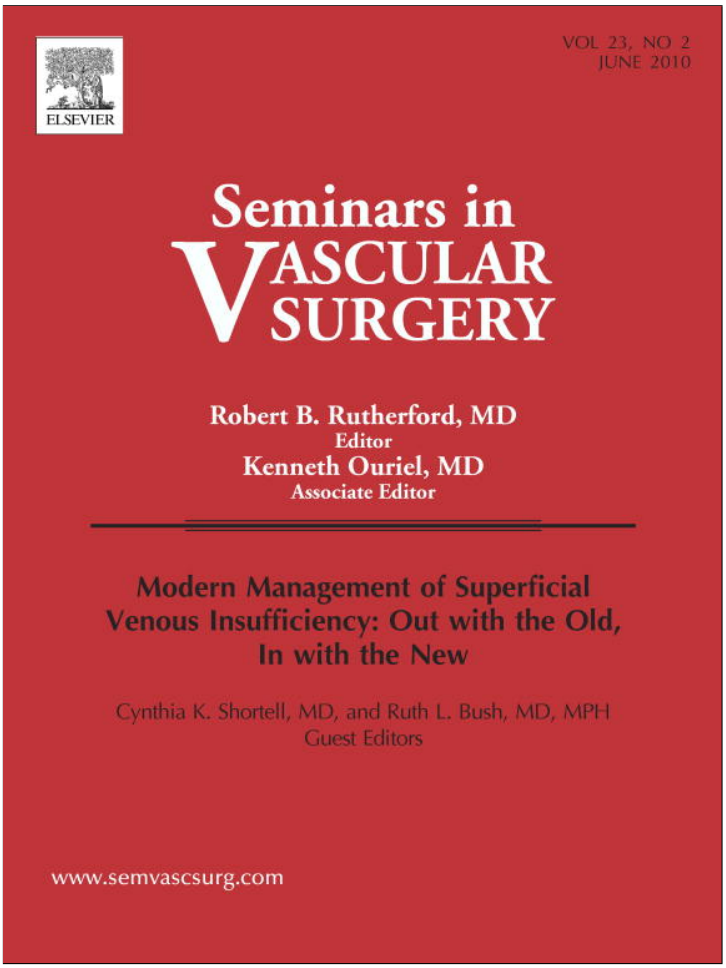

ELSEVIER

Seminars in VASCULAR SURGERY

The Importance of Uniform Venous Terminology in Reports on Varicose Veins

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There is a need for a standardized consistent language in vascular surgery that allows easy flow of information and comparison of results among clinicians. Beginning with current nomenclature, a common language serves as a framework for more detailed efforts. Understanding the outcomes assessment tools available provides the opportunity for universal outcomes reporting. Data collected at widespread points can then be fairly compared, and common goals of therapy can be determined. Common outcomes that have demonstrated verifiable trends and reproducibility should be subjected to the rigors of evidence-based questioning. The resultant standards of care and expectations of therapy are then confidently presented for everyday practice and ongoing research.
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NO CHAPTER ON uniform venous terminology is complete without an examination of the origins and developments of nomenclature. Uniform terminology and accurate nomenclature are the bedrock for valuable discourse in medicine. This common language of vascular nomenclature leads to the standardization of outcomes reporting, which in turn enables the verified outcomes of evidence-based medicine. With regard to anatomy and procedural technique, nomenclature dispels gray areas in reporting and unifies treatment goals.

Vascular anatomic nomenclature is as old as the study of anatomy itself. From an ancient tablet in Athens depicting a man holding a leg with visible varicose veins,[1] to the identification of blood circulation,[2] advent of arteriography[3] and venography,[4] to heparin[1] and the embolectomy catheter,[3] the work of past investigators has formed the foundation for the current knowledge base and for discoveries yet to come.[2] Like many areas of science, vascular medicine developed its core sensibility through the works of many disparate investigators, sometimes working continents and centuries apart.

