

# UVM ScholarWorks

## Improving Identification of Peripheral Arterial Disease In the Outpatient Setting

Item Type	Presentation;Presentation
Authors	Robinson, William
Download date	2026-06-11 10:30:29
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# Improving Identification of Peripheral Arterial Disease



William Robinson, MS3

Porter - Vergennes/Middlebury

R7, 1/30/2023 – 3/10/2023

Mentor: Dr. Catherine Ayers



# Problem Identification

- A large study in the United States conducted between 1999 and 2004 revealed that roughly **7.1 million Americans** were diagnosed with PAD at that time<sup>1</sup>
- However, it is also well established that **undiagnosed PAD is common**<sup>2</sup>
  - In a study of >7,000 primary care patients over 70 years old, or between 55-69 with risk factors for atherosclerosis, PAD was identified using ankle brachial index (ABI) in 29%
  - Over half of these cases were new diagnoses
- PAD **frequently goes unrecognized** by physicians, even when patients are symptomatic. Furthermore, in a study of almost 2,000 PAD patients, only **10% had a classic intermittent claudication** presentation consistent with the widely used Rose criteria (defined as exertional calf pain resolving 10 mins after rest)<sup>3,4</sup>



# Description of Need

- One meta-analysis evaluating several studies investigating ABI and subsequent cardiovascular complications for patients with an ABI between 0.8 and 0.9 compared to patients with a normal ABI, **likelihood ratios for CHD, stroke, and cardiovascular death were 2.5, 2.5, and 5.6, respectively**<sup>5</sup>
- While the AAFP does not recommend screening for PAD with ABI in asymptomatic patients, it **does recommend screening for exertional leg symptoms** in those at increased risk (e.g. hypertension, diabetes, smoking history)
- Given the prevalence of PAD, its known association with other significant cardiovascular events, and the easy yet actionable conservative treatment options, a **targeted screening program with in-office ABI capability would identify more patients with PAD** and provide a valuable opportunity for intervention and improved preventative care

TABLE 1

## Risk Index for 10-Year Mortality Rates in Patients with Lower Extremity Peripheral Artery Disease

Risk factors	Points
Renal dysfunction	+ 12
Heart failure	+ 7
Age > 65 years	+ 5
Hypercholesterolemia	+ 5
ST-segment changes on ECG	+ 5
Ankle-brachial index < 0.6	+ 4
Q-waves on ECG	+ 4
Cerebrovascular disease	+ 3
Diabetes mellitus	+ 3
Pulmonary disease	+ 3
Statin use	- 6
Aspirin use	- 4
Beta blocker use	- 4

Risk category	Points	Associated 10-year mortality
Low	< 0	22.1%
Low-intermediate	0 to 5	32.2%
High-intermediate	6 to 9	45.8%
High	> 9	70.4%

ECG = electrocardiography.

Information from reference 7.

Feringa HH, Bax JJ, Hoeks S, et al. A prognostic risk index for long-term mortality in patients with peripheral arterial disease. *Arch Intern Med.* 2007;167(22):2482-2489.



# Public Health Cost

- Patients with PAD have **higher health care associated expenses** compared to the general population which has been shown to significantly compound lost wages and opportunity costs, as well as **impact expenditures and income opportunities for family members** responsible for care at home
- Much of these increased expenditures result from **escalating medication requirements, outpatient care, and PAD related hospitalizations**<sup>6</sup>
- **Each year in the US, over 150,000 amputations are performed on PAD patients.** Over 55% of these patients are deemed permanently disabled afterwards. A similar number never regain full ambulatory function.
- Estimates of annual **Medicare expenditures on PAD patients exceed \$84 billion**, with the expenses rising to as high as \$381 billion when long term care costs are considered<sup>7</sup>



