

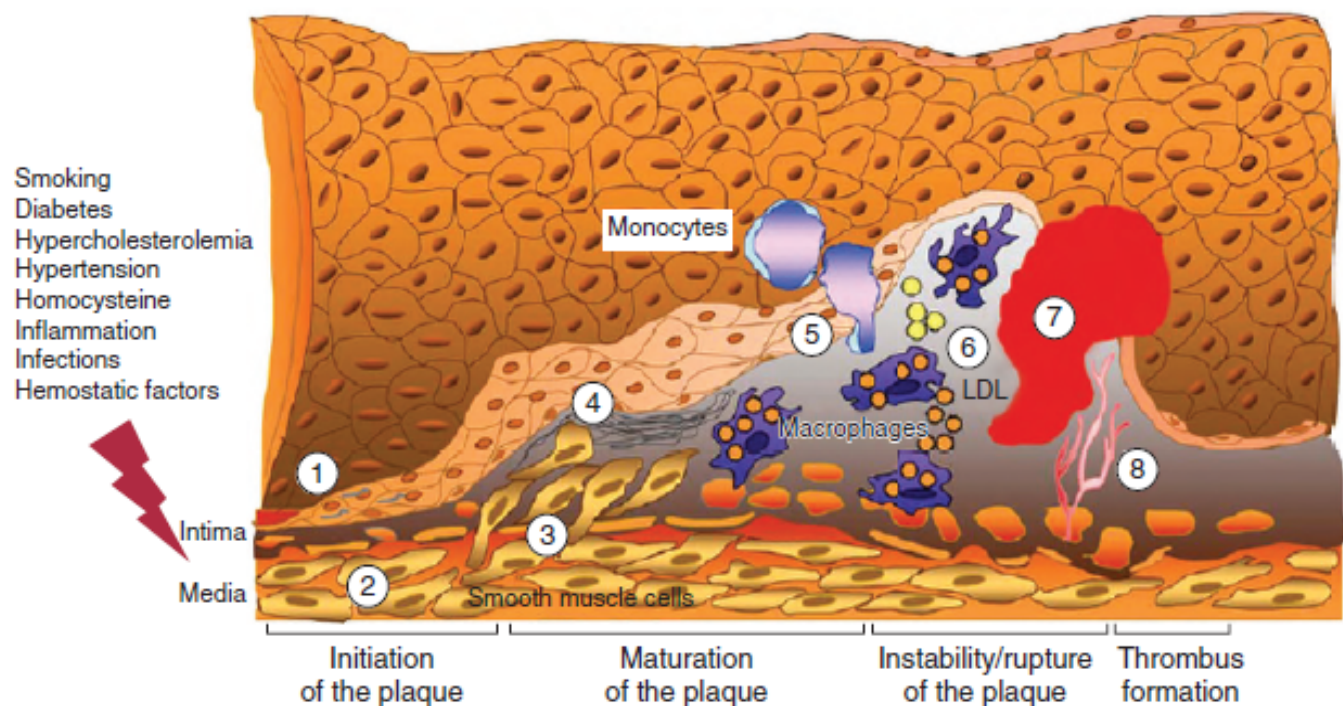
# Update on PVD

Jerry J. Kim, MD

Vascular Surgery

# PAD vs. PVD

- PAD is specific to arteries
- Many venous disorders now separately classified
- PAD patients are unique
- Definition: 50% or more stenosis in any arterial bed



**Figure 26-1** Evolution of arterial wall changes and plaque formation in the response-to-injury hypothesis: 1, endothelial dysfunction; 2, vascular smooth muscle cell hypertrophy; 3, migration and proliferation of vascular smooth muscle cells; 4, matrix elaboration; 5, expression of adhesion molecules and migration of monocytes; 6, uptake of low-density lipoprotein (LDL) and formation of foam cells; 7, thrombus formation; 8, angiogenesis and neovascularization. (Modified from Defraigne JO: Development of atherosclerosis for the vascular surgeon. In Liapis CD, Balzer K, Fernandes e Fernandes J, Benedetti-Valentini F, editors: *Vascular surgery*, New York, 2007, Springer, p 24.)

# Epidemiology

- PAD in 3-10% of American population
- PAD in 15-20% of age >70

# PAD clinical staging

# Stages of Chronic Limb Ischemia

## Rutherford Category

## Clinical Description

0	Asymptomatic
1	Mild claudication
2	Moderate claudication
3	Severe claudication
4	Ischemic rest pain
5	Minor tissue loss
6	Major tissue loss <sup>‡,§</sup>

- Claudication is reproducible
- Rest pain is worse when supine
- Symptoms are CONSISTENT

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**“critical limb  
ischemia”  
(CLI)**

# Critical limb ischemia ≠ Acute limb ischemia

## Stages of Chronic Limb Ischemia

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Table 162-1

Clinical Categories of Acute Limb Ischemia

Category	Description/Prognosis	Sensory Loss
I: Viable	Not immediately threatened	None
II: Threatened: a: Marginally b: Immediately	Salvageable if promptly treated Salvageable with immediate revascularization	Minimal (toes) More than to rest pain
III: Irreversible	Major tissue loss or permanent nerve damage inevitable	Profound, and

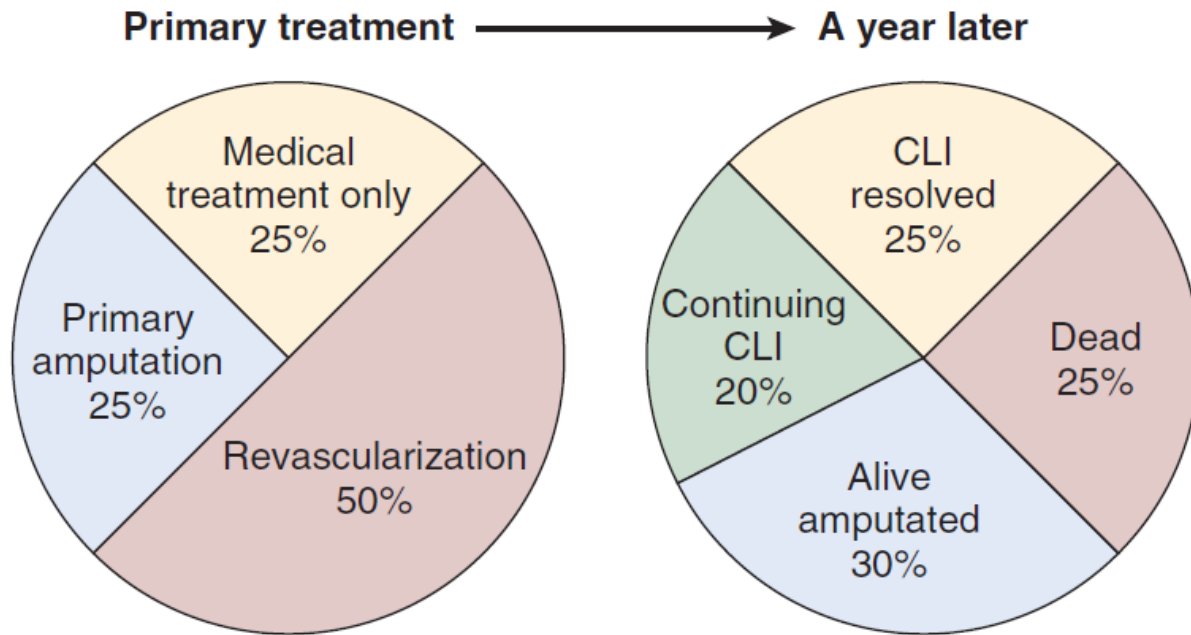
“critical limb ischemia”