In the 4th century, Oribasius of Pergamum wrote extensively on surgery of varicose veins, producing the first written accounts of surgical techniques in Byzantine times. Surgeons of this period had developed methods based on early vascular techniques of Greek physicians from the Hellenistic and Alexandrian periods. The influence of Oribasius' writings can be seen throughout Medieval times and early European surgical history, and the experiences of surgeons during this period added to the knowledge base of early vascular surgery.[5] Oribasius' description of varicosities as "a broadening of the veins in such a way that they contain increased blood"[5 (p 197)] echoed Galen's definition that "nature accumulates melancholic blood in the leg veins causing them to extend and become varicose; with the passage of time the covering skin becomes black."[5 (p 200)]

In 1603, Ab Aquapendente wrote: "Valves of the veins is the name I give to some extremely delicate little membranes in the lumen of the veins."[2 (p 438)] While he may have been the first person to correctly identify the function of venous valves, they had been noted and studied as early as 1539.[1,2] The 1600s also saw the first accurate description of the circulatory system by Harvey.[2] This provided a framework for much of the anatomic and physiologic investigations to come (Fig 1).

By the 19th century, medical and surgical therapies for vascular disease were flourishing. Mott performed groundbreaking procedures using arterial ligation to treat aneurysms and other disorders,[6] while European physicians focused on the diagnosis and treatment of venous disease, with venous ligation, injection therapy of varicosities, description of reflux and its role in venous disease, and ulcer treatment with Unna paste among the significant advancements of this time. In 1803, von Loder provided the most thorough description to date of the communicating and perforating veins in the legs,[7] leading to an increased understanding of the mechanism of ulcer formation and healing. The 1878 work, "On the

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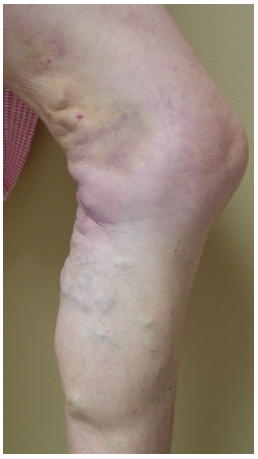
Attribute	Absent (0)	Mild (1)	Moderate (2)	Severe (3)
Pain	None	Occasional	**Daily**	Daily w/meds
Varicose Veins	None	Few	**Multiple**	Extensive
Venous Edema	None	Evening only	**Afternoon**	Morning
Skin Pigmentation	None	Limited, old	Diffuse, more recent	Wider, recent
Inflammation	None	Mild cellulitis	Mod cellulitis	Severe
Induration	None	Focal <5cm	<1/3 gaiter	> 1/3 gaiter
No. Active Ulcers	None	1	2	>2
Active Ulcer Size	None	<2cm	2-6cm	>6cm
Ulcer Duration	None	<3mo	3-12mo	>1yr
Compression Therapy	None	Intermittent	**Most days**	Fully comply

Pain=2, VV=2, Edema=2, Pigmentation=0, Inflammation=0, Induration=0, Active ulcers, size, duration=0, Compression therapy=2. **Total VCSS =8**



Attribute	Absent (0)	Mild (1)	Moderate (2)	Severe (3)
Pain	**None**	Occasional	Daily	Daily w/meds
Varicose Veins	None	**Few**	Multiple	Extensive
Venous Edema	None	**Evening only**	Afternoon	Morning
Skin Pigmentation	None	Limited, old	Diffuse, more recent	Wider, recent
Inflammation	None	Mild cellulitis	Mod cellulitis	Severe
Induration	None	Focal <5cm	<1/3 gaiter	>1/3 gaiter
No. Active Ulcers	None	1	2	>2
Active Ulcer Size	None	<2cm	2-6cm	>6cm
Ulcer Duration	None	<3mo	3-12mo	>1yr
Compression Therapy	None	Intermittent	**Most days**	Fully comply

Pain=0, VV=1, Edema=1, Pigmentation=0, Inflammation=0, Induration=0, Active ulcers, size, duration=0, Compression therapy=2. **Total VCSS =4**

Figure 1 The "visual language" of Venous Clinical Severity Score (VCSS). Consistency in physician scoring and reporting allows a common language of venous disease to emerge. Basic clinical-etiologic-anatomic-pathophysiologic (CEAP) 3, VCSS 8 (pre)—CEAP 3, VCSS 4 (post).

