JOURNAL OF INTERNATIONAL CRISIS AND RISK COMMUNICATION RESEARCH
ISSN: 2576-0017
2024, VOL 7, NO S10

Peripheral Arterial Disease: A Nursing Perspective on Prevention, Diagnosis, and Care

Saleh Moslim ALHashem [(1)], Ahmed Hejji Al Salem [(2)], Jafar Ali Alothman [(3)], Eyad Ibrahim Albarri [(4)], Ahmed Kalifah Alhammad [(5)], Zainab Ali Al Muhathab [(6)], Jalilah Habib Mahdi Al-Mutlaq [(7)], Mohammed Habib Almuhawis [(8)], Maryam Mohammed Ali Alali [(9)], Mohammed Abdullah Alsahhaf [(10)], Mohammed Ibrahim Aldaghir [(11)], Murtadha Saleh Aleid [(12)], Sadek Hussain Ali Albiladi [(13)], Kadhem Yousef Al Sultan [(14)], Ahmed Mohammed Alfayez [(15)].

[1]Nursing Technician, Psychiatry hospital in Alhasa, Ministry of Health, Kingdom of Saudi Arabia. Saalhashem@moh.gov.sa
[2]Nursing Technician, Psychiatry hospital in Alhasa, Ministry of Health, Kingdom of Saudi Arabia. ahm14000@hotmail.com
[3]Anesthesia technician, Alomran Alaam in alhasa, Ministry of Health, Kingdom of Saudi Arabia. JAlothman@moh.gov.sa
[4]Nursing Specialist, King Fahad Hofuf Hospital, Ministry of Health, Kingdom of Saudi Arabia. ealbarri@moh.gov.sa
[5]Nursing Technician, Psychiatry hospital in Alhasa, Ministry of Health, Kingdom of Saudi Arabia. akalhammad@moh.gov.sa
[6]Nursing Technician, Psychiatry hospital in Alhasa, Ministry of Health, Kingdom of Saudi Arabia. zalmothab@moh.gov.sa
[7]Health assistant-Nursing, Psychiatry hospital in Alhasa, Ministry of Health, Kingdom of Saudi Arabia. Jalmutlaq@moh.gov.sa
[8]Nursing Assistant, Al-Ahsa Mental Health Hospital, Ministry of Health, Kingdom of Saudi Arabia. Mhalmuhawis@moh.gov.sa
[9]Nursing specialist, MCH Al hassa, Ministry of Health, Kingdom of Saudi Arabia. Mamoalali@moh.gov.sa
[10]Nuclear Medicine specialist, Psychiatry hospital in Alhasa, Ministry of Health, Kingdom of Saudi Arabia. Maalsahhaf@moh.gov.sa
[11]Nursing Technician, Psychiatry hospital in Alhasa, Ministry of Health, Kingdom of Saudi Arabia. maldaghir@moh.gov.sa
[12]EMT Technician, Emergencies, Disaster and Ambulances Services Alahsa, Ministry of Health, Kingdom of Saudi Arabia. he.512@hotmail.com
[13]Nurse, Psychiatry hospital in Alhasa, Ministry of Health, Kingdom of Saudi Arabia. salbiladi@moh.gov.sa
[14]Lab specialist, King Fahad hufof hospital, Ministry of Health, Kingdom of Saudi Arabia. kadhem.alsultan@gmail.com
[15]Nursing technician, Psych alhasa, Ministry of Health, Kingdom of Saudi Arabia. Alfayez20@hotmail.com

ABSTRACT

Peripheral arterial disease (PAD) is a prevalent condition caused by the narrowing or occlusion of the aorta and limb arteries due to atherosclerosis. This systemic condition elevates the risk of cardiovascular and cerebrovascular events, and its

impact is comparable to or greater than coronary artery disease or stroke. PAD disproportionately affects older adults, with higher prevalence and worse outcomes noted in socioeconomically disadvantaged populations and minority groups. Nurses play a pivotal role in the assessment, management, and education of PAD patients, emphasizing the need for early detection, comprehensive risk factor management, and guideline-directed medical therapy (GDMT). Effective strategies include antiplatelet therapy, lipid and glucose management, smoking cessation, and supervised exercise programs. Advanced treatments, including revascularization and multidisciplinary care, are essential for patients with critical limb-threatening ischemia or refractory symptoms. This article highlights the importance of a team-based approach and the integral role of nurses in improving outcomes for PAD patients through vigilant care, patient education, and collaboration with healthcare providers.

