

**Supervised exercise training as an adjunct therapy for venous leg ulcers: a randomised controlled feasibility trial**

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## Online Supplement 2

### Sample Size

The sample size for a feasibility study should be adequate to estimate critical metrics, needed to assess the feasibility of conducting the definitive study, with sufficient precision. Herein, the critical metrics are the consent rate (i.e., the proportion of eligible patients who consent to participate and be randomly assigned), ulcer-healing rates and compliance with treatment, and attrition. Forty patients in each group will provide a sufficiently precise (within 15 percentage points for a 90 % CI) estimate of the proportion willing to be randomly assigned, assuming 35–40 % intention to be randomly assigned. A sample size for an adequately powered randomised controlled trial will be determined from the results of this trial.

### Health Economics and QoL Analysis Statistical Appendix

This section provides detailed computation of healthcare utilisation of both NHS and private services by the patients recruited for the study over 12 months (Table A1), total cost of intervention delivery (Table A2), health related quality of life (Table A3) and changes in EQ5D-5L utility scores (Table A4).

Any out-of-pocket (OOP) payments or expenses incurred by the patients to avail of healthcare services (such as travel, medical equipment, and non-prescriptions medicines) were reported in Table A1. The unit cost of providing healthcare services were used to convert the utilisation rate into monetary terms and then added to arrive at total values of healthcare resources used by the patients during the 12 months in the study. The utilisation data were presented separately for first 3 months into study and all 12 month into study for intervention, control as well as combined group. The healthcare utilisation costs were quite similar between intervention and control group during first 3 months; however, the differential in costs between intervention and control group became much wider after completing 12 months into study. It is revealing to note that the cumulative benefits of exercise intervention were realised with passage of time.

<b>Table A1: Annual Healthcare Consultations, A&amp;E, Inpatient Admissions, Diagnostic tests and Prescriptions and Out-of-Pocket Expenses on Travel, Equipment and Medicines</b>							
Consultations/Visits	0 - 3 study months			Whole study period			Unit Cost (£)
	Exercise	Control	Combined	Exercise	Control	Combined	
<b>I. Healthcare Professional</b>							
GP-Dr	51	18	69	62	210	272	47
GP-home visit	0	0	0	3	3	6	94
GP-Nurse	120	71	191	221	275	496	12
GP-Nurse home visit	24	69	93	132	507	639	24
Ulcer Clinic-Dr	12	31	43	14	35	49	14
Ulcer Cilnic-Nurse	165	241	406	280	536	816	12
Consultant	1	4	5	1	16	17	58
Hospital-Nurse	0	3	3	2	5	7	12
Hospital-Dr	3	9	12	5	9	14	14
NHS-Physio	0	1	1	0	2	2	17
All NHS Visits	376	447	823	720	1598	2318	