# CLI

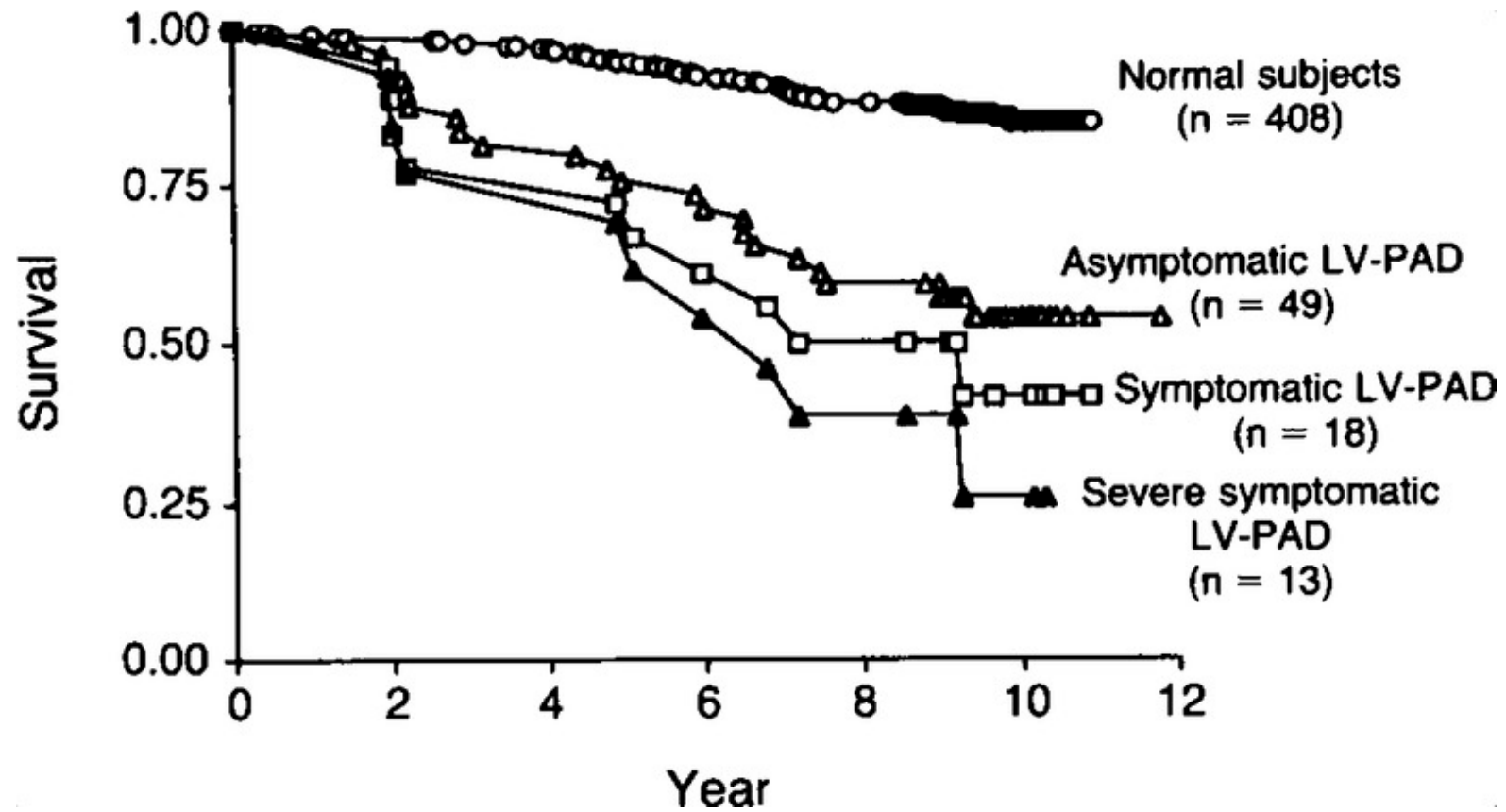
- Critical limb ischemia treatment timeline:
  - During index admission
  - Within 2 weeks as outpt.

