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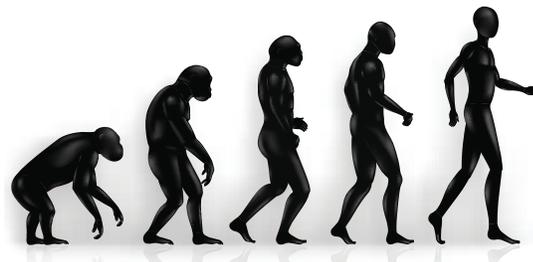
Evolution and Varicose Veins: Why Humans Get Varicose Veins



By Robert C. Kiser, DO, MSPH

Varicose veins occur when veins become distensible, leading to valve dysfunction and venous insufficiency. In the previous Venous Review newsletter, we learned that it is primarily humans who suffer from varicose veins of the lower extremities.

This article looks at why varicose veins and venous insufficiency occur and persist in humans from an evolutionary perspective.



The field of Darwinian Medicine or Evolutionary Medicine was pioneered by University of Michigan psychiatrist Randolph Nesse and Stony Brook University biologist George C. Williams¹. In Dr. Nesse's words:

"All biological traits need two kinds of explanation, both proximate and evolutionary. The proximate explanation for a disease describes what is wrong in the bodily mechanism of individuals affected by it. An evolutionary explanation is completely different. Instead of explaining why people are different, it explains why we are all the same in ways that leave

us vulnerable to disease. Why do we all have wisdom teeth, an appendix, and cells that can divide out of control?"²

Varicose veins occur because of both inherited and environmental factors. A specific gene has not yet been definitively identified as causing the predisposition to varicose veins, although the FOXC2

gene on 16q24 has shown evidence of linkage in one study^{3,4}. The evidence that varicose veins are inherited comes from studies showing that varicosities occur more commonly in those whose parents have varicose veins.

Ultimately, the cause of venous insufficiency and varicose veins is gravity. More proximately, the largest contributing factor is our upright posture. The first primate to have been bipedal is believed, at the time of this writing, to be Oreopithecus bambolii, a southern Italian ape whose feet and pelvic structure suggests an upright, bipedal gait. O. bambolii lived approximately 9 million years ago.⁵ It is believed that hominids developed a

VENOUS Review

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Maintaining the Quality in Venous Care



By Khanh Nguyen, DO, Corporate Medical Officer

Over the course of the last few years, the world of venous care has evolved at a staggering pace. There are more phlebology practices now than ever before, and unfortunately there is significant variance in the quality of vein care provided by the various practitioners. This may be due to the great variability of training or the broad range of treatment modalities. For this reason, it is more important than ever to examine each practice's quality-related processes and outcomes.

As every field in medicine gets analyzed more closely for overutilization, effectiveness, and patient outcomes, the field of phlebology will also be in the cross hairs.¹ It is important that everyone who practices venous insufficiency treatment takes on the responsibility of providing the best care available. This can be achieved by establishing medical protocols, continuous evaluation and grading of providers, clinical audits on complication rates, regular reviews of evidence-based treatment plans, and compliance reports.

Evidence-based treatment protocols ensure the most appropriate



Regular evaluation and grading of providers using a “score card system,” which includes criteria such as post-procedure venous closure rates, improvement in Venous Clinical Severity Score (VCSS), as well as physician evaluation skills should be included as part of a continuous evaluation of all providers. This ensures that the quality of care is at or above national standards. This “score care system” also gives providers and practices a chance to objectively improve on the quality of care, thus always advancing the field.

Ongoing audits of patient complication rates, evidence based treatment plans, and clinical compliance reports can also be valuable tools in the management of venous care.³ This is important to the patient and critical to the practice as well, because these audits ensure that the care of the patient is consistent, safe and effective. In today's healthcare environment,

this is not optional.

The above processes should come together in regularly scheduled Quality Assurance Meetings. Here, every physician's charts are randomly selected for review on a quarterly basis. Complication rates, treatment plan evaluations, and documentation should be reviewed for accuracy and completeness. The QA Committee not only reviews any incidents that have occurred and takes action to prevent any future recurrences, but also reviews any protocol and process changes to make sure they are in the best interest of patient care.

