Evaluating and improving health-related quality of life in patients with varicose veins

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Purpose: We set out to assess the new Aberdeen Varicose Veins Questionnaire (Aberdeen Questionnaire) for the properties necessary for a valid measure of health outcome, to determine quality of life of patients with varicose veins, and to determine the effect of surgery on quality of life.
Methods: A prospective consecutive cohort of 137 patients undergoing varicose vein surgery completed the self-administered SF-36 and Aberdeen Questionnaire and 25 questions relating to the symptoms and concerns of patients with varicose veins. Follow-up was done by repeated questionnaires 6 weeks after surgery. The Aberdeen Questionnaire was assessed for reliability, validity, responsiveness, and practicality. Quality of life of patients with varicose veins was compared with an age- and sex-matched sample of the general population.
Results: Reliability estimates for the 8 scales short-form health survey (SF-36) and the Aberdeen Questionnaire were all above 0.7 (Cronbach's alpha). The Aberdeen Questionnaire had a highly significant correlation ($r = 0.74$, $P < .0001$) with the patients' symptoms and concerns questionnaire, which is evidence of its validity. Patients with varicose veins score lower than United Kingdom norms ($P < .001$) in the physical domains of the SF-36, indicating worse health. After surgery, the SF-36 scores improved in all 8 domains of health, reaching significance in "Mental Health" ($P < .05$) and approaching significance in "General Health" ($P = .066$). The Health Transition Item of the SF-36 and the Aberdeen Questionnaire both showed a highly significant improvement in health ($P < .001$).
Conclusion: The Aberdeen Questionnaire is a valid measure of quality of life for patients with varicose veins. Persons with varicose veins have a reduced quality of life compared with the general population, and this discrepancy is significantly improved at 6 weeks by operating on them. (J Vasc Surg 1999;30:710-9.)

Varicose veins are a worldwide problem. They affect up to 15% of men and 25% of women and account for around 56,000 operations each year in the United Kingdom alone (both the National Health Service and private health sectors).[1,2] Such a high number of procedures consumes large amounts of health service resources. The benefit of surgery for the treatment of varicose veins is understandably being questioned, because it is not clear how effective the various forms of treatment are for this condition, the lack of a consistent outcome measure being a major problem.[3,4] With increasing demand on health service resources, clinicians must justify the appropriateness and cost-effectiveness of the treatment they recommend.[5] The most comprehensive way to assess the effect of varicose veins on patients, and whether surgical intervention produces improvement, is to measure health-related quality of life (HRQOL).

The Aberdeen Varicose Veins Questionnaire (Aberdeen Questionnaire) is a disease-specific questionnaire that measures HRQOL for patients with varicose veins.[6,7] The questionnaire, designed in 1993, consists of 13 questions relating to all aspects of the problem of varicose veins.[6] The questionnaire has a section in which the patients can indicate dia-

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grammatically the distribution of their varicose veins. There are questions relating to the amount of pain experienced, ankle swelling, and use of support stockings, interference with social and domestic activities, and the cosmetic aspects of varicose veins. The questionnaire is scored from zero to 100, where zero represents a patient with no evidence of varicose veins and 100 represents the most severe problems associated with varicose veins. In the development of this questionnaire, two independent vascular surgeons weighted the individual questions in proportion to the perceived contribution to severity of the question.

This instrument (in this contest, an instrument describes a questionnaire that assesses HRQOL), despite having undergone rigorous testing as a measure of health outcome,[6,7] has never been used in clinical practice, and so its responsiveness to the symptoms and concerns of patients with varicose veins has not been fully assessed. This instrument gives a single index for HRQOL for patients with varicose veins. Specific instruments, such as the Aberdeen Questionnaire, may be more responsive to clinically important changes in health as a result of an intervention. Because of their specific nature, they may not take into account the side effects of a treatment, which is a reason why they are usually used alongside a generic instrument such as the short-form health survey with 36 items (SF-36). Also specific instruments do not take into account the influence of comorbidity on the HRQOL. A copy of the questionnaire and details of its scoring system can be obtained from the developers of the instrument and is appended in this article.[6]

The SF-36 general health survey is a well-validated generic measure of health status used for multiple conditions worldwide[8-11] including varicose veins.[6,7,12] The SF-36 provides a summary of HRQOL. It is not specific to any disease or treatment and therefore can take account of multiple conditions and the influence of comorbidity on health.[8-10] The SF-36 consists of 36 questions forming eight domains of health that fit broadly into physical or mental health status scales. In contrast to the Aberdeen Questionnaire, the SF-36 domains are scored where zero represents the worse possible health and 100 the best possible health. A license to use the SF-36 with details of how to score the questionnaire can be obtained from the Medical Outcomes Trust.[10] To assess fully HRQOL for any given condition it is preferable to use both a generic and a specific instrument.[10,11] The use of two measures of health status such as those discussed above should give a true representation of the problem to the patient. These measures should be able to determine what impact, if any, treatment has on the problem.