<b>Cost to NHS (£): Sum</b>	6661.00	7091.00	13752.00	12724.00	34573.00	47297.00	
<b>: Per Patient</b>	391.82	337.67	361.89	748.47	1646.33	1244.66	
Non-NHS Visits	0	0	0	0	0	0	
<b>No. of visits per patient</b>	<b>22.1</b>	<b>21.3</b>	<b>21.7</b>	<b>42.4</b>	<b>76.1</b>	<b>61.0</b>	
<b>II. A&amp;E</b>							
A&E Visits	0	1	1	0	10	10	211
<b>Cost to NHS (£): Sum</b>	0.00	211.00	211.00	0.00	2110.00	2110.00	
<b>: Per Patient</b>		10.05	5.55		100.48	55.53	
<b>Travel Costs for I &amp; II (£):Sum</b>	557.92	915.28	1473.2	1081.66	2282.48	3364.14	
<b>:Per Patient (£)</b>	<b>32.82</b>	<b>43.58</b>	<b>38.77</b>	<b>63.63</b>	<b>108.69</b>	<b>88.53</b>	
<b>III. Inpatient care</b>							
(i) Day Case	0	1	1	0	5	5	713
(ii) Unplanned stay long	0	1	1	0	2	2	2900
(iii) Unplanned stay short	0	0	0	0	0	0	
No. of patients hospitalised	0	2	2	0	3	3	
Total inpatient days	0	11	11	0	15	15	
<b>Cost to NHS (£): Sum</b>	0.00	3613.00	3613.00	0.00	9365.00	9365.00	
<b>: Per Patient</b>	<b>0.00</b>	<b>172.05</b>	<b>95.08</b>	<b>0.00</b>	<b>445.95</b>	<b>246.45</b>	
<b>Travel Costs for III (£): Sum</b>	0	20	20	0	59.2	59.2	
<b>:Per Patient (£)</b>	<b>0.00</b>	<b>0.95</b>	<b>0.53</b>	<b>0.00</b>	<b>2.82</b>	<b>1.56</b>	
<b>IV. Diagnostic Tests</b>							
X Ray	1	1	2	2	1	3	14
CT scan	0	1	1	0	1	1	125
MRI scan	0	1	1	1	1	2	213
Doppler	0	2	2	0	2	2	54
Ultrasound	0	2	2	0	3	3	58
Any other test	0	0	0	0	1	1	56
Blood test	4	7	11	4	14	18	4
<b>Cost to NHS (£): Sum</b>	30.00	604.00	634.00	257.00	746.00	1003.00	
<b>: Per Patient</b>	<b>1.76</b>	<b>28.76</b>	<b>16.68</b>	<b>15.12</b>	<b>35.52</b>	<b>26.39</b>	
<b>TOTAL COST TO NHS (I+II+III+IV)(£): SUM</b>	<b>6691.00</b>	<b>11519.00</b>	<b>18210.00</b>	<b>12981.00</b>	<b>46794.00</b>	<b>59775.00</b>	
<b>: Per Patient</b>	<b>393.59</b>	<b>548.52</b>	<b>479.21</b>	<b>763.59</b>	<b>2228.29</b>	<b>1573.03</b>	
<b>V. Medicine</b>							
No. of Patients Receiving Free Prescription	16	18	34	16	18	34	
<b>No. of Prescriptions: Free</b>	36	59	95	103	180	283	
<b>: On payment</b>	3	11	14	13	16	29	
<b>:Total</b>	39	70	109	116	196	312	
<b>Free prescription cost</b>	<b>295.20</b>	<b>483.80</b>	<b>779.00</b>	<b>844.60</b>	<b>1476.00</b>	<b>2320.60</b>	8.20

to NHS							
<b>TOTAL COST TO NHS Including FREE Medicine: SUM</b>	<b>6986.20</b>	<b>12002.80</b>	<b>18989.00</b>	<b>13825.60</b>	<b>48270.00</b>	<b>62095.60</b>	
<b>: Per Patient</b>	<b>410.95</b>	<b>571.56</b>	<b>499.71</b>	<b>813.27</b>	<b>2298.57</b>	<b>1634.09</b>	
<b>OOP prescription expenses</b>	24.60	90.20	114.80	106.60	131.20	237.80	8.20
<b>OOP expenses on other medications: Sum</b>	75.00	157.74	232.74	122.50	282.24	404.74	
<b>TOTAL OOP EXPENSES on Medicines (£): SUM</b>	99.60	247.94	347.54	229.10	413.44	642.54	
<b>: Per Patient</b>	5.86	11.81	9.15	13.48	19.69	16.91	
<b>VI. Equipment</b>							
<b>OOP expenses on equipment purchased: Sum</b>	225.00	340.00	565.00	621.00	911.00	1532.00	
<b>: Per Patient</b>	13.24	16.19	14.87	36.53	43.38	40.32	
<b>TOTAL OOP EXPENSES including Travel (£): SUM</b>	<b>882.52</b>	<b>1523.22</b>	<b>2405.74</b>	<b>1931.76</b>	<b>3666.12</b>	<b>5597.88</b>	
<b>: Per Patient</b>	<b>51.91</b>	<b>72.53</b>	<b>63.31</b>	<b>113.63</b>	<b>174.58</b>	<b>147.31</b>	

Note: OOP stands for Out-of-Pocket

The computation of cost of intervention is done by the stages of delivery of intervention and by follow-ups of the patients. The stages were: (I) assessment, (II) baseline, (III) 12 weeks exercise delivery programme, (IV) 3 month, (V) 6 month, and (VI) 12 month follow-ups. The in-reach staff time was converted into monetary terms by using appropriate unit cost. The monetary costs of intervention delivery and follow-ups were thus calculated separately (as shown in Table A2). Finally per patient costs were arrived by dividing aggregate costs by the number of patients recruited separately for intervention and control groups.

