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.
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
• Unemployed
• Former smoker
• Did not attend high school
Lower Extremity to Brachial Indices

Segmental Limb Pressures

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Doppler Signals

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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

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

Graph showing the age-standardized PAD prevalence and 95% CI from 2003 to 2012. The graph indicates two distinct age categories: Age 65–74 and Age ≥75.
Age & PAD

Ethnicity & PAD
Ethnicity & PAD

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>% PAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non Hispanic White</td>
<td>4.9</td>
</tr>
<tr>
<td>Black</td>
<td>7.8</td>
</tr>
<tr>
<td>Hispanic</td>
<td>1.8</td>
</tr>
<tr>
<td>Asian</td>
<td>1.4</td>
</tr>
</tbody>
</table>

OR 2.34

## Ethnicity & PAD

### Rate of PAD Among Medicare Beneficiaries

<table>
<thead>
<tr>
<th></th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total number</strong></td>
<td>2,970,448</td>
<td>3,058,067</td>
<td>3,185,860</td>
<td>3,308,308</td>
<td>3,415,080</td>
</tr>
<tr>
<td><strong>Non-black</strong></td>
<td>88.5%</td>
<td>88.6%</td>
<td>88.3%</td>
<td>88.2%</td>
<td>88.0%</td>
</tr>
<tr>
<td><strong>Black</strong></td>
<td>11.5%</td>
<td>11.4%</td>
<td>11.7%</td>
<td>11.8%</td>
<td>12.0%</td>
</tr>
</tbody>
</table>

Ethnicity & PAD/Diabetes

Ethnicity & PAD

<table>
<thead>
<tr>
<th>Region</th>
<th>Caucasian (%)</th>
<th>African-American (%)</th>
<th>Hispanic (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northeast</td>
<td>21.7</td>
<td>17.4</td>
<td>21.2</td>
</tr>
<tr>
<td>Midwest</td>
<td>20.3</td>
<td>15.9</td>
<td>5.1</td>
</tr>
<tr>
<td>South*</td>
<td>41.3</td>
<td>59.3</td>
<td>43.9</td>
</tr>
<tr>
<td>West</td>
<td>16.7</td>
<td>7.4</td>
<td>29.8</td>
</tr>
</tbody>
</table>

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

Leg Amputation per 1,000 Medicare Beneficiaries with Diabetes/Peripheral Artery Disease by Hospital Referral Region (2007-11)

- 3.1 to 6.3 (62)
- 2.7 to < 3.1 (61)
- 2.3 to < 2.7 (59)
- 1.9 to < 2.3 (61)
- 1.2 to < 1.9 (61)
- Insufficient data (2)
Ethnicity & PAD

Amputation

Re-intervention

Amputation-free survival (%)

Re-intervention-free survival (%)

Months after vascular procedure

Ethnicity & PAD

Intervention-free survival (%)

Amputation-free survival (%)

Months after vascular procedure

Endovascular

Open

Non-Black
Black

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

![Bar Chart]

Poverty-income ratio (PIR)

PAD prevalence (%)
Socioeconomic Status, PAD & Hospitalization

Survival free from PAD hospitalization

Follow-up time (years)

≥$25,000/yr

$12,000-$24,999/yr

<$12,000/yr
Socioeconomic Status, Race & Major Amputation
Socioeconomic Status, Race & Major Amputation: Claudication

<table>
<thead>
<tr>
<th></th>
<th>≤ 40K</th>
<th>&gt;40K</th>
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<tbody>
<tr>
<td><strong>Diabetes and CKD/ESRD</strong></td>
<td>4.6%</td>
<td>4.1%</td>
<td>3.3%</td>
<td>3.0%</td>
</tr>
<tr>
<td><strong>Diabetes - No CKD/ESRD</strong></td>
<td>2.9%</td>
<td>2.6%</td>
<td>2.1%</td>
<td>1.9%</td>
</tr>
<tr>
<td><strong>No Diabetes - CKD/ESRD</strong></td>
<td>2.8%</td>
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Arya S, et al. J Am Heart Assoc. 2018 Jan 12;7(2)
Socioeconomic Status, Race & Major Amputation: Critical Limb Ischemia

Arya S, et al. J Am Heart Assoc. 2018 Jan 12;7(2)
Education Level & PAD
Attained Education Level & PAD

![Bar chart showing PAD prevalence by education level: Less than high school, High school or some college, College graduate or above.](chart.png)
Socioeconomic Status, PAD & Hospitalization

Survival free from PAD hospitalization

Follow-up time (years)

- >High school
- High school or equivalent
- <High school

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
Risk factors for assessing PAD are:

- ≥65
- AGE
- DIABETES
- HYPERLIPIDEMIA
- CHRONIC KIDNEY DISEASE
- ATHEROSCLEROSIS IN ANOTHER LOCATION
- SMOKING STATUS
- FAMILY HISTORY
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

• 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

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

Photo from https://support.airtasker.com
Ankle-Brachial Index (ABI)

- 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

\[
\text{ABI} = \frac{\text{Ankle systolic pressure}}{\text{Brachial systolic pressure}}
\]

Photo from [www.youtube.com/watch?v=0_OVLSTAAE](http://www.youtube.com/watch?v=0_OVLSTAAE)
### Patient Case

#### Segmental Limb Pressures

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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.
LEARN MORE
Download the PAD Clinician’s Toolkit
Heart.org/PADtoolkit

Janssen Pharmaceutical is a proud sponsor of the American Heart Association's efforts to educate patients about peripheral arterial disease.