Scope and Standards of Vascular Nursing

Contributors

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About the Society for Vascular Nursing

Founded in 1982, the Society for Vascular Nursing (SVN) is a not-for-profit international association dedicated to promoting excellence in the compassionate and comprehensive management of persons with vascular disease. SVN's mission is to provide a professional community for nurses focused on advancing the care of persons living with vascular disease through excellence in evidence-based practice and education.

About the American Nurses Association

The American Nurses Association (ANA) is the only full-service professional organization representing the interests of the nation's nearly 4.2 million registered nurses through its constituent member nurses associations and its organizational affiliates (AACN, 2022). ANA advances the nursing profession by fostering high standards of nursing practice, promoting the rights of nurses in the workplace, projecting a positive and realistic view of nursing, and by lobbying the Congressand regulatory agencies on healthcare issues affecting nurses and the public.

Introduction to Vascular Nursing Practice

Overview of the Content

Foundational Documents of Professional Nursing

Registered nurses (RNs) practicing in the United States have three professional resources that inform their thinking and decision-making and guide their practice. First, *Guide to the Code of Ethics for Nurses with Interpretive Statements: Development, Interpretation and Applicatio*n(Fowler, 2015) lists the succinct provisions that establish the ethical frameworkfor RNs across all roles, levels, and settings. Second, *Nursing's Social Policy Statement: The Essence of the Profession* (Fowler, 2015) conceptualizes nursing practice, describes the

social context of nursing, and provides the definition of nursing. *Nursing: Scope and Standards of Practice, Fourth Edition* (American Nurses Association, 2021) outlines the expectations of the professional role of the RN, includes the scope of practice statement for nursing, and identifies the Standards of Professional Nursing Practice and their accompanying competencies. *Vascular Nursing: Scope and Standards of Practice* builds on those professional resources, describes the scope of vascular nursing practice, and identifies the specialty's Standards of Practice and Standards of Professional Performance and accompanying competencies.

Audience for This Publication

RNs in every role and setting constitute the primary audience of this professional resource. Legislators, regulators, legal counsel, and the judiciary system will also want to reference this resource. Agencies, organizations, nurse administrators, and interprofessional colleagues will find this an invaluable reference. In addition, the people, families, communities, and populations using health care and vascular nursing services can use this document to better understand what constitutes this specialty nursing practice and who its members are: RNs and advanced practice registered nurses (APRNs).

Vascular Nursing Practice and the Society for Vascular Nursing

The Society for Vascular Nursing (SVN), an international organization, was founded in 1982 for the purpose of promoting excellence in the compassionate and comprehensive management of individuals and their families who suffer from vascular disease. The years since the founding of SVN have been characterized by significant changes in health care. The associated sciences and evolving research resulted in evidence about the causes, treatment, and prevention of vascular disease. This international association and its members continue to lead in the dissemination, implementation, and evaluation of evidence-based practices. Since the *Scope and Standards of Vascular Nursing Practice* was first published in 2004 in conjunction with ANA, SVN has achieved many milestones. See Appendix A for a list of these accomplishments.

To help the profession and the public better understand the practice of vascular nursing and to value today's vascular nurses, SVN supported and charged a task force to examine historical documents, references, and resources and then create the first vascular nursing specialty's scope and standards of practice, published in 2004. The scope of the practice statement defines vascular disease and vascular nursing, but more importantly serves to emphasize the unique practice characteristics of the vascular nurse, moving beyond pathophysiology and diagnosis to identify and treat human responses to actual or potential alterations in vascular system function. Vascular nurses today focus their emphasis on the promotion of health, assessment for alterations of function, and implementation of strategies to assist individuals to maintain, regain, or improve function and prevent

disability. Discussion of the practice environments and educational preparation of the vascular RN and the APRN identify those behaviors, responsibilities, functions, and skills that involve a specific and unique body of knowledge. The scope statement provides answers to the"who," "what," "where," "when," "why," and "how" questions about this nursing specialty.

As a complement, the standards for vascular nursing practice are generic statements that define the responsibilities and accountability to the profession and the public of all RNs who care for patients with vascular disease. These standards reflect the values and priorities of the profession of nursing as they relate to the specialty of vascular nursing, and include a competence framework for addressing nursing practice in the care of vascular patients in any setting.

The specialty scope and standards of practice must be reviewed and revised on a regular basis to reflect changes in health care and the nursing profession.This revised document was submitted for public comment and edited to include appropriate comments and recommendations. Then in 2023 the established ANA review process was completed for approval of the specialty's scope of practice statement and acknowledgment of the accompanying Standards of Practice for Vascular Nursing and Standards of Professional Performance for Vascular Nursing.

The evolving nature of vascular nursing is a reflection of technological advances, greater scientific understanding, and a growing research base. Nursing has moved beyond an era of needing only to provide good, safe care to the patient with vascular dysfunction, to the present era focused on the incorporation of science and research into evidence-based practice. Given rapid changes in healthcare delivery trends and technologies, the task of defining the scope of vascular nursing is complex. This document is intended to be both futuristic and flexible in nature, allowing for the response to emerging issues and technologies in the delivery of health care as well as in the practice of vascular nursing.

Scope of Vascular Nursing Practice

"Nursing integrates the art and science of caring and focuses on protection, promotion, and optimization of health and human functioning: prevention of illness and injury; facilitation of healing; and alleviation of suffering through compassionate presence. Nursing is the diagnosis and treatment of human responses and advocacy in the care of the individuals, families, groups, communities and populations in recognition of the connection of all humanity." (American Nurses Association, 2021)

Definition of Vascular Nursing

Vascular nursing is a unique nursing specialty focused on the needs and care of individuals who have known or predicted physiological alterations of the peripheral vascular system. The practice of vascular nursing is dynamic in response to the needs of individuals with vascular disease, the impact of genetic factors on vascular disease that affects the health of the entire family, as well as advancements in the fields of vascular medicine, interventional cardiovascular and radiology, and vascular surgery. Potential recipients of vascular nursing care are those individuals at risk for vascular disease as well as those individuals with known vascular system dysfunction, their families and significant others, and the society in which they live. Vascular nursing promotes and protects the health of individuals, encompassing the care of children, adults, and the elderly.

Vascular nursing includes the following: education of individuals and their families at risk for vascular disease; health promotion; assessment for alterationsof function; and implementation of strategies to assist patients to maintain, regain, or improve function and prevent disability. Creative care management options are required for persons with multiple types of vascular diseases, challenging nurses to think outside the normal. State-of-the-art treatment options are now available, even to persons with advanced vascular disease, allowing greater improvement in quality of life.

Vascular Disease Defined

Vascular disease encompasses a wide array of arterial, venous, and lymphatic problems and may be acute or chronic in nature. The epidemiology of vascular disease provides an overview of the magnitude of the disease and serves to define the patient population. Major categories of the disease that produce alterations of concern to vascular nurses includes cerebrovascular disease, aneurysmal disease, peripheral artery disease (PAD), acute arterial disease, venous disease, lymphatic disease, vascular trauma, congenital vascular conditions, nonatherosclerotic arterial disease, wound management, pain, and diabetes mellitus. Vascular nursing care is provided to patients of all ages across the continuum of care from acute care to community and home care.

Vascular disease affects persons more often in the later decades of life but may be present at any age. Congenital lymphedema may be diagnosed from birth through young adulthood. Those in their youth may experience genetic degenerative arteriopathies, such as Ehlers–Danlos syndrome, cardiomyopathy, congestive heart failure, renovascular hypertension, Buerger's disease, Raynaud's syndrome, collagen vascular disease, coagulopathies, vasculitis, or acquired vascular disease from trauma related to sports injuries, accidents or illicit druguse via injections.

Women of child-bearing age may have arrhythmia, cardiomyopathy, pregnancy-induced congestive heart failure, Raynaud's syndrome, fibrodysplastic renal artery stenosis, lymphedema, or hypercoagulopathies. Womenof child-bearing age are also at an increased risk for autoimmune disorders (Goldmuntz & Penn, 2021).

Aging is a known risk factor for vascular disease. The prevalence is just 1% among those age 40 – 49 years, versus 15% among those >70 years (Hamczyk et al., 2020; Aday & Matsushita, 2021). Recent data has emerged showing that biological age, which refers to a decline in function, is a more accurate predictor of vascular disease than chronological age. Factors known to accelerate biological aging include obesity, type 2 diabetes, chronic kidney disease, dyslipidemia, high dietary intake of saturated fat, salt and sugar, as well as smoking and substance abuse. Structural changes in aging arteries include fragmentation of elastin, collagen accumulation, smooth muscle cell loss, and increased arterial stiffness (Hamczyk, et al., 2020). So, while the elderly are certainly at the highest risk for vascular disease, providers may be reluctant to prescribe aggressive treatments because of comorbidities, polypharmacy, short life span, or belief that the atherosclerosis is irreversible. Therefore, due to frailty, pharmacological management must be approached carefully in this patient population (Whelton et al., 2018).

Arterial Disease

Causes of arterial disease are extremely varied. However, atherosclerosis is the underlying mechanism responsible for PAD. PAD encompasses those entities that result in arterial narrowing or occlusion in vessels other than those of the coronary and intracranial vascular beds. Although PAD is often a term to describe disease of the circulation of the lower extremities, it is actually a term used to also encompass disease of extracranial vessels such as the carotid arteries, upper extremity arteries, and visceral arteries, including renal and mesenteric disease. PAD places patients at a significant risk for disease sequelae such as stroke, limb loss, or aneurysm rupture. Approximately 8.5 million Americans are affected by PAD (Virani et al., 2021).

Major risk factors for vascular disease include smoking, diabetes, dyslipidemia, and hypertension. Diabetes increases the risk of PAD by two or three times. It also leads to poorer outcomes, with 70% of non-traumatic lower extremity amputations occurring in diabetics. Risk of developing PAD is double in smokers. While smoking cessation can decrease the risk of PAD, a recent study shows that it takes approximately 30 years for risk levels to decrease to that of nonsmokers (Criqui et al., 2021) Other causes of PAD include age greater than 65, male gender, family history, coronary artery disease (CAD), obesity, inflammation, hyperhomcysteinemia, a sedentary lifestyle, and a lower socio-economic status (Conte, 2023; Gerhard-Herman et al., 2017; Virani et al., 2021).

PAD is the clinical manifestation of generalized atherosclerosis, affecting over 230 million people worldwide (Byskosh et al., 2022; Criqui et al., 2021). Identification of these individuals is important, since many go untreated and are at increased risk of concomitant coronary and cerebrovascular disease. In fact, patients with PAD alone are less likely to receive optimal treatment than those with a diagnosis of only CAD (Virani et al., 2021).

