

# THE MULTI-DISCIPLINARY VASCULAR CLINIC

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## INTRODUCTION

Peripheral artery disease (PAD) is associated with substantial morbidity and mortality that is often under-diagnosed and under-treated, not only with inadequate relief of symptoms, but even more so with inadequate attention to risk factor modification to prevent adverse cardiovascular outcomes.

This unfortunate situation is the sum of many different aspects of vascular care, particularly its fragmentation among numerous providers and specialties. While each provider attends to some aspect of the vascular disease process, there is often no one overseeing the whole. As a result, there is a growing national focus on efforts to develop more comprehensive care for the population with vascular disease. This article will review the challenges facing vascular care delivery as well as the local effort to address this disease comprehensively in a multi-disciplinary vascular clinic at Lancaster General.

## PERIPHERAL ARTERY DISEASE: A BAD DISEASE SUFFERING FROM AN EVEN WORSE PUBLICIST

What disease would you blame if you were told that affected but asymptomatic patients have a survival rate at 10 years of just over 55%; that if they develop symptoms their survival declines to 40%; and if their symptoms became severe, survival plummets to just 25%? Without knowing the topic of this article, it's doubtful that many would identify peripheral artery disease as the culprit.<sup>1</sup> The ankle/brachial index (ABI), a simple blood pressure cuff ratio that uses the highest brachial cuff pressure as the "normal" for comparison with blood pressure at the ankle, demonstrates a dramatic inverse relationship with 10-year mortality. An ABI of 0.9, i.e. up to a 10% reduction in leg blood pressure compared with the arm, connotes a doubling of 10-year total mortality. Slightly more significant reductions yield a tripling of mortality, and if the ABI is reduced to 0.61-0.70, the mortality risk quadruples.<sup>2</sup>

The five-year mortality rate of symptomatic PAD

is higher than for colon cancer, Hodgkin's disease, and breast cancer,<sup>3</sup> but despite this high mortality burden, the diagnosis does not carry the gravitas of these other conditions, and we have to ask why. Could it be a problem with awareness? In comparison with those with coronary artery disease (CAD), patients with a diagnosis of PAD have higher annual rates of all-cause mortality, cardiovascular death, non-fatal stroke, and composite cardiovascular death/myocardial infarction/stroke. In one study, the composite annual rate of cardiovascular death, MI, stroke, or hospitalization for atherothrombotic events was 21% in a PAD population versus 15% in a CAD population.<sup>4</sup> For all cardiovascular outcomes, CAD had a higher observed rate than PAD only in terms of non-fatal MI – 1.4% vs. 1.3% annually – a very small difference that was not significant. Despite these ominous statistics, however, patients with CAD are more likely to be heavily counseled in lifestyle changes, to undergo efforts at tobacco cessation, and to be more stringently treated for dyslipidemia, hypertension, and diabetes than patients diagnosed solely with PAD.

## BARRIERS TO CARE

The problem is more complicated than merely solving the awareness problem, as there are other barriers to delivering effective modern vascular care.

### Loaded Associations

Let's play a game of free association. If I say "carotid stenosis," "abdominal aortic aneurysm," and "severe claudication," chances are good that the most frequent responses will be, respectively, "endarterectomy," "repair or EVAR," and "bypass or stent." Hopefully also on the list, but probably very much lower, will be something like: "sequelae of a systemic chronic disease that requires risk factor modification, long-term monitoring, revascularization when appropriate, and secondary prevention."

PAD suffers from the fact that nearly all

associations with the disease relate to the procedures performed for its advanced manifestations in their respective anatomic distributions. While all these procedures have well validated roles at specific points in the disease management scheme, modern comprehensive vascular care is more than just the procedure. The opportunity to alter the natural history of the disease will be seriously compromised if the first question is: “Does the patient need a procedure?”

### The Convoluted Venn Diagram

Currently, different aspects of care of a vascular patient are carried out by a variety of disciplines and specialties that are rarely coordinated comprehensively, and may even have competing interests. By virtue of PAD’s numerous manifestations and its association with specific risk factors, it is often managed by a loose coalition of vascular surgeons, cardiologists/interventional cardiologists, radiologists/interventional radiologists, cardiothoracic surgeons, podiatrists, endocrinologists, neurosurgeons, wound care specialists, plastic surgeons, and even more. The primary care physicians, or – to a lesser degree by virtue of their smaller numbers – vascular medicine specialists, are left to navigate this web of practitioners while trying to maintain continuity through all phases of care. Worse, the vascular specialists often have a significant presence and a clinical department only at academic quaternary care facilities.

It’s easy to see from this long list of providers that comprehensive care is difficult to orchestrate. To overcome the disadvantages of segmented care, it is essential to condense the diagram along well defined areas of overlap and to orchestrate seamless transitions as the disease evolves. To achieve these improvements, each specialty must better understand the roles and strengths of the others, and there must be a coordinated system that minimizes the cultural and procedural barriers to effective care.

### MODERN VASCULAR MEDICINE: LETTING THE DISEASE DEFINE THE CARE INSTEAD OF THE REVERSE

Rather than simply reacting with scalpels and stents, progress in treatment of PAD requires a strategy that involves interceding at all phases of the disease. The plan should include prevention, detection/diagnosis, medical management,

guideline-driven monitoring, intervention when required, post intervention surveillance, and secondary prevention. In turn, this approach requires identifying populations at risk by screening where appropriate; utilizing clinically driven and appropriate diagnostic testing at accredited vascular testing facilities with certified interpretation; providing the full spectrum of outpatient and inpatient care; creating access to advanced therapies for revascularization; and actively treating underlying risk factors throughout all stages of disease management. The methods of accomplishing these objectives are varied and there may not be a single correct approach, but one of the most significant hurdles is clearly the first: identifying those at risk who are underdiagnosed.