Keywords: Peripheral Arterial Disease, Claudication, Critical Limb Ischemia, Critical Limb Threatening Ischemia, Acute Limb Ischemia, Nurses

Introduction

Peripheral arterial disease (PAD) refers to the narrowing or blockage of the aorta or limb arteries due to atherosclerosis. As a systemic arterial condition, atherosclerosis increases the risk of ischemic cardiovascular, cerebrovascular, and limb-related events in patients with PAD. Despite being overshadowed by coronary artery disease (CAD) and cerebrovascular disease, PAD is associated with a comparable or even greater risk of adverse outcomes than CAD or stroke. The 2018 Cholesterol Guideline by the American Heart Association (AHA) and American College of Cardiology (ACC) classifies individuals with two or more significant atherosclerotic cardiovascular diseases as very high risk (Grundy et al., 2019). This discussion centers on lower extremity PAD, which is linked to exertional leg discomfort, functional decline, and diminished quality of life. Registered nurses are particularly well-positioned to identify and manage lower extremity PAD in both hospital and outpatient environments (Aday & Matsushita, 2021). This article aims to synthesize contemporary knowledge on the prevalence, symptoms, classification, diagnosis, and treatment of PAD, emphasizing nursing roles and responsibilities.

Prevalence of Peripheral Arterial Disease

PAD impacts over 230 million people worldwide, including more than 8 million individuals in the United States (Aday & Matsushita, 2021). Its prevalence increases with age, affecting approximately 4.3% of individuals aged 40 and older, 14.5% of those 70 and older, and over 20% of those aged 80 and older. Among racial groups, Black Americans and Native Americans exhibit about double the prevalence of PAD compared to non-Hispanic Whites at any age. Black and Hispanic women have comparable rates of PAD (Hackler et al., 2021). However, these statistics may underestimate the true prevalence, as PAD is frequently underdiagnosed and undertreated, particularly among Black Americans, exacerbating already significant disparities.

Risk factors for peripheral arterial disease:

- Age 65 years or older
- Age 50 to 64 years with one or more of the following risk factors for atherosclerosis:
  - Diabetes mellitus
  - History of smoking
  - Dyslipidemia
  - Hypertension
  - Family history of PAD
- Age less than 50 years with:
  - Diabetes mellitus and at least one additional atherosclerotic risk factor
- Individuals with known atherosclerotic disease in another vascular bed, including:
  - Coronary artery disease
  - Cerebrovascular disease
  - Renal artery stenosis
  - Mesenteric artery stenosis
  - Abdominal aortic aneurysm

Disparities in Peripheral Arterial Disease

Black Americans not only have a higher likelihood of developing PAD compared to other racial and ethnic groups but also tend to present with more severe forms of the disease, atypical symptoms, and worse outcomes. These disparities are attributable to the increased prevalence and inadequate management of cardiovascular risk factors, such as hypertension, diabetes, chronic kidney disease, and obesity, within Black populations (Arya et al., 2018). Socioeconomic factors, including lower income, educational attainment, and access to quality healthcare, further compound these disparities. Black and Hispanic populations are less likely to receive adequate treatment for atherosclerotic risk factors such as tobacco use, hypertension, diabetes, and dyslipidemia. Socioeconomically disadvantaged groups experience chronic stress, are less likely to quit smoking, and may face challenges affording medications. Additionally, individuals with lower socioeconomic status and Medicaid insurance are more likely to undergo amputations for critical limb ischemia (Demsas et al., 2022).

Symptoms of Peripheral Arterial Disease

The hallmark symptom of PAD is intermittent claudication, characterized by exertional fatigue or cramping pain in the lower extremity muscles that subsides with

rest (typically within 10 minutes). Critical limb ischemia, a severe progression of lower extremity PAD, carries significant risks of limb amputation, cardiovascular events, and mortality. It often involves multiple areas of the lower extremity arterial system (Uccioli et al., 2018). Between 20% and 34% of individuals with an ankle-brachial index (ABI) of less than 0.9 are asymptomatic for PAD. Most patients with PAD (70%–80%) experience stable claudication, while 10%–20% develop worsening symptoms, and a fraction require revascularization. Importantly, 20% of patients experience myocardial infarction or stroke, and 15%–30% succumb to cardiovascular causes within five years of diagnosis. The EUCLID trial (n = 13,885) reported a 9.1% mortality rate over a median 30-month follow-up, with cardiovascular causes accounting for 55.9% of deaths, including sudden cardiac death (20.1%), myocardial infarction (5.2%), and ischemic stroke (3.2%). Risk factors for increased cardiovascular mortality include older age, lower ABI values, and prior amputation. Both symptomatic and asymptomatic PAD patients face similar cardiovascular risks and functional impairments (Drachman & Beckman, 2015).