Individuals with lower-extremity PAD often present for treatment because of symptoms such as intermittent claudication or critical limb ischemia (CLI). CLI may take the form of rest pain, minor tissue loss (ulceration),or gangrene. Patients with PAD should undergo a

thorough vascular assessment, including ankle-brachial index testing. The patient may be referred for additional imaging in the modes of ultrasound, computerized tomography (CT) scan, magnetic resonance imaging, or standard angiogram. All patients with lower-extremity PAD should be treated medically for the disease, which is likely to include antiplatelet therapy, antihypertensive agents, statin therapy, glycemic control and smoking cessation (Criqui et al., 2021). The status of the patient's arterial disease determines the recommended course of treatment. For patients with relatively mild PAD, as in the case of intermittent claudication, medical management accompanied by supervised exercise therapy (SET) is the first line of treatment. SET, consisting of walking for 30 minutes 3 times per week, leads to improved walking performance and a decrease in claudication symptoms (Souza, et al., 2019). SET also benefits participants by reducing their overall cardiovascular risk, decreasing mortality by 52% and morbidity by 30% (Rodrigues & Silva, 2020). While SET is an effective tool, it is also underused. Barriers to its use include the cost of supervised programs, lack of insurance coverage, as well as their limited availability. In the absence of SET programs, home based and community-based exercise therapy should be considered (Sousa et al., 2020; Rodrigues & Silva, 2020).

In cases of more severe disease, patients are referred for either endovascular or surgical intervention. In the U.S., 40% of patients with CLI undergo a surgical revascularization procedure, versus 60% who have an endovascular intervention. Endovascular procedures are preferred due to lower rates of mortality, as well as decreased length of stay and lower cost (Criqui et al., 2021).

Outside of lower-extremity PAD, vascular nurses routinely care for those with arterial aneurysms. Arterial aneurysms are known to be associated with the same risk factors as lower-extremity PAD and also have a strong hereditary factor (Anagnostakos & Lal, 2021) Smoking is the single greatest risk factor for the development of aneurysms. While aneurysms are commonly categorized as degenerative or atherosclerotic, the former is the preferred term since there is no proven correlation between aneurysms and atherosclerosis (Lawrence & Rigberg, 2023). Abdominal Aortic Aneurysms (AAA) are predominately asymptomatic until rupture. When symptoms do occur, they are typically pain in the low back, abdomen, flank or groin. If a AAA ruptures, for which the risk varies greatly by the size of the aneurysm, the rate of death is as high as 81%. The risk for aneurysm rupture has decreased as the screening for AAA has increased. Men aged 65-75 who have a smoking history had the largest benefit from screening. (Owens et al., 2019; Anagnostakos & Lal, 2021) For those with aneurysms of an asymptomatic nature, many go undiagnosed. Others may have their aneurysm identified incidentally on physical examination, noted on other imaging for a different disease process or as part of a routine screening. Treatment of an aneurysm depends on its locationand size. Some aneurysms will be monitored with routine surveillance if they do not meet qualifications for repair, others will be treated with surgical or endovascular repair. For most of these patients, management is directed toward early detection and appropriate endovascular or surgical intervention to prevent aneurysm rupture or thrombosis.

In addition to lower-extremity PAD and arterial aneurysmal disease, an additional focus area

of many vascular nurses is care for those with carotid artery disease. Carotid artery disease is known to be associated with an increased risk of cerebrovascular accident (CVA) and transient ischemic attack (TIA) when high-grade stenosis is present. In addition to those with symptomatic carotid artery disease with CVA or TIA, many go undiagnosed with asymptomatic disease. Carotid artery disease is typically identified with routine screening ultrasound in the asymptomatic patient. Medical management of carotid artery stenosis involves anti-platelet and statin therapy. Surgical carotid endarterectomy, or endovascular intervention such as carotid artery stenting may be pursued in individuals with symptomatic disease, or those with high-grade asymptomatic disease. The goals of treatment are to reduce the risk of CVA or recurrent CVA.

In addition to carotid artery disease, lower-extremity arterial disease, and aneurysms, vascular nurses encounter patients with upper-extremity arterial disease such as thoracic outlet syndrome, subclavian steal syndrome, or hypothenar hammer syndrome. The diagnostic process of these arterial diseases is based on the patient's symptoms and physical examination, and may include arterial Doppler studies, CT or magnetic resonance angiogram (MRA) scans, or angiography. These disease processes typically warrant surgical or endovascular treatment when symptomatic.

Renovascular disease includes atherosclerotic, fibromuscular, and inflammatory disorders and can lead to renovascular hypertension. Hypertension affects 75 millions adults with renovascular hypertension being one of the most common secondary causes. (Nair & Vaqar, 2022). Diagnostic studies to determine the presence of renal artery stenosis for specific subgroups of individuals with suspected resistant hypertension, unexplained atrophic kidney, unexplained pulmonary edema, or unexplained acute renal failure include Doppler studies, CT scans, MRA scans, or standard angiography. Treatment options include both endovascular options as well as open surgical repair.

Visceral artery disease to the celiac artery or superior mesenteric artery (SMA) typically presents in the form of intestinal ischemia. This is a rare disease, but vascular nurses may encounter patients with acute mesenteric ischemia rising from an embolus or sudden loss of flow to one or both of the main arteries causing severe acute onset of abdominal pain out of proportion to the physical examination findings. Acute mesenteric ischemia requires a quick diagnosis and emergency intervention to prevent intestinal ischemia. The vascular nurse may also encounter those with chronic mesenteric stenosis, whichis typically atherosclerotic disease of the SMA or celiac artery. In the case of chronic mesenteric stenosis, patients may have postprandial pain leading to food aversion and weight loss. Endovascular or surgical treatment may be considered in these patients.

All patients presenting for treatment of their PAD should have their risk factors rigorously assessed and appropriate therapies instituted to decrease the risks of both peripheral progression and cardiovascular mortality. Vascular nurses must be familiar with the disease process to effectively counsel and educate patients and their families regarding PAD prevention, detection, and treatment options as discussed above.

Venous Disease

Venous disease encompasses a wide spectrum of disorders ranging from those with benign, primarily cosmetic concerns to those with potentially life- or limb-threatening consequences. Venous thromboembolism (VTE) is the collective term used to describe deep vein thrombosis (DVT) and pulmonary embolism. Although accurate counts of VTE occurrence are difficult to calculate, the Centers for Disease Control (CDC) estimates approximately 900,000 each year in the United States, presenting a challenge to the health-care provider. Among people who have had VTE, 25% will have sudden death as the first symptom, 10% - 30% will die within one month and 33% will have long-term complications (CDC, 2022).

In 2020, the American Heart Association released a Call to Action to Prevent Venous Thromboembolism in Hospitalized Patients. Five areas of focus were recommended to help prevent the formation of VTE in hospitalized patients, with a goal to decrease the occurrence of hospital-acquired VTE by 20% by 2030 (Henke et al., 2020).

Vascular nurses are in the unique role to educate patients and fellow professionals on the risk factors, effective prevention methods, and recommended therapy for venous disease. Vascular nurses are located in a variety of settings, enabling the vascular nurse to reach a broad spectrum of patients. Vascular nurses educate the primary care patient on the risk factors and prevention techniques prior to a long plane flight or implement the Joint Commission's performance measures on surgical patients, thereby helping to close the gap in the prevention of VTE. Vascular nurses assist in preserving the venous systemfor future arteriovenous fistula or superficial veins used in bypass procedures.Vascular nurses promote protection of the patient's veins by judicious use of peripherally inserted access devices. Treatment of venous disease consists of compression therapy, venous ablation, vein stripping, sclerotherapy, and elevation.

Other manifestations of venous pathology include superficial venous thrombophlebitis, variceal bleeding, and chronic venous insufficiency (CVI). The term CVI refers to a constellation of limb symptoms including edema, pain, pigmentation changes, and disability, which can progress to chronic ulceration. The vascular nurse provides a crucial role in the nonoperative management of CVI by symptom control, prevention of ulceration, and promotion of ulcer healing. The advanced practice registered nurse (APRN) who is an expert in venous ulcer care, provides supervision or direction for ulcer management (topical agents, dressing techniques), assists with the implementation of medical therapies when appropriate, and provides patient education and support.

Lymphatic Disease

The lymphatic system consists of an extensive network that collects lymph from various organs and tissues and connects to an elaborate system of collecting vessels that transport the lymph to the blood stream. Lymphedema results from a malformation or obstruction of the lymphatic vessels or nodes. Lymphedema may be acquired or congenital, and it may develop secondary to another event, such as trauma, or surgical intervention, such as

mastectomy. Lymphedema is caused by microcirculatory imbalances or disruptions that result in the inability of the lymphatic vessels to transport lymph fluid.

Lymphedema is classified as primary and secondary. Primary lymphedema has a much lower prevalence at 1 in 100,000 individuals. Whereas secondary lymphedema affects 1 in 1000 . Lymphedema is most widely recognized in oncology with 1 in 5 female survivors of breast cancer developing lymphedema (Sleigh & Manna, 2022). The true incidence may be higher as the condition is thought to be underreported and underrecognized by caregivers. There is no known cure for lymphedema. The therapeutic goals are to reduce the affected limbs to as near normal size as possible, maintain skin integrity, maintain normal limb function, prevent complications, and teach patients how to manage the chronic condition of lymphedema. Vascular nurses are again in a unique position to provide prevention measures and to teach patients about health promotion. Treatment is complex and consists of physical therapy, compression, complex decongestive therapy, and elevation.

The APRN has a role in the differential diagnosis of lymphedema through history taking and a comprehensive physical examination. Vascular nursing interventions are aimed at reducing edema, maintaining the edema-free state, controlling the infection, and providing education and emotional support.

COVID 19 and Vascular Pathophysiology

SARS-CoV-2 (COVID 19) emerged as an unprecedented global pandemic in 2019. The origin of SARS-CoV-2 remains under assessment by the National Intelligence Council. Two hypotheses regarding the origin of SARS-CoV-2 are plausible: natural exposure to an infected animal and a laboratory-associated incident. Lack of clinical samples or a complete understanding of epidemiological data from the earliest COVID 19 cases limits understanding or explanation for the origin of the SARS-Co-V-2 virus. (National Intelligence Council, 2021).

Although the origin of SARS-CoV-2 remains unclear, the viral coagulopathy associated with COVID 19 has been directly attributed to the inflammatory state, platelet activation, endothelial dysfunction and blood stasis associated with COVID 19 infection. (Manolis et al., 2020). Initially, identified by respiratory complications, COVID 19 is now recognized as a vascular disease. The vascular endothelium plays an intricate role in immune regulation, inflammatory equilibrium, tight junctional barriers, hemodynamic stability, and balancing thrombotic and fibrinolytic pathways (Siddiqi et al., 2020). Clinical and biomarker derangements associated with COVID 19 are classified into disruption of the immune, renin-angiotensin-aldosterone (RAA) and thrombotic balance all which converge on the vascular endothelium (Siddiqi et al., 2020).

