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PRACTICE MANAGEMENT

# Use of the Clinical, Etiologic, Anatomic, and Pathophysiologic classification and Venous Clinical Severity Score to establish a treatment plan for chronic venous disorders

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**To be useful in clinical practice and in the evaluation of clinical therapies for chronic venous disorders, a measurement instrument should be objective, inclusive of all severities of venous disease, and rapidly performed by clinicians. The Clinical, Etiologic, Anatomic, and Pathophysiologic classification helps us identify the etiology, whether it is congenital, nonthrombotic, or post-thrombotic; anatomic segments involved, whether deep, superficial, or perforators; and pathophysiologic data, such as reflux or obstruction. The Venous Clinical Severity Score can be used to observe patients longitudinally, especially after interventions, although the total score is biased with regard to advanced disease, such as C4 through C6. To be able to predict progression of disease, more patient-validated instruments are needed. Physician-reported outcomes (the Venous Clinical Severity Score and the Clinical, Etiologic, Anatomic, and Pathophysiologic classification) in association with a patient-reported outcome may be the solution for the development of an ideal treatment plan. (J Vasc Surg: Venous and Lym Dis 2015;3:456-60.)**

To be useful in clinical practice and in the evaluation of clinical therapies for chronic venous disorders (CVDs), a measurement instrument should be objective, inclusive of all severities of venous disease, and rapidly performed by clinicians. It should be accurate and reproducible without significant intraobserver variation on repeated measurement of the same limb by different clinicians. Technical success is no longer the only valid outcome on which to rely; psychometric evaluation of venous treatments with quality of life instruments and patient-reported outcome measures is gaining popularity, but a clear consensus on which instruments to use is still lacking.

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## OBJECTIVE

The objective of this practice management article is to better clarify the utility and limitations of the Clinical, Etiologic, Anatomic, and Pathophysiologic (CEAP) classification and Venous Clinical Severity Score (VCSS) systems for characterizing CVDs.

**CEAP.** In 1994, the CEAP classification was introduced to simplify reporting of CVDs.[1] CEAP provides a method for consistent communication with specific descriptors, allows standardization of CVDs into classes, and can be used to guide treatment and to assess prognosis. The initial classification poorly defined telangiectasias, reticular veins, and varicose veins and was vulnerable to intraobserver and interobserver differences. A committee of the American Venous Forum revised the classification in 2004[2] (advanced CEAP classification) to make it more compatible with the evolving insights in venous disease and to offer a more complete assessment of CVDs. CEAP revisions consisted of a basic and an advanced format (Table I) with refinement of the C classes and addition of the descriptor *n* (no venous abnormality identified). The term *chronic venous insufficiency* implies a functional abnormality of the venous system and is usually reserved for more advanced disease, such as edema (C3), skin changes (C4a, b), and venous ulcers (C5-6).

Although the history and physical examination will characterize most of the findings seen in venous disorders,

**Table I.** Revision of Clinical, Etiologic, Anatomic, and Pathophysiologic (CEAP): Summary

- Clinical classification
  - $C_0$: no visible or palpable signs of venous disease
  - $C_1$: telangiectasies or reticular veins
  - $C_2$: varicose veins
  - $C_3$: edema
  - $C_{4a}$: pigmentation or eczema
  - $C_{4b}$: lipodermatosclerosis or atrophie blanche
  - $C_5$: healed venous ulcer
  - $C_6$: active venous ulcer
  - S: symptomatic, including ache, pain, tightness, skin irritation, heaviness, and muscle cramps, and other complaints attributable to venous dysfunction
  - A: asymptomatic
- Etiologic classification
  - Ec: congenital
  - Ep: primary
  - Es: secondary (post-thrombotic)
  - En: no venous cause identified
- Anatomic classification
  - As: superficial veins
  - Ap: perforator veins
  - Ad: deep veins
  - An: no venous location identified
- Pathophysiologic classification
  - Basic CEAP
    - Pr: reflux
    - Po: obstruction
    - Pr,o: reflux and obstruction
    - Pn: no venous pathophysiology identifiable
  - Advanced CEAP: Same as basic CEAP, with addition that any of 18 named venous segments can be used as locators for venous pathology
    - Superficial veins
      - Telangiectasies or reticular veins
      - Great saphenous vein above knee
      - Great saphenous vein below knee
      - Small saphenous vein
      - Nonsaphenous veins
    - Deep veins
      - Inferior vena cava
      - Common iliac vein
      - Internal iliac vein
      - External iliac vein
      - Pelvic: gonadal, broad ligament veins, other
      - Common femoral vein
      - Deep femoral vein
      - Femoral vein
      - Popliteal vein
      - Crural: anterior tibial, posterior tibial, peroneal veins (all paired)
      - Muscular: gastrocnemial, soleal veins, other
    - Perforating veins
      - Thigh
      - Calf

