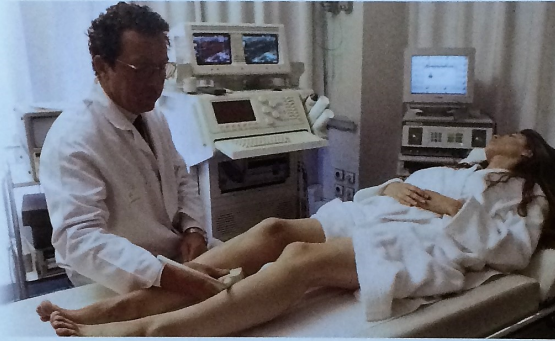


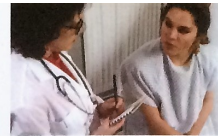
PERIPHERAL ARTERIAL DISEASE

A Physician's Guide
to Diagnosis and
Patient Management



Broadening Your
Perspective in Patient Care

Peripheral Arterial Disease Physicians' Guide Sample Copy and Layout



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Broadening Your Perspective in Patient Care

AN INTRODUCTION

Peripheral Arterial Disease* (PAD) is a serious and potentially life-threatening condition affecting about 8 to 12 million people in the United States. It is a significant concern that the disease goes undetected in more than half of these people.

As we know, PAD increasingly affects older patients with high blood cholesterol as well as diabetics and smokers. Over time, their arteries can become partially or completely blocked with plaque causing poor circulation in the extremities. As a result, patients may experience leg discomfort or pain from poor circulation. If left untreated, skin ulcers, non-healing wounds, and gangrene can occur, resulting in devastating consequences.

This guide is about Peripheral Arterial Disease. It provides an overall discussion of PAD including disease characteristics, patient groups who are at risk, and patient management that can help in preventing further progression of the disease.

The goal, then, is to promote a greater awareness of PAD in patients you routinely see, helping to increase its detection rate and enhance treatment outcomes. The goal is also to recognize the important role of the vascular specialist in consultation for your patient management.

* Also known as Peripheral Vascular Disease (PVD), leg atherosclerosis, or claudication.

A CLINICAL PERSPECTIVE

As a clinician, you, in all likelihood, have encountered PAD in many of your patients. And, you are well aware of various symptoms and major risk factors associated with PAD.

- 2 Yet, are you attuned to the full spectrum of the disease as it occurs? That is, what impact does it have on the patients you are seeing? What are some critical risk factors that patients should know about? And what more can you do to successfully address the problem of Peripheral Arterial Disease that would ultimately help improve the quality of life for your patients?

This guide offers a clinical perspective of PAD in alerting you to its various aspects that may prove helpful in your practice.



REVIEWING THE CHALLENGES OF PAD

Atherosclerosis is a systemic disease that affects all the arteries in the body. It is a well-known condition where lesions of plaque form in the intimal lining of arteries causing obstructions or partial blockages to the blood supply. As such, atherosclerosis is the same disease that causes heart attacks and strokes, by obstructing those arteries that supply the heart or brain. In addition, it also causes Peripheral Arterial Disease, by obstructing those arteries that supply the legs and feet.

With PAD, obstructed or partially blocked arteries create conditions of ischemia in the lower extremities. As circulation is poor and oxygen is deficient in muscle, it often leads to claudication, a condition of lameness and pain.

In efforts to bypass blockages, the body, at times, develops collateral blood vessels. Such vessels, however, may not always be able to support demands for additional blood downstream, especially during periods of increased walking and exercise. As a result, patients can experience intermittent claudication during these times which is usually relieved following a short period of rest.

Pain and discomfort with intermittent claudication occurs commonly in the calves yet it is often present in the buttocks, thighs, hips, and at times, in the feet.

Other potential problems associated with leg atherosclerosis include:

- ☐ Non-Healing Wounds;
- ☐ Skin Ulcers;
- ☐ Neurologic Impairment; and
- ☐ Tissue Necrosis (with the potential for limb amputation).

PATIENT RISK FACTORS

In addition to the conditions and potential problems caused by atherosclerosis, it is important to review the most significant patient risk factors that may contribute to PAD; they are:

- 4
- PATIENT'S BACKGROUND
- ☐ Age*
 - ☐ Race
 - ☐ Gender**
 - ☐ Family History
- PATIENT'S LIFESTYLE
- ☐ Smoker***
 - ☐ Use of Alcohol and Drugs
 - ☐ Diet and Eating Habits
 - ☐ Lack of Regular Exercise
 - ☐ Stress Levels
 - ☐ Occupation
- PATIENT'S DISEASE STATE
- ☐ Type 2 Diabetes***
 - ☐ Overweight / Obesity
 - ☐ Hypertension
 - ☐ Hyperlipidemia
 - ☐ Coronary Artery Disease
 - ☐ Renal Disease

In evaluating patient risk factors and the conditions associated with PAD, consultation with a vascular specialist can help determine their significance as to disease onset, length of occurrence, severity, and impact on your patient's health status.