### Coordinated Collaboration: Un-siloing Patient Care

At almost every hospital system of reasonable size, the recent trend in organizational structure is toward consolidation of programs that involve specialties that frequently interact. Institutes for cardiovascular or cancer care abound. At worst they amount to little more than a marketable name change, but at best they foster new and more productive relationships: goals become aligned, opportunities for improvement are identified and tackled collaboratively, and quality metrics drive care. In cardiovascular care nationally, these efforts are often mainly confined to the hospital and the inpatient arena, where care has focused on “downstream” therapies in imaging labs and operative suites. While this has improved patient management and navigation of sophisticated therapies for advanced disease states, the coordination of “upstream” outpatient management strategies and therapies has lagged behind. Fortunately, this imbalance is starting to change.

Institutions that vary from large academic centers to community hospital/health systems are creating vascular care programs that help patients navigate among disparate specialties. Simple web searches demonstrate that two main approaches seem dominant. The large academic institutions that are more likely to have a vascular medicine department will sometimes form vascular clinics headed by vascular medicine specialists who function as vascular primary care providers and direct patients to appropriate additional sub-specialists and proceduralists (frequently within the same

clinic). The second approach, which appears across institution types, is to have a single multi-disciplinary clinic where the different stakeholders in vascular care come together. Nearly all these centers espouse (on their websites) the same goals and benefits of comprehensive care: multi-disciplinary collaboration, coordination, convenience, and quality.

#### LANCASTER GENERAL HEALTH HEART AND VASCULAR INSTITUTE: THE VASCULAR CLINIC

Our own multi-disciplinary clinic at LGH is about one year old, and represents our initial effort at a model of comprehensive care delivery. The clinic is staffed by specialists in vascular surgery, vascular medicine, interventional cardiology and interventional radiology from both private and system-employed practices. The clinic is equipped to perform and interpret noninvasive vascular studies, and a nurse practitioner is available for patient education as well as risk factor counseling and management. This platform permits the delivery of nearly every aspect of modern vascular care, except for the initial identification of the undiagnosed or at risk patient. For those identified and referred, however, the clinic offers streamlined care in a single setting. A sample visit for a patient with claudication might entail a physiologic exercise test, after which a physician would first review the findings and outline a treatment plan, followed by a meeting with a nurse practitioner for counseling, education on modification of lifestyle and risk factors, and instruction in a claudication walking program. Accessibility to other testing modalities such as CT, MRI, and clinical laboratory testing can be expedited onsite. When required, wound center referrals, invasive angiography, and surgical procedures can be efficiently expedited given institutional integration and the overlapping roles of providers in these other environments. A patient may evolve in their needs as their disease progresses and the clinic allows them to transition between providers as required by their disease state. A new referral, a new office, an exchange of records, and all the confusion and delay a patient may experience in that process is alleviated with this configuration. This ability to allow the patient to navigate the vascular health care system with ease should also be translatable to the referring physician where the burden of

helping the patient maneuver to the appropriate resources at the appropriate stages becomes instead a simplified process with a single referral.

#### CREATING MOMENTUM

Nearly every effort for improving vascular care begins and ends with increasing awareness amongst both patients and providers regarding the disease and the gravity of the diagnosis. The vascular clinic's webpage, which can be found in the Heart and Vascular Institute portion of the LGH website<sup>5</sup>, offers a risk factor calculator that estimates a patient's relative risk of vascular disease as well as a condensed version of the Edinburgh Claudication Questionnaire (ECQ) to assess the likelihood that leg symptoms are due to PAD. The full ECQ is a well-validated tool for all practitioners that is comprised of a maximum of 6 questions if the patient does get pain or discomfort in their legs when they walk. This questionnaire has been shown to have a sensitivity of 91.3%, a specificity of 99.3%, a positive predictive value of 100%, and negative predictive value of 81% with excellent repeatability.<sup>6</sup>

The recognition of PAD (not just intermittent claudication) should always be followed by an active response which includes, at a minimum, aggressive risk factor modification. The need for a timely referral to a vascular care provider should be reconsidered at each encounter. If advanced peripheral arterial disease or critical limb ischemia has developed before the first vascular consultation, the system has failed that patient, but the responsibility for early recognition which translates into action cannot fall solely on the outpatient primary care physician. Patients admitted with conditions that put them at higher risk for vascular disease such as complications of diabetes, coronary ischemic events, and cerebrovascular events represent a population that offers an opportunity to assess, recognize, and arrange follow through of PAD as care for their primary condition continues. Modern imaging studies done for any reason often reveal incidental findings of vascular disease, and these also present opportunities to respond appropriately. If PAD is simply noted in these situations without an active response, vascular disease will continue its current status as a high morbidity, high mortality condition.

**A BRIGHTER FUTURE**

While there are many hurdles to overcome in order to achieve the necessary momentum noted above, integrated health systems have never been better situated to do so. Organizationally aligned providers have the benefit of electronic health records and shared data that can help identify populations at risk. Effective use and sharing of problem lists and medical histories make it less likely that documented incidental findings or asymptomatic

vascular conditions will be lost in the shuffle when providers change or care transitions. The increasing global emphasis on preventive efforts, and improvement of risk factor control, means that the system will respond more efficiently when at-risk patients are identified. And finally, entities such as the multi-disciplinary clinic, whereby silos of services become amalgamated, create a more navigable system that furthers the universal goal of delivering quality and value.

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