Appraisal of the information content of the C classes of CEAP clinical classification of chronic venous disorders: A multicenter evaluation of 872 patients

Patrick H. Carpentier, MD,[a] André Cornu-Thénard, MD,[b] Jean-François Uhl, MD,[c] Hugo Partsch, MD,[d] and **Pier Luigi Antignani, MD,[e] for the Société Française de Médecine Vasculaire and the European Working Group on the Clinical Characterization of Venous Disorders,** *La Léchère, Paris, and Neuilly sur Seine, France; Vienna, Austria; and Rome, Italy*

Objective: **Clinical classifications attempt to summarize a large amount of information in a few indices. CEAP is the most comprehensive and widely used classification of chronic venous disorders. The objective was to evaluate, in a routine clinical setting, the information associated with each CEAP clinical class and their ascending severity and additivity.**
Methods: **This work was a multicenter evaluation of newly designed software dedicated to the management of venous diseases. Forty-nine angiologists from nine European countries entered a total of 872 full records of unselected patients. The data were analyzed to evaluate the informational value of each of the clinical classes and to test their ascending severity and additivity, with monovariate and multivariate statistical techniques with SPSS/PC software on the database of the 872 right lower limbs.**
Results: **The series consisted of 700 women (80.3%) and 172 men, aged 18 to 100 years (median, 53 years). The ascending severity of the classes was shown with the statistical association of higher severity C classes with the age of the patient, a history of previous deep vein thrombosis, the diameter class of the most dilated varicose vein, venous symptoms, and the presence of a corona phlebectatica. The additivity, as measured with the Cronbach α coefficient analysis, was satisfactory in highest classes but poorer within the first three classes, and factor analysis of correspondences showed the heterogeneity of the variables that make the classification.**
Conclusion: **The information summarized with the CEAP clinical classes shows a good ascending severity but a poorer additivity. These limitations seem to be related to the heterogeneity of the information content, which suggests some refinements of this basic tool for clinical research in the field of chronic venous disorders. (J Vasc Surg 2003;37:827-33.)**

The wide spectrum of clinical venous disorders needs classification of subgroups of patients in a standardized fashion to allow clinical researchers to communicate about well-defined categories of patients. After the pioneering work of Widmer, Kamber, and Leu,[1] designed for epidemiologic surveys, and the SVS/ISCVS classification,[2] improved by Becker,[3] the CEAP classification system was proposed in 1995.[4] This system provides a framework for a clearly structured information about the clinical, etiologic, anatomic, and pathophysiologic status of a lower limb with chronic venous disease. The clinical section of this classification is also designed to allow a severity gradation of the disease in seven steps, from class C0 to class C6.[4,5]

From the Centre de Recherche Universitaire, Université Joseph Fourier[a]; the Service de Médecine Interne, Hôpital Saint Antoine[b]; private practice[c]; the Department of Dermatology, Wilhelminenhospital[d]; and the Department of Angiology, San Camillo Hospital.[e]
Made possible thanks to an educational grant of Servier International.
Competition of interest: none.
Reprint requests: Prof Patrick H. Carpentier, Centre de Recherche Universitaire, Université Joseph Fourier, F-73260 La Léchère, France (e-mail: patrick.carpentier@ujf-grenoble.fr).

0741-5214/2003/$30.00 + 0
doi:10.1067/mva.2003.147

This classification offers a comprehensive view of venous insufficiency and has received many positive comments.[6-13] It is already widely used in clinical research publications,[14-16] and improvements of the clinical part of the classification have been suggested.[17] However, thorough validation data are scarce. We recently published a work addressing the reproducibility and showing some limitations in the interobserver reproducibility, mostly explained by the lack of clear operational definition of the clinical items.[18] This manuscript is aimed to assess the informative content and principally the ascending severity and additivity of the clinical section of the CEAP classification in a wide panel of routine clinical settings.

