

## SCIENTIFIC SYMPOSIUM REPORTS

### CLINICAL VASCULAR MEDICINE

This educational symposium was held in conjunction with the  
Society of Interventional Radiology Annual Meeting • March 27, 2003 • Salt Lake City, Utah

#### Faculty

##### Medical Therapy of PAD

###### Alain T. Drooz, MD

Chief, Division of Vascular and  
Interventional Radiology  
Inova Fairfax Hospital  
Falls Church, Virginia

##### PAD: Natural History and Epidemiology

###### Michael R. Jaff, DO

Director, Vascular Medicine and  
Vascular Diagnostic Laboratory  
Lenox Hill Hospital  
New York, New York

##### Clinical Clues to the Diagnosis of PAD

###### Jeffrey W. Olin, DO

Director, Vascular Medicine  
Zena and Michael A. Weiner  
Cardiovascular Institute  
Mount Sinai School of Medicine  
New York, New York

##### Noninvasive Evaluation of PAD:

###### What I Like and Why

###### Keith M. Sterling, MD

Director, Department of Cardiovascular  
and Interventional Radiology  
Inova Alexandria Hospital  
Alexandria, Virginia

##### Wound Care Principles: Heal It or Lose It

###### Thomas W. Rooke, MD

Head, Section of Vascular Medicine  
John and Posy Krehbiel Professor  
of Vascular Medicine  
Mayo Clinic  
Rochester, Minnesota

## Medical Therapy for PAD—OR—What to Do Before, After, or Instead of Angioplasty

Angioplasty and stenting can result in beautifully revascularized arteries in patients with peripheral arterial disease (PAD), acknowledged Alain T. Drooz, MD, Chief, Division of Vascular and Interventional Radiology of Inova Fairfax Hospital, Falls Church, VA. “But is that the answer for every patient with symptomatic PAD?” he asked.

### Flow ≠ Function

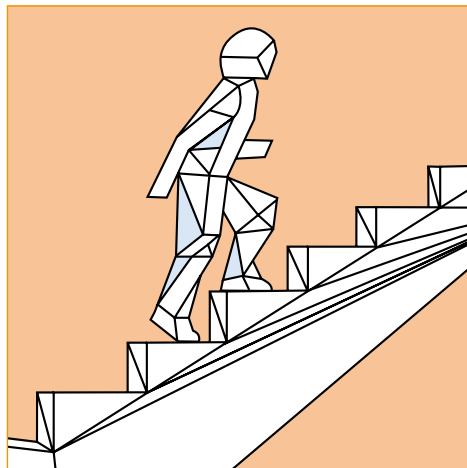
Dr. Drooz provided some hard evidence to back up his assertion that revascularization procedures alone do not yield the greatest clinical benefit for patients with PAD. Studies have shown fairly high rates for repeat interventions (from 17% at 1 year to 26%

at 4 years), and successful restoration of flow has not been correlated with improved function. In the Oxford Trial conducted by Creasy and colleagues, patients assigned to supervised exercise showed better functional improvement (measured by the increase in walking distance) than patients assigned to angioplasty, while the angioplasty group showed significant improvements in the ankle-brachial index (ABI) but no corresponding change in walking ability.

Treatment goals for PAD patients, particularly those suffering from intermittent claudication, should focus on improving functional status, and therefore quality of life, as well as restoring blood flow to the ischemic limb. For many of these patients, this does not involve angioplasty or stent placement. An overall treatment plan for PAD should also take into account the likelihood of systemic atherosclerosis, for which PAD is a strong marker. As Dr. Drooz explained, “Everywhere there is an artery, there is going to be disease [in patients with PAD].”

### Secondary Prevention Strategies

Because PAD magnifies the risk of cardiovascular events, all patients with



This symposium was jointly organized by the Society of Interventional Radiology (SIR) and the Society for Vascular Medicine and Biology (SVMB).

The SIR consists of specialists devoted to advancing patient care with vascular and nonvascular disease through the innovative integration of clinical and imaging-based diagnosis and minimally invasive therapy.

