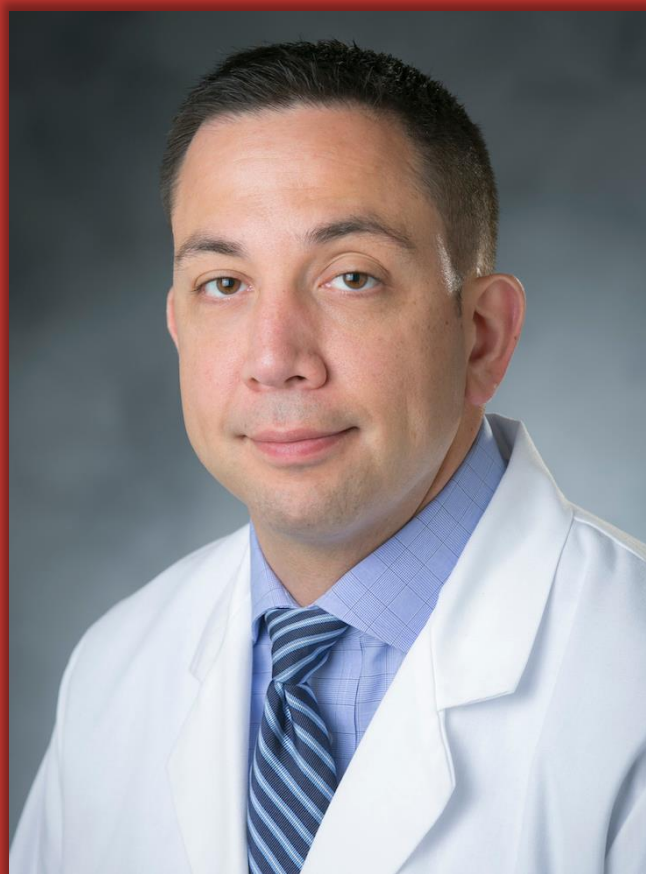




Peripheral Artery Disease (PAD) Community

*Training those who care
for the underserved*

American Heart Association



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Mayo Clinic

Presenters have no financial disclosures

Clinical Audience



- **Registered Nurses**
- **Nurse Practitioners**
- **Physician Assistants**
- **General Practitioners**

Learning Objectives

- **Recognize social determinants of health for PAD.**
- **Give examples of key social determinants for PAD** (e.g., *age, ethnicity, economic status, education, and health literacy*).
- **Use social determinants to assess for PAD.**
- **Determine key risk factors for PAD using a patient case.**
- **Construct goals for improving identification of PAD within your community.**



Patient Case



78-year-old African American female with coronary artery disease, diabetes mellitus type 2, hypertension, and hyperlipidemia presenting with right lower extremity pain with ambulation

- Walks 20 yards and gets pain in her right calf
- Denies any chest pain while ambulating
- Occasionally has pain in her right foot at rest

Patient Case

Patient was initially evaluated by podiatry for evaluation of plantar fasciitis as the cause of her symptoms. After determining this was not the etiology of her leg pain, she was then referred to orthopedic surgery for evaluation of sciatic nerve pain. After determining this was not the cause of her leg pain, she was directed to her primary care physician to evaluate for other causes of leg pain with ambulation. Six months following symptoms onset she was referred to vascular medicine.



Patient Case



Medications:

- Aspirin
- Clopidogrel
- Enalapril
- Atorvastatin
- Metformin

Labs:

- LDL 130 mg/dl and HDL 32 mg/dl
- A1c: 7.5
- Normal serum creatinine

Patient Case



Family history

- Father: coronary artery disease
- Mother: diabetes

Social history

- Widowed
- Former smoker
- Unemployed
- Did not attend high school

Lower Extremity to Brachial Indices

Segmental Limb Pressures

	Right	Left
Brachial	130	125
Ankle (PT)	70 (0.54)	108 (0.83)
Ankle (DP)	77 (0.59)	126 (0.97)
Digit	55 (0.45)	100 (0.77)

Doppler Signals

	Right	Left
Posterior tibial	monophasic	biphasic
Dorsalis pedis	monophasic	triphasic

Diagnosis of PAD

Ankle-Brachial Index (ABI)

Ankle Systolic Pressure (highest)

Brachial Systolic Pressure (highest)



Diagnosis of PAD

Resting Ankle-Brachial Index (ABI)