Immune dysregulation results in cytokine storm, macrophage activity syndrome with ultimately immune exhaustion in the severely ill COVID 19 patients. Epithelial cell dysfunction is a result of the hyper-inflammatory state. Epithelial cells are activated which prompts proinflammatory gene expression mobilizing more inflammatory cells with resultant vascular leak from induced vascular permeability which changes the thrombotic potential of the intimal surface (Siddiqi et al., 2020).

Stressful states promote activated endothelial cells to release Von Willebrand Factor and plasminogen activator inhibitor and decrease thrombomodulin and tissue plasminogen activator which promotes thrombus production (Siddiqi et al., 2020). P-selectin is also present after endothelial injury promoting thrombus by platelet binding and increased inflammation (Lowenstein & Solomon, 2020). Thrombin is also generated in large quantities which does not respond to anticoagulation with heparin (Manolis et al., 2020).

Vascular stability and function is balanced by the renin-angiotensin-aldosterone system (RAAS). The vascular influencer in the RAAS is Angiotensin II. Damaging effects are induced through angiotensin II Type 1 receptor activation of vasoconstrictor, inflammatory and fibrotic pathways. COVID 19 accesses target cells via angiotensin converting enzyme 2 (ACE2). Angio converting enzyme 2 (ACE2) exerts anti-inflammatory, antioxidant, and antifibrotic properties in the RAAS through conversion of angiotensin II to angiotensin 1-7 and angiotensin I to angiotensin 1-9. Cardiac pericytes and endothelial cells generally have ACE 2 present in large amounts thus creating a direct attack (Siddiqi et al., 2020).

Early identification of Covid 19 patients with increased thrombotic risk is imperative. Markers of thrombosis need to be examined early in COVID 19 infectious states to determine thromboembolic risk and guide thromboprophylaxis treatment. Coagulation markers that should be monitored include: D-Dimer (most useful marker), PT/APTT, Fibrinogen, Fibrin/Fibrinogen degradation products, Von Willebrand factor, and platelet count. Platelet activation markers include: Thromboxane B2, P-Selectin, Soluble CD 40 Ligand, and mean platelet volume. Inflammation markers include CRP, ESR, procalcitonin, and ferritin. The monitoring should start in the initial diagnosis of Covid 19 and monitored during illness duration even after patients are discharged. There is significant evidence of arterial and venous thromboembolic events in the initial discharge period after hospitalization with Covid 19 (Manolis et al., 2020).

Thrombotic complications are major factors in the high mortality rate of COVID 19 patients. Anticoagulation with multiple agents has been suggested: low molecular weight heparin (LMWH) or unfractionated heparin (UFH), direct oral anticoagulants (DOAC), antiplatelet agents, FXII inhibitors, thrombolytic drugs, and Nafamostat. Pleiotropic, anti-inflammatory and anti-viral effects are also present in some of the therapies as well. The optimal anticoagulation regimen remains undetermined. Randomized controlled trials (RCTs) are ongoing to determine the best approach in treating both ICU and non-ICU patients with COVID-19, including therapeutic anticoagulation versus thromboprophylaxis. In addition to anticoagulation, other therapies being studied and considered are anticomplement agents, NET inhibiting agents and Interleukin 1 receptor antagonists (Manolis et al., 2020).

The National Institutes of Health issued updated guidelines earlier this year regarding the anticoagulation therapy for treatment of Covid 19 patients. The current treatment guidelines for antithrombotic therapy in Covid 19 patients can be found on the National Institutes of Health website: https://www.covid19treatmentguidelines.nih.gov/.

The Impact of COVID-19 on the Vascular Surgery Community

Vascular patients are a vulnerable population during the COVID-19 pandemic because of the relationship between the virus, acute thrombotic events, and endothelial damage to the arterial and venous system. Additionally, there has been a disruption of clinical routine in the vascular community secondary to reduced staffing, postponement of elective and semi elective procedures, and reduced available resources used on the most critical patients. As a result, The Vascular Surgery COVID-19 Collaborative (VASCC) was launched to develop clinical research data about the impact the pandemic has on the vascular population, management, and outcomes (D'Oria et al., 2020). The Collaborative has two specific projects. Project 1 focuses on the impact of the pandemic on scheduled vascular operations (carotid, aortic, peripheral, venous, hemodialysis) while Project 2 seeks to learn the acute thrombosis events of the virus (acute limb ischemia, acute mesenteric ischemia, symptomatic VTE, stroke) and develop management protocols for these patients (D'Oria et al., 2020). The coordinated efforts are worldwide with more than 200 collaborators at more than 170 sites and 34 countries.

Following the global shutdown in March 2020, vascular quality improvement programs and research projects reported a significant decline in vascular procedures in Europe and the United States due to the pandemic (Aziz et al., 2021). Greater than 80% of clinical trials were delayed or not started for several factors including mandated institutional shutdowns, and lack of patient enrollment out of self-concern. Without evidenced based protocols on the management of elective vascular disease and acute complications related to COVID-19, the vascular community must reassess management of this patient population for routine and emergent care (Aziz et al., 2021). Vascular Quality Initiatives (VQI) and registries are primarily procedural based and not designed to monitor a delayed approach in the vascular patient. The real-world evidence of the registry has helped communities understand the impact of the COVID-19 pandemic. Up to date information will drive changes in the clinical management of the vascular patient and help the vascular community respond to the ever-changing environment in a timely fashion (Aziz et al., 2021).

COVID-19 Impact on Peripheral Arterial Disease and Management Recommendations

Available data is limited on the risk of severe COVID-19 in patients with peripheral arterial disease (PAD). Although vascular complications in COVID-19 patients may be underestimated, the virus is a significant risk factor for acute limb ischemia in patients with PAD (Gerotziafas et al., 2020). There is a 25% prevalence of PAD in both men and women over age 70 which is largely diagnosed. As such, there are recommendations from the VAS-European Independent Foundation in Angiology/Vascular Medicine for general measures in patients with PAD during the COVID-19 pandemic. PAD patients are at an increased risk of worsening disease and death; therefore, general practitioners should be aware of common clinical indicators of PAD and symptomatology. Patients with vascular disease should be at the forefront to receive protection from COVID-19 infection, specifically at the primary care level as they are at increased risk for worsening disease, venous thromboembolism, and 30-day mortality (Gerotziafas et al., 2020). See Appendix C for further recommendations.

Characteristics of Vascular Nursing Practice

Vascular nurses move beyond the diagnosis of pathophysiology to identifyingand treating human responses to actual or potential health problems related to phenomena affected by vascular system dysfunction. Specific phenomena thatform a framework for vascular nursing practice include the following:

- *Consciousness*—The awareness of, and interaction with the surrounding environment as well as the higher thought processes; alterations include problems such as TIAs and stroke.
- *Circulation*—The ability to maintain adequate blood flow/perfusion to the brain, extremities, and vital organs; alterations include stroke, acute and chronic upper- and lower-extremity arterial and venous diseases, ulcerations, gangrene, and amputation.
- *Rest/Sleep*—Behaviors needed for restorative function, and rest is needed to promote healing and to maintain an overall sense of well-being.
- *Sensation*—The ability to sense and distinguish internal and external stimuli; alterations include decreased sensation related to diabetic neuropathy and pain related to the overall mechanisms for arterial, venous, and lymphatic diseases.
- *Activity*—The ability to move freely within the environment; alterations include stroke, chronic limb ischemia, gangrene, and amputation.
- *Skin Integrity*—The maintenance of intact skin without breakdown; alterations include arterial, venous, and diabetic ulcers.
- *Adequate Nutrition*—The balance of nutrients to maintain health including an overall sense of well-being, the healing of surgical wounds, and the healing of lower-extremity vascular wounds.
- *Response to Illness/Coping*—The ability to form and maintain social support and relationships; alterations include social isolation and role changes secondary to vascular system disease.
- *Self-care*—The ability to provide one's basic needs; alterations include the inability to care for one's self.

Vascular nurses rely on a specialized body of knowledge, skills, technology, and experience to respond and adapt to patient needs. Vascular nurses use the nursing process to deliver care, including assessment, diagnosis, outcomes identification, planning, implementation, and evaluation. Vascular nursing practice is characterized by interventions that promote

health, assess for alterations in function, assist patients to regain or improve their function, and prevent furtherdisability.

Promotion of Health

The vascular nurse stresses health promotion and prevention of vascular disease, reflecting nursing's long-standing commitment to the well-being of the individual, family, group, and community. The vascular nurse performs assessments, targets individuals at risk for vascular disease, and initiates interventions aimed at promoting or maintaining vascular health. Vascular nurses are in a position to educate the individual with vascular disease regarding the disease process, thereby decreasing the risk of poor outcomes such as stroke, formation of vascular wounds, and limb loss. Vascular nurses must be familiar with the disease process to effectively counsel and educate patients and their families regarding treatment options.

Patients presenting for treatment of vascular problems should have their risk factors rigorously assessed with appropriate therapies instituted to decrease the risks of both progression of vascular complications and cardiovascular mortality. Vascular nurses practicing in a variety of inpatient and outpatient settings can assist patients with risk factor modification such as smoking cessation, maintaining glycemic control, normalizing high blood pressure and lipid levels, maintaining antiplatelet therapy, and fostering participation in exercise programs, thereby promoting positive patient outcomes.

Patients are encouraged in weight loss and diabetes control, along with exercise to decrease vascular risk by decreasing dietary cholesterol, total and saturated fat intake, and moderately decreasing sodium intake. Additionally, complex carbohydrates, fruits, vegetables, and proteins should be increased. Diet control assists in lowering drug dosing, thereby minimizing adverse side effects. Greater control of dyslipidemia, diabetes, and hypertension may slow the progression of vascular disease.

Assessment for Alterations in Function

The vascular nurse performs assessments and collects data regarding the health status of the individual with vascular disease in a systematic and ongoing manner. Collected data include not only the physical needs but also the psycho-social and spiritual needs of the individual. Out of data collection, diagnoses are formulated; measurable goals are determined; and a plan of care is developed, implemented, and evaluated. Information obtained from the individual or family is communicated to other members of the care team.

Measures to Maintain, Regain, or Improve Function and Prevent Disability

A major focus of clinical vascular nursing care involves teaching the individual or family ways to maintain, regain, or improve function, as well as to prevent disability. Teaching must take into consideration the capabilities and limitations of the individual or family and collaboration with other professionals and specialists, such as dietitians. Vascular nurses focus on the overall assessment, treatment, and evaluation of individuals requiring surgical

or interventional strategies to manage their arterial problem.