The SVMB is a professional organization that was founded in 1989 to improve the integration of vascular biological advances into medical practice, and to maintain high standards of clinical vascular medicine. In addition, the SVMB prides itself in establishing Vascular Medicine training programs and fostering formal vascular research and educational activities for medical students, residents, and fellows.

## Secondary Prevention Goals for PAD Patients

- Smoking cessation
- LDL <100 mg/dL
- Triglycerides <150 mg/dL
- Diabetes control (HbA<sub>1c</sub> <7%)
- Blood pressure <130/85 mm Hg
- Reduced cardiovascular disease risk (other): antiplatelet therapy, ACE inhibitors, weight control

the disease should be enrolled in secondary prevention, according to Dr. Drooz (see Box).

“Smoking cessation is difficult, and you are not going to get a home run with very many of your patients when you tell them to stop smoking,” Dr. Drooz admitted. A variety of strategies for discontinuing smoking are now available, such as behavioral therapy/counseling, the nicotine patch, and bupropion.

A number of trials have provided convincing evidence for the use of lipid-lowering therapy, angiotensin-converting enzyme (ACE) inhibitor treatment, and antiplatelet therapy in patients with PAD. In the Scandinavian Simvastatin Survival Study (4S), statin therapy not only significantly reduced total mortality and cardiovascular-related mortality, it also cut the 5-year risk of new or worsening claudication by 38%. In the Heart Outcomes Prevention Evaluation (HOPE) study, high-risk patients (42% of whom had PAD) treated with an ACE inhibitor experienced a 22% drop in the risk of fatal or nonfatal cardiovascular events.

Placebo-controlled trials have proved that antiplatelet therapy with aspirin reduces the risk of fatal and nonfatal cardiovascular events in patients with PAD. A trial comparing clopidogrel with aspirin found an overall reduction in the relative risk of the composite endpoint of stroke, myocardial infarction, or vascular death of over 8.7% in favor of clopidogrel. The difference between treatments was magnified in the PAD subgroup, which experienced a 24% risk reduction with clopidogrel.

## *Cilostazol, a phosphodiesterase III inhibitor, raises cellular and platelet cyclic AMP levels.*

Dr. Drooz then went on to discuss primary prevention strategies, which he defined as exercise and medication intended to address functional disability.

### **Exercise Works**

To convince the audience that exercise is effective, Dr. Drooz referred to meta-analyses showing exercise-induced increases in walking ability ranging from 122% to 150%. He went on to specify the characteristics of a good exercise program: supervised treadmill walking for >30 minutes a session 3 to 5 times weekly, exercise to near-maximal pain, and participation for a duration of 6 months. He also pointed out that exercise might confer

a number of benefits that will not necessarily occur with revascularization alone (see Box).

### **Possible Effects of Exercise**

- Improved oxygen extraction by skeletal muscle
- Decreased accumulation of metabolic intermediates
- Improved endothelial function
- Decreased blood viscosity
- Gait training
- Decreased inflammation

Exercise programs are not without their barriers to success, however. For one thing, a supervised rehabilitation program of treadmill walking is necessary for optimal improvement in claudication pain symptoms. The group setting promotes adherence that is difficult to maintain at home unless the patient is quite motivated. On-site instruction also ensures more consistent exercise intensity. However, exercise programs are not generally reimbursed. A new CPT code has been assigned (93668), but payment is likely to be modest.

### **Pharmacotherapy**

Regarding medications that increase walking capacity, Dr. Drooz focused on cilostazol, a phosphodiesterase III (PDE III) inhibitor that raises cellular and platelet cyclic AMP levels. The drug's mechanism of action is multifactorial. It produces vasodilation, inhibits platelet aggregation, and has

*continued on page 6*

*Adelphi Scientific Symposium Reports* are published by Adelphi Inc. This issue is supported by an educational grant from Otsuka America Pharmaceutical, Inc. in partnership with Pfizer Inc. The material reflects the views of the speakers cited and not necessarily those of Adelphi Inc., Otsuka America Pharmaceutical, Inc., or Pfizer Inc. Address all correspondence to: *Adelphi Scientific Symposium Reports*; Adelphi Inc.; 30 Irving Place; 10th floor; New York, New York 10003. Telephone: (646) 602-7060; Fax (646) 602-7061.

