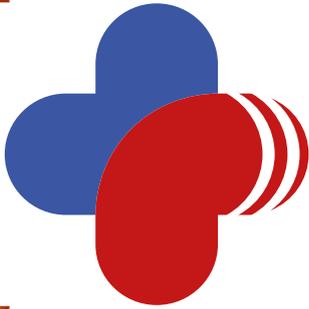
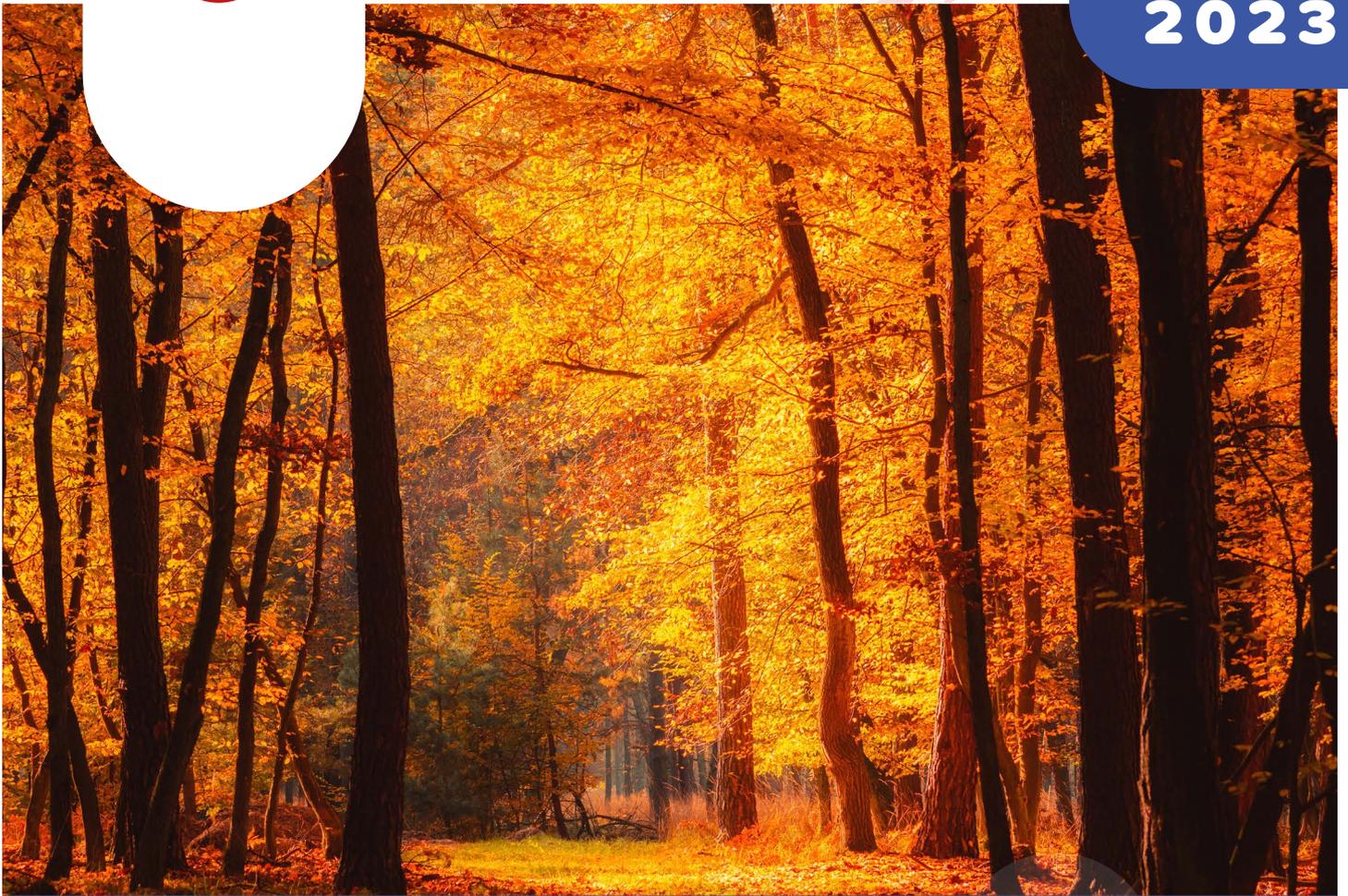


Advancing non-invasive vascular diagnostic services by promoting training and research in Vascular Science.



THE SOCIETY FOR  
VASCULAR TECHNOLOGY OF  
GREAT BRITAIN AND IRELAND

AUTUMN  
2023



## IN THIS ISSUE

- Presidents Welcome
- Article: Analysis of Doppler waveforms in the screening and investigation of lower-limb peripheral arterial disease
- Bitesize: Waveforms
- Info on Approvals for Clinical Research
- Summary of the SVT giant cell arteritis (GCA) study day
- Sharing Vascular Science with colleagues and friends in Ghana, West Africa



# SVT Presidents Welcome

---

Welcome to the Autumn SVT newsletter.