Noncompressible > 1.40

Normal 1.00 to 1.40

Borderline 0.91 to 0.99

Abnormal 0.90 or less



PAD Risk in Communities



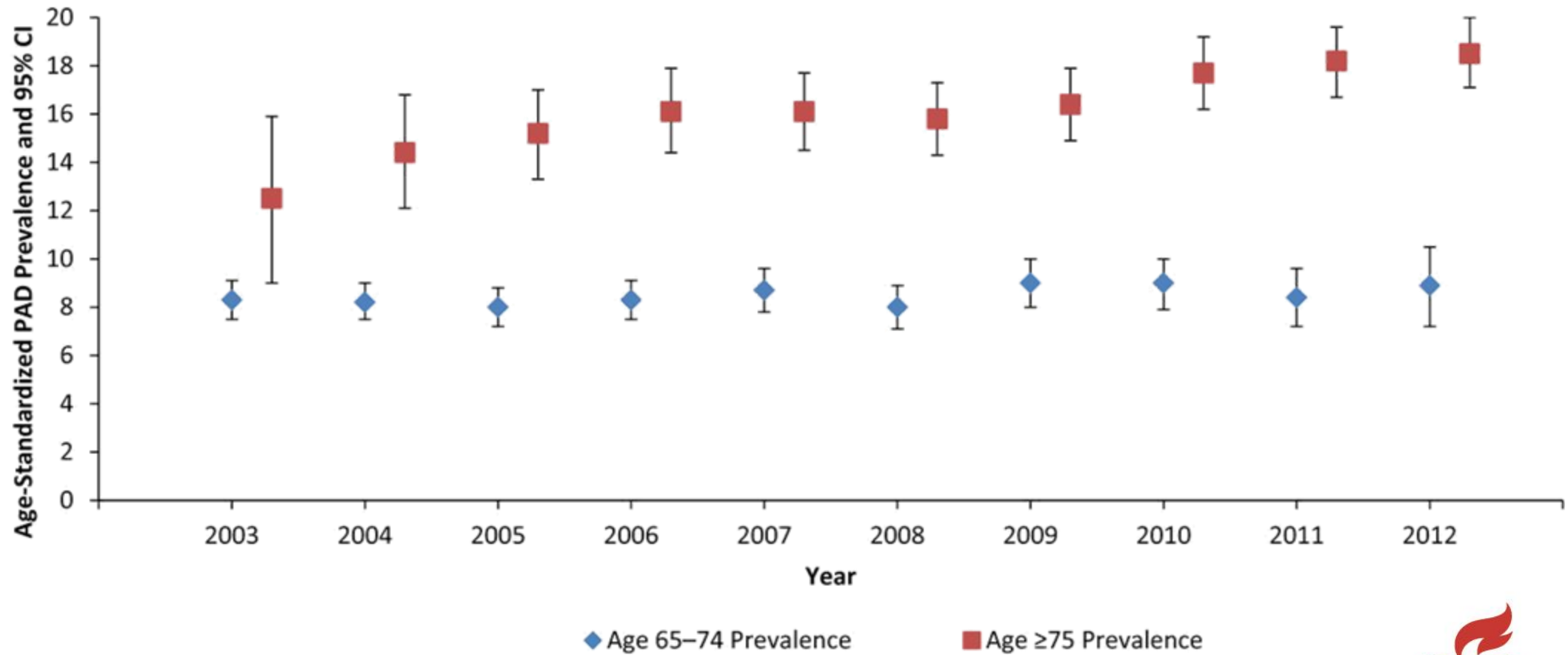
Photo from <https://www.brookings.edu/>

**Ascertainment of PAD
needs to be considered
in the setting of PAD
clinical burden.**

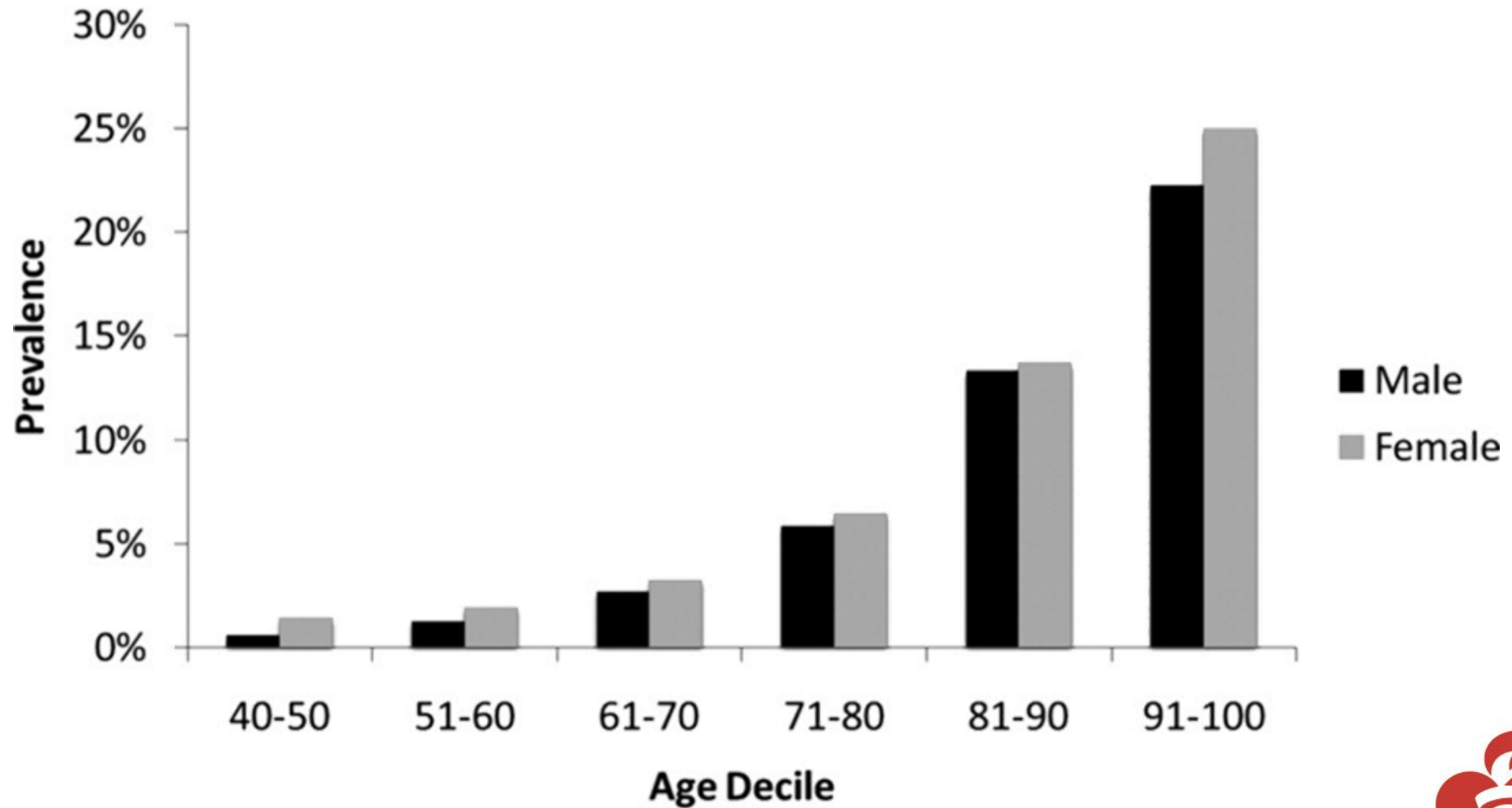


Age & PAD

Age & PAD



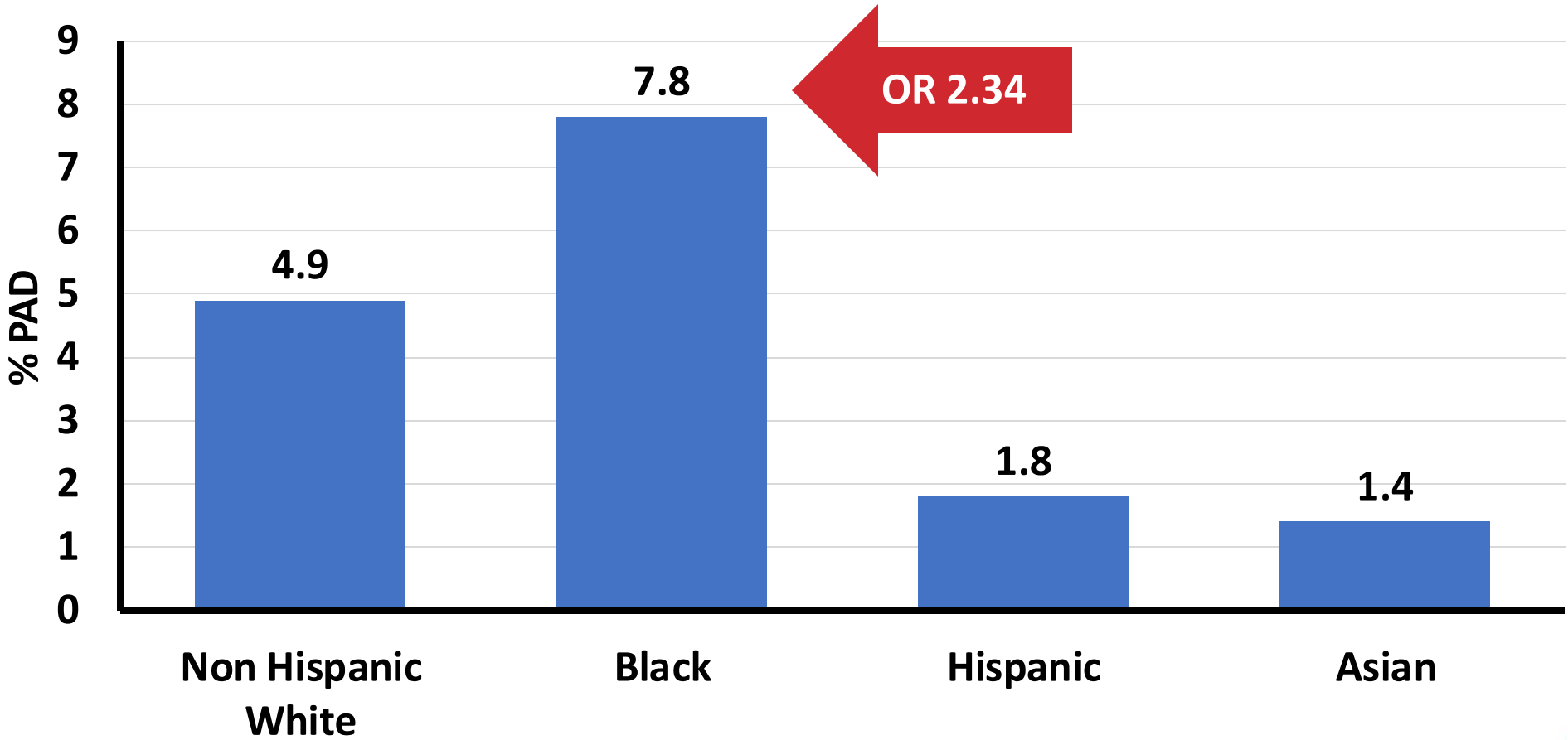
Age & PAD





Ethnicity & PAD

Ethnicity & PAD



Ethnicity & PAD

	2007	2008	2009	2010	2011
Total number	2,970,448	3,058,067	3,185,860	3,308,308	3,415,080
Non-black	88.5%	88.6%	88.3%	88.2%	88.0%
Black	11.5%	11.4%	11.7%	11.8%	12.0%