Copyright 2003 by Adelphi Inc. All rights reserved. ISSN# 1540-0409.

#### **Co-editors**

Alain T. Drooz, MD  
Chief, Division of Vascular and  
Interventional Radiology  
Inova Fairfax Hospital  
Falls Church, Virginia

Jeffrey W. Olin, DO  
Director, Vascular Medicine  
Zena and Michael A. Weiner  
Cardiovascular Institute  
Mount Sinai School of Medicine  
New York, New York

# PAD Facts Highlight Need for Improved Diagnosis

Peripheral arterial disease (PAD) is often considered a minor player within the context of atherosclerotic disease, overlooked by both physicians and patients in favor of the more commonly known entities of coronary artery disease (CAD) and cerebrovascular disease. Michael R. Jaff, DO, of Lenox Hill Hospital in New York City, promised to give his audience compelling practical information they could use to correct their patients' misperceptions concerning the importance of PAD.

## How Common Is PAD?

PAD affects an estimated 8 to 12 million Americans, making it as common as stroke, transient ischemic attack (TIA), or acute coronary syndrome. The prevalence of this disease is commonly grossly underestimated for two reasons: The majority of PAD patients are asymptomatic, and the syndrome is poorly recognized by both clinicians and patients. Screening programs using the ankle-brachial index (ABI) as a diagnostic aid have reported prevalence rates from around 25% (the Minnesota Regional PAD Screening Program) to 30% (PAD Awareness, Risk, and Treatment: New Resources for Survival [PARTNERS] program) in selected high-risk populations. The ABI is a convenient office tool that is useful for detecting early, asymptomatic PAD (see Box).

## Why Is Early Diagnosis Important?

If most patients with PAD are asymptomatic, why does early diagnosis matter? Dr. Jaff referred to the seminal study by Criqui and colleagues to illustrate the heightened health risks seen in patients with PAD. As would be expected, the presence of severe symp-

### Ankle-Brachial Index

≥0.90	Normal
<0.90 – 0.75	Mild disease
<0.75 – 0.40	Moderate disease (IC)
<0.40	Severe disease

tomatic disease markedly lowered the 10-year survival rate. But the critical message in this study was the dramatic reduction in survival of patients with asymptomatic PAD compared with normal subjects (see Figure 2).

Dr. Jaff explained that the presence of PAD escalates the risk of death from other atherosclerotic manifestations, such as acute coronary syndromes and stroke or TIA (see Box). In a VA study of almost 3000 symptomatic patients, the mortality rate was 12% per year. “That is a 5-year mortality rate that is absolutely incredible,” Dr. Jaff said. Two thirds of the deaths in this population were due to heart disease.