Roles, Education, and Practice Settings in Vascular Nursing Practice

The Vascular Registered Nurse

Registered nurses (RNs) have completed a nursing program and met state licensure examination requirements. RNs who practice in vascular nursing settings may work as staff nurses, case managers, nurse managers, and other roles in the field of vascular nursing. In today's dynamic healthcare environment, vascular nurse generalists practice in a variety of settings. These settings vary in purpose, type, location, acuity, and the auspices under which they operate. Practice settings include, but are not limited to, acute and subacute care facilities, home care agencies, ambulatory care clinics, outpatient service facilities, residential facilities, skilled nursing facilities, private practices, physicians'offices, and wound care clinics. Vascular nurses begin with basic nursing education and develop their vascular skills and competencies through a synthesis of experience, reading vascular nursing textbooks, completing continuing education classes, attendance at ankle-brachial index training offered through the SVN, and studying the SVN Core Curriculum.

The Advanced Practice Registered Nurse

The APRN within a vascular specialty role has additional knowledge and expertise in the discrete focus area of care for the vascular patient, vascular disorders, and vascular nursing practice. The vascular APRN may specialize in the care of patients with venous, arterial, lymphatic, or other vascular disorders.

The APRN specializing in vascular nursing is a licensed RN who is educationally prepared as a clinical nurse specialist or a nurse practitioner with at least a master's degree level. Vascular APRNs have acquired in-depth knowledge and clinical skills to prepare them for expansion and advancement in vascular nursing practice. Consistent with a broadened knowledge base, this advanced practice is characterized by increased complexity of clinical decision-making related to the assessment and management of individuals with vascular disease, as well as greater skill in managing organizations and environments.

Nurses in advanced practice vascular nursing roles may provide comprehensive physical assessment and demonstrate a high level of autonomy and expert skill in the diagnosis and treatment of the complex responses of individuals, families, or communities to actual or potential health problems. The APRN formulates clinical decisions to manage acute and chronic illness and promote wellness. These APRNs promote and deliver safe, quality health care that is accessible to patients and their families in various settings and throughout all stages of life.

Vascular APRNs integrate education, research, management, leadership, and consultation into clinical roles. They function in collegial relationships with nursing peers and other

professionals and people who influence the health care environment in many diverse settings. By virtue of this integration, vascular APRNs are clinicians, educators, researchers, and administrators. Specific activities will be influenced by the care setting and the role of the nurse. Emphasis is on specific elements of the nursing process; assessment, diagnosis, outcomes identification, planning, implementation, and evaluation will vary with the role as well as the setting. The vascular nurse and APRN are responsible for identifying the scope of practice permitted by state and federal laws and regulations, integrating the professional code of ethics and the professional practice standards into practice. In addition, his or her experience, education, knowledge, and abilities circumscribe the nurse's competence.

Certification of Vascular Nurses

Competence in the specialty area of the vascular nurse, including APRN, may be acquired by educational preparation or experience and is confirmed through professional credentialing as an RN–board certified nurse by passing the Cardiac-Vascular Nursing Certification examination. Certification is the process that validates, based on predetermined standards, an individual's knowledge, skills, and abilities on a defined functional and clinical area of nursing practice.The Cardiac-Vascular Nursing Certification is available through the American Nurses Credentialing Center for those nurses providing care to individuals with diagnosed cardiac/vascular disease as well as persons identified at risk for cardiac/vascular events. To take this examination, a nurse must (1) hold a current registered nursing license, (2) have practiced for at least 2 years as a full-time RN, (3) show evidence of at least 2000 hours of clinical practice in cardiovascular nursing within the 3 years prior to application, and (4) complete at least 30 hours of continuing education in cardiovascular nursing within 3 years prior to application. Currently, there are no advanced practice nursing certification programs in vascular disease available.

Ethics in Vascular Nursing Practice

The practice of the vascular nurse is guided by the *Code of Ethics for Nurses with Interpretive Statements* (Fowler, 2015). The vascular nurse following this professional code acknowledges the patient's rights to privacy and confidentiality, to be informed, and to be treated with dignity. The vascular nurses' genuine attention to culturally sensitive care closes the gap on health disparities, which is essential in everyday nursing practice (Butts & Rich, 2020). The vascular nurse recognizes the patient not only as a unique individual but also as part of a broader structure encompassing family or other significant relationships. The vascular nurse a cknowledges the patient's cultural beliefs, and individual uniqueness, and ensures that vascular nursing care is nonjudgmental and nondiscriminatory.

All nurses, including vascular nurses, are in an ideal position for a patient advocacy role. Nurses can clarify and discuss patient rights, health goals, treatment issues, and potential outcomes with the patient (Butts & Rich, 2020). In addition, the vascular nurse acknowledges the patient's rights to information, self-determination, and truthful disclosure.

Vascular nurses demonstrate moral courage by having the willingness to speak out and do the right thing, even when constraints or forces to do otherwise are present (Butts & Rich, 2020). The vascular nurse is responsiblefor maintaining competence, lifelong learning, and on going professional growth to assist in improving the healthcare environment in collaboration with other health professionals and the public. All vascular nurses consider the patient's cultural beliefs, diversity, and individual uniqueness in all decision-making, which is an especially important action.

Each of the nine provisions of the Code of Ethics for Nurses with Interpretive Statements can be applied to vascular nursing practice. The following provision examples illustrate that relevance.

Provision 1. The nurse practices with compassion and respect for the inherent dignity, worth, and unique attributes of every person.

The vascular nurse strives to assist each person in attaining his or her highest level of vascular health without consideration or judgment to cause of disease or contributing factors such as personal habits of smoking or eating a high-fat diet.

Provision 2. The nurse's primary commitment is to the patient, whetheran individual, family, group, or community, or population.

Vascular nurses promote optimal vascular health through individual instruction along with educational publications and participation in community risk factor education and disease screenings, such as ankle-brachial index or abdominal aortic aneurysm screening.

Provision 3. The nurse promotes, advocates for, and protects the rights, health, and safety of the patient.

The vascular nurse is aware of healthcare legislation and gives voice to the concerns of persons with vascular disease by writing elected officials and promoting healthcare initiatives locally, nationally, and globally that decrease the risk of vascular disease.

Provision 4. The nurse has authority, accountability, and responsibility for nursing practice: makes decisions; and takes action consistent with the obligation to promote health and provide optimal care.

Vascular nurses educate other healthcare providers in the assessment of vascular disease such as the proper technique of assessing ankle-brachial index and care of patients following vascular procedures to assure optimal outcomes.

Provision 5. The nurse owes the same duties to self as to others, including the responsibility to promote health and safety, preserve wholeness of character and integrity, maintain competence and continue personal and professional growth.

Vascular nurses seek opportunities to advance their knowledge by such things as attending the Society for Vascular Nursing Annual Conference, reading the *Journal of Vascular Nursing, reading the Core Curriculum for Vascular Nursing,* completing the ANA Cardiac Vascular Interactive Online Review Course, and seeking Cardiac-Vascular Certification through the ANCC..

Provision 6. The nurse, through individual and collective effort, establishes, maintains, and improves the ethical environment of the work setting and conditions of employment that are conductive to safe, quality health care.

Vascular nurses advocate for the attainment of Cardiac-Vascular Nursing Certification for all nurses caring for persons with vascular disease. SVN also has a position statement about the need to include vascular disease in nursing education.

Provision 7. The nurse, in all roles and settings, advances the profession through research and scholarly inquiry, professional standards development, and the generation of both nursing and health policy.

Vascular nurses participate in research and utilize available research through the use of evidence-based documents. See Appendix B for guidelines and statements used by vascular nurses.

Provision 8. The nurse collaborates with other health professionals and the public to protect human rights, promote health diplomacy and reduce health disparities.

Members of SVN and other vascular nurses collaborate with other healthcare organizations, such as the Society for Vascular Surgery, Amputee Coalition Limb Loss Task Force, American Heart Association Council on PVD, American Physical Therapy Association and Preventative Cardiovascular Nurses Association along with participating with other professional organizations in publishing research such as:

- Implementation of Supervised Exercise Therapy for Patients With Symptomatic Peripheral Artery Disease: A Science Advisory From the American Heart Association. Treat-Jacobson D, McDermott MM, Beckman JA, Burt MA, Creager MA, Ehrman JK, Gardner AW, Mays RJ, Regensteiner JG, Salisbury DL, Schorr EN, Walsh ME; American Heart Association Council on Peripheral Vascular Disease; Council on Cardiovascular and Stroke Nursing; Council on Epidemiology and Prevention; and Council on Lifestyle and Cardiometabolic Health. Circulation. 2019 Sep 24;140(13):e700-e710. doi: 10.1161/CIR.0000000000000727. Epub 2019 Aug 26.

- 2022 American Heart Association PAD National Action Plan (https://professional.heart.org/-/media/PHD-Files-2/Science-News/p/PAD-National-Action-Plan.pdf)

Provision 9. The profession of nursing, collectively through its professional organization, must articulate nursing values, maintain the integrity of the profession, and integrate principles of social justice into nursing and health policy. (American Nurses Association, 2015)

SVN defines values for vascular nursing and develops a strategic plan to assure progression to achieve these values and goals. The Society promotes it's Public Policy Committee for members to keep updated on policies related to vascular disease and encourages members to voice concerns to their elected officials.

Future Considerations for Vascular Nurses

The evolving nature of vascular nursing is a reflection of technological advances, greater scientific understanding, and a growing research base. Nursing has moved from an era of needing only to provide good, safe care to the patient with vascular dysfunction to the present era of incorporating science and research into evidence-based practice and care. Vascular nurses are increasingly involved in research activities as independent or collaborative researchers. Complementary medicine and alternative therapies are further expanding healthcare options, challenging vascular nurses to be knowledgeable, and effectively guiding their patients in understanding their choices and decision-making.

Genetics also plays a role in these expanding healthcare options. It has long been known that genetics and heredity affect risks for vascular disease. Genetic degenerative arteriopathies are found in Marfan and Ehlers–Danlos syndromes. Genetic screening to assess factors relating to PAD is currently being studied with the outcome goal of modifying those risks early in life to prevent the formation of PAD. Inherited thrombophilia include antithrombin III deficiency, protein C & S deficiencies, factor V Leiden mutation, prothrombin 20210 mutation, and dysfibrinogenemia. These conditions often require the use of anticoagulants. For persons taking warfarin, there are two genes found to affect the metabolism of this medication. Genetic testing may be beneficial for those persons who take warfarin but have required numerous modifications in dosage to obtain a stable international normalization ratio, for those who have had bleeding or clotting incidents while on warfarin, or for those requiring warfarin and have a family history of difficulties while using warfarin. Direct oral anticoagulants provide an option to persons not tolerating warfarin.

A major impact on the scope of practice in vascular nursing is the changing healthcare delivery system. Societal, economic, and political pressures are driving the development of less costly ways to meet the healthcare needs of consumers. Vascular nurses can be intimately involved in this care delivery process. Vascular nurses promote expanding community awareness of vascular disease, encouraging faster treatment along with widespread screening for early detection and prevention to lower the cost of treating vascular disease. APRNs with their expanded body of knowledge and skills, can provide high

quality care in a more cost-effective manner. Examples of this might be a nurse-managed wound clinic or a nurse-run anticoagulation service. These APRNs can also function as consultants to other nurses and other healthcare team members. Collaboration, along with effective use of resources, cost containment, increased participation by recipients of care, timely achievement of goals, and continuity of care are concepts critical to the future of vascular nursing as well as other healthcare systems.