---

**T**he countdown to the Vascular Societies ASM 2023 in Dublin is on! The Conference team have been working hard to make sure this is a roaring success. We have an advanced skills workshop on Wednesday morning covering EVAR endoleaks and pedal vessel imaging. This workshop will showcase live demonstrations and give opportunity for some hands-on practical scanning. After lunch we start our hotly anticipated Carotid session covering a recent carotid audit of UK and Ireland practice, advances of AI and 3D ultrasound in assessing Carotid disease.

Our main Thursday session is full to the brim with scientific abstracts, keynote speakers and our invited guest speakers for the Jackie Walton memorial lecture. The Ballot results, AGM and Prize giving will conclude a busy day. This year's Gala dinner will be hosted at the iconic Guinness Factory, please book your tickets asap to avoid disappointment.

The SVT has enjoyed an exceptionally productive year, and I am immensely proud of all the progress made in pursuit of ambitious goals set out last year. Our foremost objective was to expand access to educational content for our members. To achieve this, we embarked on developing a comprehensive study day program, including face-to-face workshops, on-demand content, and webinars as well as our fundamentals and revision day programs for trainees. Our collective efforts yielded two very successful London-based advanced skill workshops: the Upper Limb Arterial and Venous Day in March and the Giant Cell Arteritis Day in September. Regrettably, we were unable to proceed with the planned May EVAR workshop in Manchester due to low registration numbers.

Our research committee successfully finalized the AVS research curriculum, complemented by a research series in the newsletter and a research webinar series, all provided at no cost to our members. The webinars garnered significant interest and are readily available for on-demand viewing. Look out for the new Bitesize research articles in the newsletter.

In July of this year, the new membership fees came into effect, marking the first increase in many years. I want to express my gratitude to all of you for your continued support and hope that you are enjoying the enhanced member benefits.

On September 11th, we held an Extraordinary General Meeting of the membership, following a vote at the Executive Committee, to propose a working name change for the society. Our society's name has remained unchanged since its inception 30 years ago, while our professional title has evolved to Clinical Vascular Scientist since the early 2000s. Aligning the two to better represent our membership and contemporary times became a priority. The online ballot concluded on October 23rd, and the results will be shared with the membership. Additionally, we will vote at the Annual General Meeting in Dublin to address updates and changes to our constitution, including changes to language making it more inclusive and reflective of our Healthcare Science community. These proposed changes will be presented at the Annual Scientific Meeting.

We have embarked on a recognition of prior learning agreement with the AHCS for the AVS certificate. This has been agreed in principal and we look forward to the completion of this project in the very near future. This RPL exercise will streamline the equivalence process considerably. We will keep the membership updated via the Newsletter and website.

Newsletter Editor, Daniella Bond-Collins will be handing over to Jenny Anton, current non-portfolio executive member this November. Daniella has admirably fulfilled the demands of the role for the past three years. The Newsletter is going through further transformation and we aim to have a digital magazine set to launch next year.

Tanyah Ewen has once again excelled in planning an outstanding Vascular stream for BMUS annual conference at York racecourse this December 5th - 7th. Our thanks go to the whole BMUS team for their support professionally and administratively and to Tanyah our BMUS and CASE representative.

Towards the end of 2022, Neeraj Bhasin, Chair of the Circulation Foundation, approached the SVT with a proposal that the CF assume the role of the charity representing all vascular societies. This proposal, aimed to align with existing partnership arrangements with the ASM and journal, while also recognising the multidisciplinary nature of our professional work. We believe that this step will enhance the charity's strength, make it a more representative body of the professional vascular community, and improve its sustainability and resilience.

As this marks my final Newsletter address, I would like to take this opportunity to express my deepest appreciation for the commitment and support of my tremendous colleagues on all four committees of the SVT. A special thanks must go to Kamran Modaresi and Steven Rogers as they have been a huge support in my term as President. I wish them every success in their new roles.

Throughout my term, I've had the privilege of collaborating with several other key stakeholders, including the Professional Bodies Council of the AHCS, BMUS, SOR, CASE, the Vascular Society, the Circulation Foundation, and the Vascular CRG. Their collective efforts are instrumental in shaping the future of healthcare. I extend my heartfelt thanks for their inclusiveness and support.

Thanks to you, our terrific members for your continued support and contributions.