Non-black



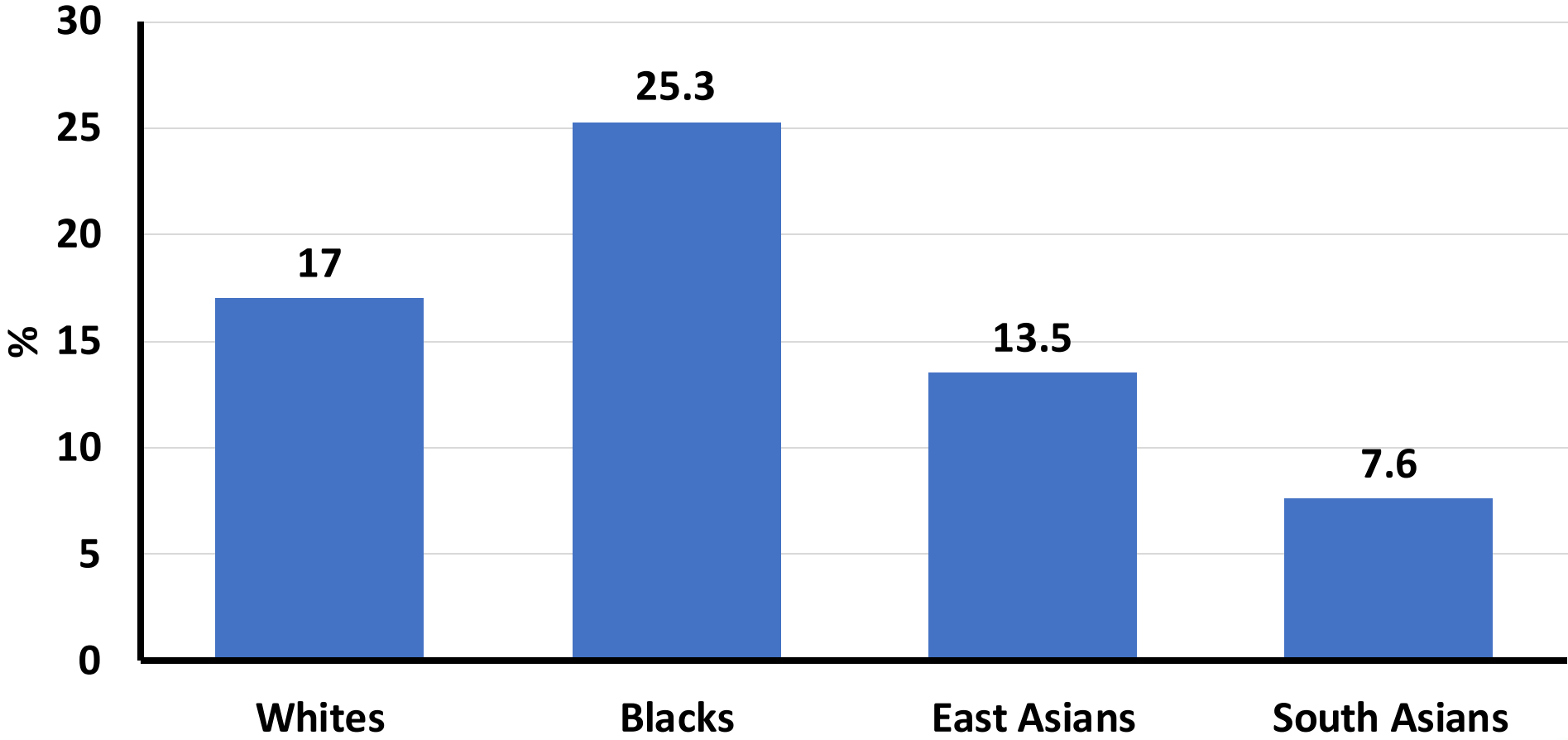
Black



Rate of PAD Among Medicare Beneficiaries



Ethnicity & PAD/Diabetes



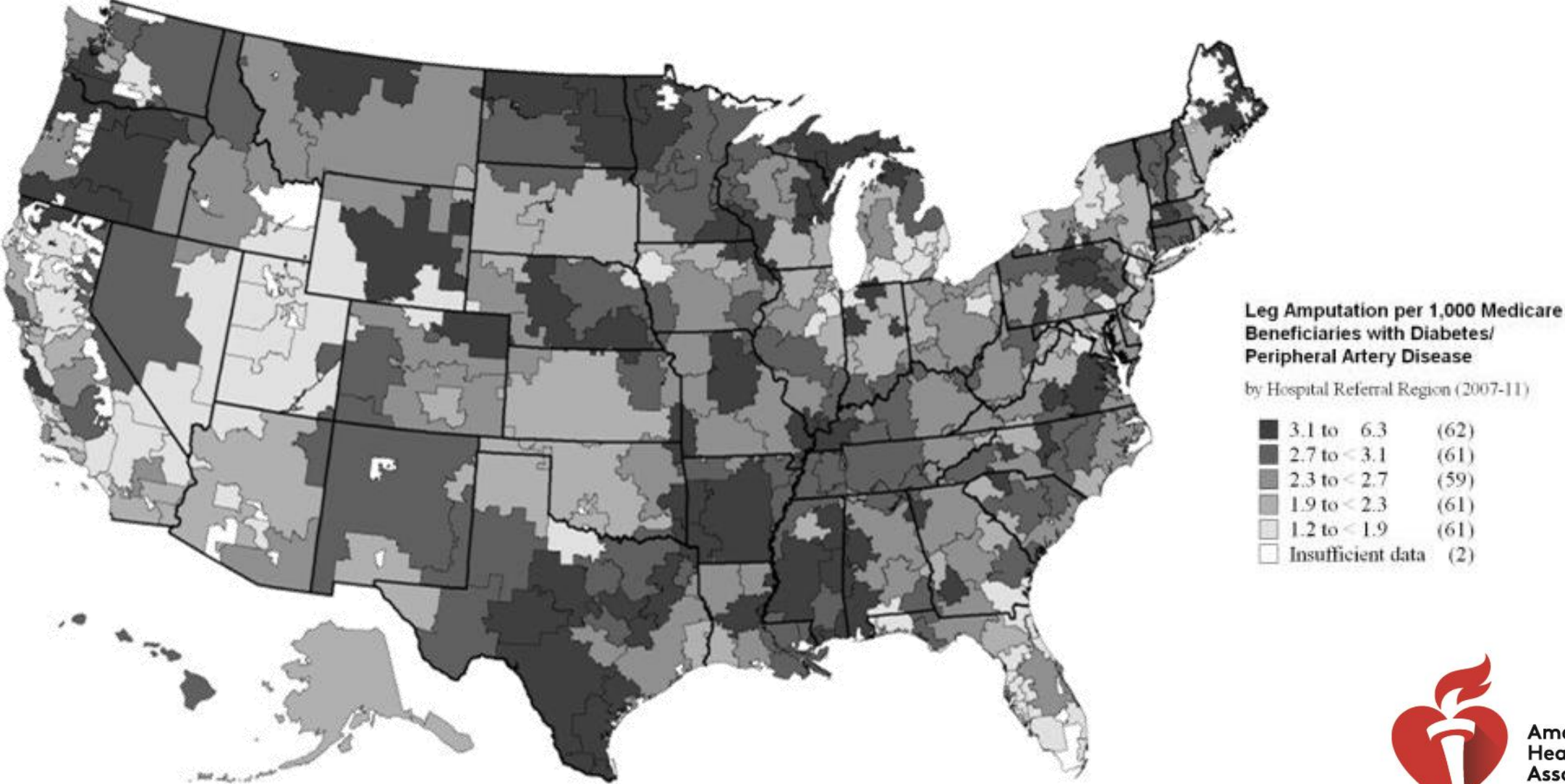
Ethnicity & PAD

	Caucasian (%)	African-American (%)	Hispanic (%)
Northeast	21.7	17.4	21.2
Midwest	20.3	15.9	5.1
South*	41.3	59.3	43.9
West	16.7	7.4	29.8

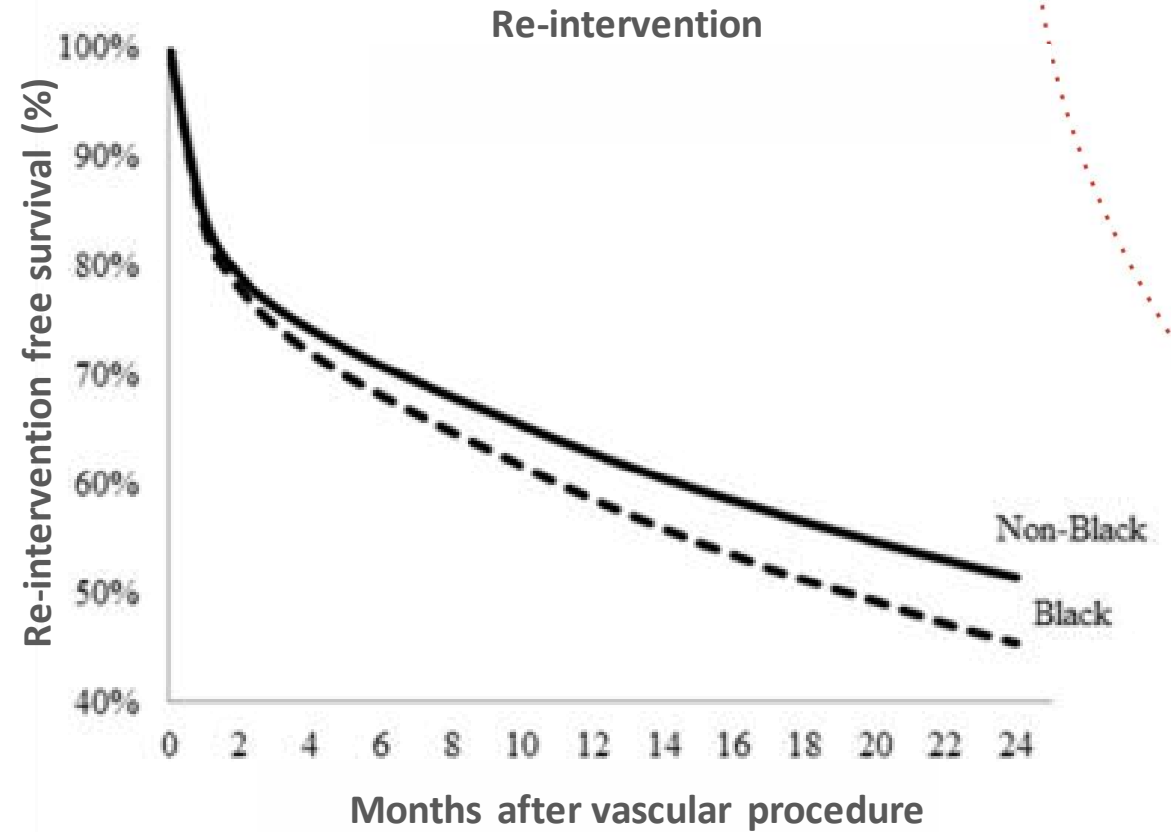
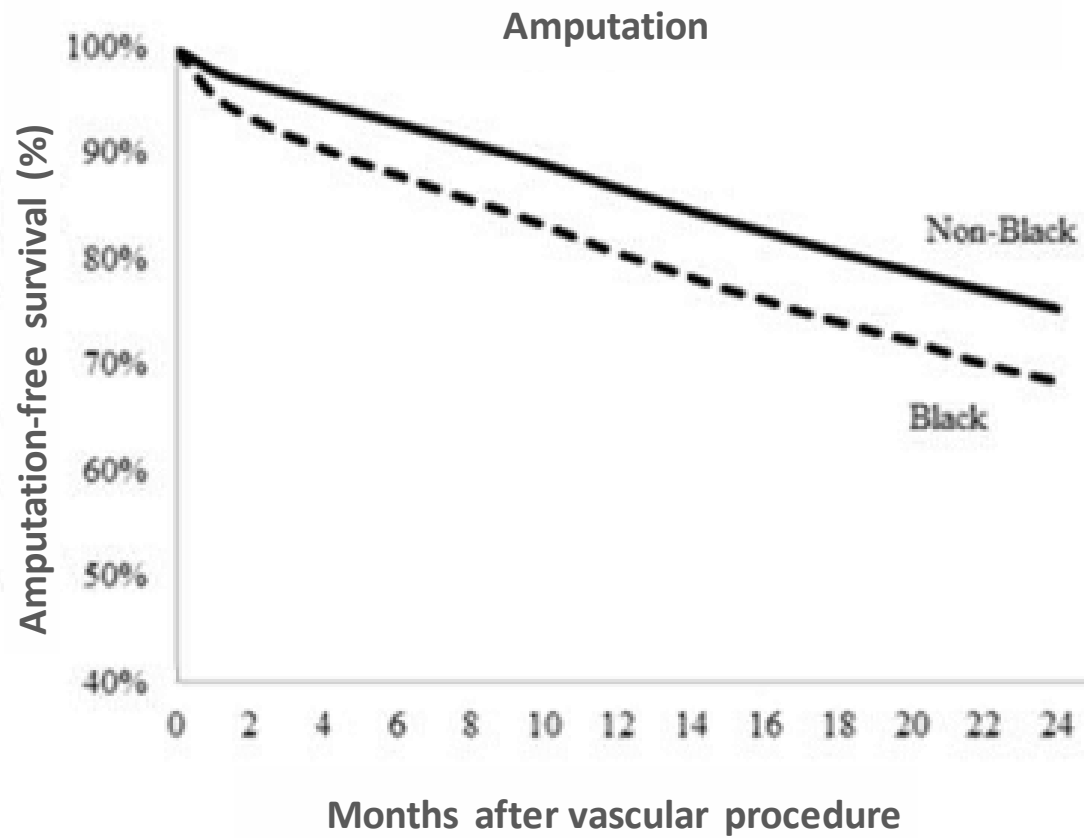
* Highest rates of PAD among African-Americans in the southern USA