Professional Organization Goals and Direction in Vascular Nursing Practice

Vascular nurses are strongly encouraged to become active members of the SVN, a specialty nursing organization with the goal to provide a professional community for nurses focused on advancing the care of persons living with vascular disease through excellence in evidence-based practice and education. SVN encourages innovation in vascular nursing practice, education, and research. This is accomplished through educational offerings, collaboration with fellow vascular nurses, maintenance of a web site for information and links to related organizations, promoting vascular nursing research, and recognition of achievement in the field of vascular nursing. Patient education materials for risk factor reduction and vascular procedures have been developed and are available to SVN members online. The society produces a peer-reviewed professional nursing journal,The *Journal of Vascular Nursing*. SVN holds an annual conference in conjunction with the Society for Vascular Surgery that serves as a forum for conducting the business of the Society as well as for academic presentations and mentorship.

A second goal of the Society is to advance the science of vascular nursing, translate evidence into practice, and improve outcomes for persons living with vascular disease. Members have developed a research priority agenda to promote nursing research for primary and secondary prevention and treatment of vascular disease. SVN is a member of the Nursing Organizations Alliance (www.nursing-alliance.org/) and collaborates with other organizations to promote vascular disease education such as:

- Amputee Coalition of America (www.amputee-coalition.org/)
- Australian and New Zealand Society for Vascular Nursing (www.anzsvn.org)
- North American Thrombosis Forum; formerly Coalition to Prevent Deep Vein Thrombosis (natfonline.org)
- Vascular and Endovascular Surgery Society(vesurgery.org)
- Society for Vascular Surgery (vascular .org)
- Society for Vascular Medicine (www.vascularmed.org)
- Canadian Society of Vascular Nursing (www.csvn.ca)
- VIVA Foundation (vivaphysicians.org)

SVN is interested in affecting the direction of both vascular nursing and public policy regarding atherosclerosis prevention and management, with a third goal to position it's members as advocates for nurses and persons living with vascular disease.

Standards of Vascular Nursing Practice

The Standards of Vascular Nursing Practice are authoritative statements of the duties that all vascular nurses, regardless of role, population, or specialty, are expected to perform competently. The standards published herein may be utilized as evidence of the standard of care, with the understanding that application of the standards is context-dependent. The standards are subject to change with the dynamics of the nursing profession, as new patterns of professional practice are developed and accepted by the nursing profession and the public. In addition, specific conditions and clinical circumstances may also affect the application of the standards at a given time, e.g., during a natural disaster. The standards are subject to formal, periodic review and revision.

The competencies that accompany each standard may be evidence of compliance with the corresponding standard. The list of competencies is not exhaustive. Whether a particular standard or competency applies depends on the circumstances.

Standards of Practice for Vascular Nursing

Standard 1. Assessment

The vascular registered nurse collects comprehensive datapertinent to the healthcare consumer's health and/or the situation.

Competencies

The vascular registered nurse:

- Collects comprehensive data including, but not limited to, physical, functional, psychosocial, emotional, cognitive, sexual, cultural, age-related, environmental, spiritual/transpersonal, and economic assessments in a systematic and ongoing process while honoring the uniqueness of the person.
- Elicits the healthcare consumer's values, preferences, expressed needs, and knowledge of the healthcare situation.
- Involves the healthcare consumer, family, and other healthcare providers, as appropriate, in holistic data collection.
- Identifies barriers (e.g., psychosocial, literacy, financial, cultural) to effective

communication and makes appropriate adaptations.

- Recognizes the impact of personal attitudes, values, and beliefs.
- Assesses family dynamics and impact on healthcare consumer health, vascular health, and wellness.
- Prioritizes data collection based on the healthcare consumer's immediate condition or the anticipated needs of the healthcare consumer or situation.
- Uses appropriate evidence-based vascular assessment techniques, instruments, and tools that are cognitively and culturally sensitive.
- Synthesizes available data, information, and knowledge relevant to the situation to identify patterns and variances in vascular health.
- Applies ethical, legal, and privacy guidelines and policies to the collection, maintenance, use, and dissemination of data and information.
- Recognizes the healthcare consumer as the authority of their own health by honoring their care preferences.
- Documents relevant data in a retrievable format.

Additional competencies for the APRN

The vascular advanced practice registered nurse:

- Initiates and interprets diagnostic tests and procedures relevant to the healthcare consumer's current status.
- Assesses the effect of interactions among individuals, family, community, and social systems on health and illness.

Example of Standard 1: Palpates the carotid, brachial, radial, femoral, popliteal, dorsalis pedis, and posterior tibial pulses to determine any decrease in perfusion.

Standard 2. Diagnosis

The vascular registered nurse analyzes the assessment data to determine vascular and other diagnoses or issues.

Competencies

The vascular registered nurse:

- Derives vascular and other diagnoses or issues from assessment data.
- Validates vascular and other diagnoses or issues with the healthcare consumer, family, and other healthcare providers when possible and appropriate.
- Identifies actual or potential risks to the healthcare consumer's health and safety or barriers to health, which may include, but are not limited to,

interpersonal, systematic, or environmental circumstances.

- Uses standardized classification systems and clinical decision support tools, when available, in identifying vascular and other diagnoses.
- Documents diagnoses or issues in a manner that facilitates the determination of the expected outcomes and plan.

Additional competencies for the APRN

The vascular advanced practice registered nurse:

- Systematically compares and contrasts clinical findings with normal and abnormal variations and developmental events in formulating differential diagnoses.
- Utilizes complex data and information obtained during interview, examination, and diagnostic processes in identifying diagnoses.
- Assists staff in developing and maintaining competence in the diagnostic process.

Example of Standard 2: Grades the pulse strength on a 0–4 scale and forms a diagnosis ofimpaired circulation if indicated. Uses ankle-brachial index measurements to quantify decreased perfusion.

Standard 3. Outcomes Identification

The vascular registered nurse identifies expected outcomes for a plan individualized to the healthcare consumer with vascular disease.

Competencies

The vascular registered nurse:

- Involves the healthcare consumer, family, healthcare providers, and others in formulating expected outcomes, especially related to vascular disease management, when possible and appropriate.
- Derives culturally appropriate expected outcomes from the diagnoses.
- Considers associated risks, benefits, costs, current scientific evidence, expected trajectory of the vascular condition, and clinical expertise when formulating expected vascular disease management outcomes.
- Defines expected outcomes in terms of the healthcare consumer, healthcare consumer culture, values, and ethical considerations.
- Includes a time estimate for the attainment of expected outcomes.
- Develops expected outcomes that facilitate continuity of care.

- Modifies expected outcomes according to changes in the status of the healthcare consumer or evaluation of the situation.
- Documents expected outcomes as measurable goals.

Additional competencies for the APRN

The vascular advanced practice registered nurse:

- Identifies expected outcomes that incorporate scientific evidence and are achievable through implementation of evidence-based practices.
- Identifies expected outcomes that incorporate cost and clinical effectiveness, healthcare consumer satisfaction, continuity and consistency among providers.
- Differentiates outcomes that require care process interventions from those that require system-level interventions.

Example of Standard 3: Identifies impaired healing of wounds with diminished pulses that are contrary to expected outcomes.

Standard 4. Planning

The vascular registered nurse develops a plan that prescribes strategies and alternatives to attain expected outcomes, especially related to vascular health or vascular disease management.

Competencies

The vascular registered nurse:

- Develops an individualized vascular disease management plan in partnership with the person, family, and others, considering the person's characteristics or situation including, but not limited to, values, beliefs, spiritual and health practices, preferences, choices, developmental level, coping style, culture and environment, and available technology.
- Establishes the health plan priorities with the healthcare consumer, family, and others, as appropriate.
- Includes strategies in the plan that addresses each of the identified vascular and other diagnoses or issues. These strategies may include, but are not limited to the following:
  - Promotion and restoration of vascular health;
  - Prevention of further deterioration as possibly due to vascular disease;
  - Alleviation of suffering, both physical and emotional; and
  - Supportive care for those who are dying.

- Includes strategies for health and wholeness across the life span with identification of risk reduction strategies.
- Provides for continuity in the plan.
- Incorporates an implementation pathway or timeline in the plan for vascular disease management.
- Considers the economic impact of the plan on the healthcare consumer, family, caregivers, or other affected parties.
- Integrates current scientific evidence, trends, and research for the management of vascular disease.
- Utilizes the plan to provide direction to other members of the healthcare team.
- Explores practice settings and safe space and time for the nurse and the healthcare consumer to explore suggested, potential, and alternative options.
- Defines the plan to reflect current statutes, rules and regulations,and standards.
- Modifies the plan according to the ongoing assessment of the healthcare consumer's response and other outcome indicators.
- Documents the plan in a manner that uses standardized language orrecognized terminology.

Additional competencies for the APRN

The vascular advanced practice registered nurse:

- Identifies assessment strategies, diagnostic strategies, and therapeutic interventions that reflect current evidence, including data, research, literature, and expert clinical knowledge.
- Selects or designs strategies to meet the multifaceted needs of complex healthcare consumers.
- Includes the synthesis of healthcare consumers' values and beliefs regarding nursing and medical therapies in the plan.
- Leads the design and development of interprofessional processes to address the identified diagnosis or issue.
- Actively participates in the development and continuous improvement of systems that support the planning process.

Example of Standard 4: Develops a nutritional plan that includes increasing protein intake to assist in wound healing.

Standard 5. Implementation

The vascular registered nurse implements the identified plan.

Competencies

The vascular registered nurse:

- Partners with the person, family, significant others, and caregivers, as appropriate, to implement the vascular disease prevention and management plan in a safe, realistic, and timely manner.
- Demonstrates caring behaviors toward healthcare consumers, significant others, and groups of people receiving care.
- Utilizes technology to measure, record, and retrieve healthcare consumer data, implement the nursing process, and enhance nursing practice.
- Utilizes evidence-based interventions and treatments specific to the vascular diagnosis or problem.
- Provides holistic care that addresses the needs of diverse populations across the life span.
- Advocates for health care that is sensitive to the needs of healthcare consumers, with particular emphasis on the needs of diverse populations.
- Applies appropriate knowledge of vascular disease problems and cultural diversity in implementing the plan of care.
- Applies available healthcare technologies to maximize access and optimize outcomes for consumers with vascular disease.
- Utilizes community resources and systems to implement the vascular disease prevention and management plan.
- Collaborates with healthcare providers from diverse backgrounds to implement and integrate the plan.
- Accommodates for different styles of communication used by healthcare consumers, families, and healthcare providers.
- Integrates traditional and complementary healthcare practices to address the vascular disease as appropriate.
- Implements the vascular disease prevention and management plan in a timely manner in accordance with patient safety goals.
- Promotes the healthcare consumer's capacity for the optimal level of participation and problem-solving related to vascular disease prevention, management, and care.
- Documents implementation and any modifications, including changes or

omissions, of the identified plan.