<b>Table A2: Cost of intervention delivery and total cost of patients' recruitment and retention in the study for 12 months</b>				
<b>Costing items by stages of intervention/outcome</b>	<b>Cost Unit/Type</b>	<b>Intervention</b>	<b>Control</b>	<b>Remarks</b>
<b>I. Assessment Stage: Number of Patients</b>		<b>18</b>	<b>17</b>	
1. Patient contact time of the Assessor	Unit cost £47	£846.00	£799.00	By GP: time 10 minutes
2. New bandage/compression hosiery after assessment	0			Ulcer clinic - usual visit
3. Photographing cost per case	£0.50 per image	£9.00	£8.50	
4. Travel cost reimbursed/voucher per patient	0			Ulcer clinic - usual visit
5. Time to contact patients for appointments/reminders	0			over the phone
<b>II. Baseline stage: Number of Patients</b>		<b>18</b>	<b>17</b>	

1. Patient contact time of the Researcher (Time: 105 minutes)	£18 per hour	£567.00	£535.50	Salary cost grade 7
2a. Doppler Procedure (Cost of equipment)	0			Ulcer Clinic: Capital already being repaid off (12+ years old equipment)
2b Doppler running expenses per procedure	£6 per test	£108.00	£102.00	
3. Travel cost reimbursed/voucher per patient	£5 per visit	£90.00	£85.00	for all patients
<b>Sub-Total (I + II)</b>		<b>£1,620.00</b>	<b>£1,530.00</b>	
<b>III. Exercise Intervention (12+2 weeks extension): Number of Patients</b>		<b>18</b>	<b>NA</b>	
1. Patient contact time of the Researcher (Time: 60 minutes)	£18 per 3 patients/session	£3,078.00	NA	3 patients per session
2. Exercise Room hire cost per session for 60-90 minutes for a group of 3 patients: 13 patients attended all 36 sessions, rest 5 completed on average 9 sessions	£ 30 per session per 3 patients	£5,130.00	NA	$(36 \times 13 + 9 \times 5) / 3 = 171$ sessions
3. Emergency bandage provided for 36 sessions per patient	0			Not needed
4. Travel cost reimbursed/voucher per patient	£5 per visit	£2,560.00	NA	512 visits
5. Refreshment provided during exercise session per patient	0			None given
6. Time to contact patients for appointments/reminders (10 minutes per patient)	£3	£216	NA	Only required for 5-6 patients occasionally
<b>Sub-Total (III)</b>		<b>£10,984.00</b>	<b>£0.00</b>	
<b>IV. 3 month follow-up: Number of Patients</b>		<b>17</b>	<b>21</b>	
1. Patient contact time of the Researcher (Time: 90 minutes)	£18 per hour	£459.00	£567.00	See above
2a. Doppler Procedure (Cost of equipment)	0			See above
2b Doppler running expenses per procedure	£6 per test	£102.00	£126.00	See above
3. New bandage/compression hosiery after assessment	0			Ulcer clinic - usual visit
4. Photographing cost per case	£0.50 per image	£8.50	£10.50	
5. Time to contact patients for appointments/reminders (10 minutes per patient)	£3	£45.00	£45.00	Only required for 6 patients occasionally
6. Travel cost reimbursed/voucher per patient	£5 per visit	£85.00	£105.00	per visit
<b>Sub-Total (IV)</b>		<b>£699.50</b>	<b>£853.50</b>	
<b>V. 6 month Follow-up: Number of Patients</b>		<b>17</b>	<b>20</b>	
1. Patient contact time of Research assistant (Time: 5 minutes)	£10 per hour	£14.17	£16.67	5 minutes per patient for posting letters
2. Postage (Self-addressed prepaid envelope & 2nd class send)	£2.50	£42.50	£50.00	

