SPECIAL COMMUNICATION

From the American Venous Forum

Revision of the venous clinical severity score: Venous outcomes consensus statement: Special communication of the American Venous Forum Ad Hoc Outcomes Working Group

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In response to the need for a disease severity measurement, the American Venous Forum committee on outcomes assessment developed the Venous Severity Scoring system in 2000. There are three components of this scoring system, the Venous Disability Score, the Venous Segmental Disease Score, and the Venous Clinical Severity Score (VCSS). The VCSS was developed from elements of the CEAP classification (clinical grade, etiology, anatomy, pathophysiology), which is the worldwide standard for describing the clinical features of chronic venous disease. However, as a descriptive instrument, the CEAP classification responds poorly to change. The VCSS was subsequently developed as an evaluative instrument that would be responsive to changes in disease severity over time and in response to treatment.

Based on initial experiences with the VCSS, an international ad hoc working group of the American Venous Forum was charged with updating the instrument. This revision of the VCSS is focused on clarifying ambiguities, updating terminology, and simplifying application. The specific language of proven quality-of-life instruments was used to better address the issues of patients at the lower end of the venous disease spectrum. Periodic review and revision are necessary for generating more universal applicability and for comparing treatment outcomes in a meaningful way. (J Vasc Surg 2010;52:1387-96.)

As awareness of the morbidity and socioeconomic consequences of chronic venous disease has increased, so has the technology available for treatment. A critical need now exists for outcomes assessment instruments that reflect the morbidity associated with chronic venous disease and the response to treatment. Several instruments have been developed that serve to describe the severity of disease or to measure clinical outcomes. Disease-specific patient-reported quality-of-life tools are popular in venous disease reporting and have high sensitivity.[1] Tools relying on physician observation classify venous disease and evaluate clinically relevant changes over time.[2] Many of these outcomes tools have been validated,[3-5] and each has strengths and weaknesses. The Venous Clinical Severity Score (VCSS) was designed not to replace the CEAP classification but to supplement it and provide a method for serial assessment.[6,7] It was also designed to give additional weight to more severe manifestations of chronic venous disease (CEAP clinical class 4 and class 6).[6] It has been shown to withstand differences in intraobserver and interobserver reproducibility and to be responsive to change.[3]

The VCSS has been used and evaluated in multiple studies,[7-13] with varied results. Despite widespread use of the CEAP clinical class and the large volume of venous procedures being performed, use of the VCSS has been limited. Although the usefulness of the VCSS has been clearly demonstrated, several areas of deficiency have also been noted.[9,10,12] Ambi-

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Table I. Revised Venous Clinical Severity Score

	None: 0	*Mild: 1*	*Moderate: 2*	*Severe: 3*
Pain or other discomfort (ie, aching, heaviness, fatigue, soreness, burning) Presumes venous origin		Occasional pain or other discomfort (ie, not restricting regular daily activities)	Daily pain or other discomfort (ie, interfering with but not preventing regular daily activities)	Daily pain or discomfort (ie, limits most regular daily activities)
Varicose veins "Varicose" veins must be ≥3 mm in diameter to qualify in the standing position.		Few: scattered (ie, isolated branch varicosities or clusters) Also includes corona phlebectatica (ankle flare)	Confined to calf or thigh	Involves calf and thigh
Venous edema Presumes venous origin		Limited to foot and ankle area	Extends above ankle but below knee	Extends to knee and above
Skin pigmentation Presumes venous origin Does not include focal pigmentation over varicose veins or pigmentation due to other chronic diseases	None or focal	Limited to perimalleolar area	Diffuse over lower third of calf	Wider distribution above lower third of calf
Inflammation More than just recent pigmentation (ie, erythema, cellulitis, venous eczema, dermatitis)		Limited to perimalleolar area	Diffuse over lower third of calf	Wider distribution above lower third of calf
Induration Presumes venous origin of secondary skin and subcutaneous changes (ie, chronic edema with fibrosis, hypodermitis). Includes white atrophy and lipodermatosclerosis		Limited to perimalleolar area	Diffuse over lower third of calf	Wider distribution above lower third of calf
Active ulcer number	0	1	2	≥3
Active ulcer duration (longest active)	N/A	<3 mo	>3 mo but <1 y	Not healed for >1 y
Active ulcer size (largest active)	N/A	Diameter <2 cm	Diameter 2-6 cm	Diameter >6 cm
Use of compression therapy	0 Not used	1 Intermittent use of stockings	2 Wears stockings most days	3 Full compliance: stockings

guity in the clinical descriptors has been identified as a primary shortcoming of the instrument.[9] Other investigators have suggested that the VCSS is more appropriate for use in severe chronic venous disease.[13]

In response to these initial experiences with the VCSS and under the auspices of the American Venous Forum, an ad hoc outcomes working group of international, interdisciplinary experts was assembled to evaluate and revise the current VCSS. The intent of this revision (Table I) includes continuing to promote use of the instrument, while not undermining current databases and ongoing trials. An excellent model of an accepted refinement is found in "Revision of the CEAP Classification for Chronic Venous Disorders: Consensus Statement."[14] The specific language of proven quality-of-life instruments was used to better address the issues of patients at the less severe disease end of the venous disease spectrum. The objective of this revision is to improve the VCSS, while acknowledging its limitations and preserving its strengths (Table II). Future studies are in progress to validate the reliability, reproducibility, and responsiveness of the revised VCSS.