Bifurcation of Blood Vessels" by Roux led to further investigation of vessel diameter and course by anatomists and other scientists.[8]

The 20th century proved to be a watershed in vascular diagnosis and therapy, and arterial disease and venous disease benefited from increased scientific attention. The direct association between ulcers and varicosities was made in 1916 by Homans,[2] along with the advent of surgical treatment that involved excision of the saphenous vein and its branches and perforators,[7] leading to a flurry of venous activity that included ambulatory venous ligation, injection of sclerosant, perforator ligation, venography as a diagnostic tool, venous bypass grafting, and the introduction of low-dose heparin.[1-4] In 1938, Linton demonstrated the direct link between anatomy and pathophysiology in the role of perforators in venous ulcers; by ligating the perforating veins, he demonstrated decreased pressure in the superficial system and improved ulcer healing.[7]

The end of the 20th century and the first part of the 21st century have been a time of compilation, contemplation, and advancement in venous disease and therapy. While treatments were being offered to patients for many vascular conditions, the outcomes were only sporadically evaluated. After pioneering three valvular reconstructive procedures, Kistner found that diagnostic and reporting methods were not standardized between facilities, preventing interinstitutional trials from taking place and diluting the outcomes data.[4] In 1994, he joined with other vascular specialists to address these issues of universality on testing and reporting; this committee developed the clinical-etiologic-anatomic-pathophysiologic (CEAP) classification system for venous disease diagnosis and outcomes that remains today's standard.[4] Eklöf[4] wrote that the CEAP classification was created to be a common language for venous disease, which lacked precise descriptions. The realization that diagnostic methods and treatment options cannot exist in myriad isolated incarnations has focused the attention of the scientific community on coalescing this information to provide a framework of commonality in clinical practice and research.

The parallel innovations of disparate physicians and surgeons were initially possible because a common anatomic language existed, namely, the nomenclature of the vascular system. One of the key issues in 21st century discussions of vascular nomenclature is accuracy and uniformity in vessel

naming. This is evidenced by support for renaming the superficial femoral vein to reflect its existence as a deep venous structure. Numerous authors have written on the potential for confusion and harm with the current name, as demonstrated in retrospective analysis of physician intent to treat when thrombus was identified in this vein on Doppler imaging.[9-12]

This issue of confusing vascular nomenclature and attempts to clarify it are not 21st century phenomena, however. The origins of the name for the saphenous vein have been attributed to a Greek derivation of the word *safaina*, meaning "evident," as well as an Arabic derivation in the writings of Avicenna of the term *el safin*, meaning "concealed."[13 (p 174)] Anatomists throughout time have tried to assign meaning to each of these derivations, summarizing that the Arabic term may refer to the proximal great saphenous vein and the Greek derivation to the palpable course of the vein on the medial thigh.[13] In 2002, the saphenous vein was again the focus of a discussion, with Kakkos and Nicolaides addressing this confusion over its naming: "The knowledge of the correct etymological origin of a scientific term is valuable since this could assist its proper usage."[14 (p 1307)]

Another recent nomenclature clarification arose with the terms *chronic venous disease* and *chronic venous insufficiency*. Although often used interchangeably, the terms have distinct meanings.

Robertson and colleagues wrote that "chronic venous disease of the legs is one of the most common diseases affecting the general adult population. It comprises a wide spectrum of clinical severity, varying from asymptomatic venous incompetence to varicose veins and, in its gravest form, trophic skin changes and ulceration."[15 (p 103)] Bergan and colleagues wrote that "chronic venous disease encompasses the full spectrum of signs and symptoms associated with classes C0 to C6, whereas the term chronic venous insufficiency is generally restricted to disease of greater severity, ie classes C4 to C6."[16 (p 488)] Porter and Moneta, writing for the International Consensus Committee on Chronic Venous Disorder, wrote that "chronic venous disease is defined as an abnormally functioning venous system caused by venous valvular incompetence with or without associated venous outflow obstruction, which may affect the superficial venous system, the deep venous system, or both."[17 (p 639)] Robertson and colleagues commented on the confusion surrounding chronic venous disease: "the exact prevalence of chronic venous disease remains difficult to determine because of variations in study population, selection criteria and disease definition between different studies."[15 (p 110)]