MATERIAL AND METHODS

A cooperative group of colleagues tested a new software tailored for venous patients (European Phlebological File [EPF][19]) that allows an automatic rating of the CEAP classification and scores. The colleagues were asked to achieve a full completion of the clinical items needed for the documentation of the C component of the CEAP and to document the other parts as carefully as possible. Both legs were examined and classified in every patient. Any patient aged 18 years or older with consultation for chronic venous disorder was eligible. No obligation was made to fulfill a series of consecutive patients.

Table I. Main characteristics of patients' series

	Women (n = 700)	*Men (n = 172)*
Age (median; range; y)	50 (38-64)	62 (48-71)
History of deep vein thrombosis	10.8%	23.0%
Weight (median; interquartile; kg)	63 (56-72)	80 (70-88)
Height (median; interquartile; m)	1.64 (1.60-1.68)	1.75 (1.70-1.80)
Body mass index (median; interquartile; kg/m^2)	23.5 (20.6-27.3)	25.9 (23.3-28.1)

Table II. CEAP clinical classes: Comparison of right versus left lower limbs (χ^2 test, not significant)

Class	*Description*	*Right limbs*	*Left limbs*
C0	No visible or palpable sign of venous disease	11.0%	11.8%
C1	Telangiectases or reticular veins (subdermal, nonpalpable, diameter < 4 mm)	20.9%	22.4%
C2	Varicose veins (subcutaneous, palpable, diameter > 4 mm)	30.2%	27.4%
C3	Edema	19.4%	20.0%
C4	Skin changes ascribed to venous disease (pigmentation, venous eczema, lipodermatosclerosis)	11.6%	11.6%
C5	Skin changes as defined previously with healed ulceration	1.9%	2.8%
C6	Skin changes as defined previously with active ulceration	4.8%	4.0%

The EPF software facilitates the completeness of the records as it asks for the items lacking to produce a comprehensive designation in the CEAP classification. The software provides illustrations of clinical items when requested by the user. Recorded CEAP C items include: telangiectases and reticular veins (C1); varicose veins (C2); edema (C3), recognized when ascribed by the clinician to venous dysfunction, with several prompts made in the EPF software to help the investigator rule out edema of nonvenous origin (cardiac, renal, hepatic, and lymphatic); eczema, pigmentation, and lipodermatosclerosis (C4); white atrophy (atrophie blanche), defined as an area of whitish and atrophic skin surrounded by dilated capillaries and pigmentation, occurring before ulceration (differentiated from ulcer scar from the patient's history),[20] considered "a skin change ascribed to venous disease" and therefore assigned to class C4[4]; and healed (C5) and open (C6) ulcerations.

The software also asks for recording of additional clinical items or more detailed refinements. Presence of a corona[1] was specifically recorded but not taken into account directly in the calculation of the C class. However, by definition, every patient with corona showed telangiectases/reticular veins and therefore validated the criteria for class C1.[4] Ankle stiffness, as a consequence of cutaneous sclerosis of the ankle region, was evaluated with physical examination and assessed in three severity grades (0, absence; 1, reducible stiffness; and 2, nonreducible/ankylosis). It was not taken into account in the calculation of the C class. Venous symptoms were defined as all symptoms attributable to venous dysfunction, such as aching, pain, congestion, skin irritation and muscle cramps, heaviness, tension, and feelings of swelling and itching, influenced by standing-still position and heat. Venous symptoms were recorded even in the absence of any associated physical sign of chronic venous disorder (class C0s). Other anamnestic information was collected, such as a history of deep venous thrombosis. The diameter of the most dilated vein when clinically evaluated in standing position was also recorded[21] and resulted in a limb rating of one of four grades: 4 mm or less, between 4 and 8 mm, between 9 and 12 mm, and more than 12 mm.