Due to the frequent asymptomatic nature of PAD or misattribution of symptoms to aging or arthritis, nurses must ask specific questions to identify the condition. Symptoms often arise from increased blood demand in leg muscles during activity and resolve with rest. Nighttime foot pain, alleviated by dangling the feet to enhance blood flow, is another common symptom. Non-healing tissue loss or gangrene are signs of advanced PAD or critical limb ischemia.

Physical Examination

The physical examination allows for the detection of asymptomatic vascular disease. Observation, palpation, and auscultation are essential components of the lower extremity assessment, while percussion is less relevant. Necessary tools include a stethoscope and a Doppler device for further evaluation (Gogalniceanu et al., 2018). Nurses should alert physicians or other providers to abnormal findings.

Observation

Chronic blood supply deprivation to the lower extremities results in observable skin and tissue changes. Nurses should examine patients' feet and legs without shoes or socks. Hair loss and shiny skin may indicate ischemia, while thickened toenails and fat pad atrophy on toes or heels suggest chronic arterial insufficiency. Slow-healing ulcers, toe cracks, or gangrene are indicative of critical limb ischemia.

Clinical signs of peripheral arterial disease:

- Decreased hair growth on the legs and feet
- Trophic nail changes, which may include:
    - Brittle toenails that grow slowly
    - Changes in color or thickness of the nails

- Tissue loss or gangrene, characterized by:
    - Non-healing ulcers or sores on the feet and toes
    - Gangrene, which is the death of tissue due to inadequate blood flow
- Loss of fat pad on the toes or heels, leading to a more pronounced appearance of bones in these areas

Palpation and Auscultation

During vascular assessment, nurses should compare foot color and temperature and palpate pulses bilaterally. Auscultation for bruits over the iliac and femoral arteries is essential, especially in patients with known abdominal aortic aneurysms. If pulses are not palpable, a handheld Doppler can evaluate perfusion. Nurses should apply conduction gel, angle the Doppler probe toward the patient's head, and assess the waveform. A triphasic waveform is normal, while biphasic or monophasic waveforms suggest arterial stenosis or multi-level arterial disease.

Classification of Peripheral Arterial Disease

Peripheral arterial disease (PAD) is classified into stages based on reporting standards, ranging from stage 0 (asymptomatic) to stage 6 (critical limb ischemia with gangrene present).

Claudication

The term "claudication" originates from the Latin word meaning "to limp." It refers to non-joint-related cramping, discomfort, or fatigue in the leg muscles that occurs at a consistent distance of activity due to insufficient arterial supply to meet exertion demands. Claudication is typically relieved within 10 minutes of rest. Arterial stenosis commonly occurs at arterial bifurcations due to blood flow turbulence, and the affected muscle group is generally located below the site of the stenosis. For instance, calf muscle claudication often results from stenosis in the superficial femoral artery. Only a small percentage (<10%–15%) of patients with claudication progress to ischemia (Conte & Pomposelli, 2015).

Critical Limb Ischemia/Critical Limb Threatening Ischemia

Critical limb ischemia (CLI) or critical limb threatening ischemia (CLTI) represents a chronic progression of PAD, characterized by insufficient blood supply that, if untreated, can result in tissue or limb loss. CLI or CLTI encompasses three levels: rest pain, tissue loss, and gangrene. Rest pain, experienced as foot pain at rest, arises from inadequate blood flow to the nerves. Tissue loss occurs when skin trauma, coupled with arterial insufficiency, leads to sores or ulcers on the foot that fail to heal. Gangrene is the death of tissue caused by inadequate arterial perfusion. Patients with CLI experience elevated mortality rates surpassing those of symptomatic coronary artery disease, reflecting the extensive systemic atherosclerotic burden (Mustapha et al., 2018).

Consequences of Critical Limb Ischemia/Critical Limb Threatening Ischemia

Risk of Lower Extremity Amputation

Between 10% and 40% of CLI patients require major amputation within six months of diagnosis. Black patients with claudication, diabetes, and kidney disease face a greater risk of amputation compared to White patients with CLI (7). Moreover, nearly half of patients aged 65 years or older with PAD succumb within one year following major lower extremity amputation.

