



**PHILIPS**

Live Image Guidance

2D Perfusion

# Making the difference **with Live Image Guidance**

In Peripheral Arterial Disease

# Real-time results, instant assessment

Severe foot complications – the result of hampered blood circulation – affect millions of people with Peripheral Artery Disease (PAD) globally. These patients are at serious risk for undergoing limb amputation.<sup>1,2</sup> Currently there is no diagnostic method to immediately assess the result of a Percutaneous Transluminal Angioplasty (PTA) procedure, the preferred option to restore blood circulation in the foot. It typically takes several weeks to determine treatment efficacy and many patients return for additional procedures if the treatment is ineffective.

To help reduce the risk of foot amputation for these people, our 2D Perfusion imaging technology visualizes the restoration of blood flow to the region of interest.<sup>3</sup> This allows interventionalists to see and quantify the effects of revascularization procedures immediately, while the patient is still on the table to decide if additional treatment is needed.

## Key benefits

- Compare perfusion characteristics in micro- and macro-circulation, pre- and post- intervention
- Instantly visualize and measure to assess treatment effects at a glance
- Supports determination of treatment endpoint

“

2D Perfusion finally puts objective information behind the tough questions I face during PAD interventions: Have I done enough, Is the tissue around the wound perfused?”

**Jihad Mustapha, MD - Metro Health Hospital, MI, USA**

“

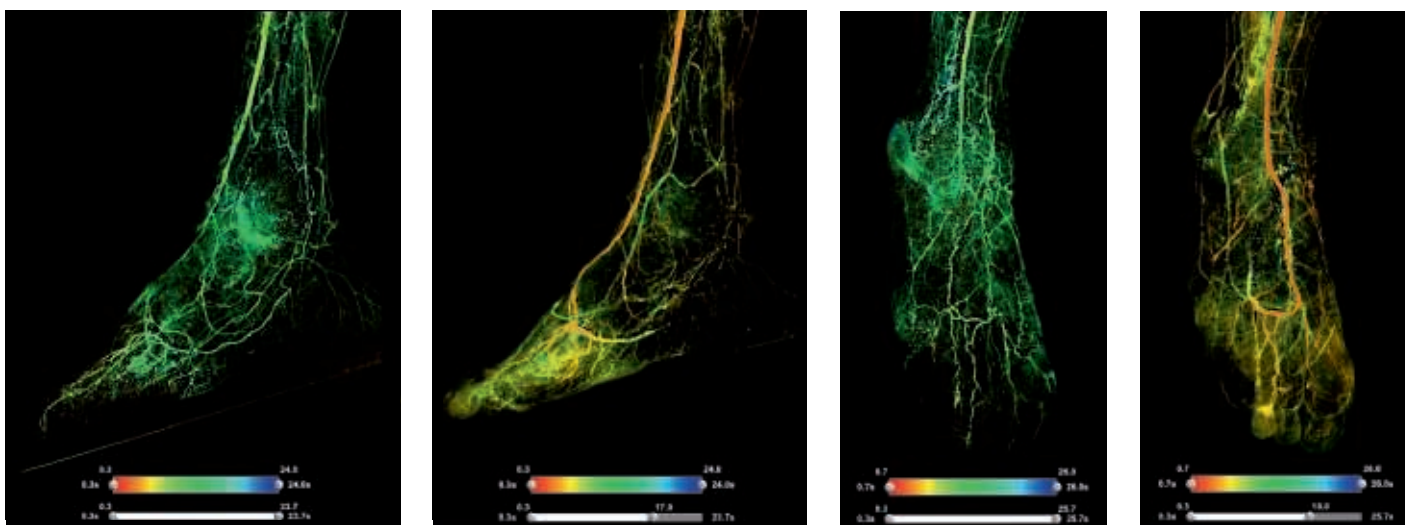
This provides clinicians not only with illustrative images but also the only currently available approach to quantitatively interpret DSA data during the procedure.”