The data were analyzed to evaluate the informational value of each of the seven clinical classes and to assess their ascending severity as external consistency (clinical classes versus other variables not taken into account in the classification but known to be linked with clinical severity) and additivity (ie, every limb of a given class should include the criteria for the lower order classes) with the Cronbach α coefficient.[22,23] Both monovariate and multivariate statistical techniques were used for this purpose and performed with SPSS/PC software (Chicago, Ill) on the database. These included χ^2 tests, χ^2 tests with rank correlation when appropriate, calculation of the Cronbach α reliability coefficient, and factorial analysis of correspondences. This latter multifactorial analysis summarizes a large set of variables in a small number of extracted factors, allowing illustration of their relationship through their association in building one or some of the factors. These new factors are orthogonal linear functions of the genuine variables, which means that they are statistically independent from each other.[23] The normalized coefficient of each genuine variable in the factorial functions and its correlation coefficient allow comparison of their contributions to the factor. After verification of the absence of significant differences between the left and right lower limbs, statistical analysis was performed on the 872 right limbs to rule out overestimation of the statistical power from the nonindependence of both limbs in a single person.

RESULTS

Description of the patient series. Forty-nine angiologists (including eight surgeons) from nine different European countries participated in the study. The series

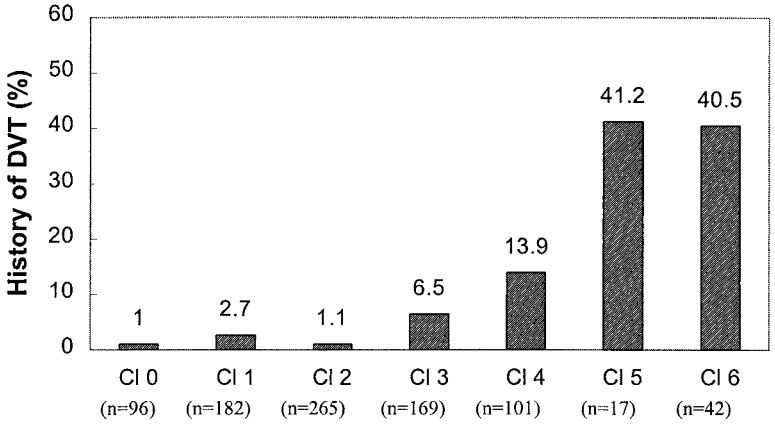

Fig 1. Proportion of limbs with history of previous deep vein thrombosis *(DVT)* in each CEAP clinical class (χ^2, $P <$ .001; Spearman rank correlation coefficient, $r = 0.33$).

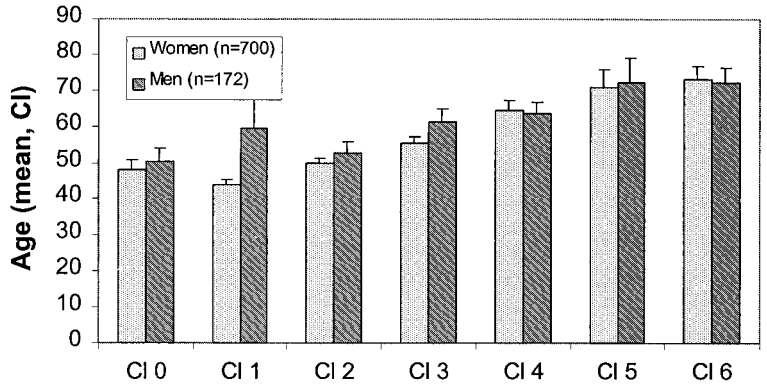

Fig 2. Age by CEAP clinical class (mean and 95% CI) in men and women (analysis of variance: gender, $r = 0.021$; age, $P < .001$; correlation coefficient, $r = 0.44$ for men and 0.41 for women).

consisted of 872 patients with full clinical data recording entered from January 1 to September 30, 1998. The series consisted of 700 women (80.3%) and 172 men, aged 18 to 100 years (median, 53 years). One hundred fifty-two patients (17.4%) reported a history of deep vein thrombosis. The main features of the patients sampled are summarized in Tables I and II.