Providing exceptional venous care requires exceptional training and lifelong learning. Continuing medical education is an important part of maintaining quality of care. All physicians practicing venous treatment also should have ongoing training opportunities, including regularly scheduled educational training symposiums with an expert Medical Advisory Board and quarterly Journal Clubs to maintain their skills and keep up with the most current therapy.

All of these measures should be a part of every venous practice. The medical field is under more scrutiny than ever. For this reason, practicing good medicine not only will protect the venous field but also will make it stronger. More importantly, our patients deserve our effort on this and the highest quality care we can provide.

Table 1: Sample Physician Report Card

	VCSS Improvement	Closure Rate	Complication Rate
National Average	3.10	92.1%	N/A
Practice Average	3.38	94.5%	0.1%
Practice Goal	3.40	95.0%	0.0%
Physician 1	3.80	99.80	0.0%
Physician 2	3.90	99.70	0.0%
Physician 3	2.40	86.00	0.2%
Physician 4	3.10	92.00	0.0%
etc.	3.70	95.00	0.1%

Venous Clinical Severity (VCSS) Improvement is defined as the decrease in VCSS 1 month after venous ablation

Closure rates are defined as the percentage of closures at 6m, and 1 yr.

Complication Rate is the incidence of serious complications including nerve damage, skin burns, DVT and PE per physician.

patient care and are becoming more and more important in every medical field. Because of the wide variation in treatment options in phlebology, medical protocols are necessary. They are a set of predetermined criteria that defines appropriate interventions that articulate or describe situations in which the provider makes judgments relative to a course of action for effective management of the venous patient. The daily use of protocols has proven to yield better results than in practices that do not utilize them.²

Footnotes:

- 1 The Perfect Storm of Overutilization, Emanuel, JAMA, 2008;299(23):2789-2791.
- 2 Why Doctors Should Accept Protocol Medicine, Schimpff, Policy Journal, August 2011.
- 3 Improving Patient Care by Linking Evidence Based Medicine and Evidence Based Management, Shortell et al, JAMA, August 2007, Vol. 298, Number 6, pg 673-676.

Evolution and Varicose Veins: Why Humans Get Varicose Veins

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bipedal gait around 4.2-3.9 million years ago.⁶ Bipedalism allows for many important evolutionary benefits, such as the ability to run and walk effectively and, in animals with hands, the ability to free the hands for other activities during ambulation. However, with an upright posture come certain disadvantages as well, such as the tendency to develop back pain, falling down, and the need to develop hemodynamic mechanisms to overcome the change in how gravitational forces interact with the previously quadrupedal physiology. On the arterial side this requires blood pressure be maintained to the head. In the venous system this requires that venous valves and vein walls maintain their structural integrity against the downward pressure of blood.

Why Varicose Veins Persist in the Human Genotype

Assuming that varicose veins have some probability of leading to end-stage signs and symptoms such as venous ulcers and varicose hemorrhage, shouldn't natural selection tend to favor those whose genotype does not contain a tendency to cause venous insufficiency? There are several possible reasons why this has not occurred. First, varicose veins generally have their onset after reproductive age and rarely reach an end stage of venous ulcer or spontaneous varicose hemorrhage before reproduction. Therefore, the phenotypic expression of the underlying genetic predisposition does not occur until an age after which reproduction is common; there is little or no selection pressure to reduce the frequency of the genes predisposing to a varicose phenotype. An example of an analogous condition would be Huntington's chorea, in which the debilitating and eventually fatal condition most commonly occurs between 35-44 and therefore after the common age for reproduction. Furthermore, the child of a person affected by Huntington's has a 50% risk of inheriting the disease. An understanding of the genetics of the disease allows for genetic counseling and genetic testing. This creates a selection pressure against replication of this gene via the mechanism of knowledge and understanding of risks. People who undergo genetic testing understand

that they have a chance to pass on the deadly gene. This allows them to choose not to have biological children, to abort an affected fetus, or otherwise avoid passing the gene.

More speculatively, varicose veins occur frequently in women after childbirth. Their frequency increases as the number of child births increase.⁷ Varicose veins in women, therefore may act as a marker of fertility, demonstrating that a woman bearing them is fertile and capable of conception and surviving childbirth. Varicosities could therefore have at some time been a sexual selection factor that positively increases its presence in the gene pool.