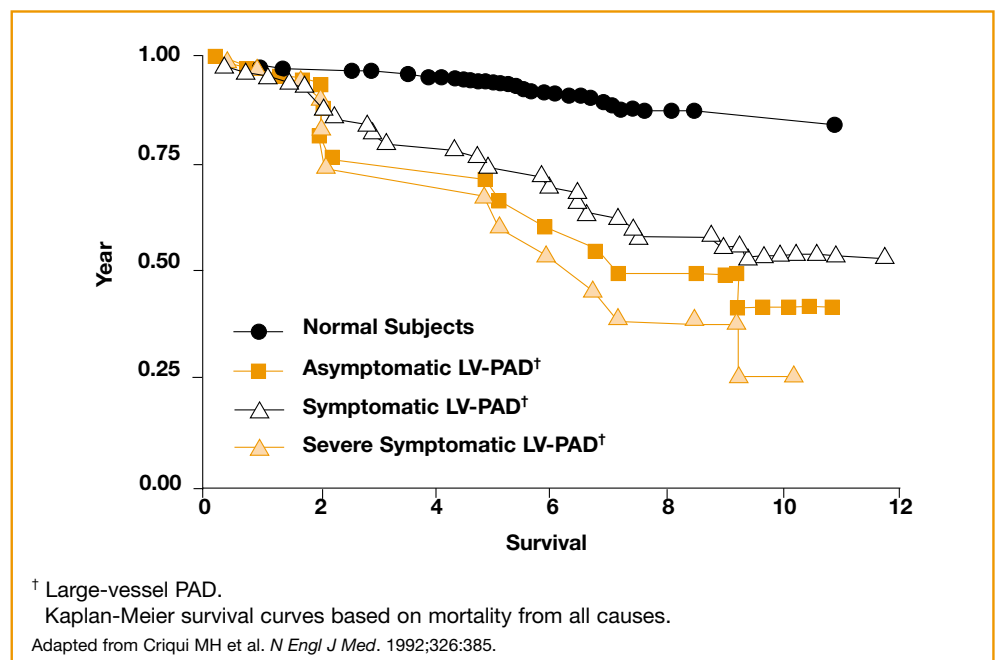
## ABI Predicts Outcome

The ABI is useful not only for PAD diagnosis, but also for determining risk of future cardiovascular events: For every 0.1 decrease in ABI, the relative risk for vascular events (myocardial infarction, ischemic stroke, or vascular death) increases by 10%. The ABI is also useful for evaluating function in PAD patients. “The lower the ABI, the more functionally impaired the patients are,” Dr. Jaff said. A study by McDermott and colleagues confirmed this, showing that almost 40% of patients with an ABI <0.7 and more than 60% of those with an ABI <0.4 had to stop during a 6-minute walking test.

### PAD Link to Mortality

- PAD itself is not usually a cause of death
- PAD markedly increases the relative risk (RR) of death
  - 3.1 RR for all-cause mortality
  - 5.9 RR for cardiovascular-related mortality
  - 6.6 RR for CAD-related mortality
- Increased risk applies to both symptomatic and asymptomatic PAD patients

*continued on page 6*



**Figure 2: PAD and All-Cause Mortality**

## A Look at the Broad Spectrum of Vascular Disease

Jeffrey W. Olin, DO, Director of Vascular Medicine at Mount Sinai School of Medicine in New York City, advised specialists in vascular medicine to cultivate a keen power of observation. They will need this asset, he explained, to distinguish the various entities included in the broad spectrum of arterial, venous, lymphatic, and other diseases they are likely to

*Vascular imaging and intervention involve complete diagnostic and therapeutic strategies for patients with vascular disease.*

encounter. Many of these diseases can have presentations that overlap the clinical presentation of peripheral arterial disease (PAD). Dr. Olin provided an overview of typical, atypical, and rare disorders, offering helpful diagnostic and treatment tips along the way.

### Disorders of Arterial Origin

Atheromatous embolization, the fragmentation and embolization of atherosclerotic debris, is too frequently misdiagnosed, in Dr. Olin's opinion. The disorder manifests clinically as a live-do pattern on the lateral portion of the foot and heels and cyanosis of the toes. If both feet are involved, the embolization originates above the aortic bifurcation. Atheroembolization is most common after catheter interventions, but can also occur spontaneously, although this is uncommon. In addition to skin symptoms, this syndrome can have renal, neurologic, cardiac, gastrointestinal, and constitutional manifestations. Dr. Olin pointed out that a

number of disorders can be mistaken for atheromatous embolization, including pernio, or chilblains (a cold-induced vasospastic disorder), vasculitis, and antiphospholipid antibody syndrome.

To illustrate the importance of thorough investigation of an ischemic presentation, Dr. Olin described a 28-year-old patient with an ischemic-like foot ulcer who had normal ankle pulses. Allen's test revealed the presence of small-vessel occlusive disease in the hand. These diagnostic clues led to a diagnosis of thromboangiitis obliterans, or Buerger's disease, which occurs only in tobacco users, usually heavy smokers. Dr. Olin pointed out that the type of lesion seen in this patient, an ischemic ulcer distally associated with superficial thrombophlebitis, is seen in 40% of cases of Buerger's disease (Figure 3). Patients with this disease can prevent amputation by discontinuing tobacco use before gangrene develops. Approximately 40% to 50% of these patients who do not stop smoking, however, will require amputation. Leukocytoclastic vasculitis, another small-vessel disease, is characterized by palpable purpura and can be associated with a number of ailments, includ-



Figure 3: Typical Lesion in Buerger's Disease

ing lupus, rheumatoid arthritis, lymphoproliferative malignancies, endocarditis, and hepatitis C.