External consistency. Comparison of the seven CEAP C classes with variables known for their relation to the clinical severity of chronic venous diseases shows a good external consistency of the classification. Limbs reported by the patient as sites of previous deep vein thrombosis were classified in significantly higher classes than limbs without such a history (χ^2 test, $P < .001$; Spearman rank correlation coefficient, $r = 0.33$; Fig 1). Mean age progressively increased from the lowest to the highest classes. This was expected in a disease in which age is one of the main risk factors[22,23] (analysis of variance, $P < .001$ for both genders; correlation coefficient, $r = 0.44$ for men and 0.41 for women; Fig 2). A significant rank correlation was found between classes of diameter of varicose veins as clinically evaluated and the assigned C class (χ^2 test, $P < .001$; Spearman rank correlation coefficient, $r = 0.33$; Table III). The proportion of patients with venous symptoms significantly increased with the C class (χ^2 test, $P < .001$; Spearman rank correlation coefficient, $r = 0.32$; Fig 3, *A*). Similarly, an association was seen of corona phlebectatica[1] to clinical severity classes (χ^2 test, $P < .001$; Spearman rank correlation coefficient, $r = 0.28$; Fig 3, *B*), which suggested that the corona should not be considered similar to telangiectases and reticular veins in other locations. We also found a significant relationship between the degree of ankle stiffness and the clinical classes (χ^2 test, $P = .001$; Spearman rank correlation coefficient, $r = 0.22$).

Additivity. Regarding the additivity of the clinical classes (Table IV), it is striking that none of the 42 limbs with open ulcers (class 6) included the criteria for all five of the lower classes. A close analysis of the discrepancies allows the following statements. Classes 3 to 6 showed good additivity but with the obvious built-in limitation that

Table III. CEAP clinical classes: Association with venous maximal diameter (clinically measured in standing position)

Maximal vein diameter *CEAP clinical class*	*≤4 mm* *(n = 653)*	*Between 4 and 8 mm* *(n = 130)*	*Between 8 and 12 mm* *(n = 66)*	*>12 mm* *(n = 23)*
C0	15%	0	0	0
C1	28%	1%†	0	0
C2	24%*	60%*	33%	30%
C3	20%	18%	17%*	22%*
C4	8%	13%	36%	22%
C5	1%	4%	6%	4%
C6	4%	4%	8%	22%

χ^2, $P < .001$; Spearman rank correlation coefficient, $r = 0.33$.
*Median class.
†Large vein with no tortuosity and no reflux.

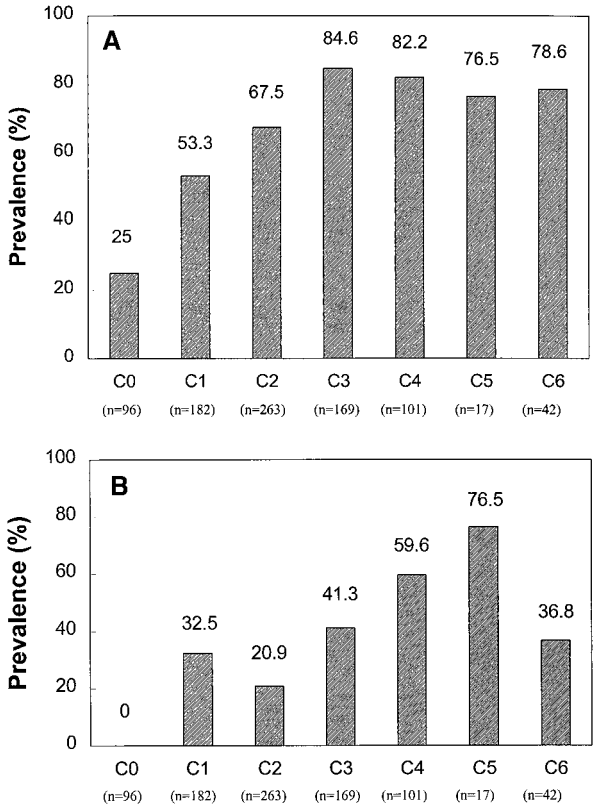

Fig 3. A, Proportion of limbs with symptoms in each CEAP clinical class (χ^2, $P < .001$; Spearman rank correlation coefficient, $r = 0.32$). **B,** Proportion of limbs with corona phlebectatica in each CEAP clinical class (χ^2, $P < .001$; Spearman rank correlation coefficient, $r = 0.28$).

because a large proportion of open ulcers were the first episode, they occurred in limbs with no ulcer scar. The association pattern of skin changes within class C4 showed that pigmentation and eczema were more common and less tightly linked to ulcers than lipodermatosclerosis (Fig 4) and white atrophy (data not shown). The presence of telangiectases was poorly associated with the other venous physical signs (Table IV).