Additional competencies for the APRN

The vascular advanced practice registered nurse:

- Facilitates utilization of systems, organizations, and community resources to implement the plan.
- Supports collaboration with nursing and other colleagues to implement the plan.
- Incorporates new knowledge and strategies to initiate change in nursing care practices if desired outcomes are not achieved.
- Assumes responsibility for the safe and efficient implementation of the plan.
- Uses advanced communication skills to promote relationships between nurses and healthcare consumers, to provide a context for open discussion of the healthcare consumer's experiences, and to improve healthcare consumer outcomes.
- Actively participates in the development and continuous improvement of systems that support the implementation of the plan.

Example of Standard 5: Provides information to caregivers on appropriate techniques for wound treatments. Uses appropriate modalities for treatments such as negative pressure wound dressings.

Standard 5A. Coordination of Care

The vascular registered nurse coordinates care delivery.

Competencies

The vascular registered nurse:

- Organizes the components of the vascular disease prevention and management plan.
- Manages a healthcare consumer's care in order to maximize independence and quality of life.
- Assists the healthcare consumer to identify options for alternative care.
- Communicates with the healthcare consumer, family, and system during transitions in care.
- Advocates for the delivery of dignified and humane care by the interprofessional team.

- Documents the coordination of care.

Additional competencies for the APRN

The vascular advanced practice registered nurse:

- Provides leadership in the coordination of interprofessional healthcare for integrated delivery of healthcare consumer care services.
- Synthesizes data and information to prescribe necessary system and community support measures, including modifications of surroundings.

Example of Standard 5A: Provides information on noninvasive and invasive treatments to improve perfusion.

Standard 5B. Health Teaching and Health Promotion

The vascular registered nurse employs strategies to promote health and a safe environment.

Competencies

The vascular registered nurse:

- Provides health teaching that addresses such topics as healthy lifestyles and behaviors aimed at reducing vascular risk, developmental needs, activities of daily living, and preventive self-care.
- Uses health promotion and health teaching methods appropriate to the situation and the healthcare consumer's values, beliefs, health practices, developmental level, learning needs, readiness and ability to learn, language preference, spirituality, culture, and socioeconomic status.
- Seeks opportunities for feedback and evaluation of the effectiveness of the strategies used.
- Uses information technologies to communicate health promotion and disease prevention information to the healthcare consumer in a variety of settings.
- Provides healthcare consumers with information about intended effects and potential adverse effects of proposed therapies.

Additional competencies for the APRN

The vascular advanced practice registered nurse:

- Synthesizes empirical evidence on risk behaviors, learning theories, behavioral change theories, motivational theories, epidemiology, and other related theories and frameworks when designing health education information and programs.
- Conducts personalized health teaching and counseling considering comparative effectiveness research recommendations.
- Designs health information and healthcare consumer education appropriate to the healthcare consumer's developmental level, learning needs, readiness to learn, and cultural values and beliefs.
- Evaluates health information resources, such as the Internet, in the area of practice for accuracy, readability, and comprehensibility to help healthcare consumers access quality health information.
- Engages consumer alliances and advocacy groups, as appropriate, in health teaching and health promotion activities.
- Provides anticipatory guidance to individuals, families, groups, and communities to promote health and prevent or reduce the risk of health problems.

Example of Standard 5B: Provides patient information for lifestyle changes such as smoking cessation and changes in diet to reduce weight and cholesterol, which affect disease progression.

Standard 5C. Consultation

The vascular advanced practice registered nurse provides consultation to influence the identified plan, enhance the abilities of others, and effect change.

Competencies for the APRN

The vascular advanced practice registered nurse:

- Synthesizes clinical data, theoretical frameworks, and evidence when providing consultation.
- Facilitates the effectiveness of a consultation by involving the healthcare consumers and stakeholders in decision making and negotiating role responsibilities.
- Communicates consultation recommendations.

Example of Standard 5C: Synthesizes assessment data to determine the most effective wound care treatment for an advanced stage pressure ulcer.

Standard 5D. Prescriptive Authority and Treatment

The vascular advanced practice registered nurse uses prescriptive authority, procedures, referrals, treatments, and therapies in accordance with state and federal laws and regulations.

Competencies for the APRN

The vascular advanced practice registered nurse:

- Prescribes evidence-based treatments, therapies, and procedures considering the healthcare consumer's comprehensive healthcare needs.
- Prescribes pharmacologic agents according to a current knowledge of pharmacology and physiology.
- Prescribes specific pharmacological agents or treatments based on clinical indicators, the healthcare consumer's status and needs, and the results of diagnostic and laboratory tests.
- Evaluates therapeutic and potential adverse effects of pharmacological and nonpharmacological treatments.
- Provides healthcare consumers with information about intended effects and potential adverse effects of proposed prescriptive therapies.
- Provides information about costs and alternative treatments and procedures, as appropriate.
- Evaluates and incorporates complementary and alternative therapies into education and practice.

Example of Standard 5D: Orders medications and dressings for wound care, uses sharp debridement as indicated, and orders medications to reduce risk factors such as antihypertensive agents, cholesterol agents, and anticoagulants.

Standard 6. Evaluation

The vascular registered nurse evaluates progress toward attainment of outcomes.

Competencies

The vascular registered nurse:

- Conducts a systematic, ongoing, and criterion-based evaluation of the outcomes in relation to the structures and processes prescribed by the plan of care and the indicated timeline.
- Collaborates with the healthcare consumer and others involved in the care or situation in the evaluation process.

- Evaluates, in partnership with the healthcare consumer, the effectiveness of the planned strategies in relation to the healthcare consumer's responses and the attainment of the expected outcomes.
- Uses ongoing assessment data to revise the diagnoses, outcomes, the plan, and the implementation as needed.
- Disseminates the results to the healthcare consumer, family, and others involved, in accordance with federal and state regulations.
- Participates in assessing and assuring the responsible and appropriate use of interventions in order to minimize unwarranted or unwanted treatment and healthcare consumer suffering.
- Documents the results of the evaluation.

Additional competencies for the APRN

The vascular advanced practice registered nurse:

- Evaluates the accuracy of the diagnosis and the effectiveness of the interventions and other variables in relation to the healthcare consumer's attainment of expected outcomes.
- Synthesizes the results of the evaluation to determine the effect of the plan on healthcare consumers, families, groups, communities, and institutions.
- Adapts the plan of care to the trajectory of treatment according to the evaluation of response.
- Uses the results of the evaluation to make or recommend process or structural changes, including policy, procedure, or protocol revision, as appropriate.

Example of Standard 6: Performs ankle–brachial index to measure the effectiveness of treatments over time.

Standards of Professional Performance

Standard 7. Ethics

The vascular registered nurse practices ethically.

Competencies

The vascular registered nurse:

- Uses the *Code of Ethics for Nurses with Interpretative Statements* (American

Nurses Association, 2015) to guide practice.

- Delivers care in a manner that preserves and protects the healthcare consumer's autonomy, dignity, rights, values, and beliefs.
- Recognizes the centrality of the healthcare consumer and family as core members of any healthcare team.
- Upholds healthcare consumer confidentiality within legal and regulatory parameters.
- Assists healthcare consumers in self-determination and informed decision making.
- Maintains a therapeutic and professional healthcare consumer–nurse relationship within appropriate professional role boundaries.
- Contributes to resolving ethical issues involving healthcare consumers, colleagues, community groups, systems, and other stakeholders.
- Takes appropriate action regarding instances of illegal, unethical, or inappropriate behavior that can endanger or jeopardize the best interests of the healthcare consumer or situation.
- Speaks up when appropriate to question healthcare practice when necessary for safety and quality improvement.
- Incorporates compassionate care with the delivery of patient-centered care by providing respect, empathy, and a caring approach to each patient's care.
- Advocates for equitable healthcare consumer care.
- Shows respect for diverse individual differences and diverse communities and populations
- Maintains awareness of personal and professional values and beliefs, and conscious and unconscious biases.

Additional competencies for the APRN

The vascular advanced practice registered nurse:

- Participates in interprofessional teams that address ethical risks, benefits, and outcomes.
- Provides information on the risks, benefits, and outcomes of healthcare regimens to allow informed decision making by the healthcare consumer, including informed consent, informed refusal, and disclose sensitive information.
- Role models respect for diversity, equity, and inclusion for all team members.

- Advocates to maximize cost effective interventions, accessibility, and equitable resources for vascular patients (Boozaripour et al., 2018.)

Example of Standard 7: Discusses risk factors for procedures, including endovascular and open procedures, respecting the patient's right to refuse care.

Standard 8. Education

The vascular registered nurse attains knowledge and competence that reflect current nursing practice.

Competencies

The vascular registered nurse:

- Participates in ongoing educational activities related to appropriate knowledge bases for vascular nursing and professional issues.
- Demonstrates a commitment to career-long learning through self-reflection and inquiry to address learning and personal growth needs.
- Seeks experiences that reflect current practice to maintain knowledge, skills, abilities, and clinical judgment in practice or role performance.
- Acquires knowledge and skills appropriate to the role, population, specialty, setting, or situation.
- Understands how local, national, and global systems, politics, regulations, and structures contribute to health outcomes of patients and populations.
- Seeks formal and independent learning experiences to develop and maintain clinical and professional skills and knowledge.
- Identifies learning needs based on nursing knowledge, the various roles the nurse may assume, and the changing needs of the population.
- Participates in formal or informal consultations to address issues in nursing practice as an application of education and knowledge base.
- Shares educational findings, experiences, and ideas with peers.
- Contributes to a work environment conducive to the education of healthcare professionals.
- Maintains professional records that provide evidence of competence and career-long learning.
- Maintains effective communication, which is a central component of all areas of nursing practice, between nurses and other healthcare professionals to deliver high quality care.

Additional competencies for the APRN

The vascular advanced practice registered nurse:

- Uses current healthcare research findings and other evidence to expand clinical knowledge, skills, abilities, and judgment; to enhance role performance; and to increase knowledge of professional issues.
- Interprets patient care data to establish benchmarks to monitor system performance and lead team-based initiatives for quality care.
- Promotes evidence-based interventions to improve patient care outcomes and reduce risk of harm.
- Mentors vascular nurses in the development of their professional growth.
- Integrates research and scientific evidence to guide decision making.

Example of Standard 8: Attends regular continuing education sessions on vascular disease such as Society for Vascular Nursing (SVN) conferences.

Standard 9. Evidence-Based Practice and Research

The vascular registered nurse integrates evidence and research findings into nursing practice.