This study aims to validate the Aberdeen Questionnaire as a measure of health outcome, to determine the HRQOL in a population of patients with varicose veins and to see if the surgical correction of varicose veins on a cohort of patients affects their quality of life.

PATIENTS AND METHODS

Selection and data collection. A prospective consecutive cohort of National Health Service patients with clinically obvious primary varicose veins without venous ulceration awaiting surgery were recruited into the study over a period of 14 months. This included 137 patients, of whom 71% were women with a median age of 46 years (range, 22–82 years, 11 patients over the age of 65 years). One hundred nine patients were available for follow-up at 6 weeks (response rate, 80%).

It is difficult for the clinician to be sure why a particular patient will seek surgery for varicose veins, because they may not tell the whole truth. However, we included consecutive patients with *clinically obvious* varicose veins with proven incompetence on Doppler / duplex scans of the long or short saphenous systems who said they had pain or whose varicose veins troubled them. A previous audit of our varicose vein surgery has shown that the main complaint, in approximately 20% of patients, was the appearance of the veins. Specific exclusions included patients with recurrent varicose veins, ulcers, or deep venous disease. All patients were asked to complete a self-administered questionnaire booklet that included the SF-36, the Aberdeen Questionnaire, and a set of 25 questions focusing on the symptoms and concerns of patients with varicose veins (see below). Only two patients refused entry into the study when approached. All patients underwent a planned operation as detailed below. Eighty-five patients underwent surgery of the long saphenous system alone involving flush sapheno-femoral transfixion and stripping of the long saphenous vein to just below the knee. Nine patients had short saphenous vein surgery alone involving sapheno-popliteal junction transfixion and removal of at least 5 cm of short saphenous vein. The remainder (15 patients) had both long and short saphenous vein surgery. All patients underwent stab phlebectomies of visible varicose veins with the use of either the Oesch hooks or a Kocherized mosquito clip. Forty-six percent of the patients in this study had bilateral surgery. All

patients were then evaluated 6 weeks later in the outpatient department. At this point, they were assessed clinically and asked to complete a second questionnaire booklet containing the SF-36 and the Aberdeen Questionnaire. All data were analyzed by using SPSS (Statistical Package for the Social Sciences) software (SPSS Inc., Chicago, Ill). Ethics committee approval was obtained for this study.

Validation of the Aberdeen Questionnaire. For an instrument to be used as a measure of health outcome, it needs to be reliable, valid, responsive, and practical.[9,10] All these aspects were assessed for the Aberdeen Questionnaire. Reliability in the context of health outcome measurement is the ability of the instrument to measure its subject consistently. Reliability was assessed with a test of internal consistency, Cronbach's alpha. This test assesses the average level of correlation between items comprising a scale. If the instrument is measuring a single construct (all items in the questionnaire are focused on a specific problem), then there should be a high level of concordance between these items. If an instrument is to be reliable, alpha should exceed 0.7.[13] Test-retest analysis has previously been performed on this instrument,[7] and it has shown stability over time. Validity in this context is the ability of the instrument to measure what is intended. This was assessed by correlation between the scores obtained for the Aberdeen Questionnaire with those obtained for the patient symptoms and concerns questionnaire and the SF-36 survey as the "gold-standard" in HRQOL assessment. Responsiveness in this context is the ability of the instrument to detect important changes in health and was assessed by using the standardized response means (SRM). One would expect an improvement in the scores for the Aberdeen Questionnaire after the postoperative period of recovery after varicose vein surgery, which would be represented by the SRM. The SRM is the mean change in score for a scale divided by the standard deviation of the change.[14] An SRM of greater than or equal to 0.2, 0.5, and 0.8 indicate small, moderate, and large clinical changes, respectively.[14] This standardized method allows comparisons to be made between different instruments. Lastly, practicality was assessed by determining the time taken to complete the questionnaires, how "complete" the questionnaires were, how acceptable they were to the patients, and how easy the questionnaires were to administer.