Meissner and colleagues define chronic venous insufficiency as "those manifestations of venous disease resulting from ambulatory venous hypertension, defined as a failure to reduce venous pressure with exercise."[18 (p 10S)] Thorisson and colleagues wrote, "chronic venous insufficiency (CVI) of the superficial and/or deep venous systems of the lower extremities is an extremely common condition and is estimated to occur in one of every five Americans. The most common manifestation is varicose veins . . . the clinical significance of CVI is not merely cosmetic because many patients experience debilitating symptoms ranging from lower extremity pain, swelling, heaviness, warmth, itching, cramping, and muscle fatigue to inflammatory dermatitis and ultimately venous stasis ulcers."[19 (p 137)] Fowkes and colleagues described chronic venous insufficiency as covering "a wide range of conditions, from asymptomatic incompetence of venous valves, through varicose veins, to venous skin changes and leg ulceration,"[20 (p S5)] while Eberhardt and Raffetto wrote that "the term chronic venous insufficiency (CVI) describes a condition that affects the venous system of the lower extremities with venous hypertension causing various pathologies including pain, swelling, edema, skin changes, and ulcerations . . . we will use the term CVI to represent the full spectrum of manifestations of chronic venous disease."[21 (p 2398)] Antignani wrote, "chronic venous insufficiency (CVI) is used to describe signs and symptoms of chronic venous hypertension in the lower limbs, a condition generally considered as the pathophysiological trigger of skin changes, the most serious of which is ulceration. Chronic venous disease of the lower limbs ranks as one of the most common conditions affecting humankind."[22 (p S17)]

The 2009 VEIN-TERM consensus document provides thorough definitions of chronic venous disease and chronic venous insufficiency and adds a third global term, namely, *chronic venous disorder*. Chronic venous disorder "includes the full spectrum of morphological and functional abnormalities of the venous system."[23 (p 499)] Chronic venous disease refers to "any morphological and functional abnormalities of the venous system of long duration manifested either by symptoms and/or signs indicating the need for investigation and/or care."[23 (p 499)] Chronic venous insufficiency (C3-C6) is "a term reserved for advanced chronic venous disease, which is applied to functional abnormalities of the venous system producing edema, skin changes or venous ulcers."[23 (p 499)] The goal of the consensus committee was to agree on "a common scientific language for reports on the management of chronic venous disease."[23 (p 498)]

In 1986, Kistner wrote about the importance of consistency in establishing diagnoses in venous disease, as well as about possible lingering ambiguity in venous nomenclature: "Historically, the venous system has not been regarded as worthy of detailed evaluation because so little could be done to repair the problems the system harbors."[24 (p 185)] As clinicians and researchers gained knowledge on the form and function of the lower-extremity vasculature, it became apparent that existing nomenclature was insufficient in its descriptions.[25] Mozes and Gloviczki proposed the framework for a new system of vascular nomenclature: "One reason to adopt a new venous terminology was to provide a system of anatomic names that are based on descriptive topographic terms rather than ill-defined eponyms. Another reason . . . was the goal to minimize possible errors in the management of patients with venous disease."[26 (p 372)]

Bonn wrote on the outcomes of a 2001 meeting held by the International Union of Phlebology to review and address inconsistencies in anatomic terminology found in clinical use and in the literature. These included "A deficiency in the nomenclature of the veins of the lower limbs . . . the intro-

Table 1 2004 Revised Terminology for the Superficial Veins of the Leg

Saphenous veins and their main tributaries
Great saphenous vein
Anterior and posterior accessory great saphenous vein
Superficial accessory great saphenous vein
Small saphenous vein
Cranial extension of the small saphenous vein
Superficial accessory small saphenous vein
Intersaphenous vein
Superficial inguinal veins
External pudendal vein
Superficial circumflex iliac vein
Superficial epigastric vein
Superficial veins of the foot
Superficial digital veins (dorsal and plantar)
Superficial metatarsal veins (dorsal and plantar)
Dorsal venous arch of the foot
Medial and lateral marginal veins
Plantar venous subcutaneous network

duction and use of names of veins not present in the existing official anatomic document . . . incorrect interpretation of these names, which leads to confusion and inappropriate treatment of venous disease; inadequate listing, specifically of perforating veins, saphenous vein collateral vessels, tributary veins, and some of the deep veins."[10] (p 605)

Many conventional naming methods have proven problematic in the nomenclature of the vascular tree. The importance of a common language of nomenclature has come to light, with a 2002 consensus statement written to clarify the terminology of venous anatomy for academic and clinical applications. Caggiati and colleagues were members of this consensus committee and wrote: "Anatomy of the venous system forms the basis of clinical phlebology and is crucial to the correct evaluation and appropriate treatment of venous disorders."[25] (p 416) "A common anatomical terminology is the foundation for a common language in phlebologic sciences. In addition, such a common language is important for investigation of the venous system and for accurate diagnosis and correct treatment of venous disorders. Universally accepted new terminology will facilitate effective international exchange of information."[25] (p 422)