Acute Limb Ischemia

Acute limb ischemia (ALI) differs from CLI or CLTI as it involves a sudden decrease in limb perfusion, posing a potential threat to limb viability. Symptoms appear within less than two weeks (Howard et al., 2015). Globally, the incidence of ALI is 1 to 1.5 individuals per 10,000 annually. Risk factors for ALI include tobacco use, diabetes, and a history of revascularization. In some cases, ALI may be the initial indicator in a previously asymptomatic PAD patient. Mortality, morbidity, and limb loss rates in acute lower extremity ischemia remain high; limb loss rates can reach 30%, and in-hospital mortality rates for ALI are approximately 20%. ALI represents a medical emergency requiring prompt diagnosis and rapid revascularization (Björck et al., 2020, p. 2). Nurses play a critical role in detecting ALI in patients with known or suspected vascular disease.

Limb viability in ALI is assessed using the Rutherford Classification of ALI, which evaluates sensory changes, motor changes, and arterial and venous Doppler results.

Diagnostic Testing

When PAD is suspected, diagnostic tests are essential to confirm the diagnosis. Nurses should be knowledgeable about vascular diagnostic procedures and their interpretations.

Ankle-Brachial Index

The ankle-brachial index (ABI) is a simple, cost-effective screening tool for diagnosing lower extremity PAD and can be performed in inpatient or outpatient settings. Normally, ankle blood pressures are equal to or higher than arm blood pressures. The ABI is calculated as the ratio of the higher ankle systolic pressure to the higher arm systolic pressure, measured with a Doppler. The ABI's sensitivity for detecting PAD ranges from 68% to 84%, and its specificity ranges from 84% to 99%. However, in individuals with diabetes, chronic kidney disease, or advanced age, ABIs may be falsely elevated due to noncompressibility from medial artery calcification (Gerhard-Herman et al., 2017).

Toe-Brachial Index

The toe-brachial index (TBI) is a diagnostic test used when ABI is noncompressible (>1.40). Since digital arteries in the toes are rarely calcified, TBI can diagnose PAD. To calculate the TBI, a blood pressure cuff is placed on the first toe of

each foot, and the toe pressure is divided by the higher of the two arm systolic pressures measured by Doppler. A TBI of less than 0.6 or a toe pressure below 30 to 50 mm Hg indicates CLI, suggesting limited wound healing potential (Gerhard-Herman et al., 2017).

Rest and Exercise Ankle-Brachial Indices

Resting ABIs can appear normal in patients with lower extremity claudication. When vascular history suggests claudication, both rest and exercise ABIs are valuable for PAD diagnosis and are typically conducted in outpatient settings. During exercise, arterial dilation decreases leg blood pressure, and ABI decreases if arterial stenosis is present. A greater than 20% drop in ABI during exercise compared to resting ABI confirms PAD. Exercise ABIs also serve as objective measures of functional improvement after claudication treatments, such as structured exercise programs or revascularization (Alqahtani et al., 2018).

Pulse Volume Recording

Pulse volume recording (PVR), also known as plethysmography, is a noninvasive imaging test performed in outpatient settings to evaluate lower extremity blood flow using principles like ABI. PVR involves placing two blood pressure cuffs on both the thigh and calf to identify arterial stenosis origins. PAD is diagnosed when cuff pressure drops exceed 20 to 30 mm Hg. PVR confirms the anatomic location of lower extremity PAD and aids in determining treatment plans (Hashimoto et al., 2016).

Arterial Duplex Ultrasound

An arterial duplex ultrasound is a noninvasive imaging modality that utilizes color flow imaging and Doppler waveforms to assess blood flow within the arteries of the lower extremities. This test is instrumental in determining the precise anatomical location and severity of arterial stenosis. The data obtained are valuable for therapeutic planning and monitoring the patency of revascularization procedures.

Other Diagnostic Tests

Additional diagnostic modalities for assessing lower extremity PAD include computed tomography angiography (CTA), magnetic resonance angiography (MRA), and traditional angiography. These advanced tests carry inherent risks, such as contrast-induced nephropathy, allergic reactions to contrast agents, radiation exposure, and arterial injury, making them typically reserved for vascular specialist use. Nurses play a crucial role in monitoring vital signs, peripheral pulses, and kidney function and in observing access sites post-procedure.