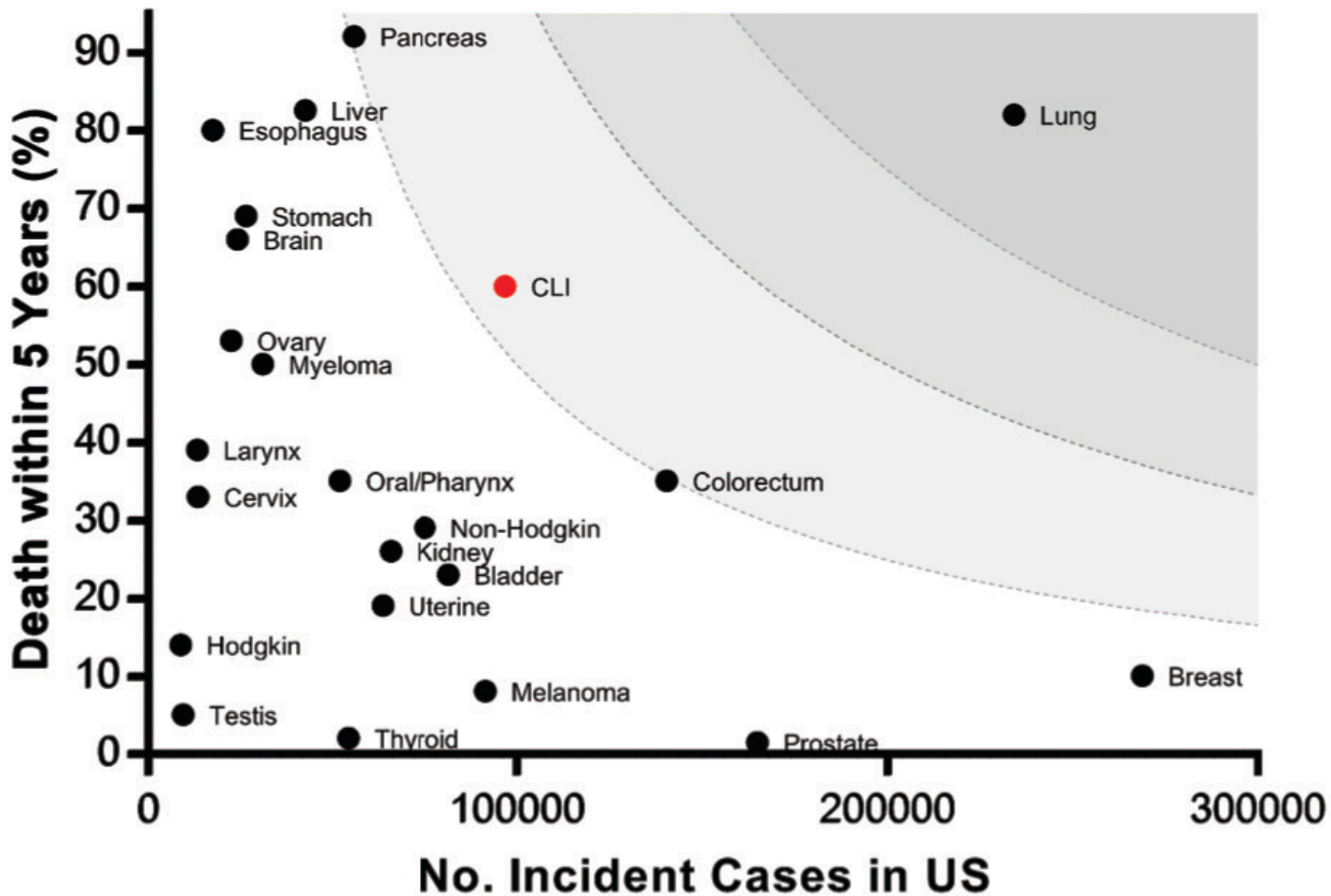
# CLI implications



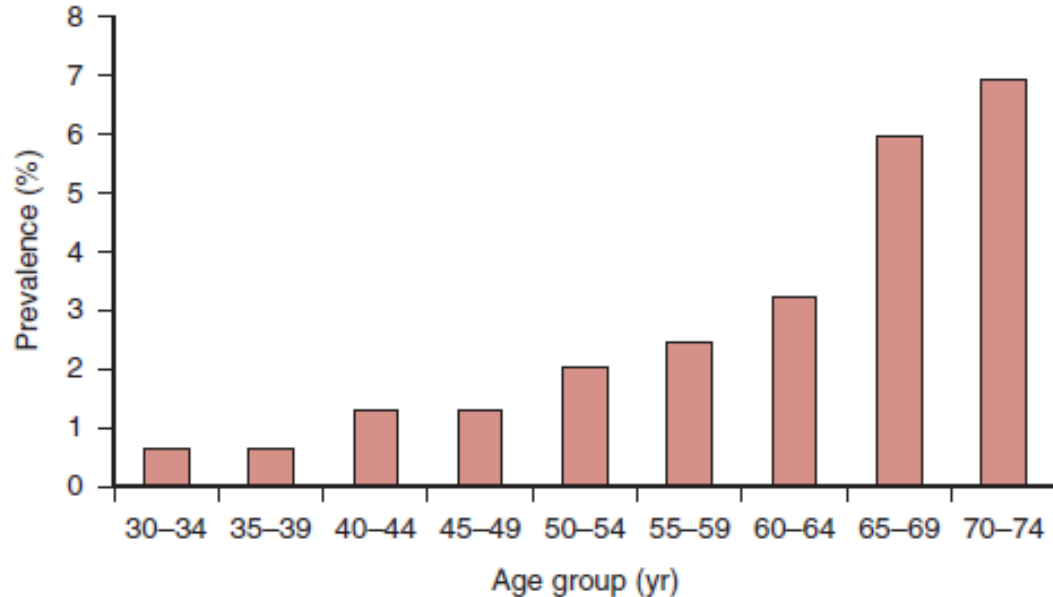
**Figure 108-3** The estimate of the initial treatment and status a year later of patients presenting with chronic critical limb ischemia. (Redrawn from Norgren L, et al: TASC II Working Group, Inter-Society Consensus for the Management of Peripheral Arterial Disease (TASC II). *J Vasc Surg* 45:S11, 2007.)