In conjunction with a 2004 international consensus committee meeting on the subject of nomenclature, Caggiati and colleagues went on to write, "Anatomic terminology is the foundation of medical communication. Effective exchange of information is possible only if a common terminology is used."[27] (p 724) The 2004 consensus committee "developed a refinement of the nomenclature from 2002, focusing on new terms, on the veins of the pelvis, and on practical recommendations regarding the daily clinical use of the proposed terminology."[27] (p 719) The committee recommendations included restricting the use of eponyms, confining them to publications with international circulation, and limiting them to "Giacomini's vein, Cockett's perforating veins and Santorini's plexus."[27] (p 722) Also defined were terms relating to vein size and development.

In 2008, the Atherosclerotic Peripheral Vascular Disease Symposium II met to "suggest definitions, usage and nomenclature of specific terms commonly used to describe vascular diseases."[28] (p 2826) The group determined that "The major structural components of the vascular system are the veins, lymphatic vessels, and arteries. These serve as the basis of the nomenclature system for vascular diseases."[28] (p 2826)

The 2009 VEIN-TERM consensus statement also expressed concern about the lack of uniformity in nomenclature: "The increasing universal interest in the proper management of chronic venous disorders has exposed problems caused by non-uniform use or misuse of a number of venous terms."[23] (p 498)

Mozes and Gloviczki wrote that a common language in treatment and outcomes, based on a common anatomic language, would lead to beneficial standardization of contributing factors to venous disease.[26] The goal of this standardization is clarity in outcomes reporting and the ability to compare results: "Outcome scoring systems have made a difference in scientific assessment of venous disease. There remains, however, the confusion over the different names used for leg veins. The confusion includes the terminology of saphenous veins (long, great or greater, small, short or lesser), the myriad of eponyms of the perforators, and, most importantly, the superficial femoral vein (a deep vein) (Tables 1 to 3)."[26] (p 368)

Universal agreement on nomenclature and the anatomy of chronic venous disease will result in uniformity in reporting standards and outcomes assessments. A common language must be in place for the outcomes assessment to be relevant in international settings. Meissner and colleagues wrote about the importance of evaluating outcomes: "The scientific future of studies of chronic venous disease and its management depends on using proper outcome assessment meth-

Table 2 New Terminology for the Deep Veins of the Lower Extremity

Deep veins of the thigh
Common femoral vein
Femoral vein
Profunda femoris or deep femoral vein
Medial and lateral circumflex femoral veins
Sciatic vein
Popliteal vein
Deep veins of the leg
Genicular venous plexus
Soleal veins
Gastrocnemius veins (medial/lateral and intergemellar)
Anterior tibial veins
Posterior tibial veins
Peroneal or fibular veins
Deep veins of the foot
Deep digital veins (plantar and dorsal)
Deep metatarsal veins (plantar and dorsal)
Pedal vein
Deep plantar venous arch
Medial plantar veins
Lateral plantar veins

Table 3 New Terminology for the Perforating Veins of the Lower Extremity

Thigh perforators
Perforators of the femoral canal
Inguinal perforators
Knee perforators
Medial, lateral, supra-, and infrapatellar and popliteal fossa perforators
Leg perforators
Medial perforators (paratibial and lower, middle and upper posterior tibial)
Lateral perforators
Anterior perforators
Posterior perforators (gastrocnemius, intergemellar, and para-Achillean)
Ankle perforators
Medial, lateral and anterior perforators
Foot perforators
Medial, lateral, dorsal and plantar perforators

Reprinted from Mozes G, Gloviczki P: New discoveries in anatomy and new terminology of leg veins: Clinical implications. Vasc Endovasc Surg 38:367-374, 2004,[26] with permission.

ods, and this should be a major priority of all those engaged in the study of venous disease. However, measuring outcomes in CVD is complex and more difficult than most other vascular diseases."[18] (p 18S) They also discussed what is required to achieve true standardization: "Bolstering clinical assessment by objective improvement in universally accepted venous tests could have a tremendous impact on venous outcomes assessment . . . [and] [r]equires that the normal range for each venous test parameter be standardized . . . . In addition, what constitutes a significant change in each of these parameters also needs to be established, to provide an objective basis for claiming improvement in response to an intervention. Finally, test protocols must be standardized and variability established for this approach to have universal application."[18] (p 20S)