**Larry J. Diaz-Sandoval, MD Metro Health Hospital, MI, USA**

### A real clinical need

When it comes to performing CLI procedures, there are no guidelines for the optimal treatment approach.<sup>5</sup> Various studies<sup>6,7</sup> have shown that restoring vessel patency is not always a predictor for clinical outcome and vice versa.<sup>7</sup> That is why many interventionalists have told us they struggle with questions like ‘How can I be sure the vessels I open will provide sufficient perfusion in the foot’ or ‘Did I do enough to initiate wound healing?’.

They want to be able to tell patients what kind of follow-up they can expect and if amputation is likely or not. 2D Perfusion imaging technology provides interventionalists with an objective understanding of the impact of their treatment to help determine the outcome of perfusion procedures.



2D Perfusion images pre and post intervention from Lateral - and AP view. Post intervention image visually shows an improved perfusion after opening the anterior tibial artery.

Image courtesy: Prof. Jae Kyu Kim, MD & Nam Yeol Yim, MD - Chonnam National University Hospital, South Korea

“

2D Perfusion angiography gives us a huge help to decide the end of the endovascular treatment.”

**Prof. Jae Kyu Kim, MD & Nam Yeol Yim, MD - Chonnam National University Hospital, South Korea**

## Clinical case study

- 70 years old male
- Diabetes Mellitus type 2, CLI
- Non healing ulcer, first toe on right foot
- Rutherford class V

### Lesion 1:

- Mid Anterior Tibial Artery
- Diameter: 3mm
- Length: 80mm
- Pre-stenosis: 100%
- Post PTA with 3.0 x 80 balloon  
30 % residual stenosis

### Lesion 2:

- Ostio-proximal of Anterior Tibial Artery
- Diameter: 3mm
- Length: 250mm
- Pre-stenosis: 80%
- Post PTA with 3.0 x 250 balloon  
20% residual stenosis
- Additional angioplasty performed in Dorsalis Pedis

### Treatment:

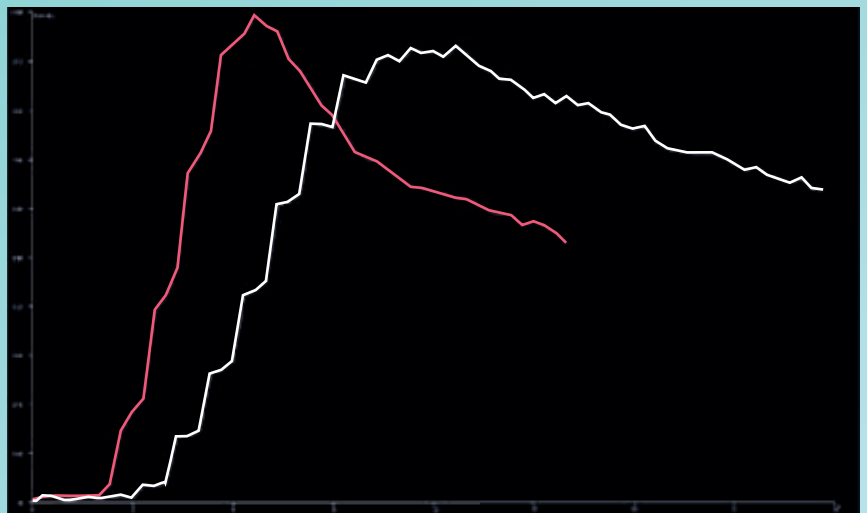
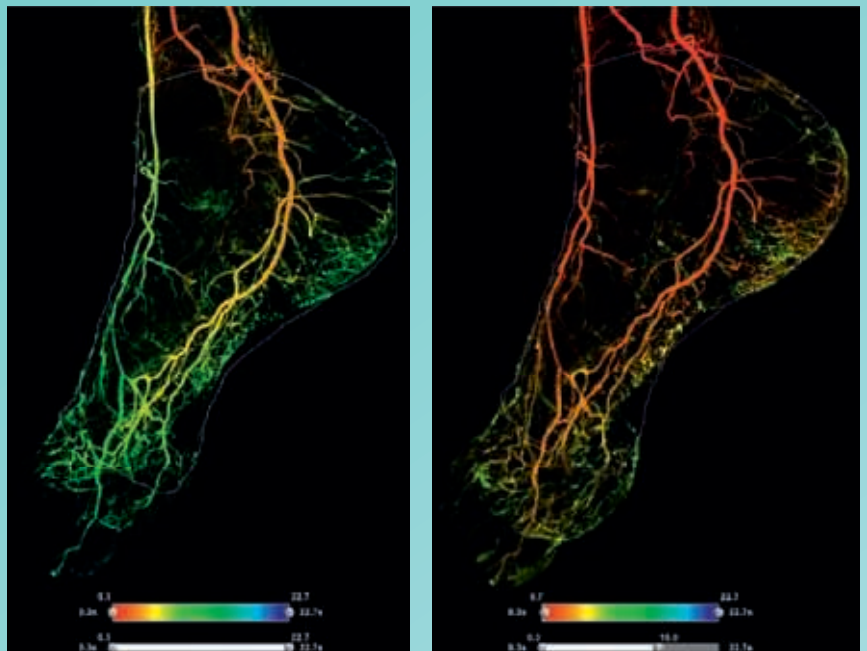
PTA with 3.0 x 250 balloon:  
20% residual stenosis