Yours sincerely,

**Emma Waldegrave**  
*President of the SVT (2021-2023)*

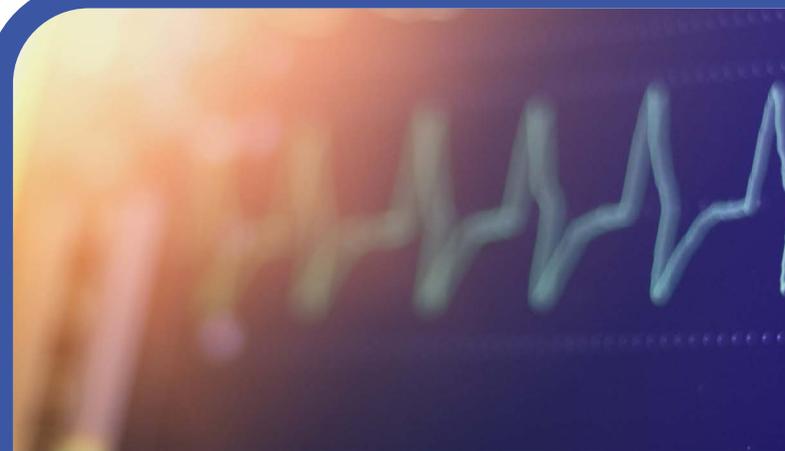
# Analysis of Doppler waveforms in the screening and investigation of lower-limb peripheral arterial disease

Dr Nida Nadeem<sup>1</sup> and Mr Ben Warner-Michel<sup>2</sup>

<sup>1</sup> Vascular Laboratory, King's College Hospital, London, SE8 5DT

<sup>2</sup> Salford Royal Ultrasound Department, Northern Care Alliance NHS Foundation Trust, Salford, M6 8FT

Azzopardi Y.M. et al (2019). Agreement of clinical tests for the diagnosis of peripheral arterial disease. *Prim Care Diabetes*. Vol 13, pp 82-86.



## SUMMARY

50 patients with type 2 diabetes mellitus underwent bilateral lower limb screening for peripheral arterial disease (PAD), to assess agreement of the 6 most commonly-used screening methods for identifying PAD (palpation, ankle-brachial pressure index (ABPI), toe-brachial pressure index (TBPI), absolute toe pressure (ATP), transcutaneous oximetry (TcPO2) and Doppler waveforms). Out of 100 limbs, Doppler waveforms were most likely to indicate PAD (93%), followed by TBPI (72%), ABPI (57%), ATP (35%), TcPO2 (30%) and palpation (23%). 📌

Full article can be read at

[https://www.svtgbi.org.uk/media/resources/Analysis\\_of\\_Doppler\\_waveforms\\_Oct\\_2023.pdf](https://www.svtgbi.org.uk/media/resources/Analysis_of_Doppler_waveforms_Oct_2023.pdf)



# Bitesize Research: Waveforms

Dr Nida Nadeem<sup>1</sup> and Ben Warner-Michel<sup>2</sup>

<sup>1</sup> Vascular Laboratory, King's College Hospital, London, SE8 5DT

<sup>2</sup> Northern Care Alliance NHS Foundation Trust

*Descotes J and Cathignol D. (1975). Classification of changes in circulatory rate in the arteries of the lower limbs. Transcutaneous measurement by Doppler effect. Nouv Presse Med. Vol 4, pp 2091-3*

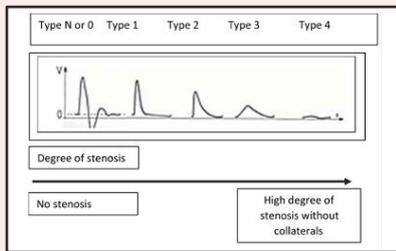


Figure 1: Descotes & Cathignol classification.

## SUMMARY

One of the early attempts to classify waveforms was in 1975. They distinguished between 5 types of Doppler waveforms (figure 1) from normal (type 0 or N) to most pathological (type 4).

## PROS

Illustration of the waveforms is useful in demonstrating the change of waveform shape from normal to disease. Describes arterial waveforms according to the number of phases and relates them to the different stages of arterial wall damage.

## CONS

Efficacy of any classification depends on how many waveforms can be identified as belonging to a category within that classification. Since there is a limited range of waveforms here, some studies have shown that the Descotes

and Cathignol method has the most uncategorized waveforms amongst vascular physicians.

## IMPACT ON PRACTICE

Although the waveforms then did not have names as we know them now, the representation of the shape and associated detailed descriptions paved the way towards understanding that the greater the number of phases and the sharper the upstroke the healthier the artery and vice versa

*Spronk S. et al (2005). Value of the duplex waveform at the common femoral artery for diagnosing obstructive aortoiliac disease. J Vasc Surg. Vol 42, pp 236-42.*

## SUMMARY

The group in the described study, imaged 381 aortoiliac segments to classify waveforms of the common femoral artery (CFA) in to four groups shown in figure 2:

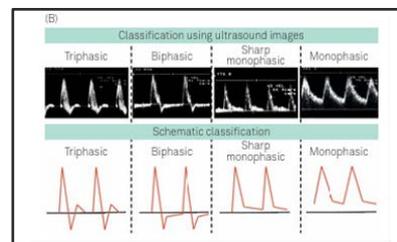


Figure 2: Spronk et al. classification.

## PROS

Diagnostic accuracy of the waveforms were compared to a reference standard methods such as magnetic resonance angiography, therefore making this a more

reliable study in determining the accuracy, sensitivity, specificity, positive and negative predictive values of waveforms in detecting significant obstructive aortoiliac disease.