The α coefficient of Cronbach analysis (Table V) showed a poor reliability with any set of C class criteria containing C1 and C2 (0.08 to 0.49). In contrast, a much better score was obtained with the criteria of upper classes (0.61 to 0.74).

Factor analysis was performed with the clinical symptoms and signs of venous insufficiency used in the CEAP classification (ie, telangiectases, reticular veins, varicose veins, edema, atrophie blanche, skin sclerosis, dermatitis, pigmentation, healed ulceration, active ulceration, symptoms) and some non-CEAP items (ankle stiffness and corona phlebectatica). The analysis confirms the multidimensional information given by the classification because several orthogonal (mathematically independent) factors can be extracted from the data set, the first four of which explain as much as 58% of the total variance. Analysis of the correlations of the genuine clinical parameters with each of the extracted factors allows a crude "clinical" interpretation of these factors. The "varicose veins" factor contrasts with the "trophic changes" and the "telangiectases" dimensions. This analysis also suggests a relationship between symptoms and edema, both of which are linked to the same fourth extracted factor (Table VI).

DISCUSSION

This study shows the feasibility of a multicenter collection of cases with the CEAP classification and a common software that aims at improving the homogeneity of the clinical assessment and recording procedures. The data analyzed in this study were derived from a large number of patients with consultation for a variety of venous disorders. The data were collected by clinicians with different practices in different countries. Therefore, the data are not similar to the general population nor representative of a specific kind of patient with consultation for venous disease. However, the data are likely to provide adequate material for a thorough detection of potential pitfalls of the classification.

Results regarding the external consistency clearly show that the conceptual framework of classes with ascending severity is correct, as far as groups of patients are concerned. An increasing degree of the mean value of each severity index tested correlates with increasing C classes. That is

Table IV. Additivity of "C" clinical classes

	Limbs with perfect additivity	*Additivity with telangiectases*	*Additivity with varicose veins*	*Additivity with edema*	*Additivity with skin changes*	*Additivity with ulcer scars*
Class C0 (n = 96)	96 (100%)					
Class C1 (n = 182)	182 (100%)					
Class C2 (n = 265)	165 (62.3%)	62.3%				
Class C3 (n = 169)	37 (21.9%)	66.9%	61.5%			
Class C4 (n = 101)	9 (8.9%)	70.3%	78.2%	63.4%		
Class C5 (n = 17)	2 (11.8%)	82.4%	82.4%	70.6%	94.1%	
Class C6 (n = 42)	0	52.4%	81.0%	88.1%	90.5%	42.9%

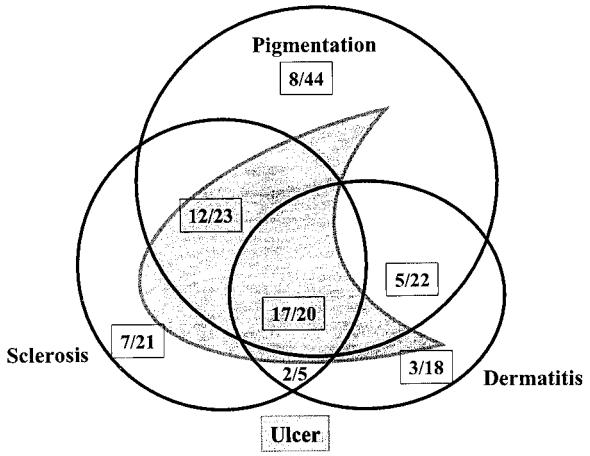

Fig 4. Venn diagram of association pattern of venous skin trophic changes and proportion of limbs with ulcers for each association. Surface areas of subsets are proportional to number of corresponding limbs. Limbs with leg ulcers (open or healed) appear as *hatched* areas.