METHODS

At the 20th Annual Meeting of the American Venous Forum in 2008, an outcomes ad hoc working group was created to review and revise the original VCSS (Table III). This group evaluated available patient-reported and clinical outcomes instruments, examined studies regarding use of the VCSS, and considered recommendations from the assembled experts. In addition to several meetings, correspondence was conducted by e-mail. Published studies using the VCSS were reviewed and considered for this revision. Based on these interactions, the clinical descriptors were altered to clarify the language and use universally accepted terms, while retaining the basic construct of the instrument. Based on the clinician's examination and ob-

Table II. Instructions for using the Revised Venous Clinical Severity Score

On a separate form, the clinician will be asked to:
"For each leg, please check 1 box for each item (symptom and sign) that is listed below."

Pain or other discomfort (ie, aching, heaviness, fatigue, soreness, burning)
The clinician describes the four categories of leg pain or discomfort that are outlined below to the patient and asks the patient to choose, separately for each leg, the category that best describes the pain or discomfort the patient experiences.

None = 0:	None
Mild = 1:	Occasional pain or discomfort that does not restrict regular daily activities
Moderate = 2:	Daily pain or discomfort that interferes with, but does not prevent, regular daily activities
Severe = 3:	Daily pain or discomfort that limits most regular daily activities

Varicose Veins
The clinician examines the patient's legs and, separately for each leg, chooses the category that best describes the patient's superficial veins. The standing position is used for varicose vein assessment. Veins must be ≥3 mm in diameter to qualify as "varicose veins."

None = 0:	None
Mild = 1:	Few, scattered, varicosities that are confined to branch veins or clusters. Includes "corona phlebectatica" (ankle flare), defined as >5 blue telangiectases at the inner or sometimes the outer edge of the foot
Moderate = 2:	Multiple varicosities that are confined to the calf or the thigh
Severe = 3:	Multiple varicosities that involve both the calf and the thigh

Venous Edema
The clinician examines the patient's legs and, separately for each leg, chooses the category that best describes the patient's pattern of leg edema. The clinician's examination may be supplemented by asking the patient about the extent of leg edema that is experienced.

None = 0:	None
Mild = 1:	Edema that is limited to the foot and ankle
Moderate = 2:	Edema that extends above the ankle but below the knee
Severe = 3:	Edema that extends to the knee or above

Skin Pigmentation
The clinician examines the patient's legs and, separately for each leg, chooses the category that best describes the patient's skin pigmentation. Pigmentation refers to color changes of venous origin and not secondary to other chronic diseases.

None = 0:	None, or focal pigmentation that is confined to the skin over varicose veins
Mild = 1:	Pigmentation that is limited to the perimalleolar area
Moderate = 2:	Diffuse pigmentation that involves the lower third of the calf
Severe = 3:	Diffuse pigmentation that involves more than the lower third of the calf

Inflammation
The clinician examines the patient's legs and, separately for each leg, chooses the category that best describes the patient's skin inflammation. Inflammation refers to erythema, cellulitis, venous eczema, or dermatitis, rather than just recent pigmentation.

None = 0:	None
Mild = 1:	Inflammation that is limited to the perimalleolar area
Moderate = 2:	Inflammation that involves the lower third of the calf
Severe = 3:	Inflammation that involves more than the lower third of the calf

Induration
The clinician examines the patient's legs and, separately for each leg, chooses the category that best describes the patient's skin induration. Induration refers to skin and subcutaneous changes such as chronic edema with fibrosis, hypodermitis, white atrophy, and lipodermatosclerosis.

None = 0:	None
Mild = 1:	Induration that is limited to the perimalleolar area
Moderate = 2:	Induration that involves the lower third of the calf
Severe = 3:	Induration that involves more than the lower third of the calf

Active Ulcer Number
The clinician examines the patient's legs and, separately for each leg, chooses the category that best describes the number of active ulcers.

None = 0:	None
Mild = 1:	1 ulcer
Moderate = 2:	2 ulcers
Severe = 3:	≥3 ulcers

Active Ulcer Duration
If there is at least 1 active ulcer, the clinician describes the 4 categories of ulcer duration that are outlined below to the patient and asks the patient to choose, separately for each leg, the category that best describes the duration of the longest unhealed ulcer.

None = 0:	No active ulcers
Mild = 1:	Ulceration present for <3 mo
Moderate = 2:	Ulceration present for 3-12 mo
Severe = 3:	Ulceration present for >12 mo

Table II. Continued.

Active Ulcer Size	
If there is at least 1 active ulcer, the clinician examines the patient's legs, and separately for each leg, chooses the category that best describes the size of the largest active ulcer.	
None = 0:	No active ulcer
Mild = 1:	Ulcer <2 cm in diameter
Moderate = 2:	Ulcer 2-6 cm in diameter
Severe = 3:	Ulcer >6 cm in diameter
Use of Compression Therapy	
Choose the level of compliance with medical compression therapy	
None = 0:	Not used
Mild = 1:	Intermittent use
Moderate = 2:	Wears stockings most days
Severe = 3:	Full compliance: stockings

jective measurements, a venous origin is presumed for all clinical descriptors. Each limb is considered and scored separately.