When ischemic lesions appear in atypical locations—in other words, not over bony prominences or distally—the clinician should keep a number of possibilities in mind, including atheromatous embolization, insect bites, trauma, vasculitis, and hypertensive ulcer.

### Disorders of Nonarterial Origin

Phlegmasia cerulea dolens is an iliofemoral deep vein thrombosis in which all the collaterals are thrombosed. "So blood can get into the leg, but it can't get out," Dr. Olin explained. Early diagnosis of this disorder is essential because once irreversible gangrene sets in, amputation will be necessary. If caught at the early stage, however, these lesions are reversible with catheter-directed thrombolytic therapy, or surgical or mechanical thrombectomy.

Chronic venous insufficiency is also fairly common. Dr. Olin reminded the audience that venous ulcers can degenerate into squamous cell carcinoma. He estimated the cost of healing a venous ulcer at about \$10,000.

Dr. Olin brought home the importance of ordering appropriate diagnostic tests by describing the case of a patient who presented with intense calf pain of sudden onset in association with swelling. A venous duplex scan showed rupture of the medial head of the gastrocnemius tendon. "If you start these patients on heparin, they bleed extensively into their calf, and they can actually develop a compartment syndrome from so much bleeding." Ultrasound revealed that the patient's pain was due to a muscle tear, rather than a vascular cause. ■

# Noninvasive Evaluation of Suspected PAD

Diagnostic accuracy, a top priority for any patient care system, is enhanced when the physician matches the clinical question to the capabilities of the diagnostic test, according to Keith M. Sterling, MD, Director, Cardiovascular and Interventional Radiology, Inova Alexandria Hospital, Alexandria, VA.

Dr. Sterling discussed evaluation of the peripheral arterial disease (PAD) patient from the context of his practice, an in-hospital noninvasive interventional radiology lab. He identified a number of key questions that should be answered by the patient evaluation (see Box). Noninvasive tests are “uniquely suited” to correlate symptoms with physiologic changes related to PAD and are also excellent methods for patient follow-up. Dr. Sterling said that he and his colleagues take a nontraditional approach by using their noninvasive vascular laboratory as a clinic. They first perform noninvasive physiologic tests and supplement with anatomic evaluations (eg, duplex ultrasound). Following this, a physician will see the patient and provide recommendations that may include risk fac-

## PAD Patient Evaluation

- Does the patient have disease?
- Where is the disease?
- How does the disease relate to the patient presentation?
- What are the therapeutic options?
- What are the results of therapy?

## Advantages of Doppler Waveform Analysis

- Simple, limited equipment
- Reproducible
- Segmental anatomic information
- Not affected by calcific, non-compliant vessels
- Complementary to segmental pressures

tor modification, an exercise program, or arteriography with possible revascularization.

## Physiologic Assessment

Ankle-brachial indices (ABIs), segmental limb pressures, Doppler waveform analysis, and volume plethysmography are the main components of noninvasive physiologic examination. Each aspect of the examination will provide complementary information about the severity and nature of disease present (see Table 1). Segmental limb pressures, ABIs, and Doppler waveforms provide anatomic information. Volume plethysmographic waveforms provide information about overall limb perfusion. Digital photoplethysmography (DPP) can be performed in patients in whom limb-threatening ischemia may be present and information about healing potential is needed. In addition, when conditions such as vasculitis are suspected, DPP can be performed following warm or cold temperature immersion.

“Exercise testing is mandatory in all patients with normal resting studies,”

## Advantages of Segmental Volume Plethysmography

- Estimation of overall perfusion of the limb
- Simple, limited equipment
- Reproducible (not tech-dependent)
- Segmental anatomic information
- Not affected by calcific, non-compliant vessels
- Complementary to segmental limb pressures and Doppler waveform analysis

## Disadvantages of Segmental Volume Plethysmography

- Difficult to detect mild disease
- Limited anatomic information
  - Segmental data
  - Unable to reliably distinguish occlusion from stenosis
- May “normalize” with collaterals

Dr. Sterling emphasized. Exercise testing can be particularly helpful in patients with mild symptoms or atypical presentations. A positive exercise test will demonstrate exercise-induced ischemia, which will be reflected in changes in the plethysmographic tracing commonly obtained at the ankle level.