CTA, performed with or without intravenous contrast, visualizes lower extremity arterial anatomy and identifies stenotic areas, aiding in revascularization planning. MRA employs radiofrequency waves and magnetic fields to generate detailed images of arterial blood flow. When enhanced with gadolinium-based contrast agents, the test's accuracy improves by highlighting the arteries. However, gadolinium can precipitate nephrogenic systemic fibrosis in patients with renal impairment. MRA's advantage lies in its ability to precisely delineate arterial stenosis and characterize atherosclerotic plaque. Digital subtraction arteriography, often referred to as an arteriogram, uses intravenous contrast to map and treat arterial stenoses. Access is

usually via the contralateral femoral artery, with the catheter navigating through the iliac bifurcation into the target leg for treatment.

Treatment of Peripheral Arterial Disease

Upon confirming a diagnosis of PAD, guideline-directed medical therapy (GDMT) should be implemented. This includes structured exercise programs, cardioprotective medications (such as antiplatelets, anticoagulants, statins, and antihypertensives), lifestyle adjustments, and risk factor management to reduce cardiovascular events and enhance functional capacity. However, research indicates that patients with PAD are less likely to receive GDMT compared to those with coronary artery disease (Krishnamurthy et al., 2014).

Cardiovascular Risk Factor Modification

Risk factors such as cigarette smoking, hypertension, type 2 diabetes, and dyslipidemia account for approximately 75% of the risks associated with PAD development. Addressing these factors is essential to improving patient outcomes.

Tobacco Use

Tobacco use remains a leading preventable cause of mortality. Smoking is a more potent risk factor for PAD than for coronary artery disease, increasing PAD risk by 2.3 times. Observational studies indicate that myocardial infarction, mortality, and amputation rates are significantly higher in smokers, regardless of whether they undergo lower extremity revascularization. Nurses should consistently counsel PAD patients who use tobacco to quit and assist in creating personalized cessation plans. This includes exploring nonpharmacologic strategies, pharmacotherapies (e.g., varenicline, bupropion, or nicotine replacement therapy), and referrals to cessation programs. Additionally, patients should be advised to avoid secondhand smoke exposure in all settings (Lu et al., 2018).

Hypertension

Numerous large-scale studies have demonstrated a robust correlation between hypertension and PAD. Hypertension, defined as a blood pressure ≥130/80 mm Hg,40 increases the likelihood of developing PAD by 50%. Each 20 mm Hg increase in systolic blood pressure further amplifies this risk.10 At age 60, individuals with hypertension face a 60.2% lifetime risk of cardiovascular disease. Patients with both hypertension and PAD should receive angiotensin-converting enzyme inhibitors or angiotensin receptor blockers to reduce the risk of myocardial infarction, stroke, heart failure, or cardiovascular death by 25%.

Diabetes

Patients with PAD and diabetes are at a significantly higher risk for major lower extremity amputations compared to PAD patients without diabetes. Lowering hemoglobin A1c levels to below 7.0% through GDMT has been shown to reduce microvascular complications, improve cardiovascular outcomes, and decrease limb-

related complications (American Diabetes Association Professional Practice Committee, 2022). Cardiovascular risk reduction and glucose control can also be achieved with sodium-glucose cotransporter-2 (SGLT2) inhibitors and glucagon-like peptide-1 (GLP-1) receptor agonists. Nurses can emphasize the importance of glucose management and adherence to GDMT in achieving optimal A1c targets.

Dyslipidemia

Dyslipidemia, characterized by elevated levels of total cholesterol, triglycerides, or low-density lipoprotein cholesterol (LDL-C), or decreased levels of high-density lipoprotein cholesterol (HDL-C), is a significant risk factor. In symptomatic PAD patients, the target LDL-C level is less than 70. All patients with PAD, symptomatic or asymptomatic, should be prescribed statins to reduce cardiovascular risks and enhance walking capacity. Studies have shown that statin therapy reduces adverse limb events (e.g., worsening claudication, new critical limb ischemia, revascularization, or ischemic amputation) and decreases the relative risk of peripheral vascular events, including noncoronary revascularization, aneurysm repair, major amputation, and PAD-related mortality.

