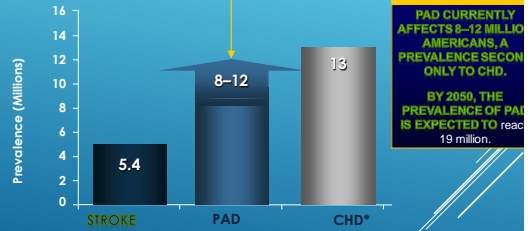


STRATEGIC VASCULAR INTERVENTION IN THE COMPLEX LOWER EXTREMITY WOUND

Greg Clabeaux D.O.
Senior Fellow; Vascular Surgery
Catholic Health System

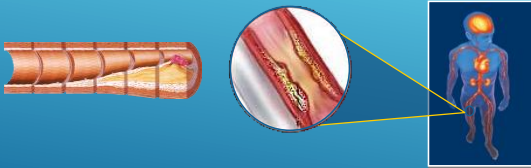
Vascular Disease in the US



* CHD = coronary heart disease. PAD = peripheral arterial disease.
* Includes myocardial infarction and angina pectoris.
American Heart Association. Heart Disease and Stroke Statistics.

Pathologic Progression of PAD

Atherosclerosis > Thrombus Formation > Ischemia > Limb Pain/Wounding > Impairment

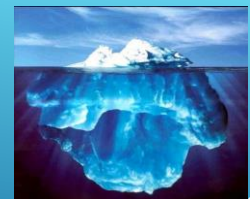


Atherosclerosis and platelet activation lead to the formation of a thrombus in arteries

Narrowed arteries and formation of a thrombus impedes blood flow to the periphery and results in ischemia

Ischemia may lead to painful symptoms, cell death, and physical impairment

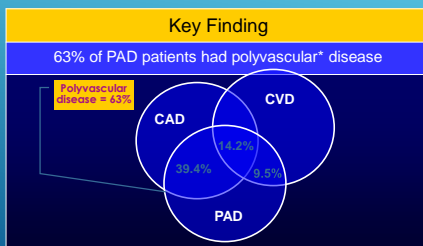
Ross R. N Engl J Med. 2004;351:115-126.



IT'S MORE THAN MEETS THE EYE

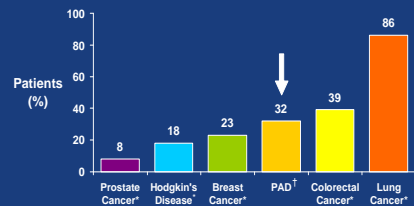
Risk Profile of PAD

The REACH (Reduction of Atherothrombosis for Continued Health) Registry studied 7,013 patients with symptomatic PAD

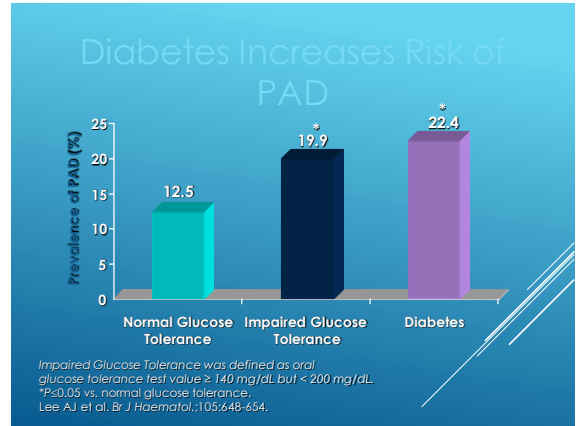
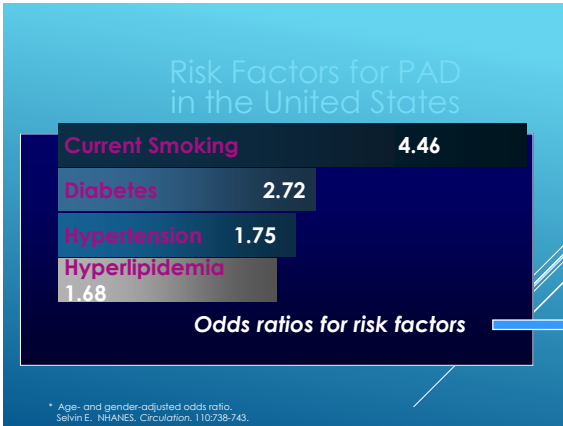


* PAD patients with polyvascular disease had concomitant symptomatic cerebrovascular or cardiovascular disease or both. Bhatt DL, et al. American College of Cardiology.