Dr. Sterling stated, “Each test has a unique set of characteristics which determines its utility in the evaluation of a suspected vascular abnormality. The decision of which test to perform should depend on matching the question at hand to the characteristics of the examination.”

## Anatomic Assessment

Dr. Sterling said that anatomic testing is most useful when a specific anatomic question has been raised by the results of physiological tests. Anatomic detail without physiologic information may lead to inappropriate treatment of

*continued on page 7*

**Table 1. Diagnostic Modalities**

Modality	Physiologic	Anatomic
Segmental limb pressures	+++	+
Doppler waveform analysis	+++	+
Plethysmography	+++	+
Duplex scanning	+	+++
MR angiography	–	++++

## Medical Therapy for PAD

*continued from page 2*

antithrombotic activities. Cilostazol has also been shown to increase high-density lipoprotein cholesterol and reduce triglycerides.

Cilostazol has consistently demonstrated superiority to placebo in

*A PAD treatment plan includes multiple approaches.*

improving the functional status of patients with intermittent claudication, as assessed by their maximal walking distance (MWD). In a study comparing cilostazol with pentoxifylline and placebo, cilostazol improved MWD by 54%, while the results with pentoxifylline were similar to those of placebo (see Figure 1). Cilostazol was generally well tolerated, although minor side effects were more common than with

placebo. “In most cases, the headaches, diarrhea, or abdominal pain can be treated by reducing the dose to half for a period of several weeks and then resuming full dose,” Dr. Drooz advised.

All members of the class of PDE III inhibitors are contraindicated in patients with congestive heart failure (CHF). Clinical studies of the PDE III inhibitors milrinone and vesnarinone have shown increased morbidity and mortality in patients with New York Heart Association classes III and IV heart failure. Based on the experiences with other PDE III inhibitors, cilostazol is contraindicated in patients with CHF.

### The Recommended Approach

Dr. Drooz acknowledged that remarkable innovations in revascularization are on the horizon. “But I think in terms of functional improvements and quality of life improvements for our patients, we need to do better,” he advised. He concluded by reiterating his preference for a PAD treatment plan that includes multiple approaches,

from secondary prevention for reducing cardiovascular morbidity and mortality and preventing progression of atherosclerosis to medical therapy and exercise for relieving intermittent claudication and revascularization for limb preservation. “These simple approaches are inexpensive and effective. They are appropriate for those patients with mild and moderate symptomatic disease, and I also recommend that they be instituted for all patients post-intervention.” ■