Competencies

The vascular registered nurse:

- Utilizes current evidence-based nursing knowledge related to vascular disease management and vascular health care promotion, including research findings, to guide practice.
- Incorporates evidence when initiating changes in nursing practice.
- Participates, as appropriate, to education level and position, in the formulation of evidence-based practice through research.
- Uses a problem-solving approach to the delivery of healthcare with using best evidenced based practice from studies, patient care data and clinical expertise.
- Shares personal or third-party research findings with colleagues and peers.

Additional competencies for the APRN

The vascular advanced practice registered nurse:

- Contributes to nursing knowledge by conducting or synthesizing research and other evidence that discovers, examines, and evaluates current

practice, knowledge, theories, criteria, and creative approaches to improve healthcare outcomes.

- Promotes a climate of research and clinical inquiry.
- Disseminates research findings through activities such as presentations, publications, consultations, and journal clubs.

Example of Standard 9: Participates in the development of clinical practice guidelines such as those for carotid endarterectomy, endovascular carotid artery stenting, and endovascular repair of abdominal aortic aneurysms.

Standard 10. Quality of Practice

The vascular registered nurse contributes to quality nursing practice.

Competencies

The vascular registered nurse:

- Demonstrates quality by documenting the application of the nursing process in a responsible, accountable, and ethical manner.
- Uses creativity and innovation to enhance vascular and other nursing care.
- Participates in quality improvement. Activities may include:
  - Identifying aspects of vascular nursing practice important for quality monitoring.
  - Using indicators to monitor quality, safety, and effectiveness of nursing practice.
  - Collecting data to monitor quality and effectiveness of nursing practice.
  - Analyzing quality data to identify opportunities for improving nursing practice.
  - Formulating recommendations to improve nursing practice or outcomes.
  - Implementing activities to enhance the quality of nursing practice.
  - Developing, implementing, and/or evaluating policies, procedures, and guidelines to improve the quality of practice.
  - Participating on and/or leading interprofessional teams to evaluate clinical care or health services.
  - Participating in and/or leading efforts to minimize costs and unnecessary duplication.
  - Identifying problems that occur in day-to-day work routines in order to

correct process inefficiencies.

- Analyzing factors related to quality, safety, and effectiveness.
- Analyzing organizational systems for barriers to quality healthcare consumer outcomes.
- Implementing processes to remove or weaken barriers within organizational systems.
- Advocating for health policy that affects nursing practice and health outcomes at local, state, and federal levels by evaluating and promoting policy change.

Additional competencies for the APRN

The vascular advanced practice registered nurse:

- Provides leadership in the design and implementation of quality improvements.
- Designs innovations to effect change in practice and improve health outcomes.
- Evaluates the practice environment and quality of nursing care rendered in relation to existing evidence.
- Identifies opportunities for the generation and use of research and evidence.
- Obtains and maintains professional certification.
- Uses the results of quality improvement to initiate changes in nursing practice and the healthcare delivery system.
- Use current research and emerging evidence to develop patient care guidelines.
- Role models best care practices to the team and collaborates with other healthcare professionals to improve patient care.

Example of Standard 10: Participates in research to improve vascular care such as the measurement of functional status in claudication, a research study completed by members of the SVN.

Standard 11. Communication

The vascular registered nurse communicates effectively in a variety of formats in all areas of practice.

Competencies

The vascular registered nurse:

- Assesses communication format preferences of healthcare consumers, families, and colleagues.
- Assesses his or her own communication skills in encounters with healthcare consumers, families, and colleagues.
- Seeks continuous improvement of his or her own communication and conflict resolution skills.
- Conveys information to healthcare consumers, families, the interprofessional team, and others in communication formats that promote accuracy.
- Questions the rationale supporting care processes and decisions when they do not appear to be in the best interest of the patient.
- Discloses observations or concerns related to hazards and errors in care or the practice environment to the appropriate level.
- Maintains communication with other providers to minimize risks associated with transfers and transition in care delivery.
- Contributes his or her own professional perspective in discussions with the interprofessional team.
- Identifies different methods of communication technologies used in care settings and how to effectively use these communication tools.
- Understands basic concepts of electronic health, mobile health, and telehealth systems for patient care.

Additional competencies for the APRN

The vascular advanced practice registered nurse:

- Researches and identifies best practices for application of communication technologies for patient care.
- Identifies potential fiscal impacts of communication technologies on patient care.

Example of Standard 11: Volunteers to present vascular topics for local or national nursing conferences, as well as community-sponsored health fairs.

Standard 12. Leadership

The vascular registered nurse demonstrates leadership in the professional practice setting and the vascular nursing profession.

Competencies

The vascular registered nurse:

- Oversees the nursing care given by others while retaining accountability for the quality of care given to the healthcare consumer.
- Abides by the vision, the associated goals, and the plan to implement and measure progress of an individual healthcare consumer or progress within the context of the healthcare organization.
- Demonstrates a commitment to continuous, career-long learning and education for self and others.
- Mentors colleagues for the advancement of nursing practice, the profession, and quality health care.
- Treats colleagues with respect, trust, and dignity.
- Develops communication and conflict resolution skills.
- Participates in professional organizations.
- Communicates effectively with the healthcare consumer and colleagues.
- Seeks ways to advance nursing autonomy and accountability.
- Participates in efforts to influence healthcare policy involving healthcare consumers and the profession.

Additional competencies for the APRN

The vascular advanced practice registered nurse:

- Influences decision making bodies to improve the professional practice environment and healthcare consumer outcomes.
- Provides direction to enhance the effectiveness of the interprofessional team.
- Promotes advanced practice nursing and role development by interpreting its role for healthcare consumers, families, and others.
- Models expert practice to interprofessional team members and healthcare consumers.
- Mentors colleagues in the acquisition of clinical knowledge, skills, abilities, judgment, professional growth, and accountability.
- Promotes patients to engage with their personal health data.
- Evaluates the impact of state and federal regulations and policies on health data and patient care outcomes.
- Demonstrates and role models professionalism responsibilities and leadership skills when involved in professional activities and with

organizations.

Example of Standard 12: Becomes a mentor for vascular nurses new to vascularnursing practice.

Standard 13. Collaboration

The vascular registered nurse collaborates with the healthcare consumer, family, and others in the conduct ofnursing practice.

Competencies

The vascular registered nurse:

- Partners with others to effect change and produce positive outcomes through the sharing of knowledge of the healthcare consumer and/or situation.
- Communicates with the healthcare consumer, the family, and the healthcare providers regarding healthcare consumer care and the nurse's role in the provision of that care.
- Promotes conflict management and engagement.
- Participates in building consensus or resolving conflict in the context of patient care.
- Applies group process and negotiation techniques with healthcare consumers and colleagues.
- Adheres to standards and applicable codes of conduct that govern behavior among peers and colleagues to create a work environment that promotes cooperation, respect, and trust.
- Cooperates in creating a documented plan focused on outcomes and decisions related to the care and delivery of services that indicates communication with healthcare consumers, families, and others.
- Engages in teamwork and team-building processes.

Additional competencies for the APRN

The vascular advanced practice registered nurse:

- Partners with other disciplines to enhance healthcare consumer outcomes through interprofessional activities, such as education, consultation, management, technological development, or research opportunities.
- Invites the contribution of the healthcare consumer, family, and team

members to achieve optimal outcomes.

- Leads in establishing, improving, and sustaining collaborative relationships to achieve safe, quality healthcare consumer care.
- Documents plan-of-care communications, rationales for plan-of-care changes, and collaborative discussions to improve healthcare consumer outcomes.

Example of Standard 13: Participates in intersocietal practice reviews to improve care such as:

Gerhard-Herman, M. D., Gornik, H. L., Barret, C., Barshes, N. R., Corriere, M. A., Drachman, D. E., Fleisher, L. A., Fowkes, F. G. R., Hamburg, N. M., Kinlay, S., Lookstein, R., Mirsa, S., Mureebe, L.,Olin, J. W., Patel, R. A., Regensteiner, J. G., Schanzer, A., Shishehbor, M. H., Stewart, K. J., Walsh, M. E. (2017). 2016 AHA/ACC guideline on the management of patients with lower extremity peripheral artery disease: A report of the American College of Cardiology/ American Heart Association Task Force on Clinical Practice Guidelines. *Circulation, 135*(12). https://doi.org/10.1161/cir.0000000000000471

Standard 14. Professional Practice Evaluation

The vascular registered nurse evaluates her or his own nursing practice in relation to professional practice standards and guidelines, relevant statutes, rules, andregulations.

Competencies

The vascular registered nurse:

- Provides age-appropriate and developmentally appropriate vascular nursing care in a culturally and ethnically sensitive manner.
- Engages in self-evaluation of vascular nursing practice on a regular basis, identifying areas of strength as well as areas in which professional growth would be beneficial.
- Obtains informal feedback regarding his or her own practice from healthcare consumers, peers, professional colleagues, and others.
- Participates in peer review as appropriate.
- Takes action to achieve goals identified during the evaluation process.
- Provides the evidence for practice decisions and actions as part of the

informal and formal evaluation processes.

- Interacts with peers and colleagues to enhance his or her own professional nursing practice or role performance.
- Provides peers with formal or informal constructive feedback regarding their practice or role performance.

Additional competencies for the APRN

The vascular advanced practice registered nurse:

- Engages in a formal process seeking feedback regarding his or her own practice from healthcare consumers, peers, professional colleagues, and others.
- Fosters the delivery of care that supports nursing practice to the full scope of education.

Example of Standard 14: Participates on the *Journal of Vascular Nursing* Editorial Board in reviewing articles for publication.

Standard 15. Resource Utilization

The vascular registered nurse utilizes appropriate resources to plan and provide nursing services that are safe, effective, and financially responsible.

Competencies

The vascular registered nurse:

- Assesses individual healthcare consumer vascular care needs, vascular disease prevention and management needs, and resources available to achieve desired outcomes.
- Identifies healthcare consumer vascular care needs, potential for harm, complexity of the task, and desired outcome when considering resource allocation.
- Delegates elements of care to appropriate healthcare workers in accordance with any applicable legal or policy parameters or principles.
- Identifies the level of evidence when evaluating resources for best evidenced based practice and processes.
- Advocates for resources, including technology, that enhance nursing practice.
- Modifies practice when necessary to promote positive interaction between healthcare consumers, care providers, and technology.

- Assists the healthcare consumer and family in identifying and securing appropriate services to address needs across the healthcare continuum.
- Assists the healthcare consumer and family in factoring costs, risks, and benefits in decisions about treatment and care.

Additional competencies for the APRN

The vascular advanced practice registered nurse:

- Utilizes organizational and community resources to formulate interprofessional plans of care.
- Formulates innovative solutions for healthcare consumer care problems that utilize resources effectively and maintain quality.
- Designs evaluation strategies that demonstrate cost-effectiveness, cost-benefit, and efficiency factors associated with nursing practice.