Medications for Peripheral Arterial Disease

Antiplatelet Agents

Antiplatelet therapy is recommended for patients with PAD to lower the risk of myocardial infarction (MI), stroke, or cardiovascular mortality. Patients presenting with symptomatic PAD, such as lower extremity claudication or prior lower extremity revascularization, should receive antiplatelet medications like aspirin (75–325 mg daily) or clopidogrel (75 mg daily) to reduce cardiovascular events by 22%. Dual antiplatelet therapy combining aspirin and clopidogrel has shown efficacy in minimizing limb-related events in symptomatic PAD patients following lower extremity revascularization for up to six months. Studies have indicated that ticagrelor does not significantly reduce cardiovascular mortality, MI, or ischemic stroke compared to clopidogrel in patients with symptomatic PAD (Berger et al., 2018).

Phosphodiesterase Inhibitor/Antiplatelet Agents

Cilostazol, a phosphodiesterase type 3 inhibitor, enhances the deformability of red blood cells, reduces platelet aggregation, and induces vasodilation, facilitating blood flow through narrowed arteries. Cilostazol (50–100 mg twice daily) effectively alleviates claudication symptoms and increases walking distances by 40% to 60% after three to six months of use. However, cilostazol is contraindicated in patients with heart failure due to its potential to cause fluid retention, negatively affect cardiac contractility, and elevate the risk of ventricular arrhythmias.

Anticoagulants

The COMPASS trial demonstrated that combining rivaroxaban (2.5 mg twice daily) with aspirin (81 mg daily) effectively reduces major adverse cardiovascular and limb events.

Foot Care

Foot ulcers are a prevalent complication of diabetes mellitus, with an estimated lifetime risk of 19% to 34% among diabetic individuals. PAD increases the likelihood of foot ulcers, infections, and amputations. For patients with diabetes and PAD, the mortality rate reaches 40% within five years of foot ulcer onset. Contributing factors to foot ulcers include prior amputations, foot deformities, history of ulcers, peripheral neuropathy, PAD, visual impairments, poor glycemic control, and tobacco use. Preventative strategies such as foot surveillance and proper foot care can mitigate these risks. Nurses play a critical role in educating patients and their families on foot care techniques, which include nail and skin care, daily washing and drying of the feet, performing foot exercises, and using well-fitting socks and shoes to avoid foot problems.

Supervised Exercise Therapy

Supervised exercise therapy (SET) is a cornerstone of managing stable symptomatic PAD, as it enhances collateral blood flow, thereby improving claudication distance. SET has been shown to improve walking performance, functional ability, and overall quality of life. This therapy involves 60-minute sessions, conducted three times a week for 12 weeks. Patients who fail to respond to medical therapy or exhibit critical limb ischemia (CLI) characterized by ischemic rest pain, nonhealing wounds, or gangrene, should be promptly referred to a vascular specialist. For those with CLI and tissue loss, interdisciplinary care is necessary to achieve wound healing and restore functional outcomes.

Revascularization

Endovascular procedures are minimally invasive catheter-based techniques performed during arteriograms to achieve revascularization. These include the use of covered stents, cutting balloons, drug-coated balloons, and stents. Endovascular approaches for PAD, such as atherectomy and angioplasty (with or without stenting), are more commonly performed than surgical methods and have fewer complications. However, their durability is lower than surgical options, often necessitating repeat interventions. Revascularization is recommended for patients with lifestyle-limiting claudication unresponsive to guideline-directed medical therapy (GDMT) to enhance functional capacity and quality of life.

Surgical revascularization for patients with chronic limb-threatening ischemia (CLTI) often involves bypass grafting to the popliteal or infrapopliteal arteries using autogenous veins, which demonstrate superior patency compared to prosthetic grafts, particularly below the knee. Hybrid procedures, which combine endovascular and surgical techniques, are suitable for complex arterial lesions in CLI, such as pairing common femoral artery endarterectomy with endovascular treatment of the superficial femoral artery.

Team-Based Approach to Care

Patient-centered care for PAD requires shared decision-making, wherein clinicians and patients collaborate to develop a treatment plan based on clinical evidence while considering risks, benefits, and patient preferences. Given the complex nature of PAD, a multidisciplinary care team is essential for coordinating efforts in medical management, revascularization, risk reduction, and wound healing. Multispecialty teams include experts in revascularization, footwear design for pressure offloading, infection control, wound care, risk factor modification, and patient education.

Nursing care plays an integral role within this multidisciplinary framework. Nurses in both inpatient and outpatient settings must recognize the association between PAD and cardiovascular conditions, as well as identify PAD risk factors and symptoms. Routine assessments, such as removing a patient's socks during an examination, can reveal crucial findings. Nurses should be adept at conducting vascular pulse examinations and using handheld Doppler devices. Post-procedure, they are responsible for monitoring for complications and educating patients about symptoms requiring immediate attention, including rest pain, nonhealing wounds, disabling claudication, hematomas, wound dehiscence, or acute limb ischemia (ALI) symptoms such as sudden foot pain, pallor, coldness, paralysis, or paresthesia.