## PAD Facts Highlight Need for Improved Diagnosis

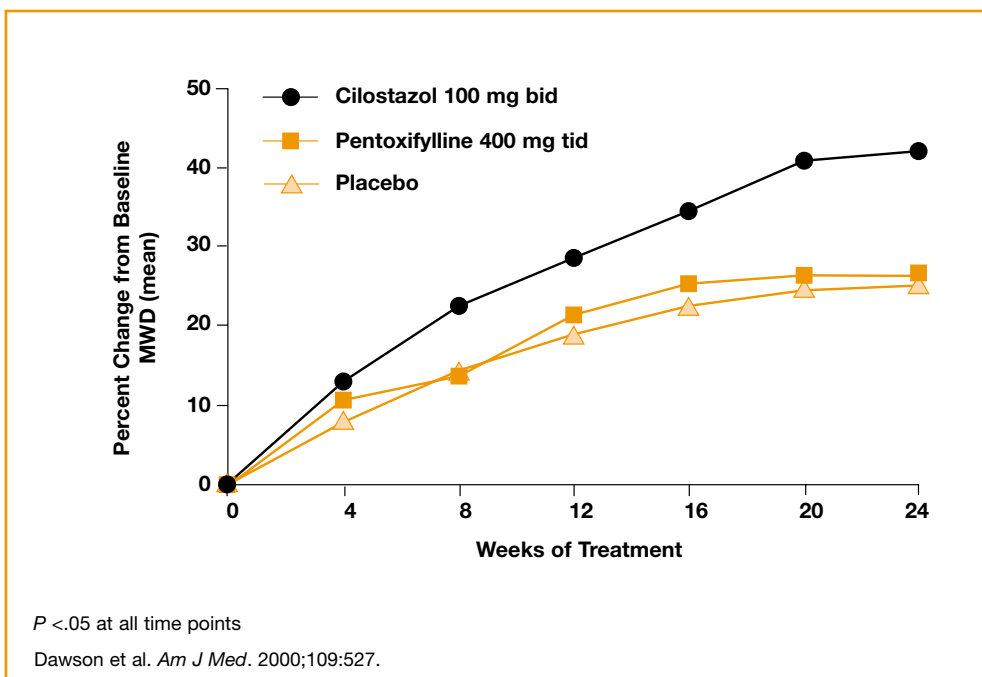
*continued from page 3*

### The PAD Risk Factor Profile

Because PAD is a disease of atherosclerosis, its risk is increased by traditional atherosclerotic risk factors, such as male sex, family history of CAD, hypercholesterolemia, hyperhomocysteinemia, increased age, hypertension, cigarette smoking, and diabetes. Cigarette smoking and diabetes are particularly potent risk factors, both for the development of PAD and for the risk of adverse outcomes in PAD patients. In the Minnesota screening study, almost 70% of PAD patients were smokers, and diabetes was almost twice as common in those with the disease. “If you really want to make an impact on these patients, it is diabetes that you have to address,” Dr. Jaff insisted. A recent study by Jude and colleagues showed a 5-fold increased risk of amputation in PAD patients with diabetes than in those who had PAD alone; the risk of death was also three times higher in these patients.

### The Clinical Message

The incidence of PAD, like those of CAD and cerebrovascular disease, increases with age. Therefore, because



**Figure 1: Effect of Therapy on Maximal Walking Distance**

the population is aging, “as the years go by we are going to be seeing more of these patients,” Dr. Jaff said. The population in the PARTNERS study was comprised of patients  $\geq 70$  years or  $\geq 50$  years with a history of diabetes or smoking. “If you are going to consider screening populations in your practice, these are good populations to study,” he recommended. Dr. Jaff emphasized the strong association between PAD, CAD, and cerebrovascular disease, and reiterated that patients with diabetes, who smoke, and/or who have lipid abnormalities or elevated homocysteine levels are at highest risk. ■

### Noninvasive Evaluation of Suspected PAD

*continued from page 5*

lesions which may not be symptomatic. For example, if the physiological tests detect femoral–popliteal disease, a duplex ultrasound scan should be performed to determine whether there is focal disease or a long-segment occlusion. Duplex scans provide good anatomic information, but only for the specific area examined. Images of the iliac artery are far less accurate (compared with the femoral and popliteal arteries), and imaging the aortoiliac segment can be very time-consuming. Dr. Sterling said that in most labs, the status of the aortoiliac segment is inferred from the results of Doppler waveform analysis. Magnetic resonance angiography (MRA) provides excellent anatomic detail but is relatively expensive and time-consuming. In addition, it does not provide physiologic data and can yield artifacts. However, MRA can be a useful modality in the work-up of certain patients, such as those with impaired renal function or those who will need certain surgical revascularizations.

Dr. Sterling gave several examples

of patients who had undergone interventions that turned out to be inappropriate and ineffective. In each case, the decision to perform the procedure was based on the results of diagnostic tests that were evaluated without

appropriate clinical correlation. As Dr. Sterling reminded the audience, “Proper interpretation [of all noninvasive diagnostic assessments] requires a true understanding of the test and the disease.” ■

### Heal It or Lose It: Wound Care Basics *continued from back cover*

include an electrically powered dressing that warms the wound, hyperbaric oxygen, maggot therapy for cleaning wounds, and vacuum-stimulated wound healing.