# CLI implications





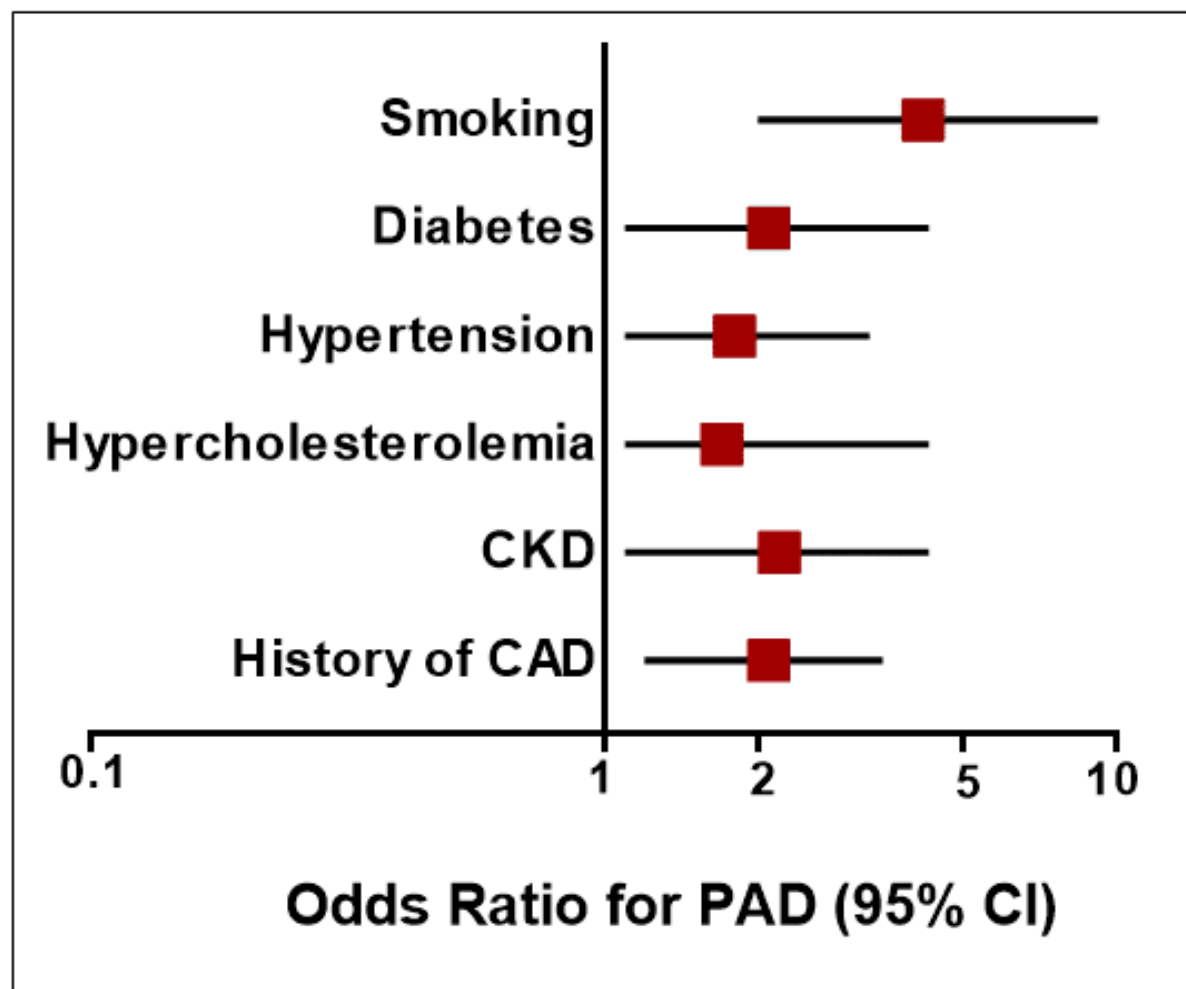
- Claudication: rate of limb loss <1% per year



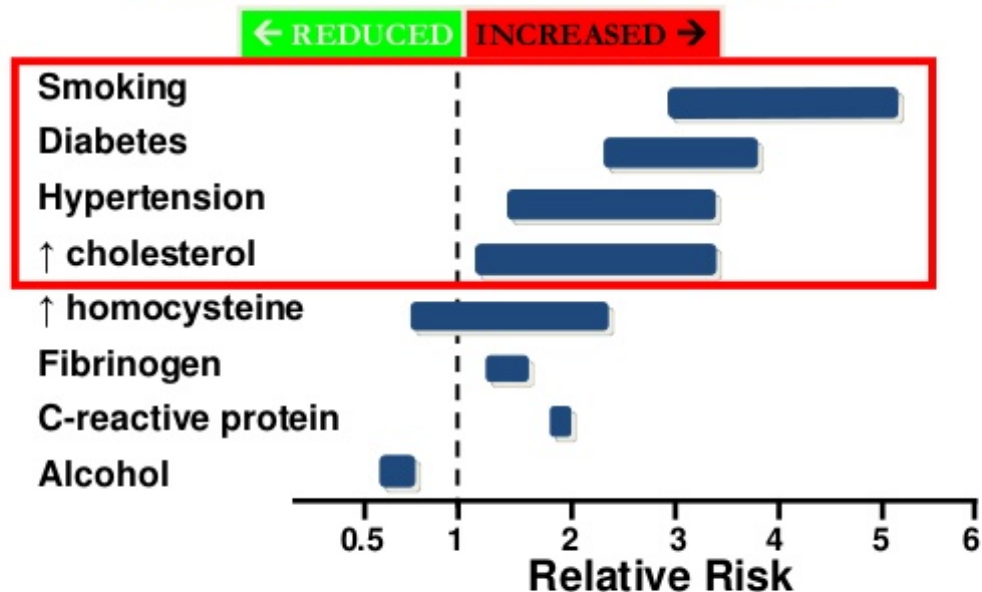
**Figure 108-4** Weighted mean prevalence of intermittent claudication (symptomatic peripheral arterial disease) in large population-based studies. (Redrawn from Norgren L, et al: TASC II Working Group, Inter-Society Consensus for the Management of Peripheral Arterial Disease (TASC II). *J Vasc Surg* 45:S7A, 2007.)

# PAD risk factors

Figure 2. Risk Factors and Odds Ratio for PAD (10).

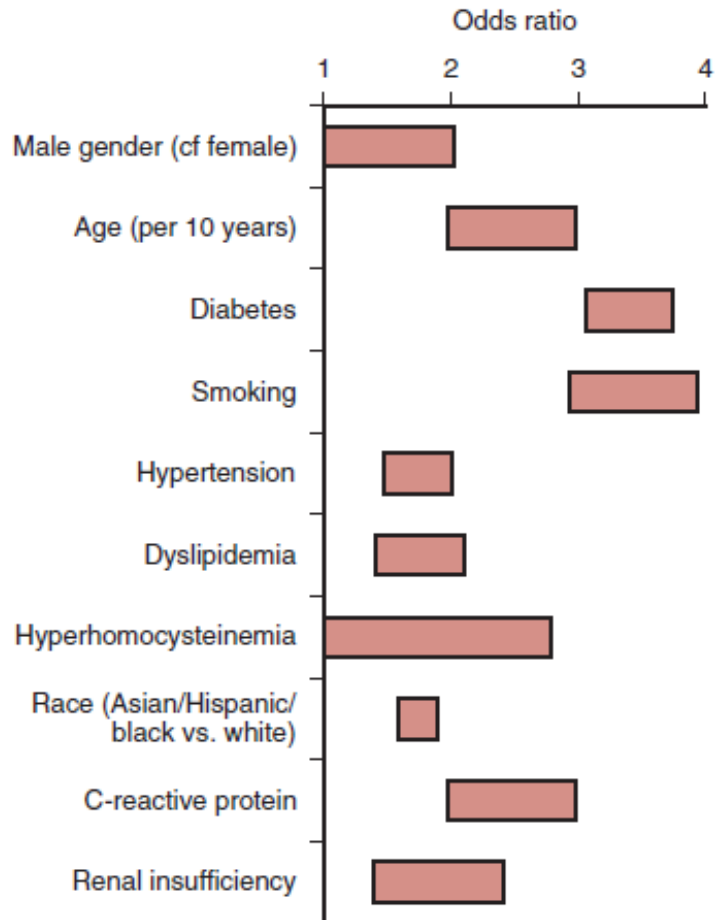


# Risk Factors for PAD



- Dormandy JA, Rutherford RB, for the TASC Working Group. *J Vasc Surg.* 2000;31(1 pt 2):S1-S296;
- Graham IM, et al. *JAMA.* 1997;277:1775-1781; Hiatt WR, et al. *Circulation.* 1995;91:1472-1479;
- Newman AB, et al. *Circulation.* 1993;88:837-845; Ridker PM, et al. *Circulation.* 1998;97:425-428.