Venous diseases, and varicosities in particular, are being diagnosed with increasing frequency worldwide, with varicosities being the most frequently diagnosed vascular anomaly.[29] The use of outcome assessments in venous disease has grown in importance with the explosion of technology and procedures offered for chronic venous insufficiency. To place these procedures on an international-level playing field for accurate comparison, O'Donnell wrote: "The adoption of a surgical strategy that corrects the abnormal superficial venous system alone (saphenous veins and perforators) in the face of deep venous reflux requires that the therapeutic outcomes of such a strategy be judged with objective criteria. The improved clinical status of a limb as defined by ulcer healing and by lack of ulcer recurrence, especially when expressed in a life-table format, clearly is an objective outcome measurement."[7] (p 780)

After years of debate and trial-and-error attempts to identify the standard for outcome reporting, the consensus is that scoring instruments should provide uniform, accurate, reproducible measurements and be amenable to change to reflect the chosen therapy.[30] According to Dayal and Kent, they should "define essential terms and make recommendations regarding the following: clinical classification of disease; criteria for improvement, deterioration, and failure; a grading system for risk factors; categorization of operations and interventions; [and] complications encountered with grades for severity or outcome."[30] (p 42) Results should be reported in a common language, which will lead to easy comparison of outcomes across studies.[31]

Because of the variability in presentation of chronic venous disease, outcome reporting instruments have been difficult to devise. Meissner and colleagues wrote, "The ideal clinical outcome measure for CVD would include the full spectrum of disease and be sufficiently sensitive to allow stabilization, improvement or deterioration to be precisely quantified."[32] (p 889)

One example of a useful outcome reporting method in chronic venous disease is the CEAP classification. The basic design of the CEAP classification is to function as a universally accepted system for quantifying all degrees of chronic venous disease, leading to a common platform for clinical intervention and scientific inquiry.[33] In 1994, the CEAP classification was adopted[33] and, over time, has become "the accepted standard for classifying chronic venous disorders."[34] (p 55S) The CEAP classification meets the desired criteria for an assessment in the range of systems and symptoms included, the nature of the severity measurements, and the inclusion of a disability score.[33]

The major drawback to the CEAP classification is the static nature of assessment: it measures severity at a single time point. Like many other chronic conditions, venous disease encompasses a continuum of symptoms and severity, and change in status following therapy is an ongoing process. Some investigators have proposed combining the CEAP classification with other outcome assessment measures to increase its specificity for longitudinal assessment.[35,36]

The Venous Clinical Severity Score (VCSS) is a longitudinal measure of nine categories universally considered relevant in the diagnosis and management of chronic venous disease. This score has a strong relationship with the CEAP classification, indicating that "to some extent both scores are based on common characteristics."[29] (p 227) That validation study by Kakkos and colleagues[29] found that the VCSS and the CEAP classification were equally sensitive in outcome assessment over time. While the VCSS was determined to be useful in assessing postprocedural outcomes in the short-term and in the long-term, the CEAP classification was found to be valuable in staging venous disease throughout the treatment period.[29]

The VCSS has also demonstrated good correlation with the results of ultrasonography, and its simplicity makes it easy to administer and score.[35,37] Recently, a valuable application for the VCSS has arisen in the form of its visual descriptive power. The "visual language of [the] VCSS" is a common framework for consistent physician scoring of venous disease (Fig 1). Similarity in scoring and in descriptions of venous sequelae adds to the structure of the language of chronic venous disease.

In 2007, through the American Venous Forum, an international ad hoc working group was created to revise VCSS.[38] The intention was to update the terminology, simplify the application, and clarify ambiguities. The additional objective was to protect the strengths of the VCSS, while acknowledging limitations. Revisions to each of the clinical descriptors were made using, where applicable, quality-of-life language. The pain component now contains common patient symptoms (aching, heaviness, fatigue, soreness, and burning) that establish a venous origin. The effect on different types of daily activities is clarified. The varicose vein component has modified the vein size criteria to >3 mm to maintain consistency with the revised CEAP. Telangiectasias and reticular veins remain without a score; however, corona phlebectatica (ankle flare) has been added to the mild category. The edema component presumes a venous origin and now reflects anatomic distribution and extent. Skin pigmentation has guideline criteria for anatomic distribution and extent and excludes nonvenous causes. Inflammation has been expanded to include more than just recent pigmentation changes or underlying infection. Erythema, cellulitis, venous eczema, and dermatitis have been incorporated, as well as anatomic distribution and extent. Induration has been modified to reflect more severe venous disease. Chronic edema with fibrosis, hypodermitis, white atrophy, and lipodermatosclerosis have been added. The ulcer categories have been refined to include size and duration to reflect the largest and longest active ulcers. The compressive therapy category led to the most discussion and has now eliminated leg elevation to reflect that the category comprises only the wearing of compression garments. This revised VCSS is currently undergoing validation testing internationally.