Relative 5-Year Mortality Rates



*American Cancer Society. Cancer Facts and Figures, 2000.
†Ciriqui MH et al. N Engl J Med. 1992;326:381-6.



Diabetes and Atherosclerosis

Diabetes mellitus:

- Accelerates atherosclerosis 200%–400%
- Risk of coronary artery ischemic events increases 2–4 times
- Results in 4 times risk of stroke
- PAD develops a decade earlier
- CV risk equivalent to 3 non-diabetic risk factors

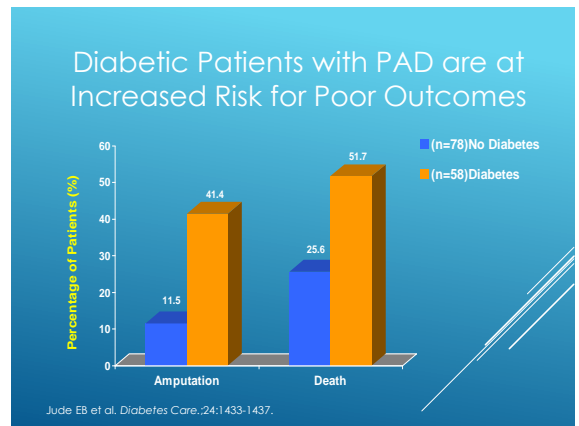
Peripheral Vascular Disease, 5th edition. WB Saunders & Co; 1980. Cardiovascular Disease and Diabetes Mellitus. Symposium at 58th Annual Scientific Session, American Diabetes Association. Chicago, Ill. June 1998.

EPIDEMIOLOGY OF DIABETES

- 20 million Diabetics U. S.
- 6-7% population
- Higher prevalence in AA and HA (11%)
- 2200 new diagnosis/day (1.5/minute)
- 6th leading cause of death

MORBIDITY/MORTALITY OF AMPUTATION

- 68% Contralateral Amputation within 5 years
- 50% mortality rate within 3 years
- 25% remain hospitalized



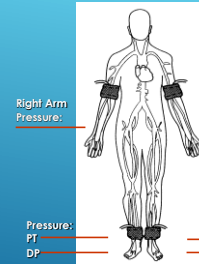
VASCULAR STUDIES

- ▶ Palpate Pulses-Femoral, Popliteal, DP,PT
- ▶ Non-invasive testing
 - ▶ Ankle Brachial Index
 - ▶ Segmental pressures
- ▶ TcPO2
- ▶ CTA or MRA
- ▶ Angiogram

How to Perform and Calculate the ABI

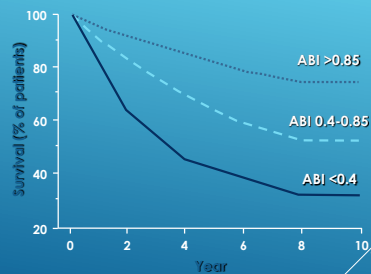
PARTNERS Program ABI Interpretation

Above 0.90	— Normal
0.71-0.90	— Mild Obstruction
0.41-0.70	— Moderate Obstruction
0.00-0.40	— Severe Obstruction



Right ABI	Higher Right Ankle Pressure	mm Hg	Higher Left Ankle Pressure	mm Hg
Higher Arm Pressure			Higher Arm Pressure	
Example	Higher Ankle Pressure	92 mmHg	164 mmHg	0.56
	Higher Brachial Pressure			See ABI Chart

Decline in Survival Associated With Severity of PAD



ABI = ankle-brachial index, PAD = peripheral arterial disease, McKenna M et al. *Atherosclerosis*. 1991;87:119-128.

PAD Disease Management

Symptomatic Treatment/Prevention of Ischemic Events

- Exercise¹
- Smoking cessation^{1,2}
- Pharmacologic therapy
 - Pentoxifylline¹
 - Cilostazol³
- Selective use of interventional therapy⁴
- Control of risk factors⁴
 - Smoking
 - Hyperlipidemia
 - Hypertension
 - Diabetes
- Antiplatelet therapy²

1. McDermott MM, McCarthy W. *Surg Clin North Am*. 1995;75:581-591.
 2. Clagett GP, Krupski WC. *Chest*. 1995;108 (4 suppl):431S-443S.
 3. Pletal (cilostazol) Prescribing Information.
 4. Kempczinski RP, Bernhard VM. In: Rutherford RB, ed. *Vascular Surgery*. 1989; chap. 53.