### 1 month follow up:

All three tibial vessels are patent.  
Ulcer healed and patient went  
from Rutherford 5 to Rutherford 0.

### 3 month follow up:

No (new) ulcer or complaints on  
right foot.

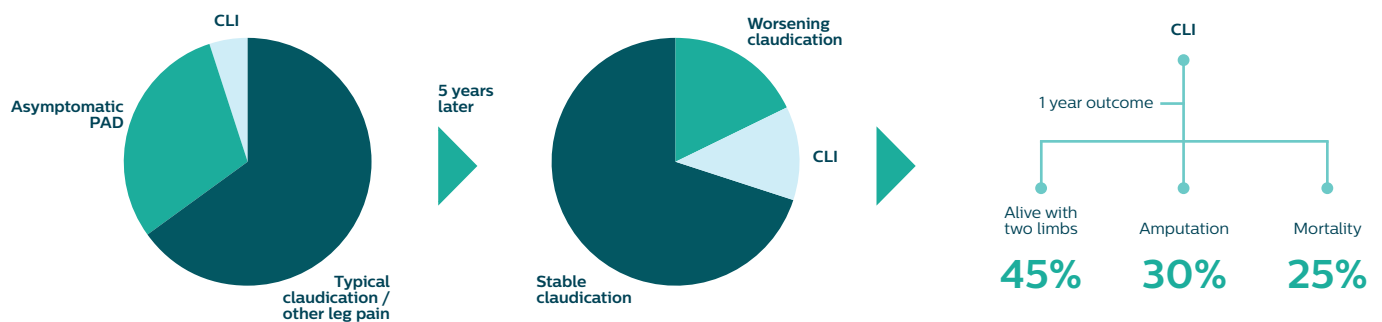


# A growing epidemic

Over 200 million people worldwide are living with Peripheral Arterial Disease (PAD).<sup>4</sup> Today 422 million people globally are living with diabetes, and they are at higher risk for developing PAD and severe diabetic foot complications.<sup>1</sup> Despite strong growth in device availability for below the knee angioplasty, 30% of patients with Critical Limb Ischemia (CLI) will undergo amputation and 25% will die.<sup>5</sup>

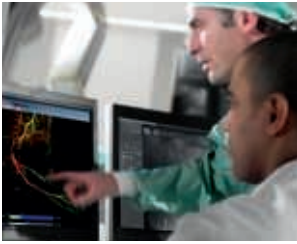
## Clinical impact

- Worldwide, over 200 million people were living with PAD in 2010<sup>4</sup>
- Over time PAD can worsen and prognosis becomes very poor for CLI (end stage PAD)<sup>6</sup>