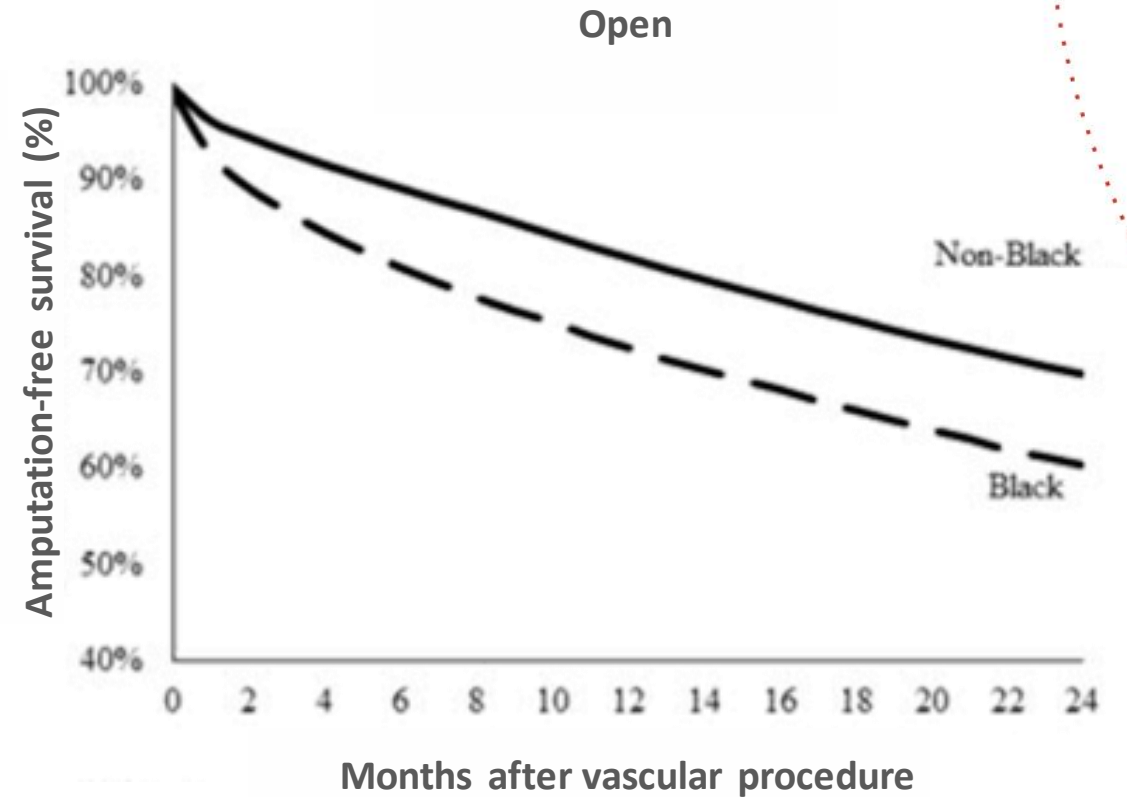
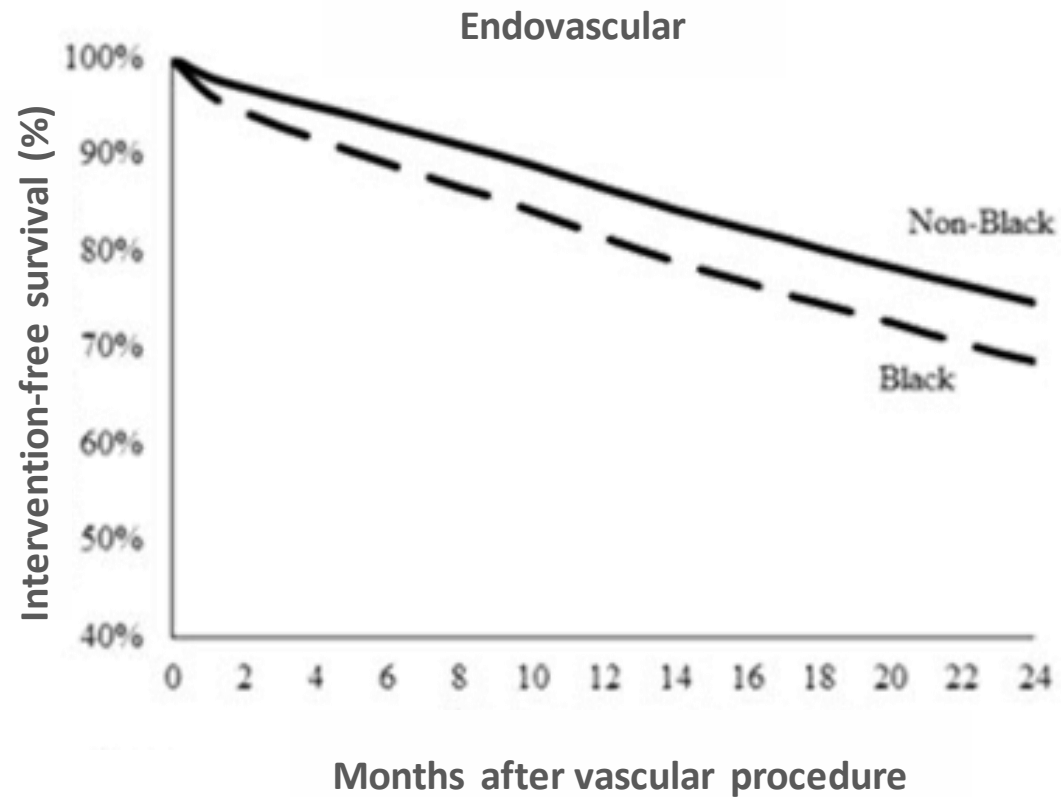
Ethnicity & PAD



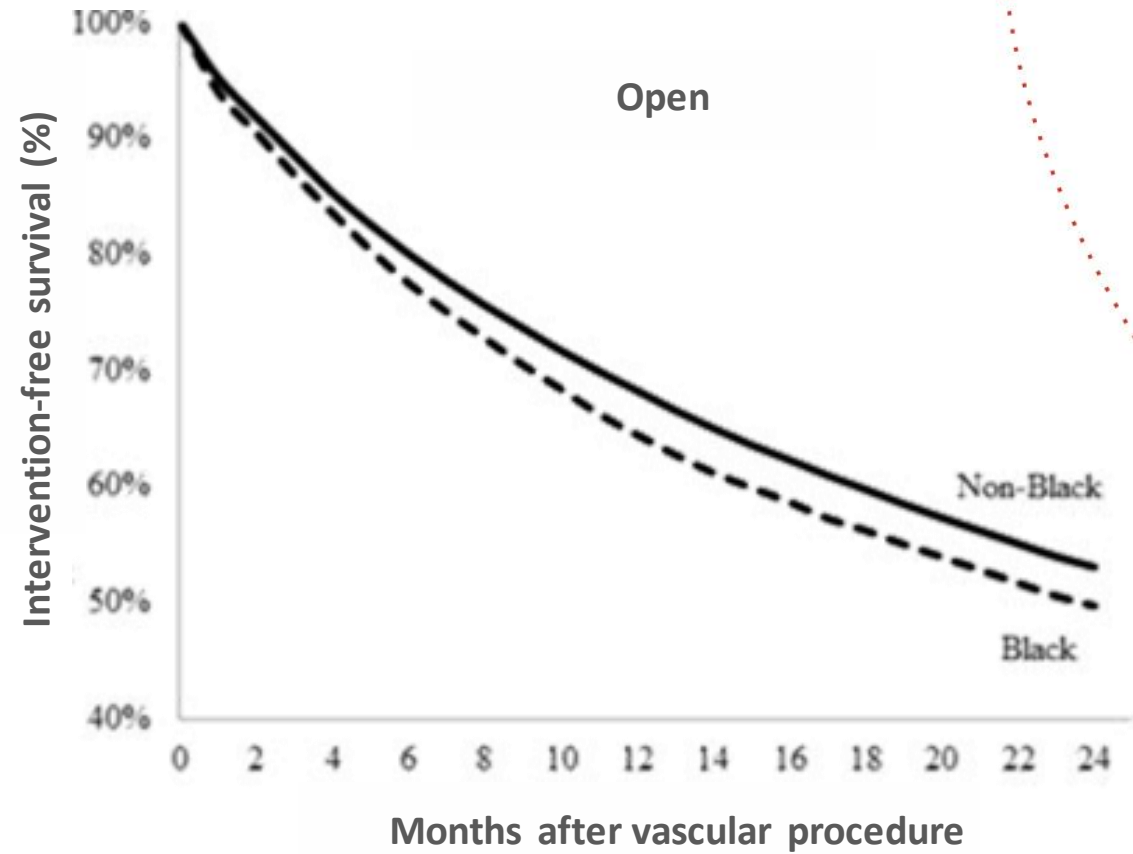
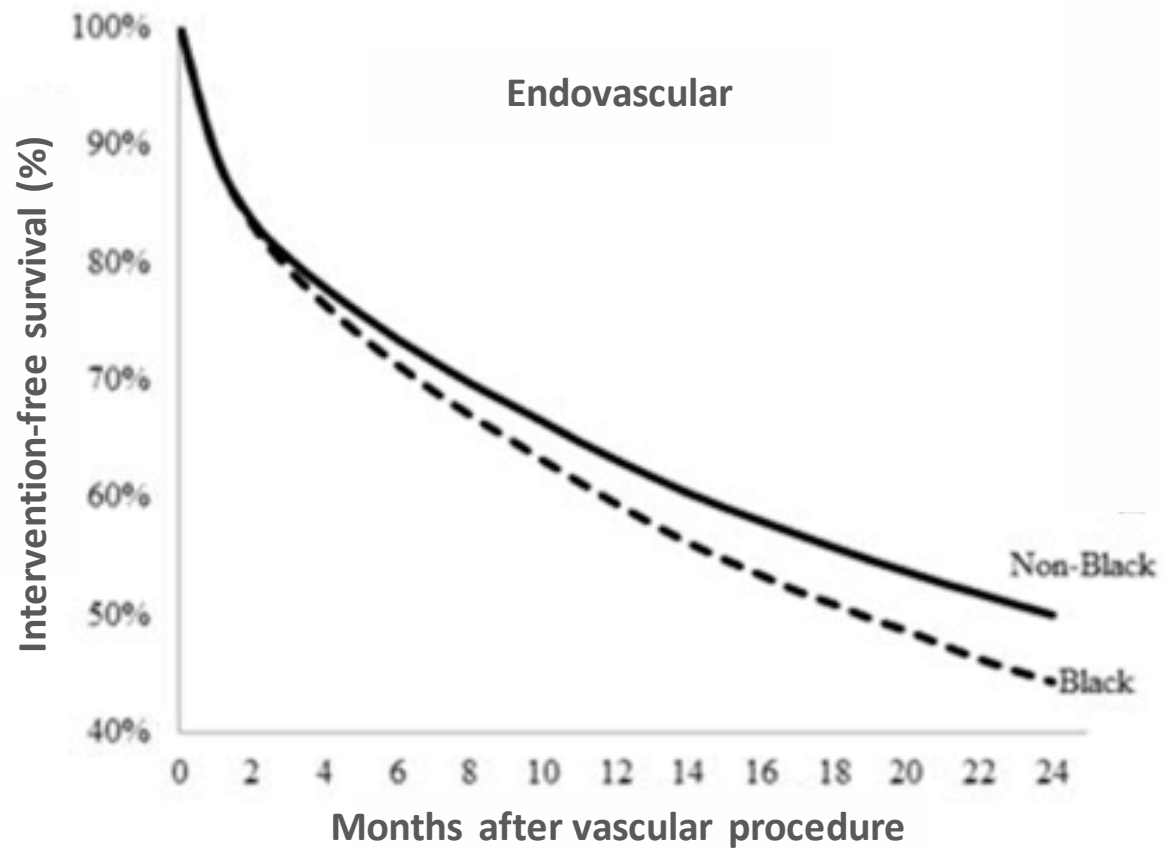
Ethnicity & PAD