Table V. Internal reliability of "C" clinical classes: The α Cronbach coefficient

Criteria associated in same leg	*Reliability: α Cronbach coefficient*
C1 + C2	0.08
C2 + C3	0.30
C3 + C4	0.68
C4 + C5	0.74
C5 + C6	0.61
C1 + C2 + C3	0.20
C1 + C2 + C3 + C4	0.38
C1 + C2 + C3 + C4 + C5	0.43
C1 + C2 + C3 + C4 + C5 + C6	0.49
C2 + C3 + C4 + C5 + C6	0.59
C3 + C4 + C5 + C6	0.63
C4 + C5 + C6	0.63

High reliability is obtained with upper classes. Deficiency is principally linked with discrepancies between C2 and C3 and even more between C1 and C2.

true for risk factors (age, pregnancy), etiologic subsets (postthrombotic syndrome), clinical indexes of severity not taken into account in the definition of classes (symptoms, corona phlebectatica, ankle stiffness), and pathophysiologic abnormalities (hemodynamic data to be published separately). This part of the results confirms the correctness of postulations by many published studies that used such a classification for pathophysiologic studies in which only group comparisons were needed.

Results regarding additivity are quite satisfactory for the three highest classes but much less so for the three lowest. Several explanations can be given for this limitation and may lead to possible improvements in the classification.

Although the conceptual definition of clinical findings is quite simple, there is a lack of clear-cut operational criteria for a nonambiguous classification of the limbs, which is evident for edema. Edema has great clinical variability and is difficult to assess in minor cases. This also could be said for the border line between classes 1 and 2, and the same is true for the small group of patients with healed or active ulcers without significant trophic changes that do not find any place in the classification. This absence of standardized operational criteria is probably the main reason for the lack of interobserver reproducibility that we recently showed for the same three first classes,[18] but it could also alter the consistency of data gathering by the observers, thereby influencing the additivity. We believe that improvements in that direction are mandatory.

Another part of the explanation is the composite nature of the information taken into account in the classification: both Cronbach α coefficient analysis and the factor analysis of principal components show that the clinical information on the cutaneous and the venous status cannot be accurately summarized in a single scale. This is not only because of an obvious difference in their natures but also because of a too poor correlation in their respective severities. Indeed, the present classification already separates the information for symptoms and signs. A similar conceptual distinction could be considered for venous and cutaneous abnormalities. In this respect, it is doubtful that we need a clinical venous scale because the Anatomic and Pathophysiologic parts of the CEAP classification already provide the necessary information on venous status. We think it more important to strengthen the cutaneous dimension of the evaluation of the clinical status, and a more refined appraisal of those signs could be proposed. This could split the present

Table VI. Factor analysis of correspondences: Coefficients of correlation between constitutive variables and four extracted factors

	Communality	*Factor 1*	*Factor 2*	*Factor 3*	*Factor 4*
Eigenvalue		4.11	1.25	1.28	1.05
Percent variance explained		29.4%	11.6%	9.1%	7.5%
CEAP C class items	0.705	−0.077	0.836	−0.031	0.020
Telangiectasia/reticular veins	0.735	0.081	0.060	0.832	0.180
Varicose veins	0.551	0.381	0.130	0.023	0.623
Edema	0.513				
Atrophie blanche	0.581	0.663	0.028	0.134	−0.235
Skin sclerosis	0.357	0.755	−0.045	0.088	0.042
Dermatitis	0.587	0.570	0.091	0.070	0.140
Pigmentation	0.382	0.689	0.208	0.148	0.217
Healed ulceration	0.540	0.601	−0.016	−0.020	0.141
Active ulceration		0.721	−0.138	0.000	−0.036
Non-CEAP items					
Symptoms	0.615	0.029	0.079	0.163	0.763
Ankle stiffness	0.279	0.356	0.209	0.140	−0.299
Corona phlebectatica	0.728	0.153	0.824	0.098	0.126
Varices diameter classes	0.733	0.158	0.008	0.841	−0.023
Skin changes	0.755	0.806	0.176	0.184	0.203
Interpretation		Skin	Telangiectases	Varicose veins	Symptoms/ edema