EXPLANATION OF REVISIONS TO THE CLINICAL DESCRIPTORS IN THE CURRENT VERSION

The first descriptor, pain, was amended to include frequently encountered patient symptoms including *aching*, *heaviness*, *fatigue*, *soreness*, and *burning*. These terms are pertinent in establishing pain as venous in origin,[15] and usually change in response to treatment, as has been demonstrated by disease-specific quality-of-life measures.[1,4,5,16-18] Pain with exercise, as more commonly experienced with iliofemoral obstruction (ie, venous claudication[19]) may be scored with this component. The pain component was also modified to assess its limiting effect on regular daily activities. Pain of nonvenous origin (such as arthritic or at the site of a treatment) is *not* to be included in this category.

Within the second descriptor, varicose veins, the vein size criterion was modified to "at least 3-mm diameter" to remain consistent with the revised CEAP classification.[14] In this definition, "varicose veins" involve any subcutaneous saphenous veins, saphenous tributaries, or nonsaphenous superficial leg veins. The standing position for varicose vein assessment has been clarified in the instructions for use (Table II). Therefore, an overall change in the standing position size of previously engorged or enlarged veins may affect the score of this section if those veins shrink to less than 3 mm in diameter. Varicosities that are confined to either the calf or thigh are distinguished from varicosities that are present in both the calf and thigh. Great saphenous varicose vein distributions are *not* differentiated from small saphenous vein distributions in this revised version. Telangiectasias and reticular veins are still not included and remain without a score. Corona phlebectatica (ankle flare) is defined as more than five blue telangiectasias on the inner or outer edge of the foot. Corona phlebectatica is associated with chronic venous insufficiency (CVI) and perforator reflux [20] but is not truly "skin pigmentation," which is defined by the revised CEAP classification as "brownish darkening of skin, resulting from extravasated blood."[14]

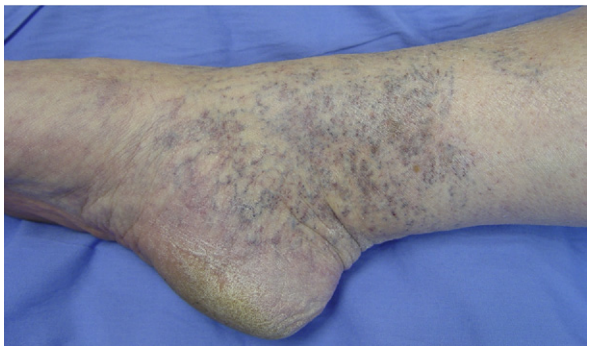

Fig 1. Corona phlebectatica.

Therefore, *corona phlebectatica* was added to the mild category and assigned a score of 1 (Fig 1).

The third descriptor, venous edema, was amended to reflect the anatomic distribution and extent. Edema of presumed venous origin is defined in the revised CEAP classification as a "perceptible increase in volume of fluid in skin and subcutaneous tissue, characteristically indented with pressure."[14] The revised VCSS edema attribute is scored by extent: (1) limited to the foot and ankle, (2) extends above the ankle but below the knee, or (3) extends to the knee or above. Considering that patients have differing daily routines, the clinician's examination should be supplemented by asking the patient about the nature and extent of leg edema experienced.

Guideline criteria are now provided for the fourth attribute, skin pigmentation, with regard to both anatomic distribution and extent. This is also reflected in the inflammation and induration categories. The criteria include skin pigmentation that is (1) limited to the perimalleolar area, (2) involves the lower third of the calf, or (3) extends beyond the lower third of the calf. Skin pigmentation refers only to color changes of venous origin and *not* those related to other chronic diseases such as vasculitis purpura. Focal pigmentation that is confined to the skin over a varicose vein is not considered to signify the same severity of venous disease as more diffuse pigmentation and is given a score of 0. Skin color changes occurring at the site of a previous

Table III. Original Venous Clinical Severity Score

Attribute	*Absent = 0*	*Mild = 1*	*Moderate = 2*	*Severe = 3*
Pain	None	Occasional, not restricting activity or requiring analgesics	Daily, moderate activity limitation, occasional analgesics	Daily, severe limiting activities or requiring regular use of analgesics
Varicose veins[a]	None	Few, scattered: branch VVs	Multiple: GS varicose veins confined to calf or thigh	Extensive: Thigh *and* calf or GS *and* LS distribution
Venous edema[b]	None	Evening ankle edema only	Afternoon edema, above ankle	Morning edema above ankle and requiring activity change, elevation
Skin pigmentation[c]	None or focal, low intensity (tan)	Diffuse, but limited in area and old (brown)	Diffuse over most of gaiter distribution (lower 1/3) *or* recent pigmentation (purple)	Wider distribution (above lower 1/3) *and* recent pigmentation
Inflammation	None	Mild cellulitis, limited to marginal area around ulcer	Moderate cellulitis, involves most of gaiter area (lower 1/3)	Severe cellulitis (lower 1/3 and above) or significant venous eczema
Induration	None	Focal, circummalleolar (<5 cm)	Medial or lateral, less than lower third of leg	Entire lower third of leg or more
No. of active ulcers	0	1	2	> 2
Active ulceration, duration	None	<3 mo	>3 mo, <1 y	Not healed >1 y
Active ulcer, size[d]	None	<2-cm diameter	2- to 6-cm diameter	>6-cm diameter
Compressive therapy[e]	Not used or not compliant	Intermittent use of stockings	Wears elastic stockings most days	Full compliance: stockings + elevation