Conclusion

Peripheral arterial disease represents a significant global health challenge, with substantial morbidity and mortality associated with untreated or inadequately managed cases. The complex interplay of systemic atherosclerosis, cardiovascular risk factors, and socioeconomic disparities underscores the need for comprehensive management strategies. Nurses, as frontline healthcare providers, are uniquely positioned to identify PAD symptoms, perform essential diagnostic assessments, and provide education on lifestyle modifications and medication adherence. Collaborative care models integrating medical, surgical, and rehabilitative interventions can optimize patient outcomes, prevent complications such as limb loss, and improve quality of life. Continued emphasis on early detection, tailored interventions, and equitable access to care will be crucial in addressing the burdens of PAD.

References

Aday, A. W., & Matsushita, K. (2021). Epidemiology of Peripheral Artery Disease and Polyvascular Disease. *Circulation Research*, *128*(12), 1818–1832. https://doi.org/10.1161/CIRCRESAHA.121.318535

Alqahtani, K. M., Bhangoo, M., Vaida, F., Denenberg, J. O., Allison, M. A., & Criqui, M. H. (2018). Predictors of Change in the Ankle Brachial Index with Exercise. *European Journal of Vascular and Endovascular Surgery: The Official Journal of the European Society for Vascular Surgery*, *55*(3), 399–404. https://doi.org/10.1016/j.ejvs.2017.12.004

American Diabetes Association Professional Practice Committee. (2022). 9. Pharmacologic Approaches to Glycemic Treatment: Standards of Medical Care in Diabetes-2022. *Diabetes Care*, *45*(Suppl 1), S125–S143. https://doi.org/10.2337/dc22-S009

Arya, S., Binney, Z., Khakharia, A., Brewster, L. P., Goodney, P., Patzer, R., Hockenberry, J., & Wilson, P. W. F. (2018). Race and Socioeconomic Status Independently Affect Risk of Major Amputation in Peripheral Artery Disease. *Journal of the American Heart Association*, *7*(2), e007425. https://doi.org/10.1161/JAHA.117.007425

Berger, J. S., Abramson, B. L., Lopes, R. D., Heizer, G., Rockhold, F. W., Baumgartner, I., Fowkes, F. G. R., Held, P., Katona, B. G., Norgren, L., Jones, W. S., Millegård, M., Blomster, J., Reist, C., Hiatt, W.

R., Patel, M. R., & Mahaffey, K. W. (2018). Ticagrelor versus clopidogrel in patients with symptomatic peripheral artery disease and prior coronary artery disease: Insights from the EUCLID trial. *Vascular Medicine (London, England)*, *23*(6), 523–530. https://doi.org/10.1177/1358863X18775594

Björck, M., Earnshaw, J. J., Acosta, S., Bastos Gonçalves, F., Cochennec, F., Debus, E. S., Hinchliffe, R., Jongkind, V., Koelemay, M. J. W., Menyhei, G., Svetlikov, A. V., Tshomba, Y., Van Den Berg, J. C., Esvs Guidelines Committee, null, de Borst, G. J., Chakfé, N., Kakkos, S. K., Koncar, I., Lindholt, J. S., … Rai, K. (2020). Editor's Choice—European Society for Vascular Surgery (ESVS) 2020 Clinical Practice Guidelines on the Management of Acute Limb Ischaemia. *European Journal of Vascular and Endovascular Surgery: The Official Journal of the European Society for Vascular Surgery*, *59*(2), 173–218. https://doi.org/10.1016/j.ejvs.2019.09.006

Conte, M. S., & Pomposelli, F. B. (2015). Society for Vascular Surgery Practice guidelines for atherosclerotic occlusive disease of the lower extremities management of asymptomatic disease and claudication. Introduction. *Journal of Vascular Surgery*, *61*(3 Suppl), 1S. https://doi.org/10.1016/j.jvs.2014.12.006

Demsas, F., Joiner, M. M., Telma, K., Flores, A. M., Teklu, S., & Ross, E. G. (2022). Disparities in peripheral artery disease care: A review and call for action. *Seminars in Vascular Surgery*, *35*(2), 141–154. https://doi.org/10.1053/j.semvascsurg.2022.05.003