Such an evaluation will help establish interventional / surgical goals designed to prevent further disease and contribute to the desired improvement of your patient's overall health.

WHAT YOUR PATIENTS MAY TELL YOU

In addition to a routine physical examination, you may observe or your patients may tell you about conditions that may suggest Peripheral Arterial Disease; they include:

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- ☐ Pain in Calves, Thighs, Hips, and Buttocks
 - Pain with exercise and walking but relieved with rest
 - Pain may cause a tired, lame, heavy, or achy sensation
 - ☐ Pain or Discomfort in the Feet
 - Pain is relieved with legs in dependent position
 - Discomfort from the pressure of bed sheets
 - ☐ Resting Pain
 - Pain that starts in the feet and toes and wakes the patient in the middle of the night
 - ☐ Weakness, Numbness, or Tingling
 - ☐ Coldness or Icy Sensation
 - ☐ Skin or Toe Discoloration
 - ☐ Pallor with Elevation
 - ☐ Loss of Leg Hair
 - ☐ Non-Healing Wounds or Skin Ulcers
 - ☐ Impotence

In quantifying the pain, you may want patients to refer to a pain measurement rating scale for determining their level of discomfort or severity of pain.

* Intermittent Claudication is likely to occur more in patients over age 50.

** PAD is predominantly, but not exclusively, a male disease.

*** Greater risk of developing atherosclerosis and poorer outcomes with onset of PAD.



RELEVANT PHYSICAL FINDINGS

If you should observe any of these symptoms or your patients report any of these conditions, there may be a possibility of Peripheral Arterial Disease. You should consider further evaluation:

- ☐ Check Pulses, Thrills, and Bruits
 - Femoral Popliteal, Posterior Tibial, and Dorsalis Pedis
- ☐ Check for Atrophic Skin Changes or Dependent Rubor
- ☐ Check Capillary Refill
- ☐ Check for Palpable Aneurysms
 - Abdomen, Groin, or Behind the Knee

CONFIRMING YOUR EVALUATIONS

Having recognized risk factors and disease symptoms in your patients, you can perform other tests to further help in your diagnosis and confirm your evaluation.

ANKLE-BRACHIAL INDEX

One recommended test is the ankle-brachial index (ABI). It's a simple, reliable means to help diagnose the presence of PAD; it's also the least expensive. If the test is not included in the patient's routine physical, it is recommended that a vascular specialist perform this procedure.

The ABI compares blood pressure in both arms with that in the ankle. Perform these blood pressure readings with a Doppler ultrasound diagnostic instrument.

To obtain the ABI, divide the systolic blood pressure in the ankle by the highest of the two systolic pressures from the arms. If the pressure measurement is:

- ☐ Between 0.91 – 1.2 ABI is Normal
 - Very Low Probability of PAD
- ☐ 0.90 or lower
 - Presence of PAD
- ☐ 0.40 or lower
 - Severe Presence of PAD

When the test results are normal, it is recommended that an ABI be repeated every five years.

Test results greater than 1.2 are likely due to non-compressible arteries of long-standing diabetes, old age, or calcification in the arteries. In such cases, the ABI cannot be relied on to detect PVD.

CONFIRMING YOUR EVALUATIONS

CONTINUED

TOE-BRACHIAL INDEX

Another test to help diagnose the presence of PAD is the toe-brachial index (TBI). A very specialized test, it is similar to the ABI except it is performed with a photoplethysmograph (PPG) infrared light sensor and a very small blood pressure cuff placed around the toe. This diagnostic tool may be used in patients who have rigid ankle blood vessels.

And like the ABI, the toe-brachial index is a calculation based on the systolic blood pressures of the arms and, in this test, of the toes. A TBI of 0.8 or greater is considered to have a very low probability of PAD. A vascular specialist can perform this procedure, as appropriate.

PULSE VOLUME RECORDINGS

Pulse volume recordings (PVRs) are common studies that are generally used to confirm or refute the diagnosis of Peripheral Arterial Disease using bi-lateral volumetric measurements from the femoral popliteal, posterior tibial, and dorsalis pedis arteries.

TRANSCUTANEOUS OXYGEN PRESSURES

Another test, transcutaneous oxygen pressures, measures skin oxygen levels. In this test, arterial calcification does not affect the measurements. It is preferable, however, to have the test performed by a vascular specialist.

LEG-ARTERIAL ULTRASOUND

Another available test is the leg-arterial ultrasound. This test is an imaging study which is usually performed after diagnosis of ischemia. An ultrasound is useful in locating specific lesions.



BEGINNING TREATMENT OF PAD

Treatment of Peripheral Arterial Disease is aimed at improving the flow of blood by removing or lessening the cause of impaired circulation.

Often a course of treatment of PAD will include initiating a healthier lifestyle through a proper diet, regular exercise, and by limiting or removing poor habits like smoking. Such measures work to help relieve leg pain and lower the risk of a heart attack or stroke.