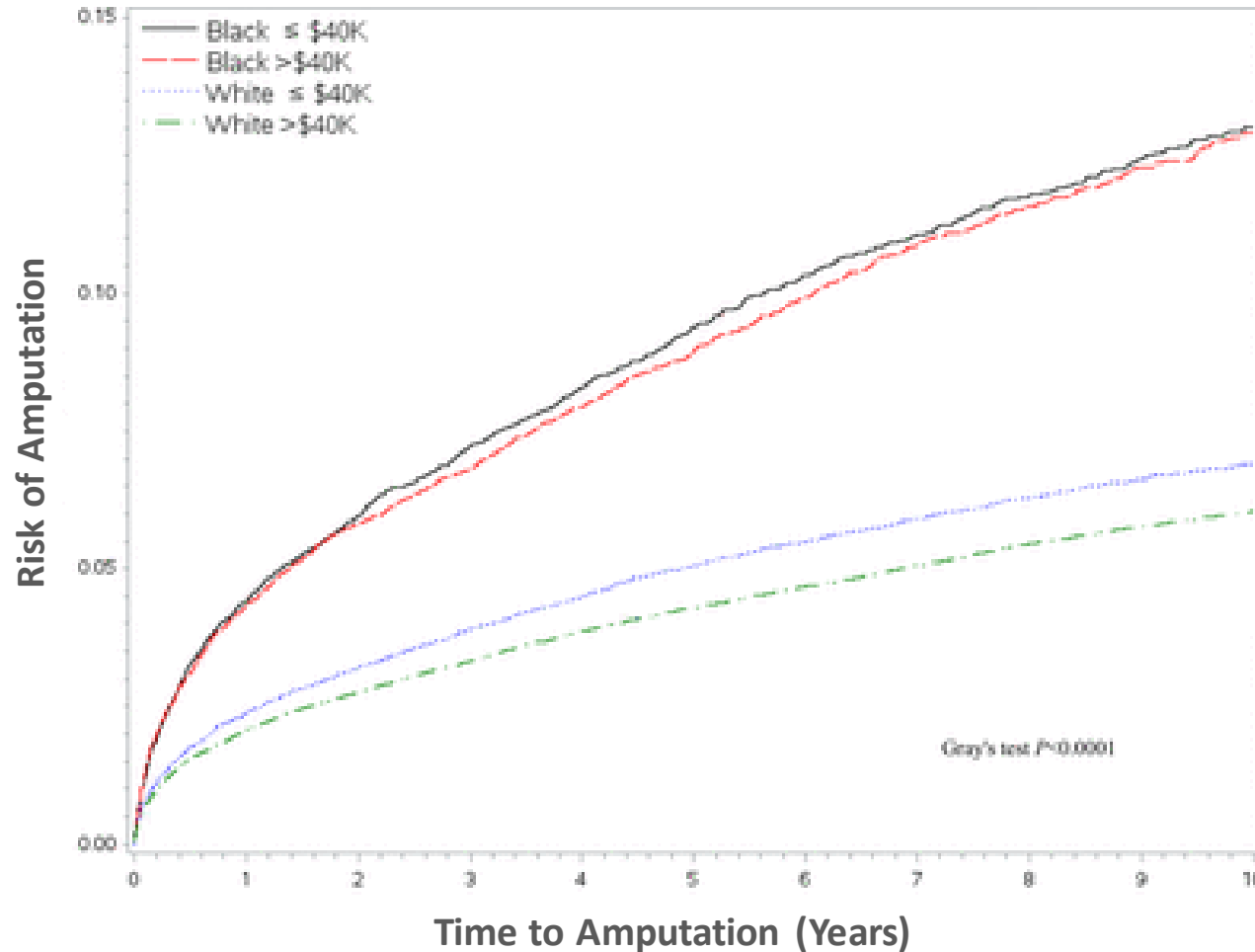
Ethnicity & PAD



Ethnicity and PAD



High Risk of Amputation in Black Patients



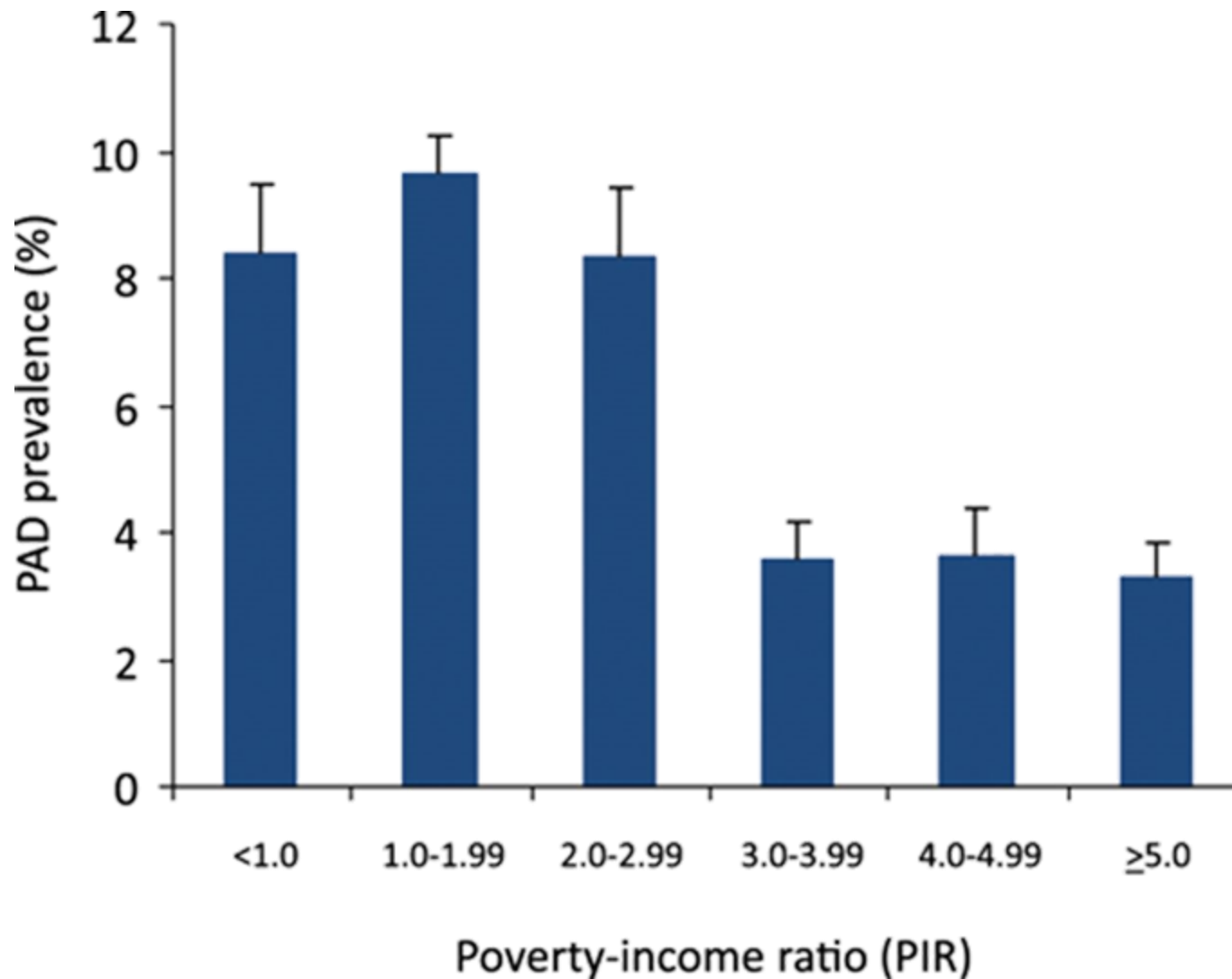
37% higher amputation risk compared with white patients (hazard ratio: 1.37; 95% confidence interval, 1.30–1.45)