Patient symptoms and concerns questionnaire. As mentioned, the Aberdeen Questionnaire has yet to be used in clinical practice. Therefore, the patients were given another questionnaire to ensure the Aberdeen Questionnaire was tapping those aspects of health important to a patient with varicose veins in terms of the patient's symptoms and concerns. This questionnaire was designed in the way recommended by Streiner and Norman[15] through a process of patient interview, literature search, and expert opinion. Twenty patients with varicose veins underwent taped interviews of 10 to 20 minutes' duration with a series of open and closed questions regarding the problems they had with their veins. A literature search was performed to determine what the perceived problems are for a patient with varicose veins. Lastly, three vascular surgeons were interviewed to see what they perceived as the main problems a patient with varicose veins will have.

From these three sources, a bank of 25 questions was compiled and arranged randomly on the questionnaire. The questions were posed in such a way so the patients were first asked about the presence of the particular problem. If the patients answered yes, they were then asked to grade the severity of this problem on a scale of 1 to 5, with 1 reserved for "no importance" and 5 for "very important." A score was calculated for each questionnaire based purely on the severity score attributed to each problem by the patients. This score was then rescaled to give a mark of zero to 100, where zero was reserved for no problems and 100 for the worst possible problems. The 25 questions used are appended with this article.

RESULTS

The results follow in three sections: validation of the Aberdeen Questionnaire, HRQOL determination of the study population, and effect of surgery on HRQOL.

Validation of Aberdeen Questionnaire

Reliability. Cronbach's alpha for the Aberdeen Questionnaire was 0.74. Alpha values for each of the eight domains of the SF-36 were also all above 0.7, as shown in Table I.

Validity. A score was calculated for the Aberdeen Questionnaire in the way recommended by the instruments' developers as described above. A score was also calculated for the "patient's concerns questionnaire" that was based on the presence of and importance of the symptoms and concerns of patients with varicose veins as described above. An association was then sought between these two separate scores, and the results can be seen in the scatter plot shown in Fig 1. A highly significant strong association, by using Pearson's correlation coefficient, was found between

Table I. Cronbach's alpha values for the eight domains of the SF-36

Domain	*Cronbach's alpha value*
PF	0.86
RP	0.84
BP	0.76
GH	0.75
VT	0.85
SF	0.74
RE	0.87
MH	0.82

PF, Physical functioning; *RP,* role limitation due to physical problems; *BP,* bodily pain; *GH,* general health; *VT,* energy; *SF,* social functioning; *RE,* role limitation due to emotional problems; *MH,* mental health.

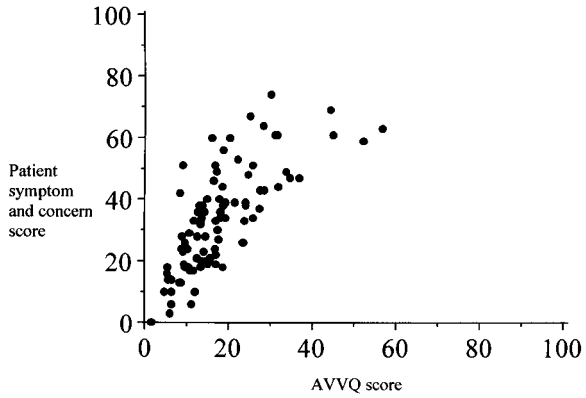

Fig 1. Relationship between the score for the patients' "symptoms and concerns questionnaire" and the Aberdeen Questionnaire. *AVVQ,* Aberdeen Varicose Veins Questionnaire. (r = 0.74, P < .001, 95% confidence intervals = 0.63 to 0.80.)

the two scores r = 0.74, P < .001 (95% confidence intervals = 0.63 to 0.80). A significant association, by Spearman's correlation coefficient, was found between the Aberdeen Questionnaire scores and four domains of the SF-36: "Physical Functioning," "Pain," "Role Limitation due to Physical Problems," and "Social Functioning" (Table II). Of particular note, 3 of the 4 significant correlations were in those domains measuring "physical health," for example, a correlation of 0.4, P < .01, (95% confidence intervals = 0.63-0.80) was obtained between the Aberdeen Questionnaire and the domain of "Physical Functioning" in the SF-36.