Indications for Surgical Intervention

- Gangrene
- Non-healing ulcers
- Ischemic rest pain
- Claudication causing lifestyle deterioration refractory to pharmacologic intervention and behavioral modification

Treating Critical Limb Ischemia

Treatment for severe PVD in the 1800's



SURGICAL OPTIONS

Surgical

- ▶ Endarterectomy
- ▶ Bypass

Percutaneous

- ▶ Angioplasty
- ▶ Atherectomy
- ▶ Stenting
- ▶ Laser

OPTIONS

- ▶ Limb/wound should be evaluated for healing potential prior to deciding on intervention
- ▶ Comorbidities and overall health need to be evaluated prior to intervention



ANATOMIC CLASSIFICATION SHOULD GUIDE TREATMENT TASC CLASSIFICATION

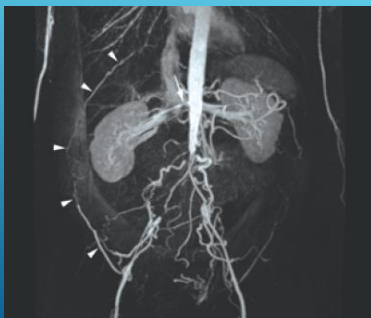
Lesion Type	Description
A	Single lesion <10 cm in length Single occlusion <5 cm in length
B	Multifocal lesions (occlusion or stenosis), each <5 cm Single lesion or occlusion >10 cm not involving the infrapopliteal arterial artery Single or multiple lesions in the absence of continuous flow vessels to bypass artery for a distal bypass
C	Single or multiple occlusion >10 cm in length Single or multiple lesions
D	Multifocal lesions or occlusions totaling >10 cm with no antegrade flow visualization Recurrent stenosis or occlusions that "head-to-head" after non-aneurysmal intervention

OPTIONS OPEN VS. PERCUTANEOUS BASIL

- ▶ 27 U.K. centers evaluating 452 patients with severe leg ischemia
- ▶ These were patients that were TASC B-C
- ▶ Findings 30% more expensive
- ▶ Over 2 years the patient was more likely to be free from amputation if they originally were randomized to surgery first
- ▶ Less amputations if had bypass first
- ▶ If patients have life span greater than 2 years and CLI, consider bypass if surgical candidate

Address Inflow First !

Occluded aorta with large collateral artery



GANGRENE OF THE FOREFOOT

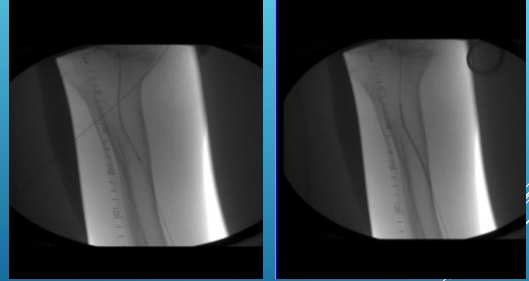
83 yo female
Smoker
Presented to podiatry
Sent for vascular evaluation



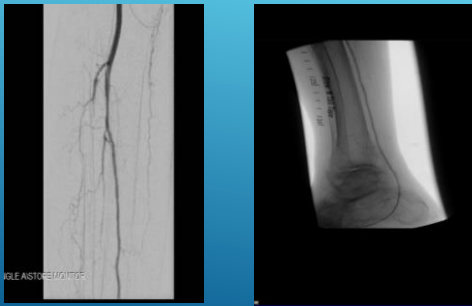
SEVERE TIBIAL DISEASE



PTA TIBIAL VESSELS



RUN-OFF INTO FOOT



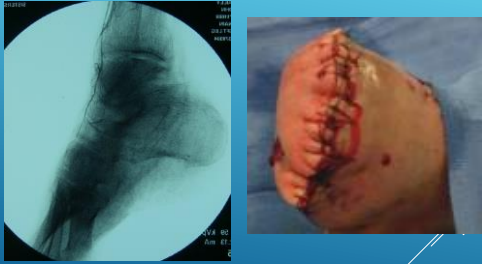
- ▶ 56 yo diabetic male
- ▶ Admitted via Medical Service
- ▶ Vascular and Podiatric evaluation