Example of Standard 15: Advocates for resources necessary for vascular assessment such as having Dopplers available on each nursing unit for pulse assessment and measurement of ankle-brachial index.

Standard 16. Environmental Health

The vascular registered nurse practices in an environmentally safe and healthy manner.

Competencies

The vascular registered nurse:

- Attains knowledge of environmental health concepts, such as implementation of environmental health strategies.
- Promotes a practice environment that reduces environmental healthrisks for workers and healthcare consumers.
- Assesses the practice environment for factors such as sound, odor, noise, and light that threaten health.
- Advocates for the judicious and appropriate use of products in healthcare.
- Communicates environmental health risks and exposure reduction strategies to healthcare consumers, families, colleagues, and communities.
- Utilizes scientific evidence to determine if a product or treatment is an environmental threat.
- Participates in strategies to promote healthy communities.

- Recognizes how to prevent workplace violence and injury.

Additional competencies for the APRN

The vascular advanced practice registered nurse:

- Creates partnerships that promote sustainable environmental health policies and conditions.
- Analyzes the impact of social, political, and economic influences on the environment and human health exposures.
- Critically evaluates the manner in which environmental health issues are presented by the popular media.
- Leads a culture of civility, respect, resiliency and well- being for the team.
- Advocates for implementation of environmental principles for nursing practice.
- Supports nurses in advocating for and implementing environmental principles in nursing practice.

Example of Standard 16: Advocates for smoke-free environments to decrease vascular risk of exposure/consumption of nicotine and second-hand smoke.

Glossary

Acute thrombotic event. The formation of a blood clot inside a blood vessel, obstructing the flow of blood through the circulatory system.

Ankle-brachial index. Measurement of the ratio of the systolic blood pressure in the ankle to that in the arm. It is an inexpensive, noninvasive test with a 79% to 95% sensitivity and a 95% to 100% specificity.

Arteriogram. A diagnostic study using ionizing radiation in the form of contrast injected into an artery delineating the arterial anatomy to detect arterial stenosis or thrombosis.

Atherosclerosis. Refers to the buildup of arterial plaque from lipids, platelets, smooth muscle cells, and foam cells, which narrows the arterial lumen (steno-sis) and can even cause arterial blockage (occlusion).

Balloon angioplasty. A balloon that is inflated at the area of stenosis in an artery, breaking the plaque against the inner wall of the artery, decreasing the stenosis, and allowing increased flow of blood through the artery.

Bruit. A high-pitched murmur secondary to turbulent blood flow.

Bypass. A conduit that provides blood flow around a stenosis using a vein, polytetrafluoroethylene graft, cryopreserved vein, or human umbilical vein. The bypass is named for the artery it originates from and connects to such asan aortofemoral bypass.

Call to Action. A call to action is a science-based document to stimulate action nationwide to solve a major public health problem.

Claudication. Characterized by pain, aching, or fatigue in the working musclesof the lower extremity at a set distance. The symptoms are typically reproducible and subside with rest.

Deep venous thrombosis. The formation or presence of a thrombus within a vein.

Embolism and thrombosis. A collective term for diseases characterized by the formation, development, or presence of a thrombus (thrombosis) and the blocking of the vessel by a thrombus brought to its site by the blood current (embolism).

Endothelial damage. An epithelium of mesodermal origin composed of a single layer of thin flattened cells lines the lumens of vessels. Any alteration of this layer causes damage that over time decreases the diameter of the vessel leading to partial or complete obstruction of the vessel and damage to the tissues distal to the blockage.

Endarterectomy. Surgical removal of plaque from the inner wall of the artery.

Ischemia. Insufficient blood flow to supply the tissues with the minimal oxygen and nutrients required to maintain tissue health.

Peripheral vascular disease. Disease of the extracardiac blood vessels including diseases of the arteries, veins, and lymphatics.

Plaque. The buildup of hardened, fatty deposits in the arteries of the body.

Pulmonary embolism. A portion of thrombus detaches and lodges in a segment of the pulmonary arterial system.

Sclerotherapy. Used to treat telangiectasia and reticular veins, performed byinjecting a sclerosing agent directly into the vein, causing the vessel to swell and seal itself off and blood is no longer able to flow into this portion of the vein.

Stasis ulcer. Progressive, uncontrolled edema leads to injury to the skin as the skin is stretched to its maximum capacity causing a breakdown of the skin,allowing bacteria to enter and lead to infection and resulting skin breakdownor ulceration.

Stent. A small metal coil positioned in a partially blocked artery and usually inflated with a balloon to hold the arterial wall open, allowing blood to flow more freely.

Thrombin. A proteolytic enzyme that is formed from prothrombin and facilitates the clotting of blood by catalyzing conversion of fibrinogen to fibrin.

Ulcer. A lesion on the surface of the skin or mucous surface, produced by thesloughing of inflammatory necrotic tissue.

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Appendix A

Society for Vascular Nursing Accomplishments

The Society for Vascular Nursing (SVN) was founded in 1982 for the purpose of promoting excellence in the compassionate and comprehensive management of individuals and their families who suffer from vascular disease on a worldwide basis. In the years since its collaboration with the American Nurses Association in publishing the *Scope and Standards of Vascular Nursing Practice* in 2004, SVN has achieved many milestones, including:

- Completion of the first Vascular Nursing Certification Workshop. This information had been developed into online modules available through CoursePark: Peripheral Artery Disease (PAD) and Performance of the Ankle-Brachial Index (ABI), Aortic Aneurysm,Carotid Artery Disease, PAD Management, and Venous Disease.
- An SVN member was elected co-chair of the Peripheral Arterial Disease Coalition, part of the Vascular Disease Foundation.
- SVN reviewed and endorsed the American College of Cardiology (ACC)/American Heart Association (AHA) Practice PAD Guidelines.
- SVN member representation on the ACC/AHA Clinical Data Standard and Performance Measures Writing Committee.
- International chapters were developed: Australian & New Zealand SVN in 2007 and the Canadian SVN in 2009. Both countries now have their own vascular nursing societies.
- *Core Curriculum for Vascular Nursing* was first published in 2007; the second edition was published in 2014.
- *Cardiovascular Nursing Scope and Standards of Practice* was published in 2008, updated in 2016 and endorsed by SVN.
- *ACCF/AHA/ACR/SCAI/SIR/SVM/SVN/SVS 2010 Clinical Performance Measures for Adults with PAD* was endorsed by SVN. SVN members were present in both the writing and review committees.
- *2011 ACCF/AHA/ACR/SCAI/SIR/SVM/SVN/SVS Key DataElements and Definitions for PVD* was endorsed by SVN.
- *2012 ACCF/AHA/ACR/SCAI/SIR/SVM/SVN/SVS Key Data Elements and Definitions for Peripheral Atherosclerotic Vascular Disease: A Report of the American College of Cardiology Foundation/American Standards for Peripheral Atherosclerotic Vascular Disease* was published.

- *Development of Clinical Practice Guidelines for Carotid Endarterectomy, Endovascular Repair of Abdominal Aortic Aneurysm and Carotid Stenting* were published in the *Journal of Vascular Nursing*. The *SVN Endovascular repair of an Abdominal Aortic Aneurysm Clinical Practice Guideline* was updated in 2020.
- An SVN representative was requested to participate in the Planning Committee for the Vascular Interventional Advances Allied Health Program. SVN continues to participate in this meeting.
- An SVN representative was requested to participate in the American Nurses Credentialing Center Expert Panel for the Cardiovascular Certification Exam.
- SVN members participated in the publication of Scientific Statements: *American Heart Association Scientific Statement: A Call to Action: Women and Peripheral Arterial Disease*; *Measurement and Interpretation of the Ankle-Brachial Index: A Scientific Statement from the American Heart Association*.
- Development of the ABI Registry: a train-the-trainer program on the technique to accurately perform the ankle-brachial index.
- Development of SVN position papers, such as: *Evidence-Based Practice and the Role of the Registered Nurse in Research Activities; Inclusion of Vascular Disease into Nursing Education*.
- SVN members are recognized as experts in vascular nursing and are representatives on nursing/interdisciplinary panels and boards, and are keynote/plenary speakers at local, regional, national, and inter-national nursing and intersocietal meetings.
- Orientation modules developed to educate nurses on the vascular nursing specialty.
- Mentor match program designed to help nurses increase their vascular knowledge at every level of the educational continuum.
- Developed an organizational membership status that includes membership for SVN members as Society for Vascular Surgery (SVS) affiliates with the goal of increasing awareness of vascular nursing in the surgical practice and increasing membership in SVN.
- Added a retired membership category and expanded graduate nurse membership benefits to include receiving the Journal of Vascular Nursing and SVS dual membership status.
- Endorsed the Global Vascular Guidelines on Critical Limb Threatening Ischemia on behalf of the SVS, European Society for Vascular Surgery and the World Federation of Vascular Societies.
- Began affiliations with:
    - Vascular Center Verification and Qualify Improvement Program

    - Intersocietal Accreditation Commission
    - SVS Perioperative Project
    - SVS Population Task Force
    - American Heart Association Liaison
    - American Heart Association/American College of Cardiology Guidelines
    - Peripheral Artery Disease National Action Plan, Heart.org/PADACTIONPLAN
- SVN Virtual Roundtables are free to participate in for all SVN members. These quarterly Roundtable discussions are designed to be an informal venue to discuss key issues and hot topics with your nursing colleagues.
- In July 2022, an SVN member was selected to join the PAD Collaborative which works to implement the PAD National Action Plan.

Appendix B

Guidelines for Vascular Disease

Vascular nurses follow these research- and evidence-based guidelines along with the scientific statements. (All URLs are current as of October 18, 2022.)

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Appendix C

Recommendations on caring for persons with COVID-19 and peripheral artery disease.

Systematically perform appropriate physical examination upon medical visits at home or regular consultation, including measurement of the ankle-brachial index, particularly in elderly, smokers, and diabetic patients. Providers are also advised to include and collect data regarding PAD in the COVID-19 patients' database and to share them at the site https://www.vas-int.net/.

From a general point of view, during COVID-19 epidemic:

- Nonurgent vascular exams have to be deferred to protect patients and aid in the management of COVID-19.
- For urgent vascular exams, practices have to be adjusted to best safeguard the technologist and the patient.
- Main clinical indications for urgent vascular exams include critical limb ischemia and stroke.
- Vascular ultrasound is the optimal exam for these conditions. All the other conditions/exams have to be considered elective and should be deferred.
- Portable, dedicated equipment, where available, should be used. Equipment not necessary should be removed to make the process easier as well as for the equipment cleaning. Essential and competent staff should be involved in performing the exam to obtain the most relevant result.
- Management of other acute/emergency conditions (aortic dissection, aneurism rupture, etc.) should follow the existing protocols.

Gerotziafas et al., 2020