## CONS

Very basic classification. Four waveforms do not really cover the wide breadth of waveforms seen in daily practice. Waveform interpretations were made from prints and not real time duplex scanning, this made some waveforms non-diagnostic due to artefact.

## IMPACT ON PRACTICE

This study provides evidence that in practice there is high degree of confidence that there is likely a haemodynamically significant stenosis present in the aorto-iliac segment, with monophasic/poor monophasic waveforms in the CFA. This may be useful when scanning the entire length of aortoiliac arteries is difficult e.g. obesity, gas, heavy calcification. It can provide a first line rapid health evaluation of the aorto-iliac segment. However, care needs to be taken not to completely dismiss triphasic and particularly biphasic waveforms as being 100% indicators of no presence of significant disease. In certain instances, waveforms recorded at sufficient distances from a stenosis can normalise and was seen in one quarter of patients in this study

Poor monophasic waveform at CFA was a reliable predictor of significant aortoiliac disease (92% predictive value) and the sharp

monophasic waveform was a reliable predictor of occlusive superficial femoral artery disease.

---

*Azzopardi Y.M. et al (2019). Agreement of clinical tests for the diagnosis of peripheral arterial disease. Prim Care Diabetes. Vol 13, pp 82-86.*

## SUMMARY

50 patients with type 2 diabetes mellitus underwent bilateral lower limb screening for peripheral arterial disease (PAD), to assess agreement of the 6 most commonly-used screening methods for identifying PAD (palpation, ankle-brachial pressure index (ABPI), toe-brachial pressure index (TBPI), absolute toe pressure (ATP), transcutaneous oximetry (TcPO<sub>2</sub>) and Doppler waveforms). Out of 100 limbs, Doppler waveforms were most likely to indicate PAD (93%), followed by TBPI (72%), TcPO<sub>2</sub> (30%) and palpation (23%).

## PROS

These findings demonstrate significant disagreement between these commonly-used screening tools, and indicates that Doppler waveform screening is most likely to detect patients with PAD and palpation is least likely to detect patients with PAD.

## CONS

No gold-standard diagnostic imaging was performed to confirm presence of PAD e.g. arterial duplex or CT angiography, therefore the precise sensitivity, specificity, positive and negative predictive values of each screening technique cannot be determined

Patients with open wounds, history of lower limb amputation or revascularisation history were excluded, which is likely to have skewed the study population in favour of patients with mild-moderate PAD as opposed to severe

limb-threatening PAD, which can affect the most appropriate screening modality to use.

## IMPACT ON PRACTICE

This study demonstrates the importance of not relying solely on one screening tool for identification of PAD, and of correlating positive screening tests with diagnostic imaging. Further investigation to determine the sensitivity and specificity of each screening tool correlated with diagnostic imaging would be of benefit to highlight the most accurate combination of screening tools for identifying PAD.

---

*Guilcher et al. (2021). Comparison of the Use of Arterial Doppler Waveform Classifications in Clinical Routine to Describe Lower Limb Flow. Vol 10, pp 464.*

## SUMMARY

1033 lower limb arterial waveforms were obtained and analysed by 11 vascular physicians and classified using the Descotes & Cathignol (1975), Spronk et al (2005) and simplified Saint-Bonnet (2017) criteria. PAD severity was determined using the Fontaine classification scale. Doppler waveforms were most effectively categorised using the Saint-Bonnet system (98.2%), followed by Spronk et al (91.3%) and Descotes & Cathignol (76.8%). Most normal waveforms were identified in asymptomatic patients, and most abnormal waveforms were identified in symptomatic patients.

## PROS

This study highlights the significant variability in waveform classification, and indicates that the simplified Saint-Bonnet guide is the best system for classification of peripheral arterial Doppler waveforms, as it contains the widest range of waveform types and includes classification of wave-

forms with continuous antegrade flow throughout diastole.

## CONS

Patients with severe PAD had low prevalence in this study, resulting in fewer waveforms being present from the severely abnormal end of the spectrum for each classification system. Additionally, presence of PAD was assessed using the Fontaine scale which grades severity of symptoms, but did not utilise diagnostic imaging to confirm and characterise presence of PAD.

## IMPACT ON PRACTICE

Standardisation of Doppler waveform descriptors would be of great benefit to the vascular community to improve interpretation of Doppler waveforms as reported on vascular ultrasound reports. The simplified Saint-Bonnet classification system is the most effective system for classifying waveforms due to the increased number of waveform types represented, however the correlation between waveform type and characterisation of PAD was not assessed in this study.