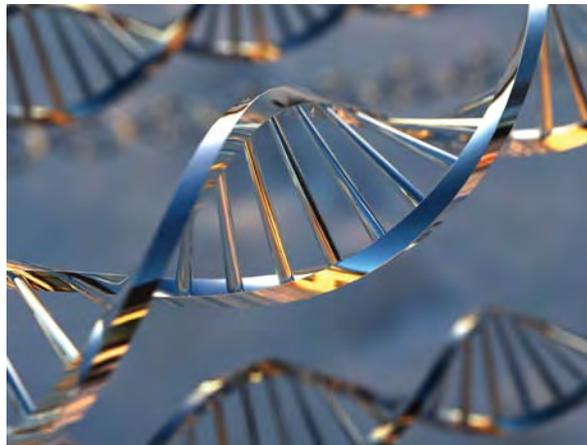
It is also possible that the tendency to varicose veins is associated with other characteristics which have selective advantages at least in some circumstances. For instance, varicose veins are noted to be associated with lighter skin tones, which may have some selective advantage in extreme Northern climates (due to increased vitamin D production at lower light levels). So the tendency to develop varicose veins may aggregate with other genes that have are favored due to natural selection or sexual selection.

Conclusion

As Dr. Nesse tells us, we clinicians can benefit from having a more global view of disease – both the proximate and evolutionary causes. Understanding that humans as a species are on some level predisposed to developing venous insufficiency can help physicians reshape their thinking when it comes to prevention, diagnosis, treatment, and ultimately compassion for their patients and the difficulties this condition can bring.



Dr. Robert Kiser (L) of Center for Vein Restoration and Richard Dawkins (R), noted evolutionary biologist.



Footnotes:

1. Nesse, R. M., & Williams, G. C. (1995). *Why We Get Sick*. New York: Times Books.
2. Nesse RM (December 2008). "Evolution: medicine's most basic science". *Lancet* 372 (Suppl 1): S21-7. doi:10.1016/S0140-6736(08)61877-2.
3. Ng MY, Andrew T, Spector TD, Jeffery S; Lymphoedema Consortium. Linkage to the FOXC2 region of chromosome 16 for varicose veins in otherwise healthy, unselected sibling pairs. *J Med Genet*. 2005 Mar;42(3):235-9.
4. Joseph J, Naoum, Glenn C, Hunter. Pathogenesis of Varicose Veins and Implications for Clinical Management. *Vascular*. 2007;15(5):242-249.
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6. McHenry, H.M (2009). "Human Evolution". In Michael Ruse & Joseph Travis. *Evolution: The First Four Billion Years*. Cambridge, Massachusetts: The Belknap Press of Harvard University Press. p. 263. ISBN 978-0-674-03175-3.
7. <http://aje.oxfordjournals.org/content/158/5/448.short>

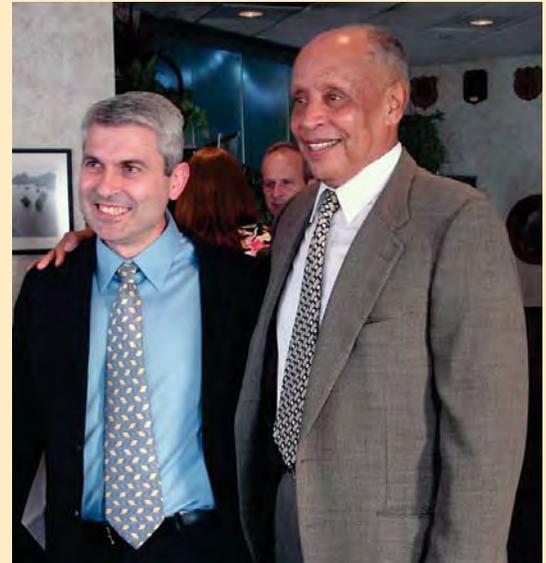
Dr. Sufian Presents Research at AVF Annual Meeting

Center for Vein Restoration's Shekeeb Sufian, MD, FACS presented CVR's clinical research at the recent American Venous Forum 2013 Annual Meeting in Phoenix, Ariz.

In a poster presentation, Dr. Sufian discussed research into the incidence, progression and risk factors for endovenous heat-induced thrombosis (EHIT) after laser ablation vs. radiofrequency ablation. The purpose of the study was to evaluate the incidence of EHIT, its progression and risk factors that may contribute to its formation, after endovenous laser ablation (EVLA) and compared it to CVR's published data after radiofrequency ablation (RFA). CVR uses both modalities in treating patients.