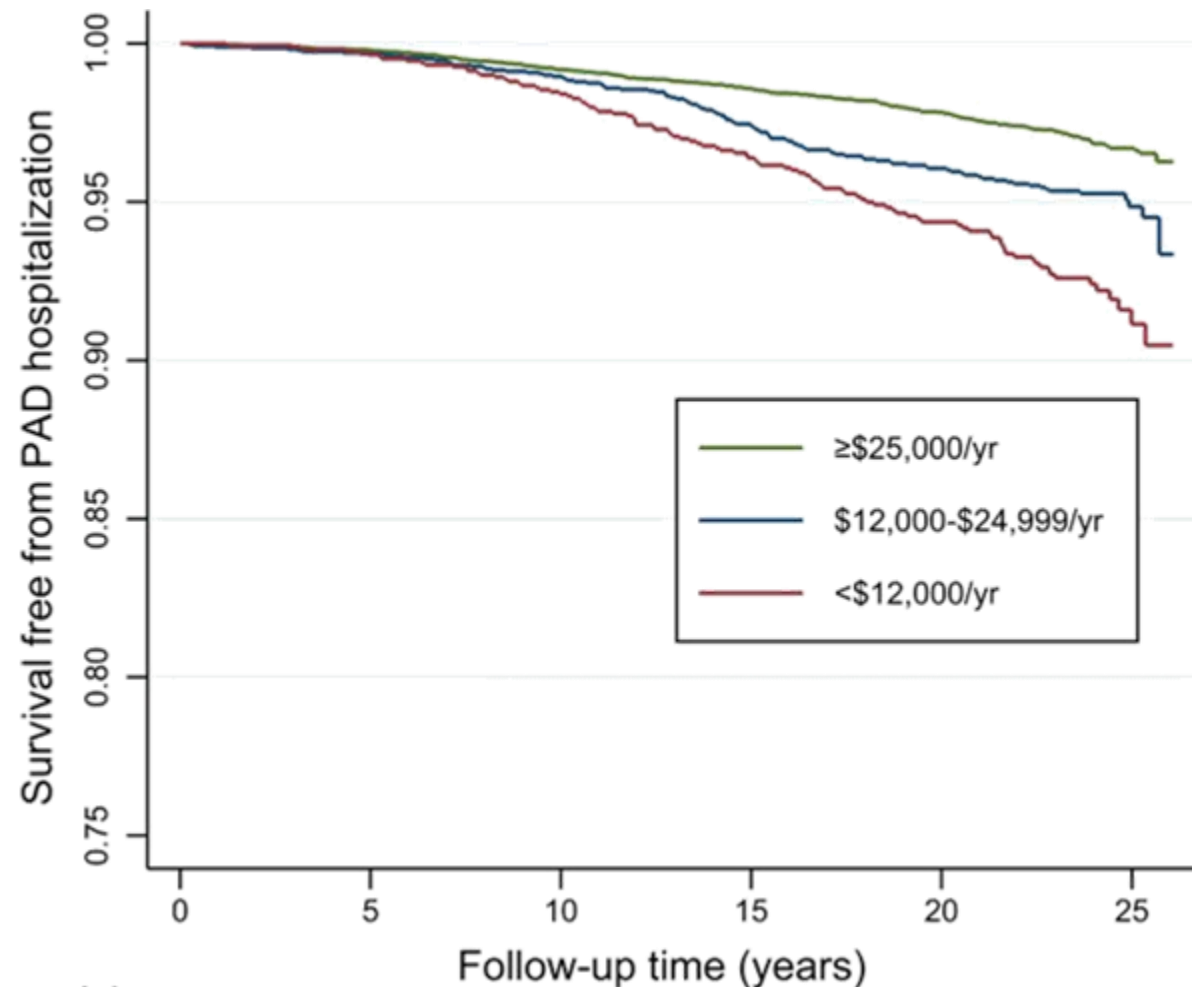


Economic Status & PAD

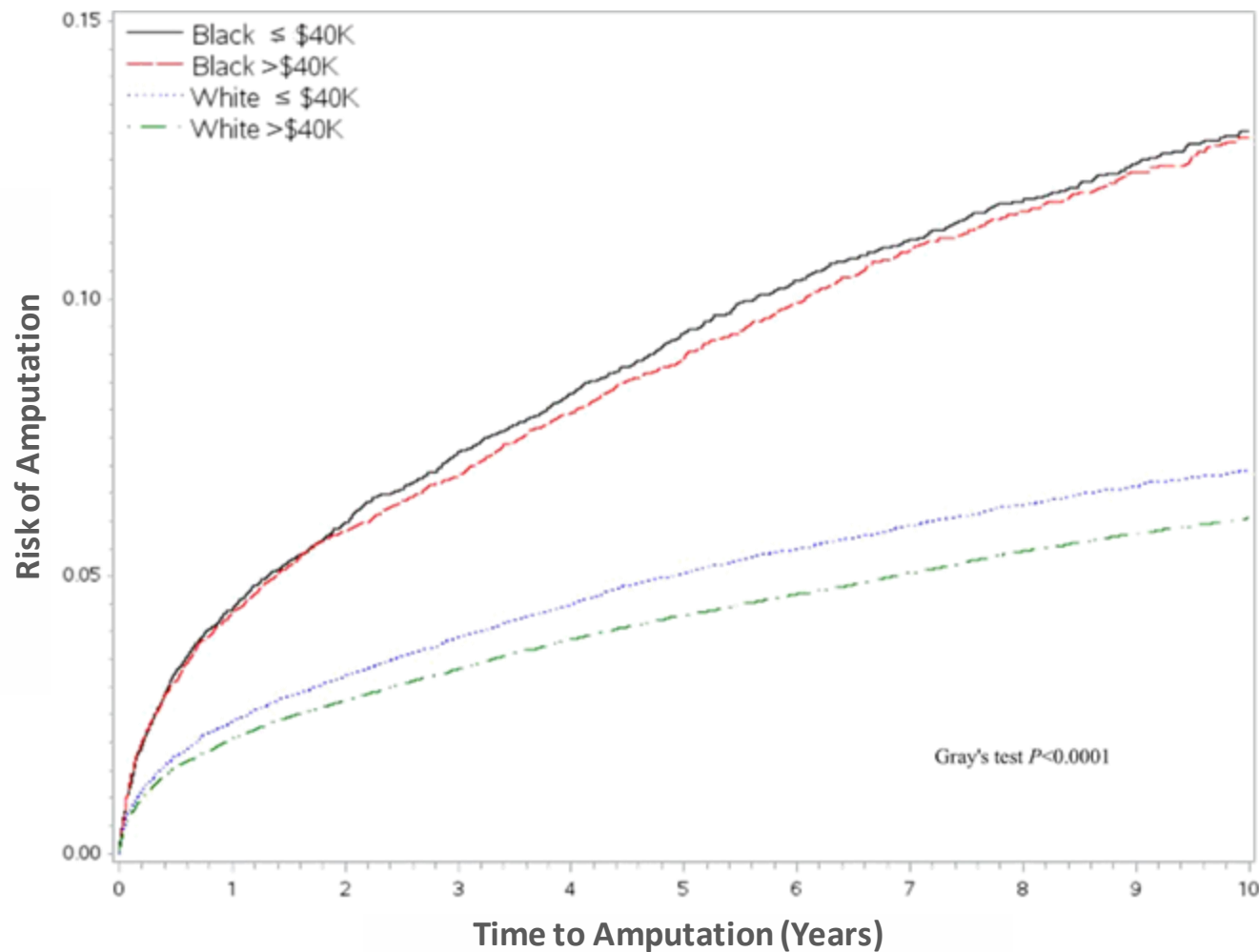
Poverty-Income Ratio & PAD



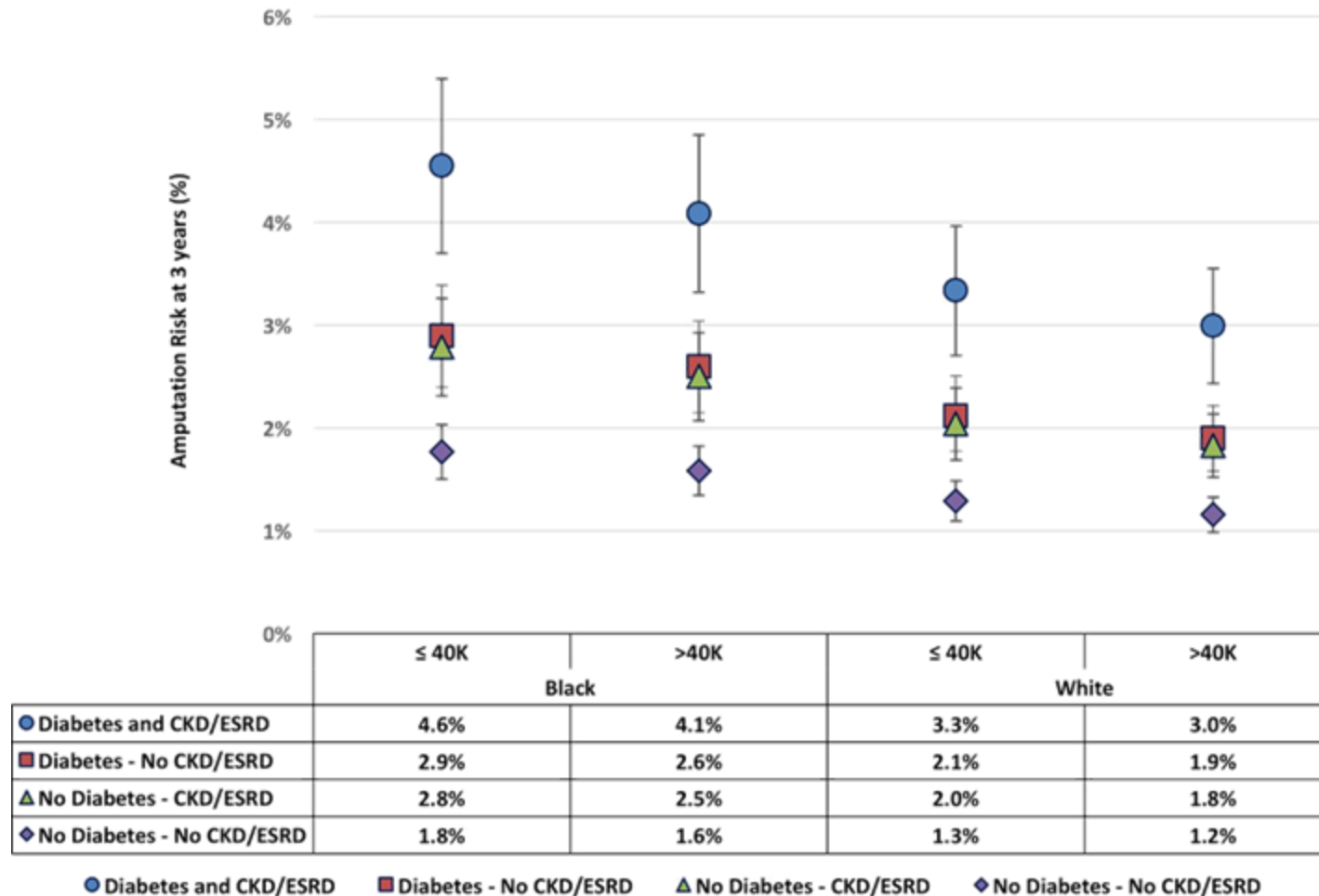
Socioeconomic Status, PAD & Hospitalization