Extraction of factor was performed as analysis of correspondences with varimax rotation method.
Quality of factorization was validated with Kaiser-Meyer-Oklin measure of sampling adequacy and Bartlett test of sphericity.
Communality is proportion of variance of variable explained by four factors taken altogether; "interpretation" of factors is subjectively deduced from examination of correlation coefficients between extracted factors and individual clinical items

class 4 into two subsets, as already proposed by Coleridge-Smith (Communication to the Third Pacific Vascular Symposium, Nov 2-6, 1999, Mauna Lani, Hawaii). On the other hand, if a clinical venous scale were to be built, we think that diameter classes could be taken into account (Table III).[21] We would also suggest a stronger consideration of the corona phlebectatica, which in most cases does indicate a more severe venous disease than telangiectases and reticular veins in other locations (Fig 3, *B*).

Obviously, it is too early to make a formal proposal for an improved clinical classification on the basis of the data of a single study. More data, obtained form other studies with different designs, are needed to document the easiest way to grade the clinical severity with better consistency and reproducibility.

CONCLUSION

Our data support the conceptual framework of ascending severity classes, which makes the C of CEAP quite suitable for pathophysiologic studies. Evaluation of additivity shows nice scoring for upper classes but discrepancies in the lower ones. Factorial analysis partly explains this limitation, showing the multidimensional structure of the information content; it contrasts especially the "venous" and "skin trophic changes" dimensions. The latter provides the best additivity and could be refined through the introduction of two C4 subclasses; other refinements with corona phlebectatica and ankle stiffness might be tested in the future. More accurate operational definitions of the lower classes could be another way of improving the informational significance of the classification to optimize a tool that is of crucial importance for progress toward a better understanding of venous diseases.

This work was performed by: in France, P. Auboiroux, J. F. Auvert, F. Becker, P. Boivin, P. Capoulade, P. H. Carpentier, F. Chleir, H. de Cottereau, M. Colomb, A. Cornu-Thénard (study coordinator), M. Coupé, D. Creton, A. S. Debuse, B. Fadel, D. Franchiti, C. Fréchinos, J. P. Gobin, Y. Goulley, J. J. Guex, B. Guias, G. Jantet, M. Lampel, G. Lance, E. LeFloch, J. M. Mollard, M. Moulinié, B. Payen, M. Perrin, A. M. Sarteel, M. Tapon, J. F. Uhl, and B. Villemur; in Italy, C. Allegra, G. M. Andreozzi, P. L. Antignani, A. Apollonio, U. Baccaglini, A. Caniato, M. Catalano, G. A. Murgiano, A. Pieri, D. Righi, G. Scondotto, and L. Tessari; in Austria, H. Partsch and B. Borst-Krafek; in Belgium, I. Staelens, J. C. Wautrecht, and M. Flour; in Germany, E. Rabe; in The Netherlands, M. Neumann and E. Braam; in Spain, V. Ibanez-Esquembre; in Switzerland, M. Depairon; and in the United Kingdom, P. Coleridge-Smith and A. Nicolaïdes. We thank Dr John J. Bergan for his advice and for rereading the manuscript.

REFERENCES

1. Widmer LK, Kamber V, Leu HJ. Documentation and classification. In: Widmer LK, editor. Peripheral venous disorders. Berne: Hans Huber Publishers; 1978. p. 17-32.
2. Reporting standards in venous disease. Prepared by the Subcommittee on Reporting Standards in Venous Disease, Ad Hoc Committee on Reporting Standards, Society for Vascular Surgery/North American Chapter, International Society for Cardiovascular Surgery. J Vasc Surg 1988;8:172-81.
3. Becker F. Maladies post-thrombotiques veineuses des membres inférieurs. J Mal Vasc 1992;17:77-83.