The study was a prospective evaluation of all the patients who had EVLA of the great saphenous vein (GSV), accessory saphenous vein (AGSV) and small saphenous vein (SSV) in four of our affiliated vein centers using a 1470 nm wavelength laser. All patients who had EHIT at the saphenous junctions were included. Demographic data, history of venous thrombosis, body mass index, vein diameter, reflux time, catheter tip position, EHIT progression, number of phlebectomies, and venous clinical severity scores (VCSS) were analyzed. Duplex ultrasound was done in all patients preoperatively and 2-3 days postoperatively. If EHIT was diagnosed, subsequent imaging was done every 1-2 weeks until the thrombus retracted.

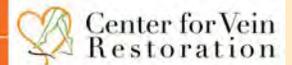
Dr. Sufian and team found that EVLA-induced EHIT incidence was significantly less than with RFA. This can be attributed in part to the larger diameter veins in the latter. Risk factors associated with EHIT formation both for EVLA and RFA were vein size, male gender and multiple phlebectomies.



American Venous Forum 2012/2013 Program Committee Chair, Nicos Labropoulos, PhD, RVT (L), and Presenter, Shekeeb Sufian, MD, FACS (R).

INCIDENCE, PROGRESSION AND RISK FACTORS FOR ENDOVENOUS HEAT INDUCED THROMBOSIS AFTER LASER ABLATION VS RADIOFREQUENCY

S. Sufian, MD, FACS, A. Arnez, MD, N. Labropoulos PhD, RVT, S. Lakhnpal, MD, FACS
Center for Vein Restoration, LLC. Greenbelt, Maryland



Purpose

This study evaluated the incidence of endovenous heat induced thrombosis (EHIT), its progression and risk factors that may contribute to its formation, after endovenous laser ablation (EVLA) and compared it to our published data after radiofrequency ablation (RFA)*

Methods

This was a prospective evaluation of all the patients who had EVLA of the great saphenous vein (GSV), accessory saphenous vein (AGSV) and small saphenous vein (SSV) in 4 of our affiliated vein centers using a 1470nm wavelength laser. All patients who had EHIT at the saphenous junctions were included. Demographic data, history of venous thrombosis, body mass index, vein diameter, reflux time, catheter tip position, EHIT progression, number of phlebectomies, and venous clinical severity scores (VCSS) were analyzed. Duplex ultrasound was done in all patients preoperatively and 2-3 days postoperatively. If EHIT was diagnosed subsequent imaging was done every 1-2 weeks until the thrombus retracted.

Results

Demographics

Table 1. Patient demographics and type of vein treated:

Age	Gender	Mean BMI	Mean Vein Diameter	Mean Reflux Time	Mean Catheter Tip Position	Mean Number of Phlebectomies	Mean VCSS
65.4	65%	28.5	0.8	1.2	1.5	1.2	1.5

Table 2. EHIT count by CEAP classification:

EHIT Class	EVLA	RFA
1	1	2
2	0	1
3	0	0
4	0	0

Fig 1A - Distribution by EHIT Class - EVLA

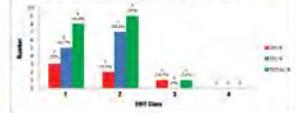
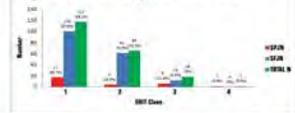


Fig 1B - Distribution by EHIT Class - RFA*



Incidence

Table 3. Incidence of EHIT:

Modality	Incidence
RFA	10%
EVLA	0%

This is higher in RFA group compared to EVLA

Vein Size

Table 4. Average Diameters of Veins in cm:

- GSV/AGSV diameter was significantly larger in EHIT cases in both groups
- SSV diameter was significantly larger in EHIT cases with RFA, not for EVLA

Modality	GSV/AGSV	SSV
RFA	0.9	0.7
EVLA	0.8	0.6

Concomitant Phlebectomies

Table 5. Concomitant Phlebectomies:

- Were significant for both groups

Modality	Mean Number
RFA	1.2
EVLA	1.2

Worsening EHIT

Table 6. Worsening EHIT:

Modality	Worsening
RFA	0%
EVLA	0%

EHIT Progression



Fig 2A - EHIT Progression - Resolution - EVLA

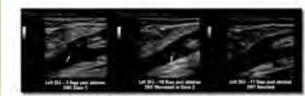


Fig 2B - EHIT Progression - Resolution - RFA*

Conclusions

EVLA induced EHIT incidence was significantly less than with RFA (p=0.0001). This can be attributed in part to the larger diameter veins in the latter. Risk factors associated with EHIT formation both for EVLA and RFA were vein size and multiple phlebectomies. EHIT resolves in 2-4 weeks in most patients but it may worsen in a few that will require further follow-up until they resolve.