[a]"Varicose" veins must be >4-mm diameter to qualify so that differentiation is ensured between C1 and C2 venous pathology.
[b]Presumes venous origin by characteristics (eg, brawny [not pitting or spongy] edema), with significant effect of standing/limb elevation and/or other clinical evidence of venous etiology (ie, varicose veins, history of DVT). Edema must be regular finding (eg, daily occurrence). Occasional or mild edema does not qualify.
[c]Focal pigmentation over varicose veins does not qualify.
[d]Largest dimension/diameter of largest ulcer.
[e]Sliding scale to adjust for background differences in use of compression therapy.

venous procedure such as endovenous ablation, phlebectomy, or sclerotherapy should not be included in the assessment of skin pigmentation. Different levels of pigmentation are illustrated in Fig 2.

The inflammation fifth descriptor was expanded to focus on more than just recent skin pigmentation changes or underlying infection. Inflammation here refers to the acute aspects of venous disease, those likely to respond to treatment, which may occur at the same time as other more chronic changes of skin pigmentation, induration, or ulceration. The terms *erythema*, *cellulitis*, *venous eczema*, and *dermatitis* were incorporated here. Also, the descriptors now provide for anatomic distribution and extent, similar to the skin pigmentation and induration categories (Fig 3).

Induration, the sixth descriptor, was modified to reflect more severe venous disease. *Chronic edema with fibrosis*, *hypodermitis*, *white atrophy*, and *lipodermatosclerosis* were terms added in part to promote more universal use. It is recognized that this category, similar to skin pigmentation, is usually much slower to respond to treatment, if at all. For simplicity, the distribution language is the same as that for skin pigmentation and inflammation (Fig 4).

In the active ulcer categories, descriptor 7 (ulcer number) remains unchanged. Descriptors 8 and 9 were refined in regard to ulcer size and ulcer duration. The largest active ulcers should be scored in the size category. The longest active ulcer should be scored in the duration category. Healed ulcers or a history of ulcers should be included in earlier clinical descriptors. A large ulcer that becomes separated by a healing bridge of tissue should still be considered a single ulcer and is given a score of 1 (Fig 5).

Inclusion of the final 10th clinical descriptor, use of compression therapy, has perhaps been the most controversial element of the original VCSS. It is recognized that use of compression therapy is not itself a measure of venous severity. However, use of compression therapy is a measure of compliance with conservative measures and generally will lead to diminished symptoms or signs (ie, pain, venous edema, and active ulcer) and thus a lower VCSS. Additionally, use of compression therapy has no effect on the change in severity score if the background of compression use does not change during the therapy. Although removing this attribute from the VCSS was seriously debated, doing this would constitute a major revision to the VCSS, upset ongoing data collections using the original VCSS, and is not clearly supported by available evidence. Therefore, the compression therapy descriptor was changed only to eliminate the additional variable of leg elevation. The description of the frequency with which a compression garment is worn remains unchanged in this revised version of the VCSS.

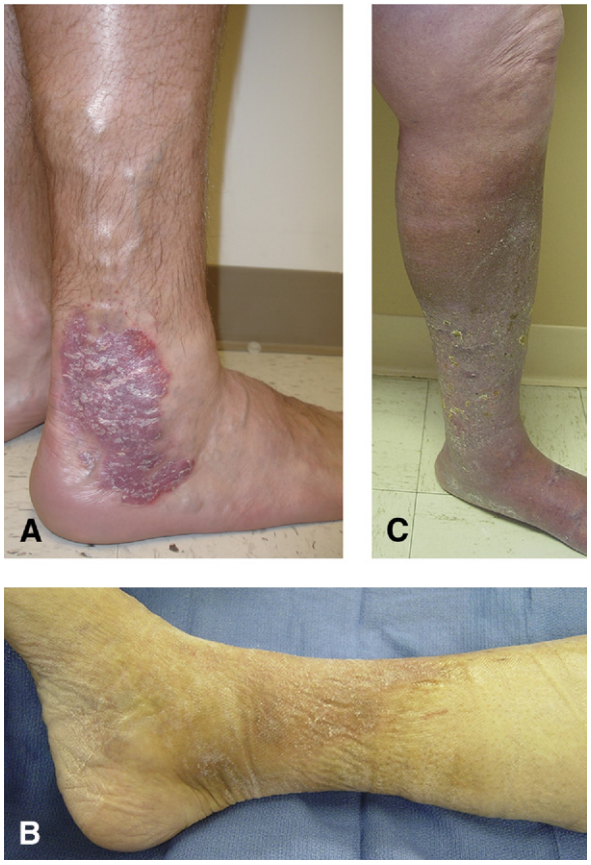

Fig 2. Skin pigmentation. **A,** Perimalleolar. **B,** Lower third calf. **C,** Above lower third calf.