Responsiveness. The SRM was calculated from the Aberdeen Questionnaire scores at 6 weeks, and a value of 0.55 was obtained.

Practicality. Practicality of the instrument has been demonstrated in a number of ways: (1) It takes less than 5 minutes to complete. (2) Of 109 completed questionnaires at 6 weeks, only 1 had to be rejected from the analysis because less than 50% of questions were completed. (3) The questionnaire is simple to administer to patients from the clinicians point of view because they are contained in one booklet and are completed without physician input.

Comparison with the general population

To assess the impact of varicose veins on HRQOL, we took the scores obtained on the SF-36 for the study population and compared them with those obtained for the general population, using a Mann-Whitney U test (Fig 2). The general population scores were from a sample of more than 9000 patients in the United Kingdom (age range, 18-64 years)[16] (personal communication with Dr Crispin Jenkinson, Department of Public Health and Primary Care, University of Oxford). Men and women were analyzed separately. For the study population, women scored on average less (meaning worse function / health) than the UK norms for all eight domains of the SF-36, this difference being significant in four of the eight domains. Men also scored less (worse function / health) than UK norms for six of the eight domains, this difference being significant in two of the eight domains. In the two domains (energy and mental health) where the men scored more than UK norms, the difference was not significant. In both men and women this difference in scores was most noticeable in the domains assessing physical, rather than mental, health problems.

Table II. Relationship between the scores for the Aberdeen Questionnaire and the eight domains of the SF-36

Domain	*Correlation Coefficient (Spearman)*	*95% confidence intervals*
PF	–0.394*	–0.53 to –0.24
RP	–0.409*	–0.55 to –0.25
BP	–0.391*	–0.53 to –0.23
GH	–0.178	–0.34 to –0.01
VT	–0.161	–0.33 to 0.01
SF	–0.390*	–0.53 to –0.23
RE	–0.169	–0.33 to 0
MH	–0.175	–0.34 to –0.01

Asterisk, P < .01; *CIs,* confidence intervals; *PF,* physical functioning; *RP,* role limitation due to physical problems; *BP,* bodily pain; *GH,* general health; *VT,* energy; *SF,* social functioning; *RE,* role limitation due to emotional problems; *MH,* mental health.

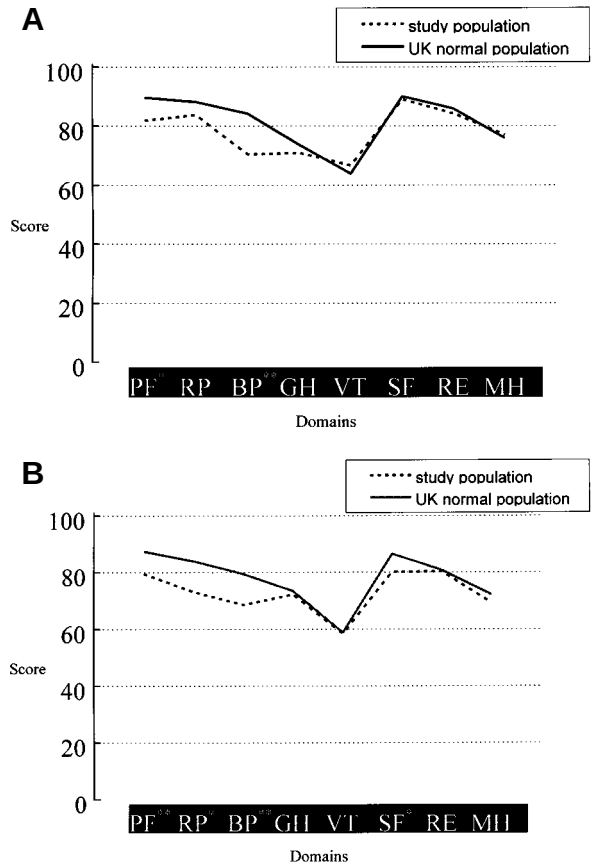

Fig 2. A, Comparison of the eight domains of the SF-36 for the study population and UK norms (men). B, Comparison of the eight domains of the SF-36 for the study population and UK norms (women). *Asterisk, P* < .01; *double asterisk, P* < .001; *PF,* physical functioning; *RP,* role limitation due to physical problems; *BP,* bodily pain; *GH,* general health; *VT,* energy; *SF,* social functioning; *RE,* role limitation due to emotional problems; *MH,* mental health.