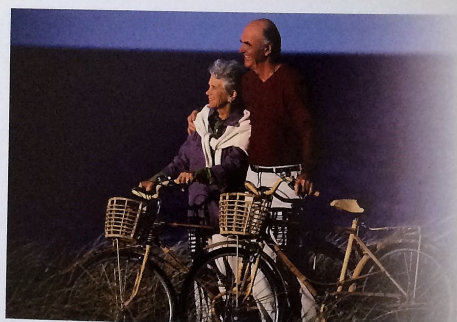
Proper exercise, for example, enables muscles to use oxygen more efficiently. And a healthy diet, of course, can be instrumental in controlling blood pressure and cholesterol levels. Special attention is critical especially in controlling diabetes.

Medications, too, work to lower blood pressure and cholesterol levels within normal range. Drugs may be prescribed to help prevent blood clotting or relieve pain.

These suggestions are usually sufficient in cases of mild PAD causing claudication. There are times, however, when other interventional or surgical procedures are required, in which cases conferring with a vascular specialist can be of particular value.

INITIATING A HEALTHIER LIFESTYLE

- ☐ Proper Diet Regimen
- ☐ Weight Reduction Program
- ☐ Exercise Program
- ☐ Smoking Cessation
- ☐ Stress Management Consultation / Therapy
- ☐ Relaxation Exercises
- ☐ Medication to:
 - Lower Blood Pressure
 - Lower Cholesterol Levels
 - Manage Pain and Discomfort
 - Prevent Blood Clotting
- ☐ Behavior Modification
- ☐ Patient Education / Compliance Programs
- ☐ Changes in Lifestyle and Occupation



CONFERRING WITH A VASCULAR SPECIALIST

Physicians specially trained in the field of vascular disease provide the best consultation for attending clinicians in their management of patients with Peripheral Arterial Disease.

The seriousness of PAD demands accurate diagnosis of patients with symptoms and accompanying risk factors as soon as possible and the assurance of providing the most appropriate treatments available.

In patient evaluation, the vascular specialist may uncover the need for more aggressive treatment beyond what can be normally provided by attending clinicians. This is usually necessary in patients with rest pain or tissue loss such as non-healing ulcers or gangrene.

Treatments or procedures that a vascular surgeon / interventionalist may recommend, as appropriate, include:

- ☐ Angioplasty
- ☐ Thrombolytic Therapy
- ☐ Dec clotting
- ☐ Bypass Grafting
- ☐ Stenting / Endovascular Stenting

REMAINING ALERT TO THE SIGNS OF PAD

Clinicians who are alert to the signs of Peripheral Arterial Disease have an opportunity to lessen the potential severity of pain, suffering, and, perhaps, amputation in those affected by this serious disease. Patients, too, should be encouraged to be alert in reporting signs of claudication, thus enabling early treatment.

Attending clinicians together with vascular specialists can make a difference that will be rewarded by helping to restore PAD patients to a healthier life.

QUICK GUIDE TO TERMINOLOGY

ACUTE ISCHEMIA

A deficiency of blood in a specific area of the body caused by an obstruction in a blood vessel.

12

ANGIOPLASTY

A procedure for the surgical repair of an artery whereby a balloon-tipped catheter is passed through a blood vessel to the area that is blocked by atherosclerotic plaque. The balloon is inflated and compresses the plaque against the wall of the artery. A stent may also be deployed in the artery to help maintain patency.

ATHEROSCLEROSIS

A condition characterized by the accumulation of fatty substances within the inner layer of an artery causing blockage that can interfere with blood flow.

BYPASS GRAFTING

A surgical procedure to reroute the flow of blood around a blocked or partially blocked section of an artery. The procedure involves harvesting a section of autologous vein, or using a synthetic graft material such as expanded polytetrafluoroethylene (ePTFE), and connecting it to the artery, above and below the blockage, creating a bypass.

INTERMITTENT CLAUDICATION

A condition characterized by lameness and pain, usually in the calf muscles, caused by ischemia. Intermittent claudication is brought on by walking or exercise and is relieved when the limb is at rest. The condition may occur in other muscles including those of the buttocks, hips, thighs, and feet.

PERIPHERAL ARTERIAL DISEASE

Disease that affects arteries or blood vessels that carry blood to the extremities. It is also called peripheral vascular disease, leg atherosclerosis, claudication, or poor circulation.

THROMBOLYTIC THERAPY

A procedure where a clot-dissolving drug is administered in order to eliminate an obstruction.

VASCULAR SPECIALIST

A trained specialist in the diagnosis and treatment of vascular disease in surgical and interventional therapies.

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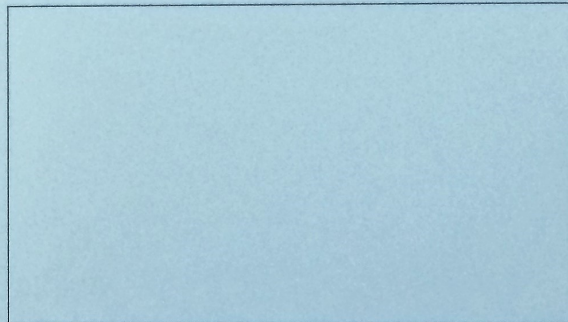
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