DISCUSSION

Reporting of clinical outcomes in a standard fashion is expected by physician societies, hospitals, third-party payers, and government agencies. Such standardized reporting practices are required to compare devices and other therapeutic methods intended to improve clinical outcomes. Despite the tremendous increases in venous technologies and procedural volumes over the past decade, clinical outcome reporting continues to be lagging.[2,21] Surrogate outcomes, such as vein occlusion rates, stent patency, and changes in venous hemodynamics do not necessarily relate to a clinical change.

As physicians, we have an obligation to demonstrate that our interventions are based on best available evidence and use outcomes that are of importance to the patient and to society, rather than surrogate markers of unclear or doubtful significance.

Although the VCSS is derived directly from the CEAP clinical class, it was intended to supplement, not replace, the CEAP classification by providing a method for serial assessment over time and in response to an intervention.[6,7,11,12] The VCSS is evaluative and longitudinal, while the CEAP classification is descriptive and relatively static, especially in classes 4 through 6.[2,3,6,7] Although useful, the original VCSS remains imperfect. Perrin et al[13] reviewed important deficiencies in the VCSS. In their opinion, the usefulness of VCSS seemed lower for C1-C3 patients compared with C4-C6 patients, and VCSS was not precise enough with regard to skin changes such as dermatitis or hypodermic inflammation. However, Perrin and colleagues also noted that community-practicing French angiologists found the VCSS easy to use. The VCSS is generated by the clinician during the course of routine patient examination and can be followed readily. It has been argued that the VCSS fails to include cosmetic concerns, but inclusion of cosmetic issues is considered inappropriate in measuring the clinical severity of chronic venous disease in venous disease-specific quality-of-life studies.[4,22] Use of the current VCSS has proven valuable among patients with milder CEAP class 2 and class 3 disease in several studies.[12,23,24] Nevertheless, significant concerns remain regarding restrictive, misleading, confusing, and/or incomplete clinical descriptors, which primarily led to this revision.

Numerous venous disease-specific quality-of-life instruments have proven useful in large cohorts of patients.[1,11,16,22,25] They have been found to be valid, sensitive, reliable, relevant, and responsive.[1,16,22] They represent patient-derived constructs and have been designed to bridge objective and subjective evaluations. Multiple studies[4,8,9,10,11] have demonstrated the relationship between patient-derived and physician-evaluated tools. For patients with minimal symptoms, both patient-perceived and physician-evaluated tools are less valuable.[4,7,22] Although useful for research, quality-of-life instruments have been found by many clinicians to be time-consuming to complete and cumbersome to follow in daily practice.[5,17] There may be language or cultural barriers to proper application of some of these instruments.[18,26] In addition, the clinician may find difficulty in choosing from the many that are available.[2] Nevertheless, quality-of-life tools and the VCSS provide complementary information. If an instrument like the VCSS could be infused with the language that patients use in describing their venous symptoms and if the most valuable elements of quality of life could be combined with a practical clinical outcomes tool, such an instrument could have wide applicability. For example, the score by Villalta et al[27] was designed for patients with postthrombotic syndrome. Although this score has proven useful in this particular group of patients, it is not intended for broader use, in patients with CVD from other causes. The VCSS can be used to assess the broader spectrum of chronic venous disease as well as to compare patients with postthrombotic syndrome, those subjected to different treatment modalities of saphenous venous ablation, stenting for venous obstruction, pharmacomechanical thrombolysis, etc.

Reporting the CEAP clinical class in combination with the revised VCSS can add substantial clinical information. For example, CEAP clinical class 6 disease can only improve to class 5; class 4 disease may remain unchanged, despite

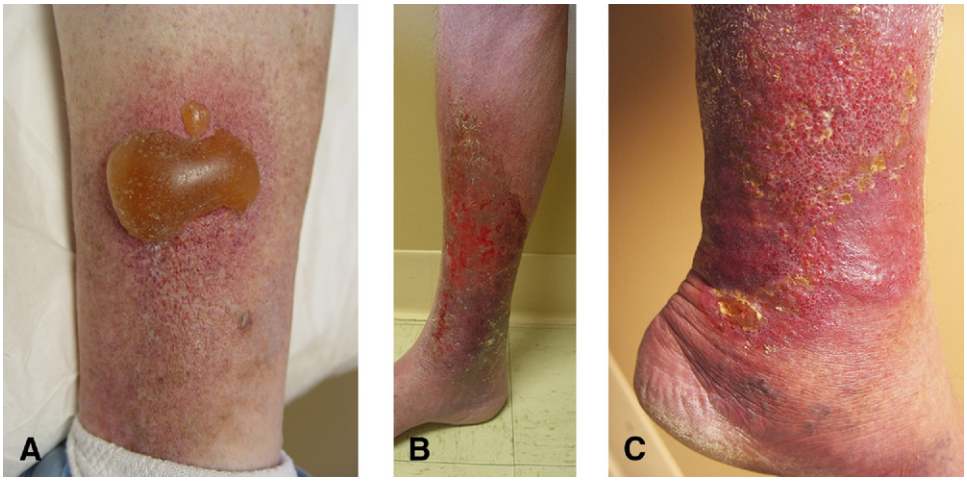

Fig 3. Inflammation. **A,** Cellulitis. **B,** Dermatitis. **C,** Venous eczema.