# Guiding tomorrow's innovation. Today.

Decide, guide, treat, confirm with the Philips Volcano PAD solution



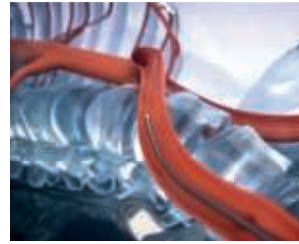
## Decide 2D Perfusion

Perfusion Imaging supports diagnosis of perfusion alterations of tissues by providing a colored 2D image. It helps identifying the areas which may be at risk of being hypo-perfused



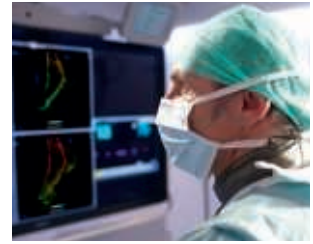
## Guide Visions PV Digital IVUS Catheters

IVUS guides therapy by providing information helpful for device sizing



## Treat Phoenix Atherectomy System

The Phoenix Atherectomy System allows clinicians to treat a variety of plaque morphologies. It continuously cuts, captures and clears debulked material with just one catheter insertion



## Confirm 2D Perfusion

2D Perfusion imaging technology provides interventionalists with an objective understanding of the impact of their treatment to help determine the outcome of perfusion procedures. IVUS also visualizes dissections or adventitial injury and helps assess completeness of therapy

## Service & economic value

How can I drive efficiency and patient satisfaction?

In the highly competitive healthcare environment advanced capabilities can make you stand out. Our products and solutions provide economic benefits by making care delivery more efficient, minimizing system waste, and expanding patient access to solutions. The result? Enhanced patient, staff and medical satisfaction with an organization that is better equipped to handle current and future challenges.

### References:

- 1 <http://www.who.int/diabetes/global-report/en/> - doa 09-01-2016
- 2 Mills JL, Conte MS, Armstrong DG, Pomposelli FB, Schanzer A, Sidawy N, Andros G on behalf of the Society for Vascular Surgery Lower Extremity Guidelines Committee. The Society for Vascular Surgery Lower Extremity Threatened Limb Classification System: Risk stratification based on Wound, Ischemia, and foot Infection (Wifl). *J Vasc Surg.* 2014;59(1):220-34.
- 3 Jens S, Marquering HA, Koelemay MJW, Reekers JA. Perfusion Angiography of the Foot in Patients with Critical Limb Ischemia: Description of the Technique. *Cardiovasc Intervent Radiol.* 2015;38(1):201-5.
- 4 Fowkes FG, Rudan D, Rudan I, Aboyans V, Denenberg JO, McDermott MM, Norman PE, Sampson UK, Williams LJ, Mensah GA, Criqui MH. Comparison of global estimates of prevalence and risk factors for peripheral artery disease in 2000 and 2010: a systematic review and analysis. *Lancet.* 2013;382(9901):1329-40.
- 5 Jones WS, Mi X, Qualis LG, Vemulapalli S, Peterson E, Patel M, et al. "Trends in settings for peripheral vascular intervention and the effect of changes in the outpatient prospective payment system". *Journal Am Coll Cardiol.* 2015; 65:920-927
- 6 Norgren L, Hiatt WR, Dormandy JA, Nehler MR, Harris KA, Fowkes FGR on behalf of the TASC II Working Group. Inter-Society Consensus for the Management of Peripheral Arterial Disease (TASC II). *J Vasc Surg.* 2007;45(1)Supplement: S5-S67.
- 7 Reekers JA, Koelemay MJW, Marquering A, van Bavel ET. Functional Imaging of the Foot with Perfusion Angiography in Critical Limb Ischemia. *Cardiovasc Intervent Radiol.* 2016;39:183-9.