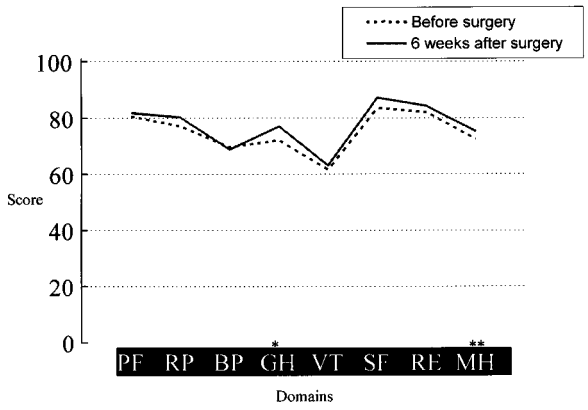

Fig 3. Change in scores for the eight domains of the SF-36, 6 weeks after surgery (all patients). *Asterisk, P* = .66; *double asterisk, P* < .05; *PF,* physical functioning; *RP,* role limitation due to physical problems; *BP,* bodily pain; *GH,* general health; *VT,* energy; *SF,* social functioning; *RE,* role limitation due to emotional problems; *MH,* mental health.

Table III. Change in scores of question 2 of the SF-36 and the Aberdeen Questionnaire after surgery

	Pre-op	*Post-op*	*P value*
Aberdeen Questionnaire	18.82	14.08	< .0001
Question 2 SF-36	50.68	64.38	< .0001

The effect of surgery

After surgery, the SF-36 scores increased (improvement in function) in all eight domains of health, reaching significance in "Mental Health" ($P < .05$) and approaching significance in "General Health" ($P = .066$; Fig 3; Wilcoxon signed rank sum test). The scores obtained from the Aberdeen Questionnaire (Table III) indicated that there was a highly significant improvement in HRQOL ($P < .001$). Question 2 of the SF-36 is not used when forming any of the eight domains of health and is known as the "health transition item." The question asks, "Compared to one year ago, how would you rate your health in general now?" on a 5-point scale, ranging from "Much better than one year ago" to "Much worse than one year ago." There are two versions of the SF-36 in use, the "acute" 1-week version and the standard 4-week version.[10] These versions have the wording of the questions changed appropriately depending on the period chosen. The version used in this study was the 4-week standard version. Question 2 was reworded to read "Compared to before your operation...." None of the other questions had the wording changed, and therefore do not invalidate the scoring of the questionnaire.

Table III describes the scores obtained at 6 weeks for both the Aberdeen Questionnaire and question 2 of the SF-36. As with the Aberdeen Questionnaire scores, there is a highly significant improvement in health 6 weeks after surgery ($P < .001$).

DISCUSSION

Varicose vein surgery in the National Health Service is an obvious target for exclusion to reduce costs, as some may see this surgery as not essential.

This is especially so if there is a predominantly cosmetic aspect to the patient's complaints. Some health authorities wish to curtail treatment for varicose veins[17] as a cost-reduction exercise.

It can be difficult to get "honest" answers from patients regarding the severity of their symptoms and thus "honest" answers to the questionnaires. One would assume that some patients will "fake-bad"[15] and answer the questionnaires in such a way as to give the worst response in order to maximize their chances of obtaining an intervention for their condition. This effect is difficult to prevent, but it was minimized here by getting the patients to complete their questionnaires immediately before surgery, by which time there is little point in "faking-bad."