* Sufian, S. Arnez, A. Labropoulos, N. Lakhnpal, S. Incidence, progression and risk factors for endovenous heat induced thrombosis after radiofrequency ablation. Accepted for publication July 15, 2012. Journal of Vascular Surgery: Venous and Lymphatic Disorders, 2013. In Press.

Q & A

In each issue of the Venous Review, members of our medical team answer questions we've received from referring physicians.

This issue's guest Q & A Editors are John Pietropaoli, MD, FACS (Prince Frederick, MD) and Gautam V. Shrikhande, MD (Westchester County, NY).

Dr. Pietropaoli



Dr. Shrikhande

Q: *"If I am referring a patient to you who has a leg ulcer should I send them to a wound care center as well?"*

A: Comprehensive wound care requires a multidisciplinary approach; that is, multiple physician specialties are involved in treating the patient properly.

Our physicians at CVR fully understand how to evaluate various types of wounds from a broad spectrum of sources. If, in fact, the wound is from a venous source, our specialists are able to begin treatment of the underlying disorder in a relatively expeditious fashion.

If the wound is originating from a source other than the veins (i.e., diabetes, arterial problems, skin problems, etc.), the physicians at CVR have the ability to refer patients to the finest sub-specialists in the region for state-of-the-art wound care and management.

Q: *"How ambulatory does a patient need to be to be considered for a vein ablation, i.e. a patient in a wheelchair?"*

A: When our physicians make decisions regarding treatment plans for a given patient, there are a multitude of factors that are taken into consideration. Our first priority is to do what is safest for the patient.

A patient's ambulatory status is certainly one consideration that is taken into account when considering venous ablation, although it is only one of many.

Ambulation assist devices such as wheelchairs, walkers, canes, and crutches are certainly NOT a contraindication to having a venous ablation performed.

Ultimately, our decision to proceed with intervention is made based upon discussions between the patient, the patient's family, and the provider. Our physician's decisions are driven by what is in the patient's best interest.

Q: *"What if a patient with varicose veins also suffers from chronic lymphedema? How can they be treated?"*

A: Lymphedema can be a fairly complex issue that is not frequently managed by many primary care or sub-specialty providers. Frequently,

patients with lower extremity lymphedema also suffer from concomitant venous disease and/or other circulatory problems.

At Center for Vein Restoration, we have dedicated members of our staff who specialize in the care of lymphedema. An appointment can be arranged by contacting our call center at the patient's convenience.

Q: *"Do (or why do) patients have to wear compression stockings for 3 months prior to a procedure?"*

A: Compression therapy is one of the mainstays of treating venous insufficiency of the lower extremities.

Depending on the extent of the problem, the duration of the problem and the complexity of the problem, the treating physician may prescribe a variable amount of time to be utilized for compression therapy.

There is not a "standard 3 month" compression therapy protocol that we use at CVR. Patients are treated individually based on the physician's assessment. In fact, some compression treatments may last only for a matter of days.

After certain types of treatments to the veins in the legs, such as a laser ablation, compression therapy is used for a finite period of time. This timeline would be discussed with patient during the pre-operative assessment and construction of the patient's individual treatment plan.

Q: *"Do ablation procedures hurt? My patients will want to know."*

A: Ablation procedures are quick, outpatient treatments that bring lasting relief from symptoms with minimal discomfort. Our physicians administer small amounts of an injected, local anesthetic along the course of the affected vein segment that is to be treated with a radiofrequency or endovenous laser catheter. This renders the procedure virtually painless while the catheter generates heat, resulting in occlusion, fibrosis, and ultimately disappearance of the vein. Recovery is generally quick and patients can return to normal activities soon after treatment.