---

*Mahe G, et al. (2018). College of the 2519 French Vascular Medicine Teachers (CEMV) statement: Arterial Doppler waveforms analysis 2520 (simplified Saint-Bonnet classification)]. J Med Vasc. Vol 43, pp 255-61.*

## SUMMARY

This classification was first proposed in 2017 and distinguishes between 13 types of waveforms (figure 3). Some of the main ones are: Type N describes a triphasic waveforms, type A, a biphasic waveform with the disappearance of forward flow and type B a sharp monophasic waveform. Type CD describes the attenuation of type B with loss of sharp peak systolic velocity rise time and more

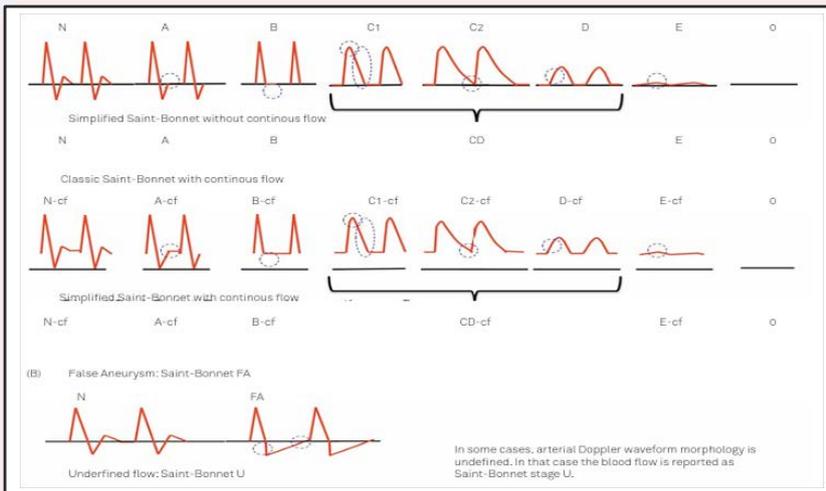


Figure 3: Saint Bonnet classification.

rounded appearance. Type E corresponds to flow velocity close to zero. A further five types are described which correspond to those described above with a continuous flow component and denoted CF. Type 0 represents no flow and type U is undefined.

## PROS

More waveform types which cover a wider breadth of waveforms seen in clinical practice. They add a categorization for continuous flow which are often a topic of contention especially when a waveform appears pulsatile and resembles triphasic but is all above baseline. Multiple studies (one mentioned below) have shown that this classification has potential for clinical standardisation of Doppler waveform morphology.

## CONS

The severity of lesions range from N to 0 with N being most normal and 0 being most severe, however the in between waveforms are open to much interpretation. Since there are many more waveform types in this classification, it can appear more complicated and it may take longer to familiarise and be able to categorize the waveforms than with those methods using less descriptors.

## IMPACT ON PRACTICE

This shows that the use of arterial Doppler waveform morphology classification is recommended to describe Doppler waveforms in patient care and research studies. Clinicians

and vascular scientists need adequate training to familiarise themselves with these classifications and to correlate them properly with various stages of arterial disease.

*Kim et al. (2020). Interpretation of peripheral arterial and venous Doppler waveforms: A consensus statement from the Society for Vascular Medicine and Society for Vascular Ultrasound. Vasc Med, Vol 25, pp484-506.*

## SUMMARY

Interpretation and classification of Doppler waveforms varies, resulting in well-documented instances of repeat examinations being requested due to misunderstanding of waveform types in vascular ultrasound reports. This paper seeks to standardise Doppler waveform descriptors in order to standardise reporting and improve interpretation of vascular ultrasound examinations.

## PROS

Simplification of waveform phasicity to be limited to 'multiphasic' (flow reversal component) or 'monophasic' (no flow reversal component), and 'high resistance' (sharp systolic upstroke, brisk systolic downstroke) or 'low resistance' (prolonged systolic downstroke with lack of end-diastolic notch), which addresses the various reported definitions of 'triphasic' and 'biphasic' which has historically caused confusion regarding classification and interpretation of Doppler waveforms.

## CONS

The above descriptors do not determine whether the waveform obtained is normal for a given arterial circulation, only how to describe the waveform itself. Knowledge of what waveform characteristics are considered 'normal' is still required for interpretation of vascular ultrasound reports; lack of knowledge in this area is likely to be a significant contributing factor for poor interpretation of waveform types and characterisation of PAD.

## IMPACT ON PRACTICE

Standardisation of Doppler waveform descriptors is likely to improve diagnostic accuracy of PAD characterisation using Doppler waveform analysis, resulting in more efficient treatment pathways and fewer instances of repeated examination requests. However, an appropriate level of understanding of vascular physiological changes and disease states. Although this has improved the reporting and interpretation somewhat, more still needs to be done to reduce the heterogeneity of Doppler waveform reporting.

## CONCLUSIONS

Over time studies have shown the usefulness of Doppler waveforms

in the detection and evaluation of PAD. But on the other hand, the absence of standardization in waveform descriptors and what classifies as normal/abnormal has resulted in much confusion in clinical practice. Attempts have been made to clarify and standardise key definitions and descriptors of arterial waveforms as well as describing alterations of waveforms with physiological changes and disease states. Although this has improved the reporting and interpretation somewhat, more still needs to be done to reduce the heterogeneity of Doppler waveform reporting.

