, ACC CV Team Physician Assistant Workgroup
Poonam Velagapudi	University of Nebraska Medical Center—Assistant Professor of Medicine	Content Reviewer, ACC CV Early Career Section Leadership Council
Pugazhendhi Vijayaraman	Geisinger Heart Institute—Cardiologist	Content Reviewer, ACC EP Section Leadership Council
Carla Weidner	St. Luke's University Health Network—Nurse Practitioner	Content Reviewer, ACC CV Team Section Leadership Council
Barbara S. Wiggins	Medical University of South Carolina—Clinical Pharmacy Specialist, Cardiology; South Carolina College of Pharmacy— Adjunct Professor of Pharmaceutical Sciences	Content Reviewer, ACC CV Team Section Leadership Council
Eric S. Williams	Indiana University School of Medicine—Professor of Medicine (Cardiology)	Content Reviewer, Competency Management Expertise

This table represent the individuals, organizations, and groups that peer reviewed this document. A comprehensive list of healthcare-related disclosures for each reviewer can be found [online](#).

ACC = American College of Cardiology; ACPC = adult congenital/pediatric cardiology; APP = advanced practice provider; CEO = chief executive officer; CHI = Catholic Health Initiatives; CV = cardiovascular; EP = electrophysiology; FIT = fellow in training; HF&T = heart failure and transplant; MCS = mechanical circulatory support; NE = northeast; NP = nurse practitioner; PA = physician assistant; UCONN = University of Connecticut.

**APPENDIX 3. ABBREVIATIONS**

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ACC = American College of Cardiology

ECG = electrocardiography

NP = nurse practitioner

NSTE-ACS = non-ST-elevation acute coronary syndrome

PA = physician assistant

STEMI = ST-elevation myocardial infarction

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