Q: *"Is there pain when the anesthesia wears off?"*

A: No, patients will not experience pain per se, but they may experience a dull throbbing or soreness due to local inflammation. This can be relieved as needed with NSAIDs; soothing aloe vera gel or cool packs also may be used to ease any discomfort. To encourage healing, patients are advised to walk and to wear compression stockings but to avoid strenuous activities, hot baths, heavy lifting, or swimming for two weeks. There may be bruising in the area where the anesthesia was administered.

Do you have clinical questions for our team? Please let us know. Submit them to Managing Editor kathleen.hart@centerforvein.com.



CVR SPONSORED CME COURSES

We are pleased to announce more CME sessions for winter 2013 on venous insufficiency. Each course is valued at 3 CME credits. Details are below; to learn more or to request a CME in a region we serve, please contact Brent Matherly at 443-370-3830 or 301-860-0930 and at brent.matherly@centerforvein.com.



Chronic Venous Insufficiency

3.0 Category One CME Credits

It's a problem affecting 10-20 percent of all adults, including patients in your practice: chronic venous insufficiency, the often undiagnosed medical condition behind varicose veins and spider veins (telangiectasia). Venous insufficiency affects a broad range of people. Common causes include heredity, age, sex, weight, history of DVT, pregnancy, inactivity and prolonged sitting or standing. Certain groups, such as expectant moms, have extra difficulty – studies show that varicose veins get worse with each subsequent pregnancy. In this informative and relevant 3-hour session, our physician presenters will describe causes, symptoms, diagnosis and treatment of venous insufficiency. Participants will learn about the staging/classification of venous insufficiency, how duplex ultrasonography is used to evaluate patients and how modern, outpatient treatments including radiofrequency and laser ablation, and foam and cosmetic sclerotherapy can make addressing varicose and spider veins quick and relatively painless so your patients can return to normal activity with short recovery times.

APRIL

APRIL 4TH – ANNAPOLIS, MD

Joint CME with Annapolis Endocrinology Assoc.
Reception & Registration: 6:30 p.m.
Dinner & Presentation: 7:00 p.m.
108 Forbes Street, Annapolis, MD 21401

MAY

MAY 2ND – WOODBRIDGE, VA

Reception & Registration: 6:30 p.m.
Dinner & Presentation: 7:00 p.m.
Travinia Italian Kitchen, Potomac Town Center Bldg. 15001, Suite 100, Woodbridge, VA 22192

MAY 2ND – SCARSDALE, NY

Reception & Registration: 6:30 p.m.
Dinner & Presentation: 7:00 p.m.
Tutta Bella Trattoria, 754 White Plains Road, Scarsdale (Eastchester), NY 10583

MAY 9TH – EASTON, MD

Joint CME with Annapolis Endocrinology Assoc.
Reception & Registration: 6:30 p.m.
Dinner & Presentation: 7:00 p.m.
Scossa Restaurant, 8 North Washington Street, Easton, MD, 21601

MAY 9TH – DC2, DC

Reception & Registration: 6:30 p.m.
Dinner & Presentation: 7:00 p.m.
DeCarlo's Restaurant, 4822 Yuma Street NW, Washington, DC 20016

FOR MORE INFORMATION ON THE ABOVE DATES, PLEASE CONTACT BRENT MATHERLY AT 443-370-3830 OR 301-860-0930 AND AT [BRENT.MATHERLY@CENTERFORVEIN.COM](mailto:brent.matherly@centerforvein.com)

WOULD YOU LIKE US TO OFFER A CME COURSE NEAR YOU?

PLEASE CONTACT BRENT MATHERLY AT 443-370-3830 OR 301-860-0930 AND AT [BRENT.MATHERLY@CENTERFORVEIN.COM](mailto:brent.matherly@centerforvein.com)

New Clinic Set to Open in Scarsdale, NY on April 15

Center for Vein Restoration is proud to be opening our first New York office; the new facility is located at 700 White Plains Rd #241, Scarsdale.

As we mentioned in our most recent newsletter, our New York expansion is being led by physician Gautam V. Shrikhande, MD, a talented clinician, prolific author and former Assistant Professor of Surgery and Director of the Vascular Laboratory, Columbia University Medical Center.

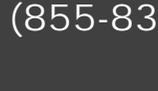
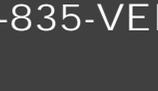
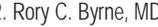
We're ready to take referrals and are now making appointments for after our official opening on April 15. Meanwhile, we're excited to be



planning local educational events in the Scarsdale area as part of our ongoing effort to build awareness of venous insufficiency, and promote

our full-service clinical approach. We'd welcome any recommendations from our New York colleagues on community groups or gatherings who might benefit from one of these presentations.