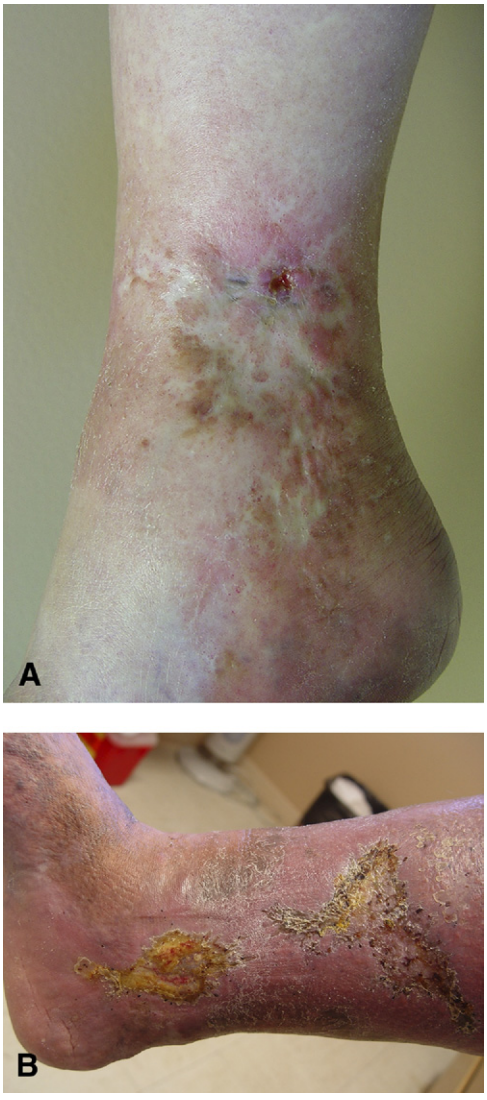

Fig 4. Induration. **A,** White atrophy. **B,** Lipodermatosclerosis.

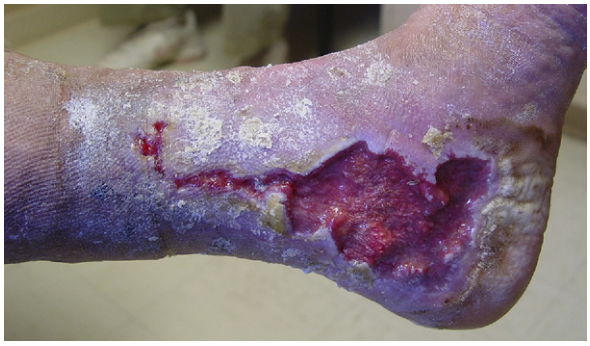

Fig 5. Number of active ulcers (*remains 1 ulcer in healing phase*).

diminishing signs and symptoms; the clinical status of patients with class 2 and class 3 level disease varies widely. Linking the VCSS to the clinical CEAP conveys a large amount of complementary information that enhances communication. Figs 6 through 9 illustrate a more vivid and dynamic clinical picture.

There is considerable overlap in the three active ulcer categories. Therefore, a dramatic VCSS score reduction usually occurs when an ulcer heals. Although the original VCSS was designed to be more heavily weighted toward the higher CEAP classes, this overlap has been thought to be excessive and will likely be amended in future revisions. Progression of CVD with clinical deterioration over time can be documented by the VCSS. In addition, a number of patients will develop recurrent disease after treatment.[15,28] The VCSS has a role in assessing these patients as well.

The current revision of the VCSS is designed primarily to clarify the clinical descriptors and thus make the instrument more precise. The issues of greatest concern with the current VCSS were addressed, and the lessons learned from the quality-of-life instruments were incorporated. A potential shortcoming of this revision is that