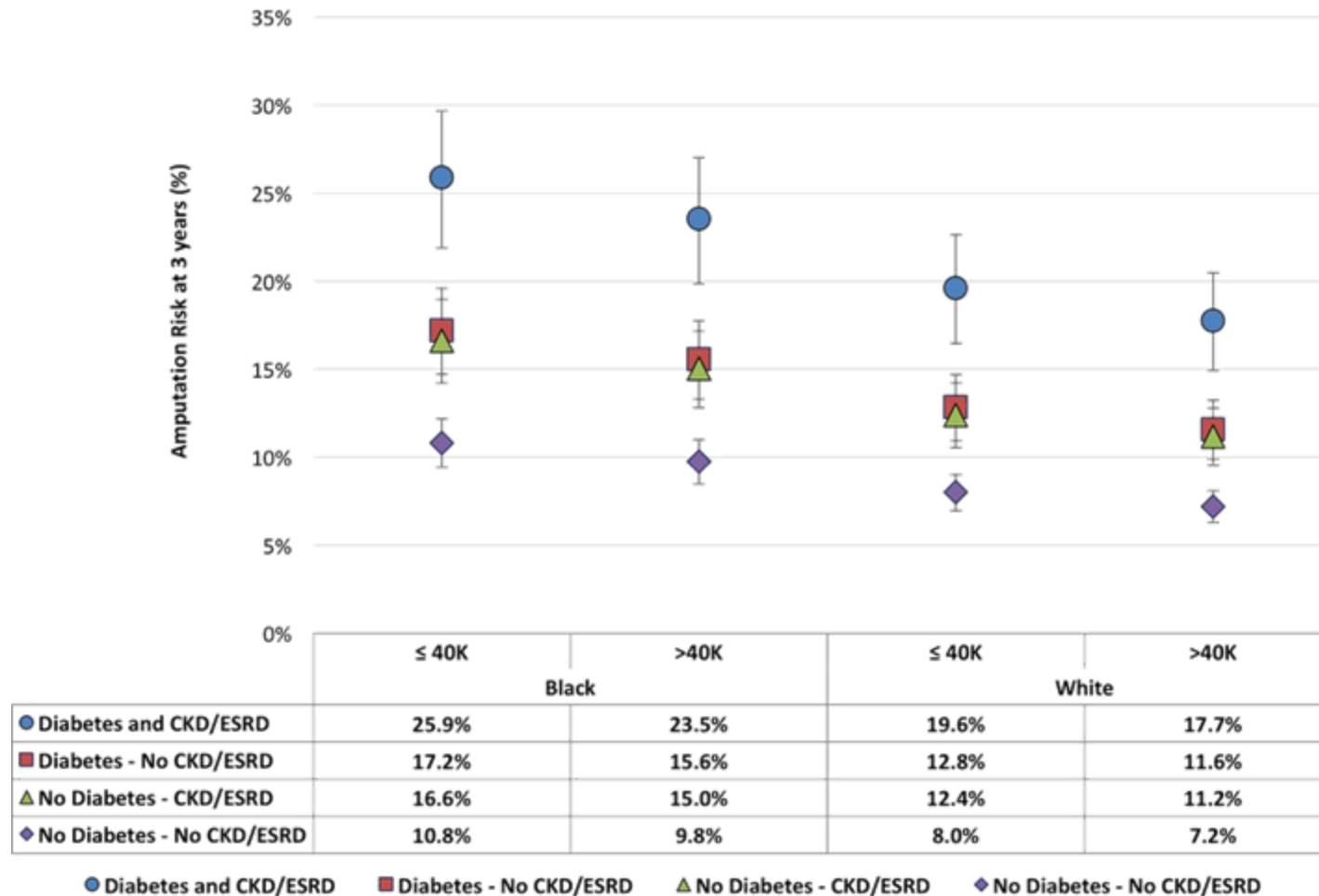
Socioeconomic Status, Race & Major Amputation



Socioeconomic Status, Race & Major Amputation: Claudication



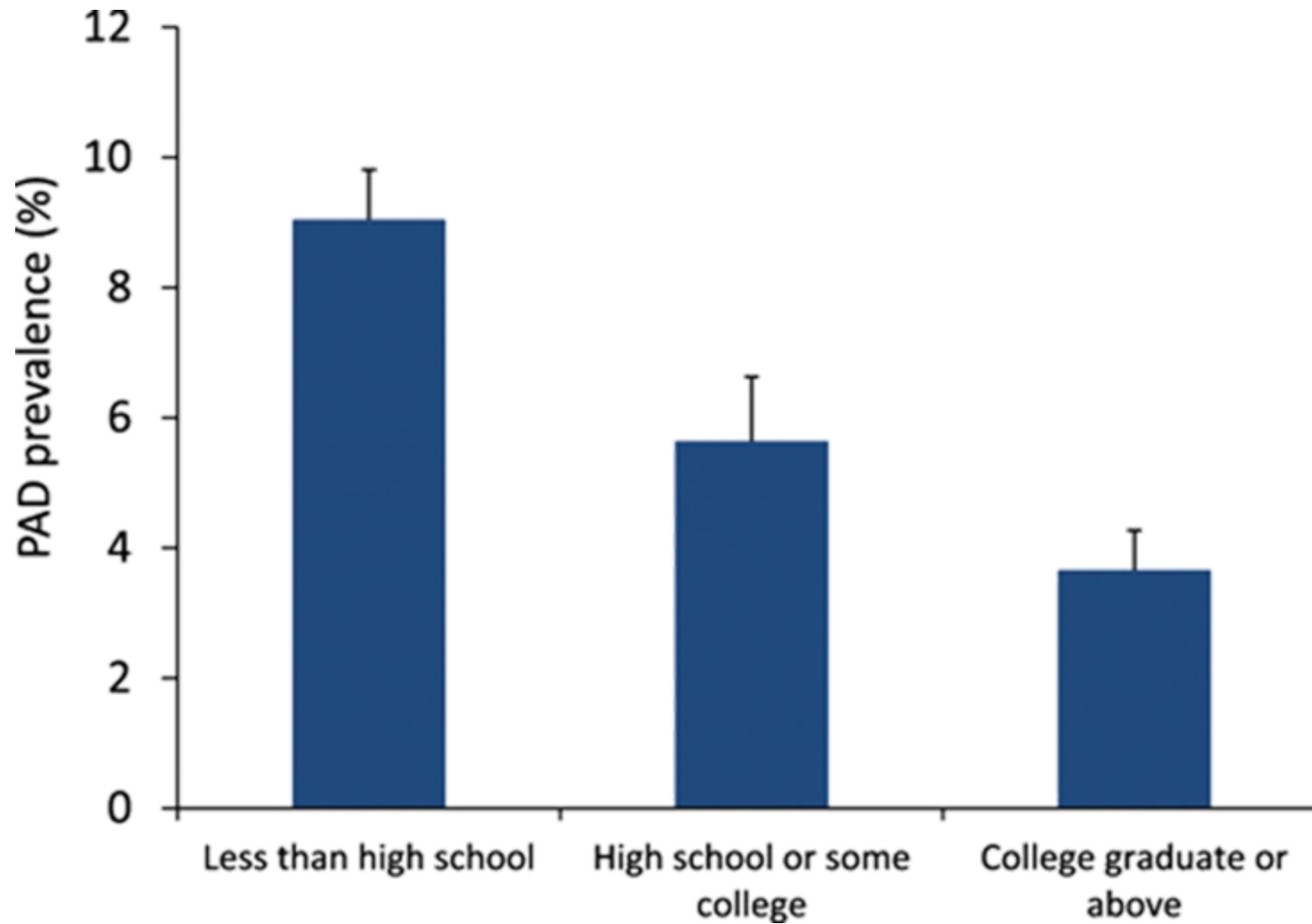
Socioeconomic Status, Race & Major Amputation: **Critical Limb Ischemia**



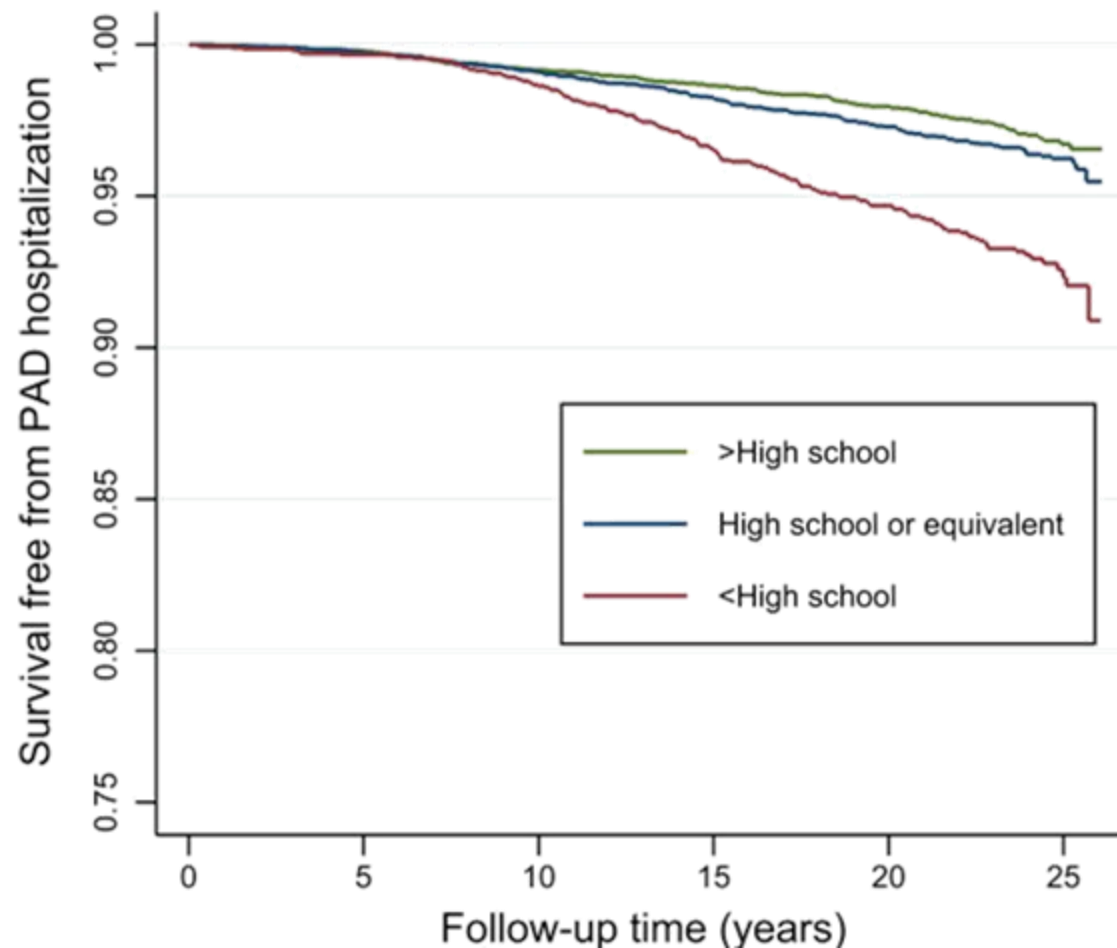


Education Level & PAD

Attained Education Level & PAD



Socioeconomic Status, PAD & Hospitalization





Health Literacy & PAD

What Is Health Literacy?