The Aberdeen Questionnaire is reliable and compares well to the results obtained by the instrument's developers.[6,7] The significant association found between the Aberdeen Questionnaire and the SF-36 is strong evidence of its validity as a measure of HRQOL. The highly significant association of the Aberdeen Questionnaire with the patients' symptoms and concerns questionnaire further strengthens this. The four domains of the SF-36 that had a high correlation with the Aberdeen Questionnaire ("Pain," "Social Functioning," "Physical Functioning," and "Role Limitation due to Physical Problems") are further evidence of validity because these are the aspects of health that you would expect to be affected in a patient with varicose veins. The instrument is responsive, as shown by an SRM of 0.55. This indicates a moderate sensitivity to clinical change—SRMs of greater than or equal 0.2, 0.5, and 0.8 indicating changes of small, moderate, and large clinical changes, respectively.[14] The Aberdeen Questionnaire therefore fulfilled all four attributes necessary for an instrument to be used as a measure of health outcome and HRQOL. However, the restrictive nature of specific instruments can limit their ability to capture the side effects of an intervention that a responsive general health profile should detect. This problem should be avoided if the instrument was designed correctly and if it is used in conjunction with a generic instrument. A quality-of-life instrument was developed for all forms of venous disease and published in *Vasa*,[18] the Freiburger Questionnaire of Quality of Life in Venous Diseases. This instrument would not have been suitable for this study for several reasons. First, and most important, to measure quality of life accurately a *specific* measure of quality of life must be used in conjunction with a generic measure. The Freiburger questionnaire assesses all grades of venous disease from normal legs to those with venous ulcers and therefore, by definition, is not specific. Furthermore, the Nottingham Health Profile was used to determine validity for this instrument. It is recognized that the Nottingham Health Profile has limitations as a generic quality-of-life measure and the SF-36 is recommended as being a superior measure.[11]

It also emerges that when the SF-36 is used to assess patients with varicose veins, they have a reduced quality of life compared with the general population in both men and women. This reduction is more clearly seen in the physical health domains than the emotional health domains and was a significant reduction in four of the eight domains for women and in two of the eight domains for men (Fig 2). Patients request surgery for a number of reasons, and whatever these reasons are, the patients have a reduced quality of life compared with the general population. Use of the SF-36 to assess patients with varicose veins has shown that if varicose veins trouble a patient then there is a significant physical component. This deleterious effect of varicose veins on health has been measured in the past,[6,7] but it is slightly different to the findings of Baker et al,[12] who found that the deleterious effect was seen only in the domains of "pain" and "general health."

A follow-up rate of 80% was achieved at 6 weeks. This is a little disappointing because great effort was undertaken to obtain a higher rate. One can only speculate on the reasons for the 20% who did not attend. A small proportion will be lost due to holidays and house moves and so on, but it is more likely that those patients who did not attend saw no good reason to attend—because they were well with no further problems. This does not explain, however, why they did not return the questionnaires posted out to them.

Although the improvement in health by operation as measured by the SF-36 reached significance in one domain ("Mental Health") and approached significance in one other domain ("General Health"), it may be too early at 6 weeks to see the full effect of surgery, and the patients are therefore being followed up for 1 year. Furthermore, the sample size required to see a significant change in all domains is large. The size varies considerably across the SF-36 scales and across study designs.[10] The three scales of "Vitality," "General Health," and "Mental Health" do best in this regard. A 5-point change in scores defines differences that are clinical-

ly and socially relevant,[10] and for the above study design sample sizes of 139, 132, and 104, respectively, are required to reach a power of 80% with significance at the 5% level.[10] Others have shown a reduction in some of the health domains at 4 weeks after surgery.[12] Despite this, patients did perceive their general health to be significantly improved after surgery, as measured by question 2 of the SF-36. This improvement in health was clearly demonstrated with the Aberdeen Questionnaire. This may be due to its more restricted focus, which makes it more responsive to small but important changes in health.

If surgery for varicose veins is denied on the National Health Service, patients will continue to complain and consume resources elsewhere through their ongoing dissatisfaction. It could be that varicose vein surgery on the National Health Service is not only best for the patient but relieves primary care of an otherwise mounting problem.

CONCLUSION

This study has demonstrated that the presence of varicose veins significantly affects patients' quality of life. The Aberdeen Questionnaire is a valid specific measure of HRQOL; when it is used with the generic SF-36, the full effect of varicose veins on patients' quality of life can be measured. Surgery for varicose veins does significantly improve patients' HRQOL even at 6 weeks.