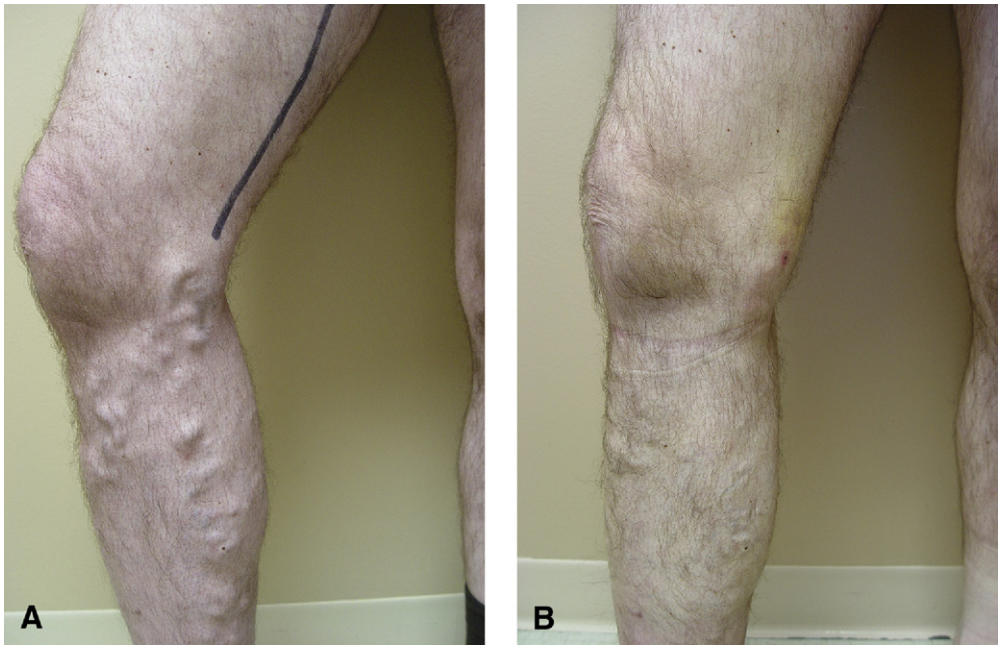

Fig 6. The "visual language" of VCSS. Consistency in physician scoring and reporting allows a common language of venous disease to emerge. **A,** Before treatment basic clinical CEAP 3-VCSS 7. Revised VCSS scoring as follows: Pain = 1, VV = 2, Edema = 2, Pigmentation = 0, Inflammation = 0, Induration = 0, Active ulcers, size, duration = 0, Compression = 2. **Total VCSS = 7**. **B,** After treatment, scoring changes to clinical CEAP 2-VCSS 3. Pain = 0, VV = 1, Edema = 0, Pigmentation = 0, Inflammation = 0, Induration = 0, Active ulcers, size, duration = 0, Compression = 2. **Total VCSS = 3**.

Clinical descriptor	*Absent (0)*	*Mild (1)*	*Moderate (2)*	*Severe (3)*
Pain	None	Occasional	Daily not limiting	Daily limiting
Varicose veins	None	Few	Calf or thigh	Calf and thigh
Venous edema	None	Foot and ankle	Below knee	Knee and above
Skin pigmentation	None	Limited perimalleolar	Diffuse lower 1/3 calf	Wider above lower 1/3 calf
Inflammation	None	Limited perimalleolar	Diffuse lower 1/3 calf	Wider above lower 1/3 calf
Induration	None	Limited perimalleolar	Diffuse lower 1/3 calf	Wider above lower 1/3 calf
No. active ulcers	None	1	2	3 or more
Ulcer duration	None	<3 mo	3-12 mo	>1 y
Active ulcer size	None	<2 cm	2-6 cm	>6 cm
Compression therapy	None	Intermittent	Most days	Fully comply

it is based on reported experiences with the original VCSS and continues to represent a consensus of expert opinion. Nevertheless, making minor revisions to the clinical descriptors was considered an important first step toward a more thorough evaluation of the instrument. In addition, observer-expectancy effect is a possibility with any physician-generated outcomes assessment tool. Studies evaluating the validity, reliability, and responsiveness of the revised VCSS are in progress and may well lead to further revisions.

CONCLUSION

With greater understanding of CVD, the ability to follow clinically relevant outcomes should increase. Future changes are likely to be needed to maintain the dynamic nature of this instrument. The VCSS is the progeny of the CEAP clinical class and has a precedent in the revised CEAP classification. It has been shown to be practical and easy to use. This document updates terminology, simplifies application, and eliminates identified ambiguities of the original VCSS to produce an instrument that can be accepted as valid, reliable, and useful by the international venous community. The revised VCSS coupled to clinical CEAP provides a standard clinical language to report and compare differing approaches to CVD management.

The authors thank Thomas Wakefield, MD, and Carolyn Munschauer, BA for their great help with this project.

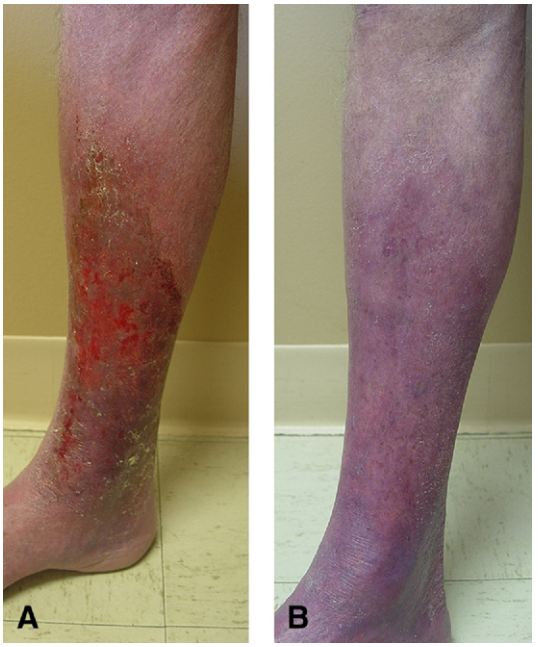

Fig 7. A, Before treatment clinical C4 -VCSS 16. Pain = 2, VV = 1, Edema = 2, Pigmentation = 3, Inflammation = 3, Induration = 3, Active ulcers, size, duration = 0, Compression = 2. **Total VCSS = 16**. **B,** Four months after treatment, patient remains clinical C4, but C4-V9. Pain = 0, VV = 1, Edema = 1, Pigmentation = 3, Inflammation = 0, Induration = 2, Active ulcers, size, duration = 0, Compression = 2. **Total VCSS = 9**.