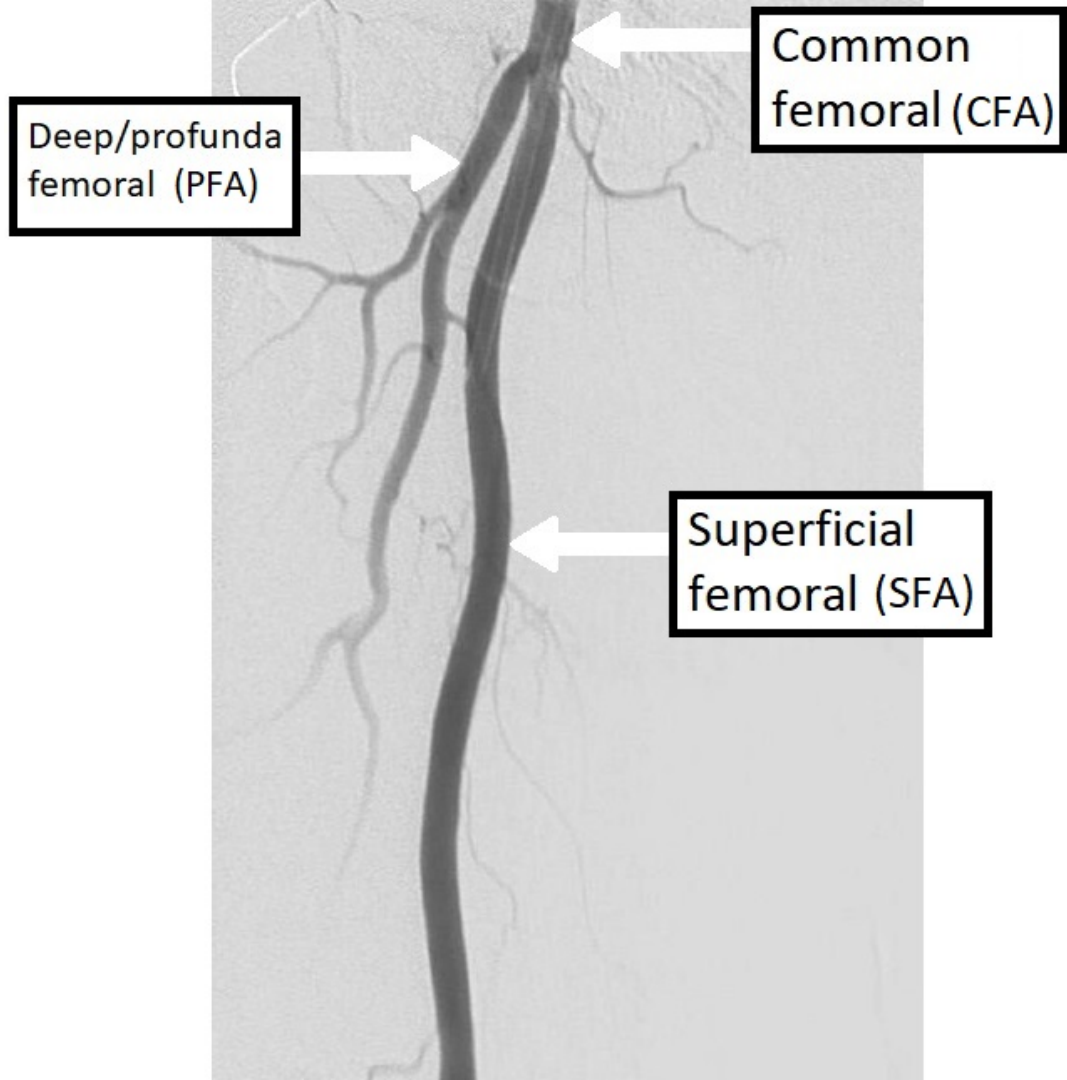




**Figure 108-2** Approximate odds ratios for risk factors for symptomatic peripheral arterial disease. (Redrawn from Norgren L, et al: TASC II Working Group, Inter-Society Consensus for the Management of Peripheral Arterial Disease (TASC II). *J Vasc Surg* 45:S9A, 2007.)

# Cases at PVHMC

# Anatomy & Normal angiography



Common femoral (CFA)

Deep/profunda femoral (PFA)

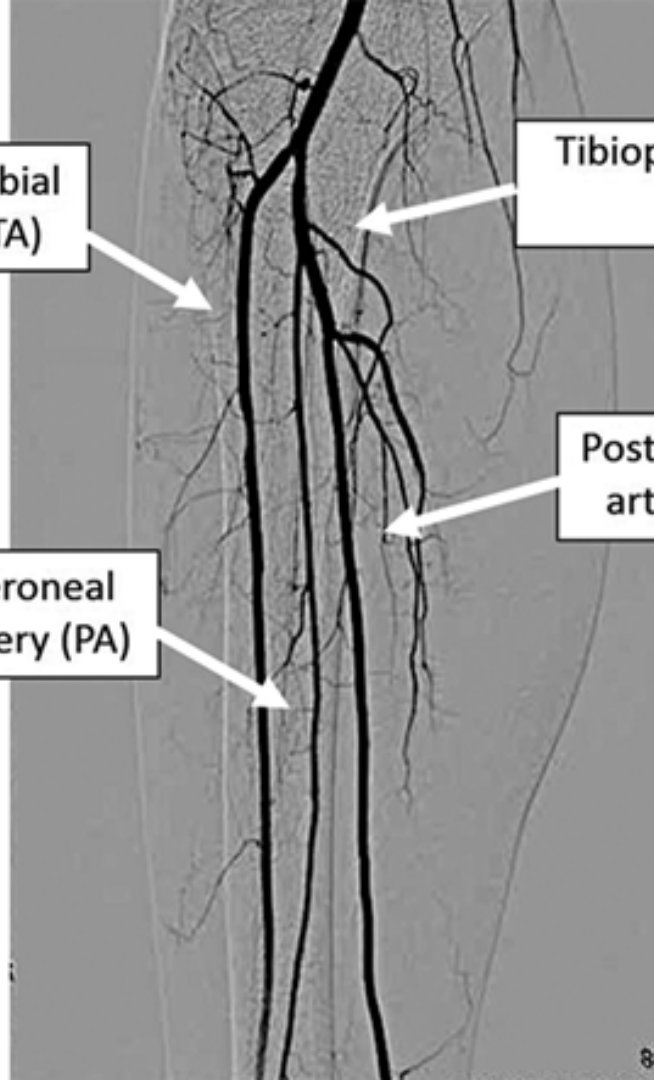
Superficial femoral (SFA)