3. Travel cost reimbursed/voucher per patient	0			Postal
<b>Sub-Total (V)</b>		£56.67	£66.67	
<b>VI. 12 month Follow-up: Number of Patients</b>		<b>17</b>	<b>20</b>	
1. Patient contact time of the Researcher (Time: 90 minutes)	£18 per hour	£459.00	£540.00	
2a. Doppler Procedure (Cost of equipment)	0			See above
2b Doppler running expenses per procedure	£6 per test	£102.00	£120.00	See above
3. New bandage/compression hosiery after assessment	0			Ulcer clinic - usual visit
4. Photographing cost per case	£0.50 per image			
5. Time to contact patients for appointments/reminders (10 minutes per patient)	£3	£45.00	£45.00	Only required for 6 patients occasionally
6. Travel cost reimbursed/voucher per patient	£5 per visit	£85.00	£100.00	per visit
<b>Sub-Total (VI)</b>		£691.00	£805.00	
<b>Total Cost: SUM</b>		<b>£14,051.17</b>	<b>£3,255.17</b>	<b>COMBINED= £17306.34</b>
<b>: Per Patient</b>		<b>£780.62</b>	<b>£155.01</b>	<b>£443.75</b>
<b>Intervention Delivery Cost: SUM</b>		<b>£10,984.00</b>	<b>NA</b>	
<b>:Per Intervention Patient</b>		<b>£610.22</b>	<b>NA</b>	
<b>Opportunity Cost of Patient Working Time</b>	0	Patients were given convenient after-office-hours appointment for the exercise session		

The health effects were measured through EQ-5D-5L questionnaire. Table A3 shows the distribution of patients reporting on five dimensions (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression) of health related quality of life (HRQoL) at baseline, 3 month, 6 month and 12 month follow-ups. The EQ5D-5L utility score values were calculated using weights derived from the general adult population to assess how patients have progressed over the 12 month period in respect to five dimensions as well as on overall HRQoL.

EQ5D-5L utility scores were calculated as 1 (which is 'full health') MINUS Mobility weighted score MINUS Self-care weighted score MINUS Usual activity weighted score MINUS Pain weighted score MINUS Depression weighted score. Higher the weighted score on each dimension lower is quality of life related to that dimension. The Table A3 last column shows that over time the 'mobility' as well as 'pain/discomfort' dimensions among participants have improved whereas 'self-care', 'usual activities' and 'anxiety/depression' problems have deteriorated further. The aggregated or overall EQ5D-5L utility scores have deteriorated over time. However, their own perception of health estate (VAS) improved over 12 month period. Both scores are also shown graphically for patients in the exercise and control group (Figure A1 and A2).

**Table A3: Distribution of Participants' by Health Related Quality of Life Five Dimensions and Levels, Mean EQ5D-5L utility and VAS scores for Baseline and 3, 6, 12 month Follow-ups**