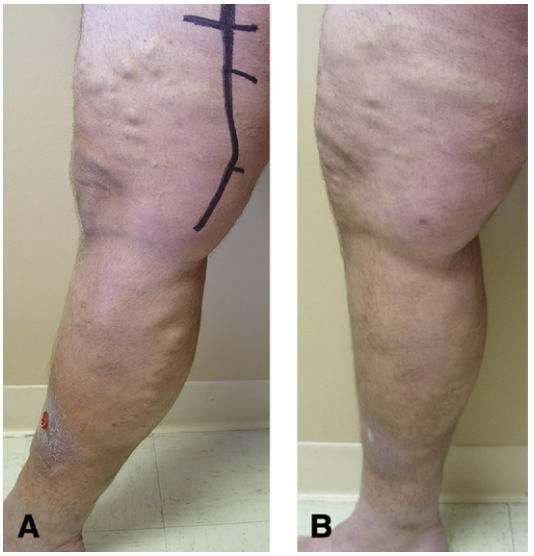

Fig 8. A, Prior to treatment, clinical C6-V18. Pain = 3, VV = 3, Edema = 2, Pigmentation = 3, Inflammation = 1, Induration = 2, Active ulcers = 1, size = 1, duration = 1, Compression = 1. **Total VCSS = 18**. **B,** One month after treatment, clinical C5-V11. Pain = 1, VV = 2, Edema = 1, Pigmentation = 3, Inflammation = 0, Induration = 2, Active ulcers = 0, size = 0, duration = 0, Compression = 2. **Total VCSS = 11**.

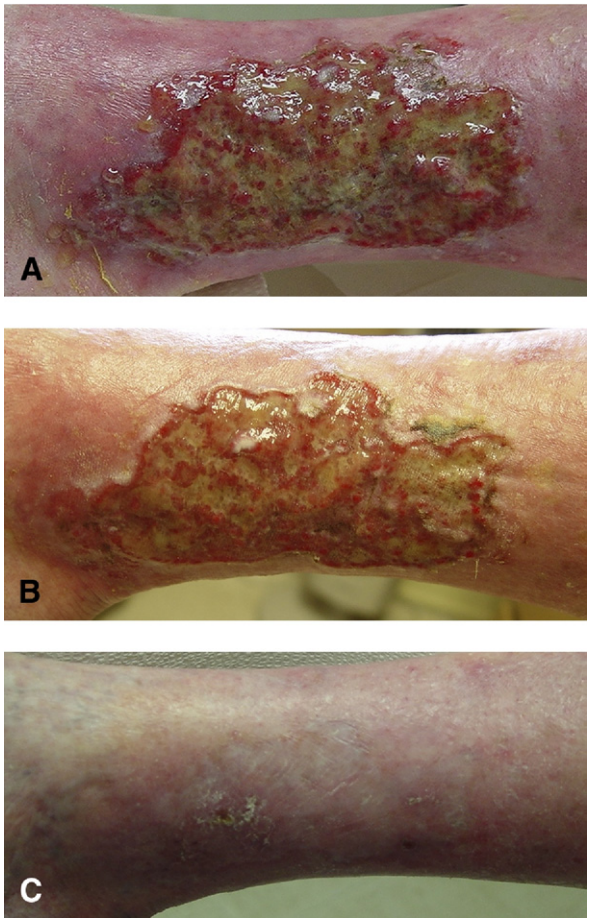

Fig 9. The broadened language of uniting CEAP with VCSS in CVD. More information is relayed in stating C6-V25 changes to C6-V21 and at last C5-V7. **A,** Pre – Pain = 3, VV = 3, Edema = 2, Pigmentation = 2, Inflammation = 3, Induration = 2, Active ulcers = 1, size = 3, duration = 3, Compression = 3. **Total VCSS = 25**. **B,** 1 week post – Pain = 2, VV = 2, Edema = 1, Pigmentation = 2, Inflammation = 2, Induration = 2, Active ulcers = 1, size = 3, duration = 3, Compression = 3. **Total VCSS = 21**. **C,** 2 months post – Pain = 0, VV = 1, Edema = 0, Pigmentation = 2, Inflammation = 0, Induration = 2, Active ulcers = 0, size = 0, duration = 0, Compression = 2. **Total VCSS = 7**.

AUTHOR CONTRIBUTIONS

Conception and design: MV, ER, RM, CS, WM, DG, MM, RR

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Data collection: MV, ER, RM, WM, MM, RR

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Final approval of the article: MV, ER, RM, WM, DG, MM, RR

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