Dr. Rooke offered some insights into the use of intermittent pneumatic compression pumps (called “impulse” pumps) as adjunct treatment for ischemic ulcers. These devices can aid tissue oxygenation in three ways: controlling edema, improving venous return, and increasing arterial inflow. The pumps operate by squeezing the foot or leg to a pressure of  $\geq 100$  mm Hg about every 20 seconds,

maintaining the pressure for 1 to 3 seconds, and then releasing. Dr. Rooke presented data showing that the pumps even promote healing in patients with low transcutaneous partial oxygen pressure ( $TcPO_2$ ) values. “We found that whereas traditionally no patients with  $TcPO_2 < 20$  mm Hg ever heal, we can now get 50% healing,” he said.

Dr. Rooke concluded with a brief discussion of other wound-healing treatment options under investigation, such as growth factors, which have proved useful regardless of lesion etiology, and alternative skin graft material. ■

**Table 2. Diagnosis and Treatment of Lower-Extremity Ulcers**

Type of Lesion	Clinical Clue	Cause	Treatment
Ischemic	Painful, pale, cool, no pulse	Arterial occlusive disease	Identify site of blockage and treat with angioplasty or revascularization
Venous	Edema, pigmentation, red granular tissue, not very painful	Obstruction and/or valvular incompetence	Elastoplast or compression stocking; iliac vein occlusion may be treated with vein bypass
Neuropathic	Over pressure point, callus present	Loss of protective sensation in foot	Orthotic shoes
Small-vessel	Often associated with rheumatoid arthritis, very painful	Small-vessel disease	Consider the underlying disease (eg, vasculitis, hypertension)

## Heal It or Lose It: Wound Care Basics

Major lower extremity amputations remain a serious problem in the United States, with 50,000 to 70,000 performed yearly. The key, of course, is to heal wounds before they lead to amputation. Thomas W. Rooke, MD, of the Mayo Clinic, Rochester MN, presented his comprehensive four-step approach to wound care:

- Identify the cause of the wound
- Eliminate the cause
- Create the proper conditions for wound healing
- Apply “extraordinary” measures, if necessary

### Managing the Underlying Cause

A physical exam and thorough patient history lay the foundation for accurate diagnosis of the etiology of the lesion. Dr. Rooke gave the audience a quick but thorough rundown of the characteristics of several distinctive lesion types (see Table 2 on page 7).

In addition to neuropathic ulcers, lesions resulting from blastomycoses, infection, frostbite, or a malignant squamous cell cancer can masquerade as vascular lesions.

### Wound Healing Strategies

Proper wound care begins with thorough cleaning of the wound. The appropriate type of dressing is based on several factors, including the need for infection control and/or debridement, how much drainage is required, and how often the patient will change it. “If you identify the correct cause of the wound, do something to treat that cause, and create the proper environment for wounds to heal, you are going to get healing in about 95% of wound care cases,” Dr. Rooke said. Therefore, only about 5% of patients will require extraordinary measures, which may

*continued on page 7*

### Interventional Radiologists – Your Partners in Patient Care

Interventional radiologists have pioneered many minimally invasive diagnostic and interventional techniques that are used worldwide, such as balloon angioplasty, vascular and nonvascular stenting, and nonsurgical tumor ablation. More specifically, interventional radiologists are specialists who can help you to help your patients with peripheral arterial disease (PAD). Because atherosclerosis is a systemic disease, patients with PAD are likely to have blocked arteries in other areas of the body. Thus, people with PAD are at increased risk for aortic aneurysms, renal disease, and stroke. Using clinical evaluation and diagnostic imaging, interventional radiologists can evaluate your high-risk patients for these diseases, perform PAD assessment, and, if necessary, help them get back on their feet with an exercise program or a minimally invasive intervention. To find an interventional radiologist who works in your area, visit [www.SIRweb.org](http://www.SIRweb.org).

**CLINICAL VASCULAR MEDICINE** is supported by an educational grant from Otsuka America Pharmaceutical, Inc. in partnership with Pfizer Inc.

**Adelphi Inc.**  
30 Irving Place  
10th Floor  
New York, NY 10003