Drachman, D. E., & Beckman, J. A. (2015). The Exercise Ankle-Brachial Index: A Leap Forward in Noninvasive Diagnosis and Prognosis. *JACC. Cardiovascular Interventions*, *8*(9), 1245–1247. https://doi.org/10.1016/j.jcin.2015.06.006

Gerhard-Herman, M. D., Gornik, H. L., Barrett, C., Barshes, N. R., Corriere, M. A., Drachman, D. E., Fleisher, L. A., Fowkes, F. G. R., Hamburg, N. M., Kinlay, S., Lookstein, R., Misra, S., Mureebe, L., Olin, J. W., Patel, R. A. G., 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: Executive Summary: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Circulation*, *135*(12), e686–e725. https://doi.org/10.1161/CIR.0000000000000470

Gogalniceanu, P., Lancaster, R. T., & Patel, V. I. (2018). Clinical Assessment of Peripheral Arterial Disease of the Lower Limbs. *The New England Journal of Medicine*, *378*(18), e24. https://doi.org/10.1056/NEJMvcm1406358

Grundy, S. M., Stone, N. J., Bailey, A. L., Beam, C., Birtcher, K. K., Blumenthal, R. S., Braun, L. T., de Ferranti, S., Faiella-Tommasino, J., Forman, D. E., Goldberg, R., Heidenreich, P. A., Hlatky, M. A., Jones, D. W., Lloyd-Jones, D., Lopez-Pajares, N., Ndumele, C. E., Orringer, C. E., Peralta, C. A., … Yeboah, J. (2019). 2018 AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA/PCNA Guideline on the Management of Blood Cholesterol: Executive Summary: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Journal of the American College of Cardiology*, *73*(24), 3168–3209. https://doi.org/10.1016/j.jacc.2018.11.002

Hackler, E. L., Hamburg, N. M., & White Solaru, K. T. (2021). Racial and Ethnic Disparities in Peripheral Artery Disease. *Circulation Research*, *128*(12), 1913–1926. https://doi.org/10.1161/CIRCRESAHA.121.318243

Hashimoto, T., Ichihashi, S., Iwakoshi, S., & Kichikawa, K. (2016). Combination of pulse volume recording (PVR) parameters and ankle-brachial index (ABI) improves diagnostic accuracy for peripheral arterial disease compared with ABI alone. *Hypertension Research: Official Journal of the Japanese Society of Hypertension*, *39*(6), 430–434. https://doi.org/10.1038/hr.2016.13

Howard, D. P. J., Banerjee, A., Fairhead, J. F., Hands, L., Silver, L. E., Rothwell, P. M., & Oxford Vascular Study. (2015). Population-Based Study of Incidence, Risk Factors, Outcome, and Prognosis of Ischemic Peripheral Arterial Events: Implications for Prevention. *Circulation*, *132*(19), 1805–1815. https://doi.org/10.1161/CIRCULATIONAHA.115.016424

Krishnamurthy, V., Munir, K., Rectenwald, J. E., Mansour, A., Hans, S., Eliason, J. L., Escobar, G. A., Gallagher, K. A., Grossman, P. M., Gurm, H. S., Share, D. A., & Henke, P. K. (2014). Contemporary outcomes with percutaneous vascular interventions for peripheral critical limb ischemia in those with and without poly-vascular disease. *Vascular Medicine (London, England)*, *19*(6), 491–499. https://doi.org/10.1177/1358863X14552013

Lu, L., Mackay, D. F., & Pell, J. P. (2018). Secondhand smoke exposure and risk of incident peripheral arterial disease and mortality: A Scotland-wide retrospective cohort study of 4045 non-smokers with

cotinine measurement. *BMC Public Health*, *18*(1), 348. https://doi.org/10.1186/s12889-018-5227-x

Mustapha, J. A., Katzen, B. T., Neville, R. F., Lookstein, R. A., Zeller, T., Miller, L. E., & Jaff, M. R. (2018). Disease Burden and Clinical Outcomes Following Initial Diagnosis of Critical Limb Ischemia in the Medicare Population. *JACC. Cardiovascular Interventions*, *11*(10), 1011–1012. https://doi.org/10.1016/j.jcin.2017.12.012

Uccioli, L., Meloni, M., Izzo, V., Giurato, L., Merolla, S., & Gandini, R. (2018). Critical limb ischemia: Current challenges and future prospects. *Vascular Health and Risk Management*, *14*, 63–74. https://doi.org/10.2147/VHRM.S125065