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REFERENCES

1. Callum MJ. Epidemiology of varicose veins. Br J Surg 1994;81:167-73.
2. Robbins MA, Frankel SJ, Nanchahal K, Coast J, Withans MH. Varicose vein treatments. Health care needs assessment: the epidemiologically based needs assessment reviews. Department of Social Medicine, University of Bristol, 1991.
3. Eklof B. Modern treatment for varicose veins. Br J Surg 1988;75:297-8.
4. Scott HJ, McMullin GM, Coleridge-Smith PD, Scurr JH. Venous disease: investigation and treatment, fact or fiction? Ann R Coll Surg Engl 1990;72:188-92.
5. Secretaries of State for Health, Wales Northern Ireland and Scotland. Working for patients. London: HMSO 1989 (Cmnd 555).
6. Garratt AM, Macdonald LM, Ruta DA, Russell IT, Buckingham JK, Krukowski ZH. Towards measurement of outcome for patients with varicose veins. Qual Health Care 1993;2:5-10.
7. Garratt AM, Ruta DA, Abdalla MI, Russell IT. Responsiveness of the SF-36 and a condition specific measure of health outcome for patients with varicose veins. Qual Life Res 1996;5:1-12.
8. Ware JE, Sherbourne CD. The MOS 36-item short form health survey (SF-36). I, Conceptual framework and item selection. Med Care 1992;30:473-83.
9. Brazier JE, Harper R, Jones NM, O'Caithin A, Thomas KJ, Usherwood T, et al. Validating the SF-36 health survey questionnaire: new outcome measure for primary care. BMJ 1992;305:160-4.
10. Ware JE. The SF-36 health survey: manual and interpretation guide. Boston: Nimrod Press; 1993.
11. Garratt AM, Ruta DA, Abdalla MI, Buckingham JK, Russell IT. The SF-36 health survey questionnaire: an outcome measure suitable for routine use within the NHS? BMJ 1993; 306:1440-4.
12. Baker DM, Turnbull NB, Pearson JC, Makin GS. How successful is varicose vein surgery? A patient outcome study following varicose vein surgery using the SF-36 health assessment questionnaire. Eur J Vasc Endovasc Surg 1995;9:299-304.
13. Cronbach LJ. Coefficient alpha and the internal structure of tests. Psychometrika 1951;16:297-334.
14. Liang MH, Fossel AH, Larson MG. Comparisons of five health status instruments for orthopaedic evaluation. Med Care 1990;28:632-42.
15. Streiner GL, Norman DR. Health measurement scales: a practical guide to their development and use. Oxford: Oxford University Press; 1990.
16. Jenkinson C, Coulter A, Wright L. Short form 36 (SF36) health survey questionnaire: normative data for adults of working age. BMJ 1993;306:1437-40.
17. Dean M. London perspective: end of a comprehensive NHS? Lancet 1991;337:351-2.
18. Augustin M, Dieterle W, Zschocke I, Brill C, Trefzer D, Peschen M, et al. Development and validation of a disease-specific questionnaire on the quality of life of patients with chronic venous insufficiency. Vasa 1997;26:291-301.

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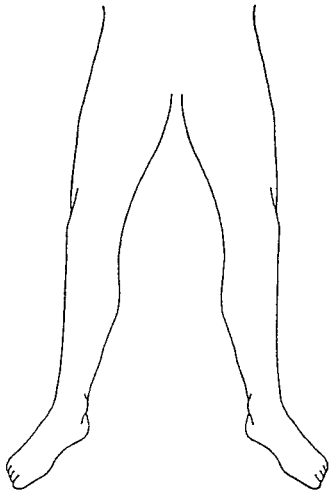
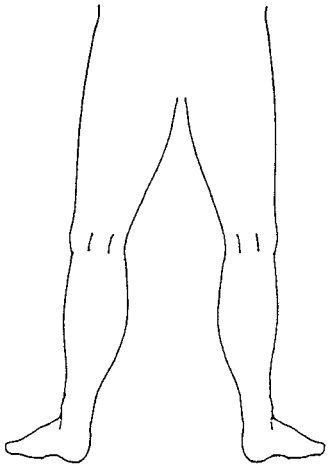
APPENDIX 1. THE ABERDEEN VARICOSE VEINS QUESTIONNAIRE

1. Please draw in your varicose veins in the diagram(s) below:-

Legs viewed from front



Legs viewed from back



2. In the last two weeks, for how many days did your varicose veins cause you pain or ache?
(Please tick one box for each leg)

	R Leg	L Leg
None at all	◯	◯
Between 1 and 5 days	◯	◯
Between 6 and 10 days	◯	◯
For more than 10 days	◯	◯

3. During the last two weeks, on how many days did you take painkilling tablets for your varicose veins?
(Please tick one box)

- None at all ◯
- Between 1 and 5 days ◯
- Between 6 and 10 days ◯
- For more than 10 days ◯