You can reach our New York team by phoning 855-824-8346. You may also make referrals directly from the homepage of our Website via our easy "Physician Referrals" button. We look forward to serving Scarsdale!



Administrative Office

Maryland Trade Center 2,
7474 Greenway Center Dr., Ste. 1000,
Greenbelt, MD 20770
Ph: (240) 965-3200

Maryland

Annapolis
108 Forbes St., Annapolis, MD 21401,
Ph: (410) 266-3820

Baltimore/Towson
7300 York Rd., Ste. LL, Towson, MD 21204,
Ph: (410) 296-4876

Bel Air
2225 Old Emmerton Rd., Ste. 110,
Bel Air, MD 21015,
Ph: (410) 569-3604

Columbia
Medical Arts Building, 11085 Little Patuxent
Pky, Ste. 203, Columbia, MD 21044,
Ph: (410) 730-2784

Easton
505A Dutchman's Ln., Ste. A-2,
Easton, MD 21601,
Ph: (410) 770-9401

Germantown
19785 Crystal Rock Dr., Ste. 310,
Germantown, MD 20874,
Ph: (301) 515-7203

Glen Burnie
1600 Crain Hway, Ste. 408,
Glen Burnie, MD 21061,
Ph: (410) 424-2237

Greenbelt
7300 Hanover Dr., Ste. 303,
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Ph: (301) 441-8807

North Bethesda/Rockville
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Takoma Park/Silver Spring
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Silver Spring, MD 20903,
Ph: (301) 891-6040

Waldorf
12107 Old Line Center,
Waldorf, MD 20602,
Ph: (301) 374-2047

District of Columbia

Washington #1
106 Irving St., N.W., Ste. 2400 N,
Washington, DC 20010,
Ph: (202) 722-0603

Washington #2
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Washington, DC 20010,
Ph: (301) 860-0930

New York

Scarsdale
700 White Plains Rd., # 241,
Scarsdale, NY 10583,
Ph: (914) 725-6800

Virginia

Alexandria
1900 N. Beauregard St., Ste. 110,
Alexandria, VA 22311,
Ph: (703) 379-0305

Fairfax/Fair Oaks
3620 Joseph Siewick Dr., Ste. 303,
Fairfax, VA 22033,
Ph: (703) 650-9712

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Michigan

Kalamazoo/Portage
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Editor-in-Chief, President & CEO,
Center for Vein Restoration
Sanjiv Lakhanpal, MD, FACS



Editor,
Robert C. Kiser, DO, MSPH

You may have heard us say it before, but it bears repeating: We believe treatment for varicose veins and spider veins is a necessity, not a privilege. Because of this tenet – and the fact that more than 30 million Americans suffer from venous insufficiency -- we're pleased to see so much growth in our relatively new specialty of vein health. At the same time, however, not all practices are created equal and we're reminded of the importance of setting and keeping the highest clinical standards as more vein practices open across the country.

In this edition of Venous Review, our Corporate Medical Officer Khanh Nguyen, DO expounds on this issue, writing about the importance for quality control and showing how smart clinics can set and keep the bar high; CVR uses such methods and we're happy to share how we do it. Additionally, we're also proud to continue our research efforts and to offer CME classes to local physicians, all taught by our medical team.

It's important for us to have these vital quality foundations in place as we continue to expand our own practice. Our 21st clinic, in Westchester County, New York, is set to open its doors in April, led by Dr. Gautum V. Shrikhande, MD, a former Assistant Professor of Surgery and Director of the Vascular Laboratory, Columbia University Medical Center and a prolific author and editor on venous insufficiency. We welcome Dr. Shrikhande and the New York team to the CVR family. More new locations – along with free screening days across our network -- will be announced soon.

Thank you as always for your interest in Center for Vein Restoration. We hope you continue to find our newsletter helpful and informative.

Yours in good health,

Robert C. Kiser, DO, MSPH

Editor



Visit our website: www.centerforvein.com



Center for Vein Restoration

**Maryland Trade Center 2
7474 Greenway Center Drive
Suite 1000
Greenbelt, MD 20770**



**BRINGING RELIEF
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