

## AN INTERVIEW WITH...

# Ehrin J. Armstrong, MD

Dr. Armstrong discusses the DANCE trial and further research in PAD treatment, recent strides in aortoiliac care, and more.



**In light of the data from the DANCE trial, where do we go next in studying biomarkers and the use of dexamethasone for treating peripheral artery disease (PAD)? Are there any current plans for further study?**

The approach of using adventitial drug therapy for treatment of PAD is both novel and exciting. Conceptually, adventitial drug delivery has the advantage of delivering an anti-inflammatory agent directly to the site of vascular injury, with the flexibility to tailor the specific medication administered. The DANCE trial, which tested the use of dexamethasone infusion after balloon angioplasty or atherectomy in the femoropopliteal segment, demonstrated primary patency results comparable to those of drug-coated balloon angioplasty. A similar approach is currently being tested in the LIMBO study for treatment of infrapopliteal disease.

It is also exciting that adventitial drug delivery has the potential to deliver other agents to prevent restenosis, as well as the administration of multiple drugs. The ongoing TANGO trial is a randomized blinded study of temsirolimus infusion after balloon angioplasty of infrapopliteal arteries. Temsirolimus is an analogue of sirolimus that has already been shown to prevent restenosis after percutaneous coronary intervention. Plans are also underway for the TWIST study, which will potentially involve the coadministration of dexamethasone and temsirolimus via adventitial infusion.

**Can you tell us about the background and aims of the National Cardiovascular Data Registry (NCDR) Peripheral Vascular Interventions Registry? Have any insights emerged from these data that you can share?**

The NCDR Peripheral Vascular Intervention Registry is an effort by the American College of Cardiology to

provide quality metric and outcome data for the treatment of patients with PAD. The current version of the registry includes iliac and infrainguinal interventions as well as carotid interventions. By 2019, the registry will expand to include supra- and infrainguinal bypass, endovascular aneurysm repair, open abdominal aortic aneurysm repair, renal artery interventions, and venous interventions for thromboembolic disease.

The initial data from the Peripheral Vascular Intervention Registry are still being analyzed, but the inclusion of > 30,000 procedures will allow us to draw significant conclusions regarding trends in interventions, adherence to guideline recommendations and appropriate use criteria, as well as the potential to perform comparative effectiveness research to better understand the optimal devices to use for a specific clinical scenario.

**What is your best pitch for persuading patients who smoke to try to quit? Do you cite any specific data, and what (if any) resources do you recommend?**

Continued smoking remains a major limitation among patients with PAD. I talk with all my patients about the importance of smoking cessation and advise them that quitting can reduce the risk of cardiovascular events and amputation. I often cite a study that we performed, which demonstrated that successful quitting in the subsequent year after endovascular intervention was associated with significantly lower rates of mortality, major amputation, and major adverse limb events.<sup>1</sup> These data confirm that it is truly never too late to quit! I always recommend counseling and offer nicotine replacement therapy as adjuncts to quitting, and I am investigating novel counseling and pharmacologic approaches to encourage smoking cessation.

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**What would you like to see from future trials studying devices to enhance lesion preparation, particularly in infrainguinal lesions?**

In my opinion, adequate lesion preparation is the key to optimizing long-term patency after endovascular intervention. Too often, endovascular intervention consists of balloon angioplasty and/or stent implantation with residual stenosis, recoil, or significant dissection. Such cases are more likely to develop restenosis and require repeat intervention, whereas careful attention to lesion preparation could avoid the need for subsequent interventions. Designing trials to specifically assess lesion preparation remains difficult, as each lesion has anatomic characteristics that may favor use of a given atherectomy device or specialty balloon. Ultimately, I would like to see comparative trials of such devices tested in a randomized manner, in much the same way that coronary interventions have been compared in head-to-head trials to delineate the optimal therapies for each clinical scenario.

**How would further elucidation of the predictors for wound healing in Rutherford class 4–6 patients affect your clinical decision-making?**

Better defining the predictors of wound healing remains a major unmet need in the care of patients with critical limb ischemia. The recent WIfI (Wound, Ischemia, and foot Infection) classification system has helped emphasize the contributions of wound size and concomitant infection to wound healing and that these factors may matter as much as the quality and extent of revascularization. We also need better parameters to determine procedural success, including measures of wound perfusion, wound blush, tissue oxygenation, or other methods to ensure that we have achieved the optimal revascularization. If such measures can be developed and are shown to correlate with subsequent wound healing, they could have a large impact on decision-making during endovascular intervention, as well as the decision to perform a repeat intervention in cases of delayed wound healing.

**What is the greatest need in aortoiliac care, and what has been the biggest improvement in treating this anatomic region over the past 5 years?**

In recent years, significant improvements have been made in aortoiliac disease, and endovascular options have been confirmed as viable for the vast majority of such patients. Among patients with abdominal aortic aneurysms, current low-profile devices now make

it possible to treat most patients with percutaneous endovascular stent grafts. A relatively understudied area remains patients with aortoiliac atherosclerotic obstructive disease. More research is necessary to better understand the optimal care of such patients, especially when disease extends into the mid and distal aorta. Newer balloon-expandable stents grafts have increased the endovascular options for endovascular treatment of these complex TransAtlantic InterSociety Consensus C/D lesions. Emerging evidence also suggests that larger stent grafts are an appropriate therapy for patients with extensive atherosclerotic disease of the aorta and proximal iliac arteries.

**What led to your choice to practice in the Veterans Affairs (VA) setting?**

When I was considering an academic interventional cardiology job, I weighed both clinical and research opportunities. In the current health care environment, it is difficult to find an academic setting that provided access to high-volume complex cases while also protecting research time. VA hospitals are in many ways an ideal setting for a complex practice in peripheral vascular disease—there is a high prevalence of PAD among veterans and the significant comorbidities of these patients often dictate an endovascular approach. As a result, my cases often involve tibiopedal access, advanced reentry strategies, and other techniques necessary to maximize limb salvage. Research is also a core mission of the VA hospitals, and there are many opportunities to study optimal medical and endovascular care of patients with PAD. In the last 5 years, I have built a large clinical trials group, which has been among the top enrollers for many new device trials. Finally, the opportunity to provide cutting-edge care to patients who served our country makes me especially proud to work at a VA hospital. ■

1. Armstrong EJ, Wu J, Singh GD, et al. Smoking cessation is associated with decreased mortality and improved amputation-free survival among patients with symptomatic peripheral artery disease. *J Vasc Surg.* 2014;60:1565–1571.

**Ehrin J. Armstrong, MD**

Associate Professor of Cardiology  
University of Colorado  
Aurora, Colorado  
ehrin.armstrong@gmail.com

*Disclosures: Consultant or advisory board member for Abbott Vascular, Boston Scientific Corporation, Cardiovascular Systems, Inc., Medtronic, and Philips.*