4. Porter JM, Moneta GL. Reporting standards in venous disease: an update. International Consensus Committee on Chronic Venous Disease. J Vasc Surg 1995;21:635-45.
5. Beebe HG, Bergan JJ, Bergqvist D, Eklof B, Eriksson I, Goldman MP, et al. Classification and grading of chronic venous disease in the lower limbs. A consensus statement. Int Angiol 1995;14:197-201.
6. Coleridge-Smith PD. Another consensus statement? Phlebology 1995; 10:41.
7. Kistner RL, Eklof B, Masuda EM. Diagnosis of chronic venous disease of the lower extremities: the "CEAP" classification. Mayo Clin Proc 1996;71:338-45.
8. Gloviczki P. Classification and reporting standards for venous disease. Mayo Clin Proc 1996;71:422-3.
9. Kistner RL. Classification of chronic venous disease. Vasc Surg 1997; 31:217-8.
10. Bergan JJ. Experience with classification of venous disorders. Vasc Surg 1997;31:218-21.
11. Rutherford RB. The CEAP classification system and assessing outcome. Vasc Surg 1997;31:221-2.
12. DePalma RG. CEAP in clinical practice. Vasc Surg 1997;31:223.
13. Labropoulos N. CEAP in clinical practice. Vasc Surg 1997;31:224-5.
14. Padberg FT Jr, Pappas PJ, Araki CT, Back TL, Hobson RW. Hemodynamic and clinical improvement after superficial vein ablation in primary combined venous insufficiency with ulceration. J Vasc Surg 1996;24: 711-8.
15. Hosoi Y, Yasuhara H, Shigematsu H, Aramoto H, Komiyama T, Muto T. A new method for the assessment of venous insufficiency in primary varicose veins using near-infrared spectroscopy. J Vasc Surg 1997;26: 53-60.
16. Delis KT, Ibegbuna V, Nicolaïdes AN, Loro A, Hafez H. Prevalence and distribution of incompetent perforating veins in chronic venous insufficiency. J Vasc Surg 1998;28:815-25.
17. Rutherford RB, Padberg FT, Comerota AJ, Kistner RL, Meissner MH, Moneta GL. Venous severity scoring: an adjunct to venous outcome assessment. J Vasc Surg 2000;31:1307-12.
18. Uhl JF, Cornu-Thénard A, Carpentier PH, Schadeck M, Parpex P, Chleir F. Reproducibility of the "C" classes of the CEAP classification. J Phlebol 2001;1:29-48.
19. Uhl JF, Cornu-Thénard A, Chleir F. The European Phlebological File (EPF) or CEAP classification on line. Scripta Phlebologica 1999;7:58-60.
20. Ramelet AA, Monti M. Cutaneous complications related to venous insufficiency. In: Ramelet AA, Monti M, editors. Phlebology, the guide. Amsterdam: Elsevier; 1999. p. 151-67.
21. Cornu-Thénard A, DeVincenzi I, Maraval M. Evaluation of different systems for clinical quantification of varicose veins. J Dermatol Surg Oncol 1991;17:345-8.
22. Moret L, Mesbah M, Chwallow J, Lellouch J. Validation interne d'une échelle de mesure: relation entre analyse en composantes principales, coefficient alpha de Cronbach et coefficient de corrélation intra-classe. Rev Epid Sante Pub 1993;41:179-86.
23. Norusis MJ. Factor analysis and reliability. SPSS statistics. 1992. p. 125-52.

Submitted May 31, 2001; accepted Sep 26, 2002.

The JVS Ombudsman

The ombudsman's role is to act as an advocate for authors and represent their position to the editorial staff in relation to the process of manuscript submission, review, and publication. The ombudsman is *not* responsible for evaluating the content of a manuscript or determining whether the editors made the correct decision with regard to acceptance or rejection of the paper. If an author or other person has an unresolved complaint or question about the editorial process of the Journal, he or she should contact Dr James S. T. Yao (Northwestern University Medical School, Department of Surgery, 201 E. Huron Street, Suite 10-105, Chicago, IL 60611), who will review the matter.