From Eklöf B, Rutherford RB, Bergan JJ, Carpentier PH, Gloviczki P, Kistner RL, et al. Revision of the CEAP classification for chronic venous disorders: consensus statement. J Vasc Surg 2004;40:1248-52.

additional noninvasive and invasive tests are useful to further delineate anatomic location and functionality. Therefore, the advanced CEAP classification instituted three levels of investigation to characterize the diagnostic method used: level I includes office visits with history and physical examination; level II includes duplex ultrasound or plethysmography; and level III includes more invasive tests, such as venography, ambulatory venous pressure, and advanced imaging.

The CEAP classification does not register any subjective complaints and is not a severity score. It is descriptive and does not allow longitudinal follow-up; thus, in the year 2000, Rutherford et al[3] developed a venous scoring system consisting of three parts: (1) the VCSS, (2) the Venous Segmental Disease Score, and (3) the Venous Disability Score. The VCSS grades clinical symptoms and the Venous Segmental Disease Score grades anatomic and pathophysiologic symptoms of venous disease. Both scores consist of the "best" elements from CEAP to create a score that is quantifiable and is responsive to changes after treatment. The Venous Disability Score, on the other hand, is an extension of the CEAP classification made to evaluate the effect of venous disease on the ability to work an 8-hour day.

**VCSS.** The VCSS has been largely adopted by the venous community and is the focus here. The VCSS is more sensitive than the CEAP classification to changes occurring with treatment.[4] The VCSS is composed of 10 attributes (pain, varicose veins, edema, pigmentation, inflammation, induration, number of ulcers, duration of ulcers, size of ulcers, compressive therapy) that escalate in severity with increased area of the limb involved and are graded 0 to 3 (absent, mild, moderate, severe; Table II). The VCSS has been evaluated and validated as an important instrument for longitudinal research to assess outcomes after treatment with low variability.[5] The VCSS has been demonstrated to increase with higher CEAP clinical class in a strong linear relationship.[6]

The VCSS is an evolving instrument because of some limitations that have yet to be corrected, especially with lower CEAP classes C1 to C3 compared with C4 to C6.[7] The absence of some key symptoms (such as venous claudication) and the inclusion of some items that are debatable indicators of venous disease are other limitations. The use of compression, for example, if it is used after a procedure and not before a procedure, will lower the VCSS improvement after a procedure, as compression is scored 0 to 3 points, depending on its use (intermittent use to fully compliant use). However, compared with other scores, the VCSS is one of the few scores that truly covers the complete spectrum of venous disease. Combining patient-reported symptoms (subjective) with clinical scores (objective) can lower the objective value of the total score. The primary shortcoming of the language of the VCSS has been reported as ambiguous in the Clinical Descriptors. A revision of the VCSS (rVCSS) has been performed, focusing on updating terminology, simplifying application, and eliminating ambiguities.[8] Special consideration was made to use the language of quality of life instruments. Marston et al[9] compared rVCSS scores to determine interobserver and intraobserver variability overall and within each CEAP clinical class. The rVCSS correlated well with the CEAP clinical class, with significant differences between rVCSS in increasing classes ($P < .0001$).