Health literacy is the degree to which individuals are able to **access** and **process** basic health information and services and thereby **participate in health-related decisions.**

How Health Literacy Interacts With the Social Determinants of Health & Outcomes

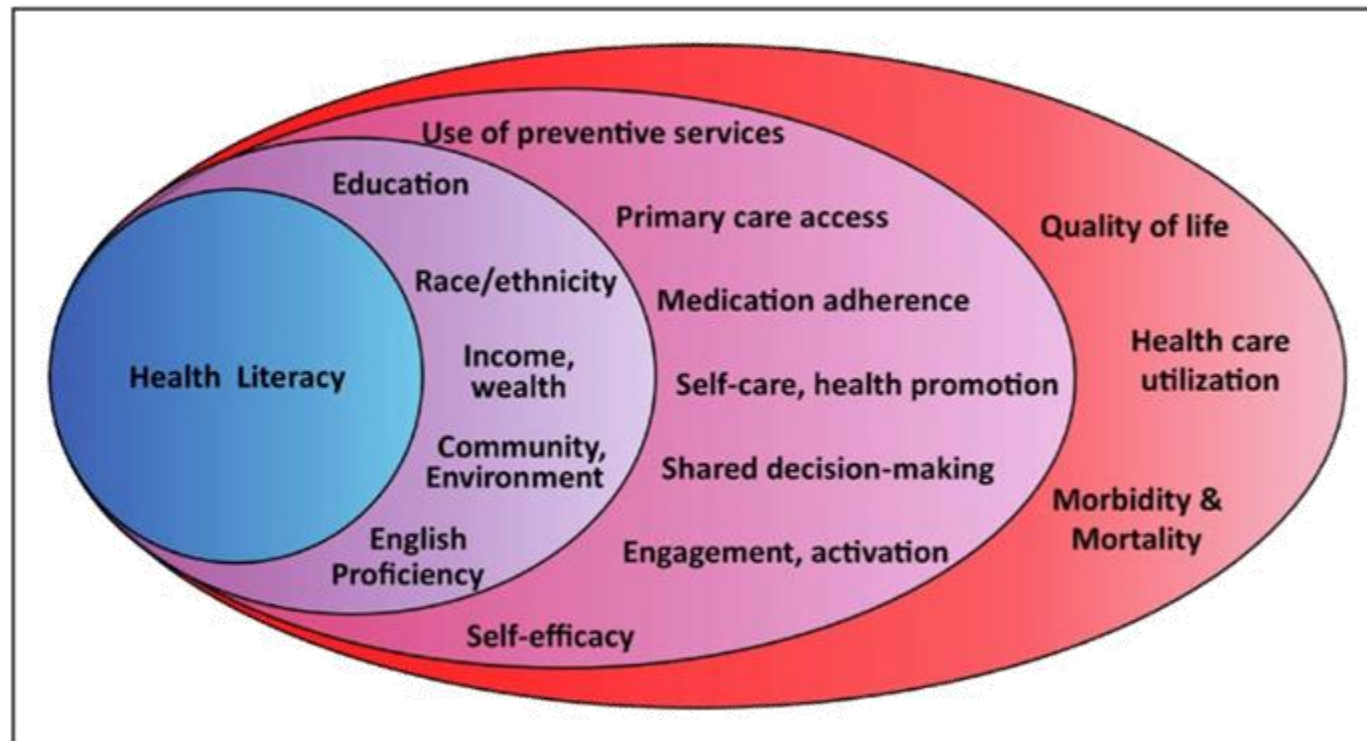


Figure 1. Health literacy nested within social determinants of health (education, race/ethnicity, income and wealth, community and environment, and English proficiency), which in turn are associated with a range of intermediate- and long-term health-care outcomes.

Why is Health Literacy Important When Caring for Patients With PAD?

- In general, patients are less familiar with PAD than heart disease or stroke.
- Patients from different racial and ethnic backgrounds can be at higher risk of complications from PAD and are likely unaware of their increased risk.
- Low socioeconomic status impacts access to care and is also associated with a lower health literacy.

Practical Steps to Help With Health Literacy for Our PAD Patients

1. Raise Awareness.

Educate staff about health literacy

2. Communicate Clearly.

Use plain language – “clogged blood vessels” in addition to “peripheral arterial disease”

Show pictures or diagrams to help with understanding

3. Use the Teach-Back Method.

Ask patients to explain what their understanding is of their treatment plan and what to watch out for





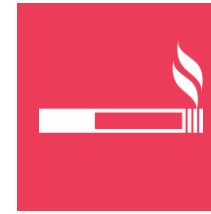
Assessing for PAD

History & Physical Exam

Risk factors for assessing PAD are:



AGE



**SMOKING
STATUS**



**DIABETES
HYPERLIPIDEMIA
CHRONIC KIDNEY DISEASE**



FAMILY HISTORY



**ATHEROSCLEROSIS IN
ANOTHER LOCATION**

History & Physical Exam



Who is at risk?

- ≥ 65 years
- 50-64 years + risk factors for atherosclerosis or family history of PAD
- < 50 years with diabetes + 1 additional risk factor for atherosclerosis
- Atherosclerotic disease in another location



History & Physical Exam



Photo from <https://www.corvascular.com/>

- Femoral pulses and bruits
- Popliteal pulses
- Pedal pulses
 - Posterior tibial pulses
 - Dorsalis pedis pulses
- Inspect the feet for wounds so **TAKE OFF SOCKS!**

Back to Our Case



History

- Claudication
- Ischemic pain at rest

Physical exam finding

- Abnormal pedal pulse

Patient Case



Photo from <https://support.airtasker.com>

Pedal pulses

- 0 on the right foot
- 1 for dorsalis pedis and posterior tibial on the left foot

Grading system for pulses

- 0 – absent
- 1 – diminished
- 2 – normal
- 3 – bounding

Ankle-Brachial Index (ABI)



Photo from www.youtube.com/watch?v=0_OVILSTAAE

- Lay patient flat for at least five minutes
- Brachial and ankle systolic pressures taken with a doppler device
- Highest brachial pressure is used as denominator for both legs
- Higher ankle pressure is used as the numerator for corresponding leg

$$\text{ABI} = \frac{\text{Ankle systolic pressure}}{\text{Brachial systolic pressure}}$$

Patient Case

Segmental Limb Pressures

	Right	Left
Brachial	130	125
Ankle (PT)	70 (0.54)	108 (0.83)
Ankle (DP)	77 (0.59)	126 (0.97)
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Doppler Signals

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Diagnosis of PAD

Ankle-Brachial Index (ABI)

Noncompressible > 1.40

Normal 1.00 to 1.40

Borderline 0.91 to 0.99

Abnormal 0.90 or less



Take-Home Points

- **Recognize social determinants of health for PAD.**
 - Age, ethnicity, economic status, education, and health literacy
- **Use social determinants to assess for PAD.**
- **Don't forget key risk factors for PAD.**
 - Cigarette smoking, diabetes mellitus, high blood pressure, and high cholesterol
- **Use the ankle-brachial index.**



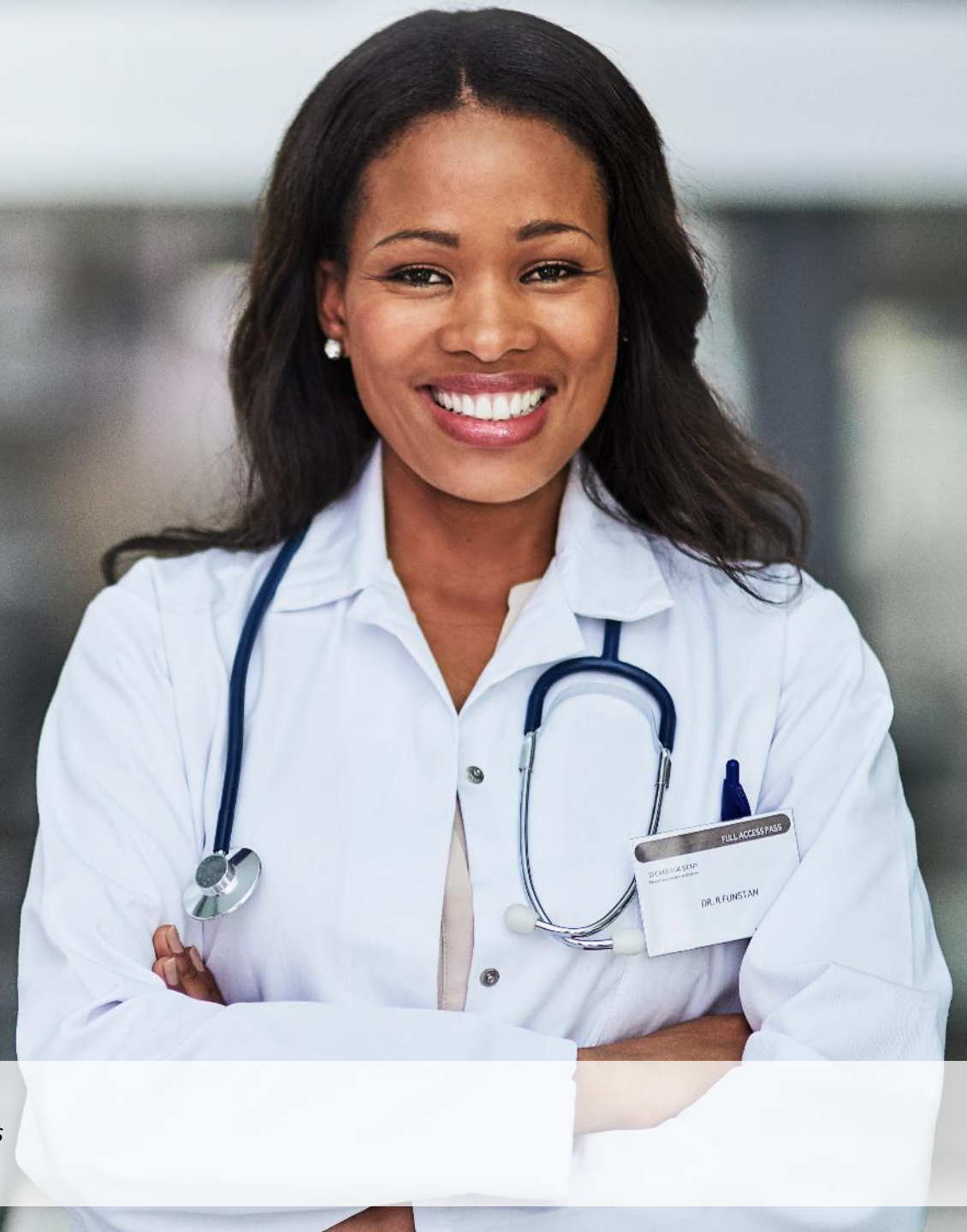


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