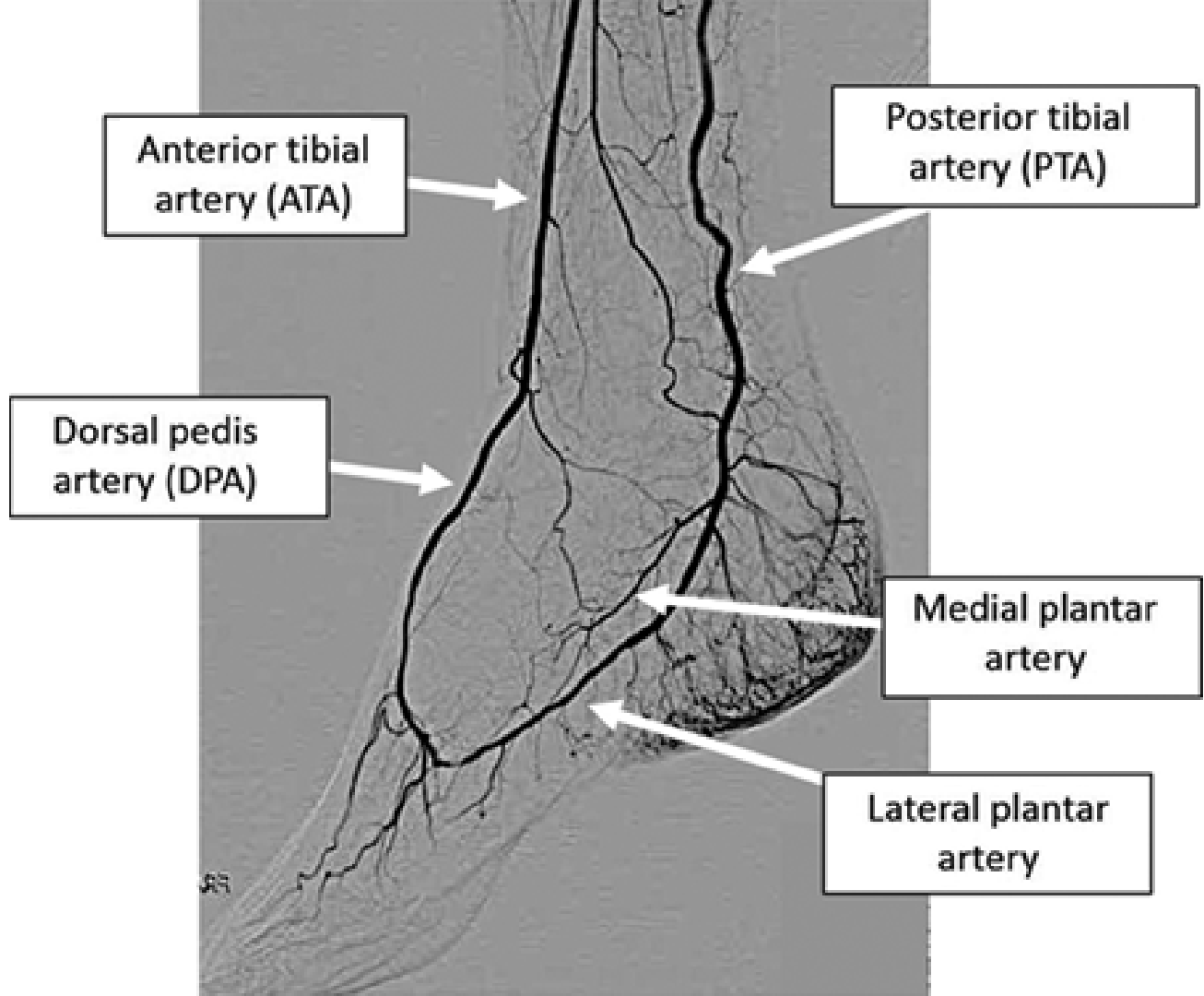
Anterior tibial artery (ATA)

Tibioperoneal trunk (TPT)

Posterior tibial artery (PTA)

Peroneal artery (PA)