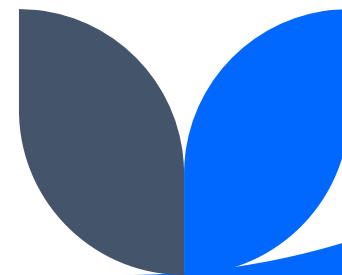
# Community Perspective

- **Dr. Michael Graham, Porter (Vergennes) Family Practice Physician**
  - After training in Vermont as a resident and now practicing here for over ten years as an attending, he has not made or seen other physicians make new diagnosis of PAD nearly as frequently as what would be expected given established PAD incidence rates
  - Targeted screening is necessary in all practices, and while access to routinely accessible and highly skilled technicians at UVM vascular lab makes in-office ABI capability less valuable in Vergennes and nearby clinics specifically, he sees this being a doable and highly impactful practice at more rural practices in Vermont
- **Anonymous patient of Porter (Vergennes) Family Practice**
  - States he went years with leg symptoms that ultimately proved to be associated with PAD prior to diagnosis
  - Has since undergone multiple toe amputations and multiple revascularization procedures, including femoral-popliteal bypass



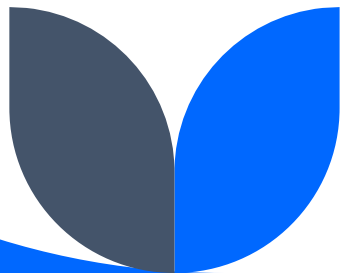
# Intervention and Methodology

- Because an overwhelming majority of PAD patients do not experience typical symptoms that might alert physician of presence of disease, goal here is to **establish routine screening questions covering typical and atypical claudication symptoms in at risk patients to identify those who may have this debilitating disease**
  - Ideally all patients over 70 years old, or between 55-69 with risk factors for atherosclerosis
- However, history and physical exam alone are known to have low sensitivity for PAD diagnosis, while ABI has sensitivity and specificity (both roughly 95%) comparable to CT angiography in patients with high clinical suspicion for PAD<sup>8,9</sup>
- Therefore, the goal would be to couple targeted screening with **training of nursing staff in primary care clinics to perform ABIs in the office which do not require extensive training, time or resources**
- Identifying high risk patients and performing simple, highly reliable testing to establish a PAD diagnosis would catch this disease early in its course when conservative measures can have a significant impact on preventing debilitating future complications



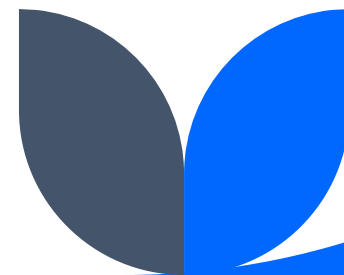
# Results

- Initial implementation so far has only consisted of asking screening questions, and this has **identified 6 patients with symptoms that could be concerning for PAD**. Most of these patients state they likely would not have discussed these symptoms given other reasons for their visit.
- Justification of this initiative would ultimately rely on **analysis of new PAD diagnoses** using this screening process
- Ideally, a retrospective chart review of patients at this clinic would be done in order to establish rates of new PAD diagnosis **before and after implementation** of this screening method
- Importantly, a **survey of the staff** would be vital in ensuring that the process is sustainable. Excessive demands on nursing staff, for example, would limit the practicality of this approach



# Limitations

- The **wide range of symptoms** PAD patients can present with is part of what makes this screening program so important, however, it also makes it difficult to establish screening questions that will identify patients who require further evaluation with ABI
- While ABIs are simple and easy to perform in an outpatient office, they do require doppler ultrasound which would be a **cost for the practice** (roughly \$500)
- As stated previously, Dr. Michael Graham points out the utility of this program in practices **located in more rural parts of Vermont**, rather than those closer to UVM with easy access to the UVM vascular lab



# Future Considerations

- Part of what could make this such an effective tool is that there is an **actionable response** to patients with ABI-confirmed PAD, and many of these treatments are simply lifestyle modifications and initiation of frequently prescribed and generally well tolerated medications
- Therefore, one future consideration is **adding a protocol** to initiate in these patients and/or a **handout to give patients** outlining simple strategies that they can take to slow progression of their disease and improve symptoms
- Broadening this initiative to **target more rural primary care clinics** where access to a vascular lab is far more difficult could serve to reach a population where ABI-capability could have a much higher impact



# Citations

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