Popliteal Occlusion Atherectomy



Transmetatarsal Amputation

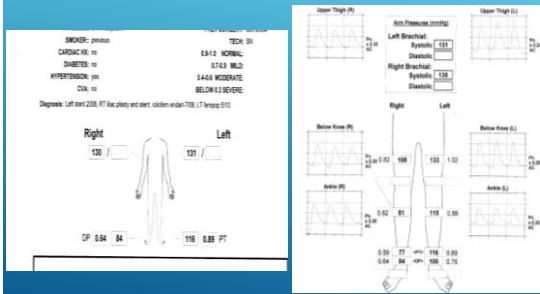


57 yo female
Pain in toes
overnight
Presented to ED

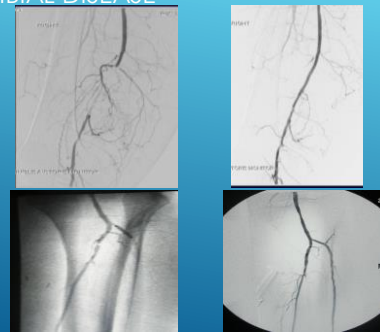
ISCHEMIC FOOT



ARTERIAL DOPPLER'S



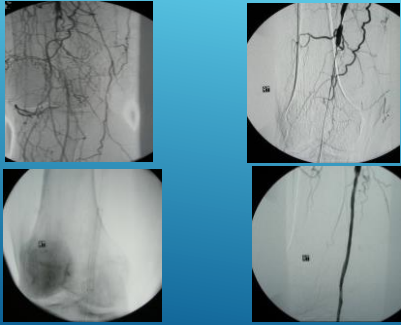
CONCOMITANT FEMORAL AND TIBIAL DISEASE



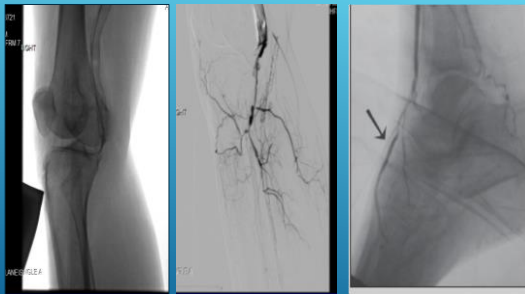
- ▶ 73 yo male post MI with PTCA
- ▶ New onset A-FIB
- ▶ Diabetes



Total Occlusion



PREVIOUS STENT



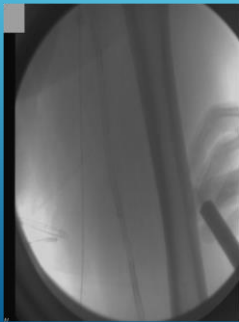
Distal Bypass



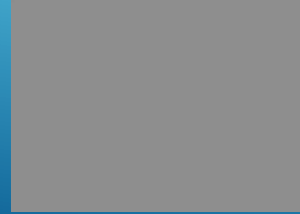
Healed Transmetatarsal Amputation



FULL METAL JACKET OR "ENDO FEM-POP"



BELOW KNEE RUNOFF

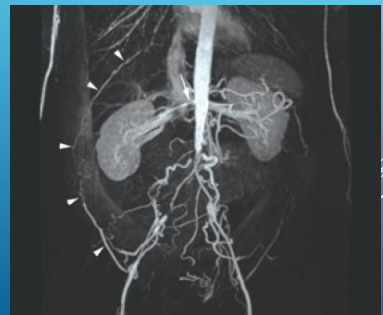


ABOVE KNEE AMPUTATION

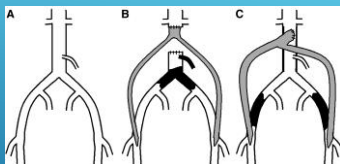


Address Inflow First !

Occluded aorta with large collateral artery



Aorto-Bifemoral Bypass



THE PAD GUIDELINE IS INTENDED TO GUIDE LIFELONG PRIMARY TO SPECIALTY PAD CARE

Population at risk: (Age and risk factors) Establish the PAD diagnosis

Population with symptoms: Improve limb outcomes Prevent CV ischemic events

Population remains at risk: Primary care management of legs and life, in collaboration with vascular specialists

- ABI
- TBI
- Duplex US
- MRA
- CTA
- Angiography

Medical Therapy Endovascular Therapy Surgical Therapy

Integrated care requires a partnership of vascular specialists (vascular medicine, cardiology, interventional radiology, nursing, podiatry, and others)

ABI=ankle-brachial index; CTA=computed tomographic angiography; CV=cardiovascular; MRA=magnetic resonance angiography; TBI=brachial index; US=ultrasound.

- Understanding PAD pathology and strategically approaching revascularization
- Understanding who benefits from Medical, interventional vs. surgical bypass
- Venous Stasis...

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