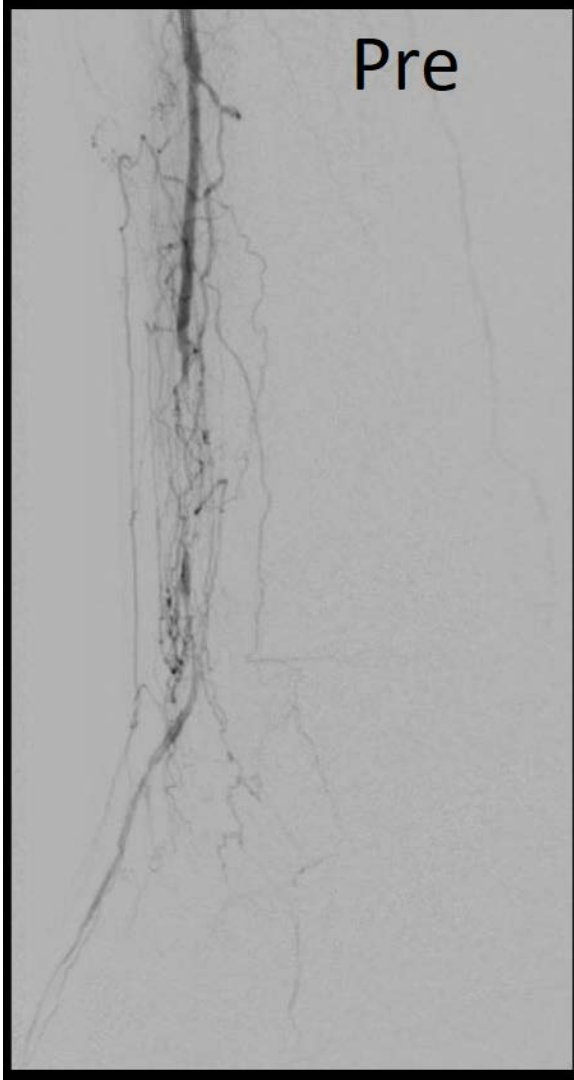


# R.P.

- 52 yo Male, ESRD
- Gangrenous digits (including finger)
- 1-2 months duration



Pre

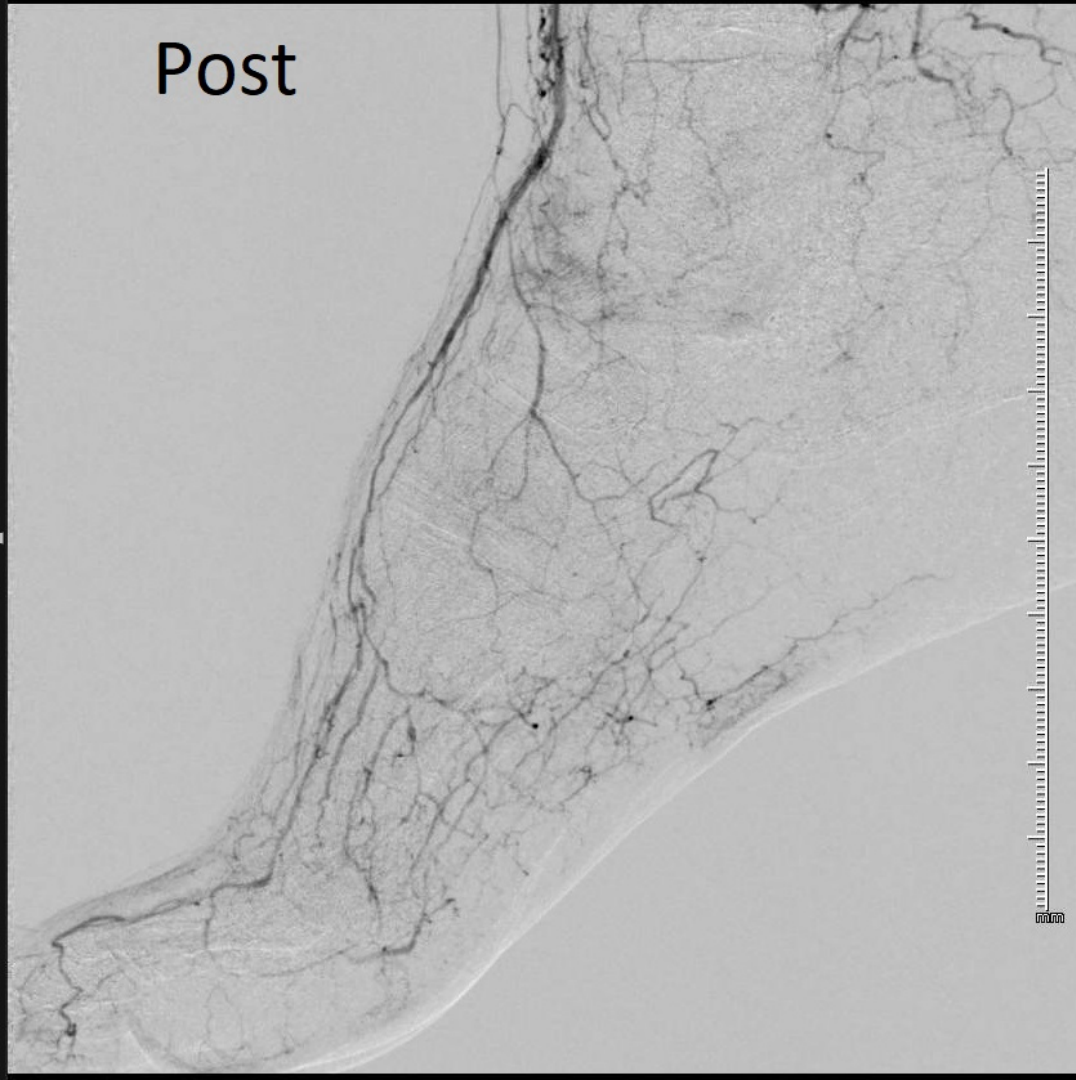




Post



Post

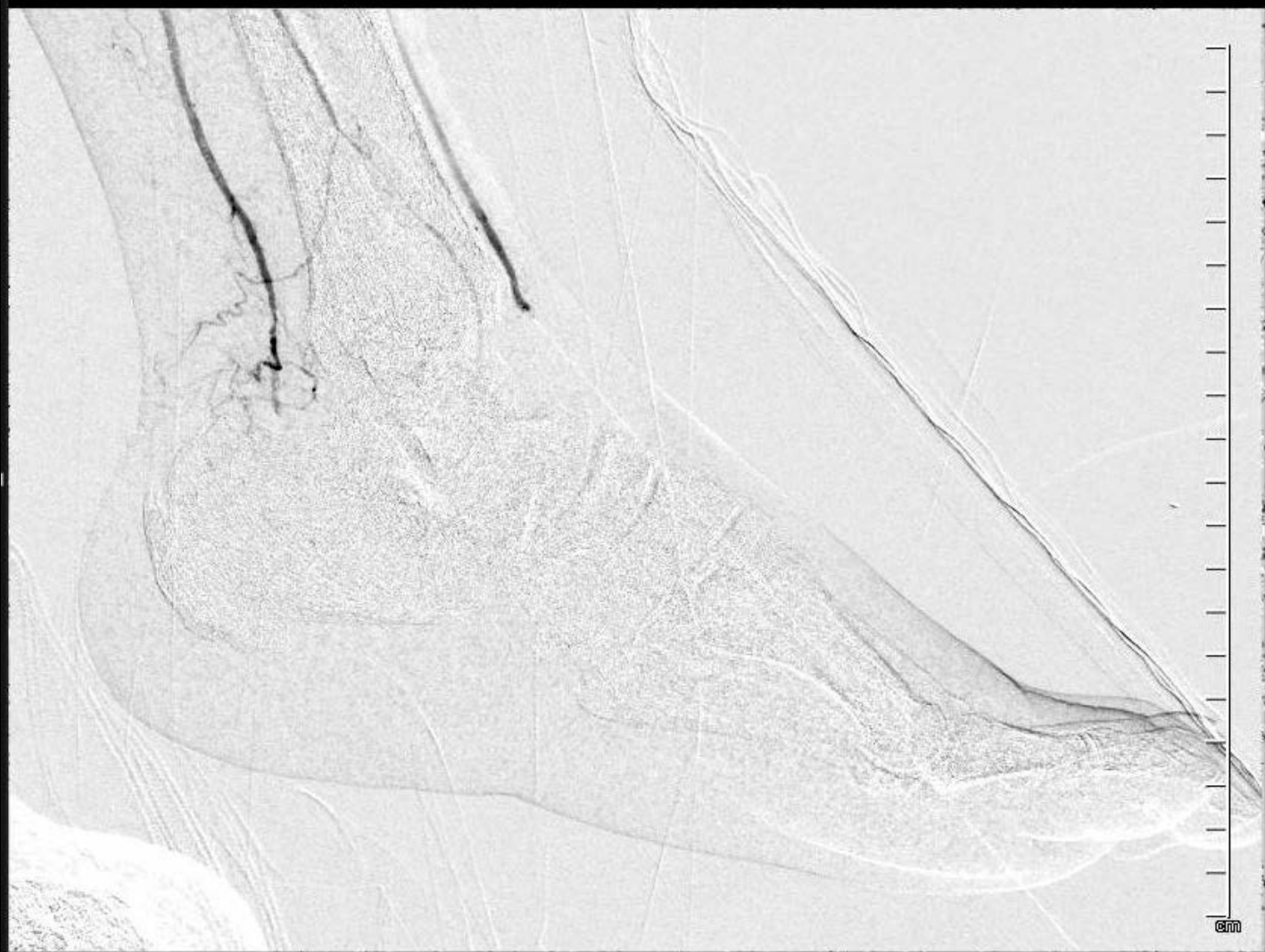


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# K.C.

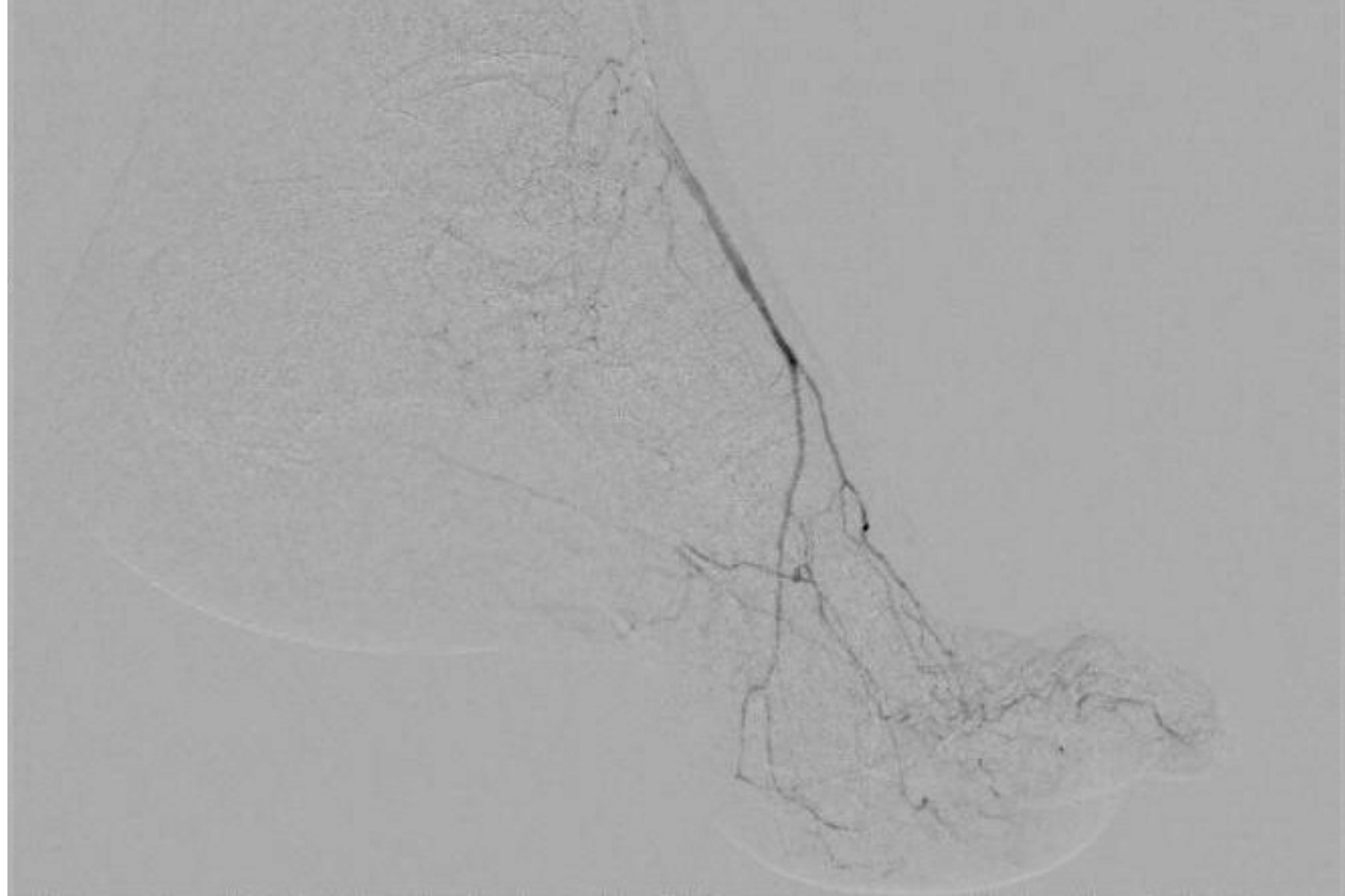
- 69 yo male smoker
- 2 months of foot/toe pain
- Initially seen and sent home with antibiotics in ED





# L.R.

- 61 year old male, HTN, DM
- 6 endovascular interventions in prior 5 months at outside facility
- New left heel gangrene



What happens if foot is debrided before revascularization?





# Which is better for CLI? Endovascular vs. open bypass surgery



I have a patient with foot pain or foot wound .... Is it PAD/CLI?

# Assess risk factors

- 70 year old
  - Former smoker
  - Diabetes
  - Dialysis

... Yes, its PAD

# PAD diagnosis

- History – risk factors
- Physical exam
- Pulse exam
- TCPO2
- ABI
- Toe pressure
- Duplex arterial Ultrasound
- CTA
- Angiogram

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- Physical exam
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More invasive  
More expensive  
More accurate

# PAD diagnosis

- History – risk factors
- Physical exam
- Pulse exam
- TCPO2
- ABI
- Toe pressure
- Duplex arterial Ultrasound
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- Angiogram

**>60 mmHg =  
good healing  
potential**

# PAD diagnosis

- History – risk factors
- ~~Physical exam~~
- ~~Pulse exam~~
- ~~TCPO<sub>2</sub>~~
- ~~ABI~~
- Toe pressure
- Duplex arterial Ultrasound
- CTA
- Angiogram

**>60 mmHg =  
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# Summary

- CLI = rest pain or tissue loss
- Overall poor prognosis
- Mandates immediate treatment
- Revascularize BEFORE debridement, toe amputation, etc.
- Toe pressure & Duplex US is objective method to assess for PAD and healing potential