### WHAT'S ON THE HORIZON?

More work is needed in describing waveform morphology and correlating any changes relative to severity of disease in a wider range of patient types, for example renal artery disease, the differences in diabetic patients with and without ulcers, arteriovenous fistula patients etc. There is scope for a future study to create a Delphi consensus of waveform terminology used by vascular scientists/physicians and how to interpret them.

**Please refer to this document for further information:**

[https://www.svtgbi.org.uk/media/resources/Doppler\\_waveforms.pdf](https://www.svtgbi.org.uk/media/resources/Doppler_waveforms.pdf)

None of the classifications mentioned above can propose an exhaustive description of the various Doppler flow waveforms seen in a clinical setting, therefore classification and interpretation errors remain. One proposal to reduce these errors has been to automate the categorisation process with the use of computer-aided technology such as artificial intelligence where some preliminary work has begun (McBane et al. 2022, Vasc Med; 27: 333-42). 📌



## The Approvals Process

The first step in the approvals process involves defining if your research question is research, or whether you will be conducting a service evaluation or audit. The HRA have a table and decision tool to help decide which category your project fits into and the rules/regulations for each vary on the type of project. As a broad outline, randomisation and generalisability of results are the defining parameters. 📌

Full article can be read at

[https://www.svtgbi.org.uk/media/resources/SVT\\_Newsletter\\_Series\\_-\\_Approvals\\_for\\_clinical\\_research.pdf](https://www.svtgbi.org.uk/media/resources/SVT_Newsletter_Series_-_Approvals_for_clinical_research.pdf)



# Summary of the SVT giant cell arteritis (GCA) study day



This year the SVT giant cell arteritis (GCA) study day was held on 7th September at the Royal College of Paediatrics and Child Health, London.

Following a gracious opening from Dr Kameran Modaresi (Vice President of SVT), the study day commenced with an introduction to vasculitis and GCA by Consultant Rheumatologist Dr. Shahir Hamdulay from Northwest University Healthcare NHS Trust. In the discourse about common signs of GCA, I was intrigued and highly engaged in Dr Hamdulay's session referencing his patient's diary. This diary underscored uncommon symptoms and provided a persuasive illustration of the significance of early recognition of atypical symptoms to prevent delayed diagnosis and vision loss. While he emphasized the utility of ultrasound scans (US) as a valuable non-invasive diagnostic tool for GCA, in instances marked by strong clinical suspicion and elevated blood markers, Dr Hamdulay advocated for the gold standard of GCA diagnosis: a biopsy.

Dr. Nazia Saeed, a Senior Vascular Scientist at London Northwick Park Hospital (LNWH), held the next presentation on setting up a new GCA service. She discussed some of the challenges she faced when

creating London's first GCA clinic at LNWH in 2017, such as lack of labs performing GCA scans and lack of protocols. She cited reaching a consensus on the diagnostic pathway and aligning the criteria with the rheumatology team as crucial goals. Dr. Saeed's presentation stimulated inquiries from the audience, particularly regarding the anticipated volume and frequency of GCA referrals.

She drew a comparison, pointing out that unlike the substantial number of referrals from the ambulatory care unit for DVTs, that GCA referrals exhibited significant variation, with some weeks seeing a surge in patients, while others had less. I found this lecture to be valuable as it offered insights into best practices and potential pitfalls for those of us involved in either the initial setup or the operation of a recently established GCA service.

In the next part of the study session, an insightful perspective was given from Mr Mojahid Najem, Consultant Vascular Surgeon at Bedford Hospital NHS Trust, on performing GCA biopsies. He spoke about

the belief that conducting numerous GCA biopsies in the past was deemed a "waste of time" and felt that time in the operating theatre could have been allocated to more impactful and life-changing surgeries. Dr Najem's viewpoint was intriguing, particularly when delving into the pros and cons of surgical approaches that entail larger incisions on the head or artery removal. Additionally, in cases of segmental GCA, the selection of the correct portion for biopsy was identified as a challenge. I gathered the impression that Mr. Najem's central message underscored the necessity for a more discerning approach to GCA biopsies and leveraging alternative diagnostic techniques like US before conducting an invasive biopsy.

Following Mr. Najem's presentation, Dr. Saeed led a multidisciplinary meeting featuring the introduction of Dr. Qasim Akram, a Consultant Rheumatologist from Stockport NHS Foundation, who joined the panel via Teams. During the Q&A session with the audience Dr Akram attributed seasonal changes, such as the onset of spring, as potential triggers for GCA. During his talk, I learned that Stockport received a greater number of GCA referrals in comparison to LNWH, primarily attributable to the predominantly Caucasian population in that area. This information was valuable especially when anticipating patient volume for planning in our respective clinics, given our geographic locations. Later in the session, we listened to Dr Akram's online lecture where he reiterated the use of US as an effective bedside tool for diagnosing GCA. It was wonderful to learn about the achievements of Dr. Akram's GCA Fast Track clinic in Stockport, which has effectively reduced GCA-related vision loss through using this approach. It was interesting to see that he employed a more open-ended approach in his clinic, accepting referrals from general practitioners (GPs) and local nurses, in contrast to LNWH specialist referral pathway.