Another outcomes assessment used in conjunction with the CEAP classification is REVAS (recurrent varices after surgery). While the CEAP classification alone is effective in staging chronic venous disease, there is a need for a tool specifically designed to score and assess recurrent varicosities after therapy. Although useful in following the course of venous disease after therapy, the VCSS is not designed to specifically address factors important in scoring recurrent varicosities, including the effect of initial treatment and the type of follow-up provided.[39]

The use of REVAS and the CEAP classification together provides the type of information that is necessary for a complete picture of the nature of recurrent varicosities in the context of chronic venous disease. This allows for clearer, more accurate reporting of this common postprocedural problem.[39]

Eklöf wrote a commentary on REVAS in which he explained that the goal was "to create a classification for REVAS to be used as a complement to [the] CEAP [classification], which was expanded to define the sites, nature, and sources of recurrence, as well as the magnitude of the reflux and possible contributory factors. Factors responsible for recurrence and recommendations for primary prevention were debated."[39] (p 334)

Regardless of the instrument chosen for outcomes assessment, the manner in which results are tabulated and presented is of paramount importance in determining the effect of therapy. Rutherford wrote: "Results mean everything. . . . The results of therapy for vascular diseases have little meaning if presented in isolation, no matter how uniform and valid the criteria used for reporting them. . . . So the proper comparison of outcomes goes much farther than standardized reporting practices, as essential as these are. It requires not only reporting outcomes in a standard fashion but including comparable data on all factors known to affect those outcomes. Although this fact is implicit in our reporting standards, their value in comparing outcomes is limited, because we do not yet have a systematic approach to using them for this purpose. . . . A number of needs could be served by a standardized approach to outcome analysis in our field."[40] (p 5)

The journey from an assessment instrument to a standardized reporting practice to a universal results measurement that is useful in clinical practice and research methods is a long exacting process. Along the way, there are key elements to consider to ensure reliability and a clear focus on the desired objectives. Rutherford wrote: "We can establish uniform criteria for success or failure, and we can identify risk factors and other variables that significantly affect outcome and develop grading scales for them that will allow valid intergroup comparisons. . . . We can set guidelines for acceptable clinical comparisons in addition to costly and lengthy prospective randomized trials. . . . These are only an initial attempt to see what can be done in extending our reporting standards to outcome assessment."[40] (p 6) Comparison of outcomes across the spectrum of vascular disease and therapy "is not a simple matter, but if we develop a good, readily usable approach to outcomes comparisons, one by which the results of our labors can be properly judged, the results are great."[40] (p 16)

Several categories of assessment tools are now in use, including physician- and patient-completed surveys, disease-specific and generic surveys, and tools that measure quality of life or that grade objective changes following intervention.[38] The choice of instrument is based on the focus of the assessment, whether a straightforward measure of success or failure following an intervention or a detailed analysis of patient perception of change over time. Recently, the case has been made for inclusion of physician- and patient-generated measures to assess the full effect of treatment for chronic venous disease.[38,41]

The derivation and use of a common language built the foundation for verifiable transferable reporting of outcomes in venous disease. Progression to the next step in assessment involves having common outcomes measures that can be subjected to rigorous examination. According to Meissner and colleagues, "An evidence-based approach to the treatment of any disease requires a mechanism for ensuring that patient populations are comparable and a means of quantifying outcome."[32] (p 892)

The assertion of facts, whether historic, scientific, medical, or otherwise, requires presentation of supporting evidence. In an article on the circular nature of history, O'Donnell writes that the earliest recorded example of evidence-based medicine may have involved the apostle St. Thomas and his

insistence on seeing and examining the wounds inflicted on Christ at the crucifixion.[7] O'Donnell asserts that an active approach to questioning provides a basis for results reporting, as practices and results will be evaluated critically.[7]