4. In the last two weeks, how much ankle swelling have you had?
(Please tick one box)

- None at all ◯
- Slight ankle swelling ◯
- Moderate ankle swelling (eg. causing you to sit with your feet up whenever possible) ◯
- Severe ankle swelling (eg. causing you difficulty putting on your shoes) ◯

5. In the last two weeks, have you worn support stockings or tights?
(Please tick one box for each leg)

	R Leg	L Leg
No	◯	◯
Yes, those I bought myself without a doctor's prescription	◯	◯
Yes, those my doctor prescribed for me which I wear occasionally	◯	◯
Yes, those my doctor prescribed for me which I wear every day	◯	◯

6. In the last two weeks, have you had any itching in association with your varicose veins?
(Please tick one box for each leg)

	R Leg	L Leg
No	◯	◯
Yes, but only above the knee	◯	◯
Yes, but only below the knee	◯	◯
Both above and below the knee	◯	◯

7. Do you have purple discolouration caused by tiny blood vessels in the skin, in association with your varicose veins?
(Please tick one box for each leg)

	R Leg	L Leg
No	◯	◯
Yes	◯	◯

8. Do you have a rash or eczema in the area of your ankle?
(Please tick one box for each leg)

	R Leg	L Leg
No	◯	◯
Yes, but it does not require any treatment from a doctor or district nurse	◯	◯
Yes, and it requires treatment from my doctor or district nurse	◯	◯

9. Do you have a skin ulcer associated with your varicose veins?
(Please tick one box for each leg)

	R Leg	L Leg
No	◯	◯
Yes	◯	◯

10. Does the appearance of your varicose veins cause you concern?
(Please tick one box)

- No ◯
- Yes, their appearance causes me slight concern ◯
- Yes, their appearance causes me moderate concern ◯
- Yes, their appearance causes me a great deal of concern ◯

11. Does the appearance of your varicose veins influence your choice of clothing including tights?
(Please tick one box)

- No ◯
- Occasionally ◯
- Often ◯
- Always ◯

12. During the last two weeks, have your varicose veins interfered with your work/ housework or other daily activities?
(Please tick one box)

- No ◯
- I have been able to work but my work has suffered to a slight extent ◯
- I have been able to work but my work has suffered to a moderate extent ◯
- My veins have prevented me from working one day or more ◯

13. During the last two weeks, have your varicose veins interfered with your leisure activities (including sport, hobbies and social life)?
(Please tick one box)

- No ◯
- Yes, my enjoyment has suffered to a slight extent ◯
- Yes, my enjoyment has suffered to a moderate extent ◯
- Yes, my veins have prevented me taking part in any leisure activities ◯

APPENDIX 2. THE "PATIENTS SYMPTOMS AND CONCERNS" QUESTIONNAIRE

	Do you have this problem	Not important				Very important
• Itching	Y / N	1	2	3	4	5
• Swelling of ankles / legs	Y / N	1	2	3	4	5
• Does the appearance of your veins worry you?	Y / N	1	2	3	4	5
• Skin discoloration	Y / N	1	2	3	4	5
• Aching	Y / N	1	2	3	4	5
• Skin rash / eczema	Y / N	1	2	3	4	5
• Night cramps	Y / N	1	2	3	4	5
• Phlebitis (tender, red, hard painful veins)	Y / N	1	2	3	4	5
• Pain	Y / N	1	2	3	4	5
• Anxiety about veins getting worse	Y / N	1	2	3	4	5
• Limitation of daily activities	Y / N	1	2	3	4	5
Which activities? :work	Y / N	1	2	3	4	5
:study	Y / N	1	2	3	4	5
:housework	Y / N	1	2	3	4	5
:walking	Y / N	1	2	3	4	5
:other (please state.....)		1	2	3	4	5
• Limitation of leisure activities	Y / N	1	2	3	4	5
Which activities? :sport	Y / N	1	2	3	4	5
:hobbies	Y / N	1	2	3	4	5
:social life	Y / N	1	2	3	4	5
:other (please state.....)		1	2	3	4	5
• Does the appearance of your veins limit your activities?	Y / N	1	2	3	4	5
please ring which activity: (work, sport, leisure, other.....) (if other please state)						
• Anxiety about ulcers developing	Y / N	1	2	3	4	5
• Does the appearance of your veins limit your choice of clothes?	Y / N	1	2	3	4	5
• Do your veins give you trouble at rest?	Y / N	1	2	3	4	5