During the afternoon session, after a delightful networking lunch, Dr. Saeed's lecture on the temporal artery scan protocol (with examples of the halo sign, stenosis, and atherosclerosis), was closely followed by one of the much-awaited segments: the hands-on practical session involving the dedicated volunteers. I felt this was an excellent way to put my knowledge into practice and acquire essential skills in conducting these scans. This session not only allowed me to network with others but also encouraged the exchange of expertise and insights. Aside from getting gel in my hair, it was one of the standout moments of the study day for me!

In summary, despite some technical issues, the day ran smoothly and provided an excellent opportunity for attendees to listen to informative lectures by esteemed professionals and to exchange techniques during the workshops. The key insight gained from this is how well-balanced the arguments were when considering the optimal approach for diagnosing and treating GCA, despite the somewhat subjective choice between biopsy and relying on US.

Whilst networking, Emma Waldegrave, President of SVT, actively participated in conversations about SVT scan protocols, local policies, and importance of one's training journey as a vascular scientist. Additionally, she informed me about the upcoming training sessions set for this year's Annual Scientific Meeting in Dublin, which I am eagerly looking forward to attending. ♦

### **Husnayya Al-haddad**

*Clinical Vascular Scientist - Lewisham and Greenwich NHS Trust*

## **AVS Accreditation**

Huge congratulations to these members for successfully passing their AVS Exams

- Marina Sealey
- Bethany Stephens
- Nia Steeves





# Sharing Vascular Science with colleagues and friends in Ghana, West Africa

Travel around the world and visit as many countries as possible is a dream for many people, but this is not a report of how wonderful it is to spend some time in an exotic place! It is instead, my written account of the most meaningful project I have ever had the pleasure to participate.



**A**lthough I enjoy building good and wide relationships at work and life in general, I tend to be more reserved when it comes to sharing my thoughts and opinions, and somehow struggle slightly to leave my comfort zone. However, I am conscious that travelling and meeting new people expands our horizons and widens our vision of the world. This is why I decided to challenge myself.

When I moved to the United Kingdom in January 2013 for a four-week Locum contract, I was far from knowing that 10 years later,

I would still be living and working in this great country, loving the culture and its people and even pledging loyalty to Her late Majesty and heirs. It has been a wonderful time in a country where I truly believe people can grow and be rewarded for hard work. However, there is always something else we can do in our demand for excitement and personal development.

It all started when two Surgeons from Ghana joined the Vascular Surgery department at Imperial College. They spent eighteen months with us and built excellent

relationships in the department, including with the Vascular Scientists. They would frequently come to the lab to discuss patients, drop their request forms or just to say hello to the team.

After they returned home, while we were recovering from the first wave of Covid, they contacted me and asked if I was willing to give some online lectures in Vascular Ultrasound to a group of radiologists in Ghana. I accepted this invite without hesitation and put together some slides on Carotid, Peripheral Arterial and Venous disease. I had no idea how these sessions would be received, but the increasing number of attendees was a nice surprise. The questions and feedback from participants in the first session showed a great interest in the subject, which motivated me to carry on...

The invite to spend a few days in Accra and Kumasi (second biggest city in Ghana) for teaching and hands-on training came in the following year. The initial feeling of apprehension for leaving my comfort zone was quickly turned into excitement by the prospect of a great adventure.

Ghanaians were an incredibly welcoming people from the moment I landed in Accra. In the first full day I was treated with a nice breakfast in a place with paradisiac sea views, followed by a visit to the Elmina Castle in the Cape Coast region.

I embraced my mission with all heart and mind during the next couple of days of clinical work at Korle Bu Teaching Hospital, Accra. My day would always start between 5.30-6.00am, so we could arrive on time for the morning teaching sessions. Ghanaians are early risers; Accra is a vibrant city, full of life from sunrise.

The morning sessions included a bit of physics, haemodynamics, pathophysiology, case studies, and lasted for approximately 1hour with questions. The topics



at Korle Bu were Venous Disease and Abdominal Aortic & Mesenteric branches assessments. The rest of the days were filled with scans that were scheduled with adequate time to allow hands on training.

We saw a combination of significant arterial and venous disease. The symptoms of our first patient included leg numbness, back pain and some suggestion of claudication but walking was not severely limited. An initial ABPI assessment revealed significant peripheral obstructive disease on the right with the subsequent Duplex ultrasound showing a common iliac occlusion (confirmed by follow-

ing day CT scan). It was interesting to note that some radiologists already had some experience in vascular scanning but ankle brachial pressure measurement was not routinely done. I think my contribute here was the introduction a new structure of imaging pathway for Peripheral Vascular Disease that should initiate with an ABPI test, followed by Doppler Ultrasound and, if required, more invasive imaging techniques.