In a 2009 talk, Meissner defined evidence-based medicine as "A respectful, but questioning approach to the evidence . . . the conscientious, explicit, and judicious use of the current best evidence in making decisions about the care of individual patients."[42 (p 245)] This can be accomplished by examining patient and physician input, as well as clinical evidence that can be readily applied to the situation at hand. Because technologic advances may overshadow what has been learned from prior evidence, Meissner asserts that "we need to individually participate in scientifically questioning the existing evidence and generating new evidence."[42 (p 248)]

The 2009 VEIN-TERM conference derived a clear link between the standardization of venous nomenclature and evidence-based medicine: without an international standard of terminology available, evidence-based medicine cannot be used to report results.[23] The demand for outcomes reporting that can be stratified among practices and even countries has led to application of this uniform nomenclature to the comparison of results.

History has provided modern medicine with a rich legacy of nomenclature and innovation. From the earliest literature on identification of vessels and circulation (Fig 2) to modern cutting-edge treatment of vascular disease, a collaboration has always existed between scientists and practitioners, often involved in parallel work from different locations. The ability to communicate in an effective manner and to be understood has been an important focus of clinical and research-based medicine since the earliest days.

In an article detailing the early attempts to identify the venous valves, Scultetus and colleagues included a quote by Johann Wolfgang von Goethe: "What is the hardest thing of all? To see with your eyes, what lays in front of your eyes."[2 (p 440)]

Consistent nomenclature provided the language foundation that has allowed communication to progress in a common direction. This communication later focused on the development and achievement of common therapeutic goals, which over time manifested as the reporting of outcomes. When results could be stratified in a universal format, these findings then could be subjected to the rigorous scrutiny of evidence-based medicine. This process is the seed for future therapies and continued conversations.

In his presidential address to the Midwestern Vascular Surgical Society, Glover spoke about the potential influence of this generation of vascular surgeons on the next.[43] He articulated the value of future research, emphasized the inevitability of change in vascular surgery, and quoted one of his mentors, Vanderbilt anatomy professor Sam Clark: "Come, let us work, and in this little time do some new thing that no one on this earth has ever thought to do. Split from the world's eternal truth some atom of the everlasting! Then let us die, and leave for coming generations one bit of knowledge by which we'll be remembered until some later one shall show the truth we found was but a grain gleaned from some vast store we'd hardly touched and we shall be forgot and he remembered—but we, out where absolute is near, shall smile, seeing how little a beach of sand resembles the granite cliff from which it weathered."[43 (p 622)]

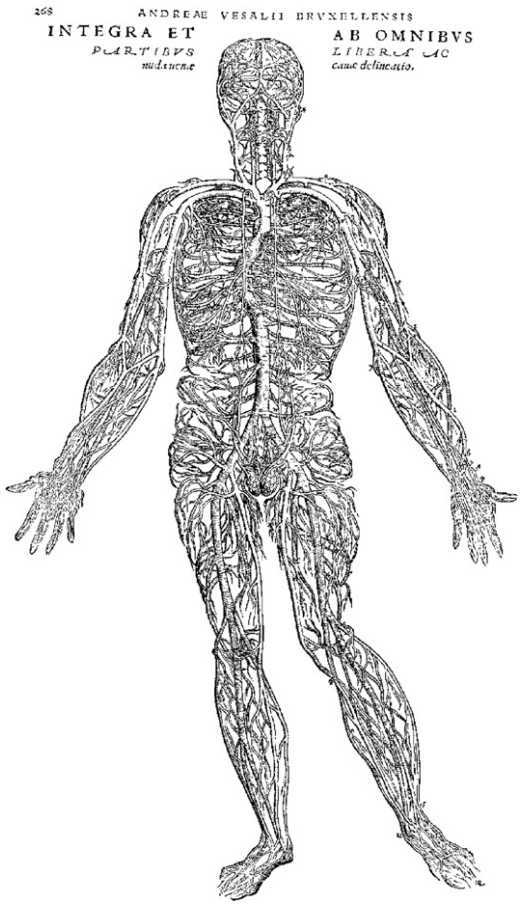


Figure 2 Human venous anatomy. From Andrea Vesalio (Vesalius). From The Humani Corporis Fabrica Libri Septem, Basel, 1543. Reprinted from Caggiati A, Bergan JJ: The saphenous vein: Derivation of its name and its relevant anatomy. J Vasc Surg 35:172-175, 2002,[13] with permission.

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