I obviously expected to see some level of vascular disease in Ghana because all patients scheduled for Vascular Ultrasound scan that week were carefully selected and triaged by the surgeons. However, I was surprised by the degree of venous disease and post thrombotic legs, which in some cases, resulted in ulceration. I have a particular interest in venous disease which extends to the pelvic disorders. I will not forget the surprise and fascination when I was able to explain and clearly demonstrate a chronic occluded left iliac venous system with large collaterals crossing the lower abdomen and draining into the right common femoral vein. My impression from my visit to Ghana is that venous scanning is the area that requires more development at the moment. I took some time to explain the full venous insufficiency assessment step by step. The squeezing and variations in the direction of flow using spectral waveforms in the deep or saphenous veins was quickly assimilated, but assessing perforators and explanation of colour scale required some more practice. I also spoke briefly about the differences between DVT and Chronic Venous Insufficiency protocols but I wasn't able to establish if there is a structured DVT pathway through the Same Day Emergency Care centres as we have currently in many places in the UK. The basics of venous scanning were explained, and I think they have the resources to develop their services.



My flight to Kumasi in the Ashanti region offered great views of the African landscape. Once again, I was greatly welcomed on arrival and was taken for some sight-seeing. The following couple of days had the same structure as in Accra, with the only difference that I was teaching a different group of people. The initial plan for the morning teaching sessions was to repeat Venous Disease and also talk about Peripheral Arteries. In my first day here, I realised there was a massive interest in fistula for haemodialysis due to their expanding renal unit, and although not prepared for it, I was still able to improvise some slides



on this topic for the following day. I noticed this group was already scanning fistulae regularly but there was some need to standardise their technique. Most questions were related to measurements of volume flow, quantification of stenosis, steal syndrome..

There was also a huge interest in renal arteries. In the absence of a well-structured power point presentation, pen and paper for an explanation of high and low resistance waveforms was the best



way to demonstrate changes in the kidney. Interestingly, we also scanned a young lady with a complex Arterio-venous malformation.

My visit to Ghana coincided with the group stage of the Qatar World Cup. When we think about football, the continents that come to our minds are usually Europe and South America but trust me if I say it is a massive thing in Ghana! The country literally stops to watch and support their players. I can't forget the moment I saw a patient with bilateral leg ulcers and bandaging, using the support of the crutches to jump of true happiness when Ghana scored their first goal. Congratulations to Argentina! It will come home next time.

My last day in Ghana was for more sightseeing, shopping and also for my first experience of a pure and traditional Coconut water. My week in Ghana was intense, rewarding and I felt my mission was accomplished. At the airport, I realised I was tired and wanted to return home, but at the same time, I also felt I had the energy for another week of hands on training.

The radiology teams in both cities have a lot of knowledge in Ultrasound and are keen to develop their skills. They have the equipment, they have the space, and



above all, they have the passion for this growing speciality. I'm proud of the work achieved so far, which included not only the technical aspects of scanning, but also helped with the creation of new reporting templates and highlighted the need to review literature and write internal protocols. Who knows if in the near future, Ghana might become an attractive option for our STP students electives?!

Vascular ultrasound is done by healthcare scientists in the U.K. and therefore, some of our Vascular Scientist colleagues, may be asking why I was willing to teach a group of medical radiologists!! Obviously, I only have a job because there is a well-established profession in the United Kingdom, but I think vascular science is above any professional dispute and my sole intention in Ghana was to share knowledge, which I did willingly and voluntarily (only travel and accommoda-

tion expenses paid for). However, it is also clear to me that Vascular Ultrasound scanning requires fully committed and dedicated professionals. Whatever the background, I truly believe we can only do a good job if we spend a substantial amount of our working lives holding the ultrasound probe. In the UK, the last 30 years showed the Accreditation by the Society of Vascular Technology of Great Britain and Ireland is an excellent example of how high quality and high standard training can be organised in other countries.

A big THANK YOU to Dr Joachim Amoako and Dr Eseenam Agbeko from Ghana, for the invite and for the hospitality and generosity during my stay. The support from our clinical director and manager at Imperial College was also essential. I don't know if there will be future opportunities to visit Ghana. I brought with me as much chocolate as I possibly could squeeze in my bags, to satisfy the sweet taste of the Vascular Science team and Surgeons. And here am I, freshly returned from the tropics to a cold winter morning, but still and proudly wearing my new African shirt. 🇵🇸

### **Carlos Pinho**

*Vascular Scientist - Imperial College Healthcare NHS Trust*

# Vascular Societies Annuals Scientific Meeting

We look forward to seeing you at the **Vascular Societies Annuals Scientific Meeting 22nd November - 24th November.**

### **Please join us at the...**

SVT Drinks Reception on:  
**Wednesday 22nd November 2023**  
**@ 19:30**

Venue:  
**Harbourmasters Bar and Restaurant,  
Customs House Dock, Dublin. DO1 W0X8**

Complimentary drinks and light  
food provided