Health Related Quality of Life	Baseline	3 month	6 month	12 month	Change over 12 month
<b><i>I. Mobility (weighted score)</i></b>	<b><i>0.0712</i></b>	<b><i>0.0619</i></b>	<b><i>0.0581</i></b>	<b><i>0.0656</i></b>	<b><i>Improved</i></b>
<b>I have no problems in walking about</b>	<b>11</b>	<b>15</b>	<b>15</b>	<b>14</b>	
I have slight problems in walking about	7	5	5	4	
I have moderate problems in walking about	13	11	11	12	
I have severe problems in walking about	8	7	6	6	
I am unable to walk about	0	0	0	1	
<b><i>II. Self-care (weighted score)</i></b>	<b><i>0.0302</i></b>	<b><i>0.0361</i></b>	<b><i>0.0388</i></b>	<b><i>0.0410</i></b>	<b><i>Deteriorated</i></b>
<b>I have no problems washing or dressing myself</b>	<b>24</b>	<b>22</b>	<b>22</b>	<b>19</b>	
I have slight problems washing or dressing myself	7	6	4	6	
I have moderate problems washing or dressing myself	6	7	7	9	
I have severe problems washing or dressing myself	2	3	4	3	
I am unable to wash or dress myself	0	0	0	0	
<b><i>III. Usual activities (weighted score)</i></b>	<b><i>0.0564</i></b>	<b><i>0.0502</i></b>	<b><i>0.0593</i></b>	<b><i>0.0602</i></b>	<b><i>Deteriorated</i></b>
<b>I have no problems doing my usual activities</b>	<b>12</b>	<b>16</b>	<b>15</b>	<b>14</b>	
I have slight problems doing my usual activities	13	10	5	8	
I have moderate problems doing my usual activities	8	6	9	7	
I have severe problems doing my usual activities	4	5	7	6	
I am unable to do my usual activities	2	1	1	2	
<b><i>IV. Pain/Discomfort (weighted score)</i></b>	<b><i>0.1024</i></b>	<b><i>0.0930</i></b>	<b><i>0.0998</i></b>	<b><i>0.0946</i></b>	<b><i>Improved</i></b>
<b>I have no pain or discomfort</b>	<b>5</b>	<b>14</b>	<b>12</b>	<b>13</b>	
I have slight pain or discomfort	15	10	9	8	
I have moderate pain or discomfort	11	5	6	7	
I have severe pain or discomfort	5	6	9	7	
I have extreme pain or discomfort	3	3	1	2	
<b><i>V. Anxiety/Depression (weighted score)</i></b>	<b><i>0.0458</i></b>	<b><i>0.0606</i></b>	<b><i>0.0596</i></b>	<b><i>0.0620</i></b>	<b><i>Deteriorated</i></b>
<b>I am not anxious or depressed</b>	<b>23</b>	<b>23</b>	<b>19</b>	<b>22</b>	
I am slightly anxious or depressed	8	6	7	6	
I am moderately anxious or depressed	6	4	8	4	
I am severely anxious or depressed	2	3	2	5	
I am extremely anxious or depressed	0	2	1	0	
<b>COUNT</b>	<b>39</b>	<b>38</b>	<b>37</b>	<b>37</b>	
<b><i>Mean EQ5D-5L(I-I-II-III-IV-V)</i></b>	<b><i>0.6939</i></b>	<b><i>0.6982</i></b>	<b><i>0.6846</i></b>	<b><i>0.6766</i></b>	<b><i>Deteriorated</i></b>
<b><i>Mean VAS Score</i></b>	<b><i>62.78</i></b>	<b><i>69.26</i></b>	<b><i>64.57</i></b>	<b><i>65.08</i></b>	<b><i>Improved</i></b>

**Table A4: Mean EQ5D-5L utility and VAS scores of Patients in Exercise and Control Group for Baseline and 3, 6, 12 month follow-ups with Quarterly Change in Scores**

Health Related Quality of Life	Baseline	3 month	6 month	12 month	Change over 12 month
<i>Mean EQ5D-5L : Exercise group</i>	<i>0.8022</i>	<i>0.8567</i>	<i>0.8147</i>	<i>0.7874</i>	<i>Deteriorated</i>
<i>% change over previous quarter</i>		<i>6.79</i>	<i>-4.90</i>	<i>-3.35</i>	<i>-1.85</i>
<i>Mean EQ5D-5L: Control group</i>	<i>0.6010</i>	<i>0.5698</i>	<i>0.5740</i>	<i>0.5825</i>	<i>Deteriorated</i>
<i>% change over previous quarter</i>		<i>-5.19</i>	<i>0.72</i>	<i>1.49</i>	<i>-3.08</i>
<i>Mean EQ5D-5L: All</i>	<i>0.6939</i>	<i>0.6982</i>	<i>0.6846</i>	<i>0.6766</i>	<i>Deteriorated</i>
<i>% change over previous quarter</i>		<i>0.62</i>	<i>-1.95</i>	<i>-1.16</i>	<i>-2.48</i>

<i>Mean VAS : Exercise group</i>	<i>69.03</i>	<i>75.35</i>	<i>71.47</i>	<i>75.53</i>	<i>Improved</i>
<i>% change over previous quarter</i>		<i>9.16</i>	<i>-5.15</i>	<i>5.68</i>	<i>9.42</i>
<i>Mean VAS: Control group</i>	<i>57.43</i>	<i>64.33</i>	<i>58.70</i>	<i>56.20</i>	<i>Deteriorated</i>
<i>% change over previous quarter</i>		<i>12.02</i>	<i>-8.76</i>	<i>-4.26</i>	<i>-2.14</i>
<i>Mean VAS: All</i>	<i>62.78</i>	<i>69.26</i>	<i>64.57</i>	<i>65.08</i>	<i>Improved</i>
		<i>10.32</i>	<i>-6.78</i>	<i>0.80</i>	<i>3.66</i>

**Figure A1: Mean EQ5D-5L Utility Score Values**

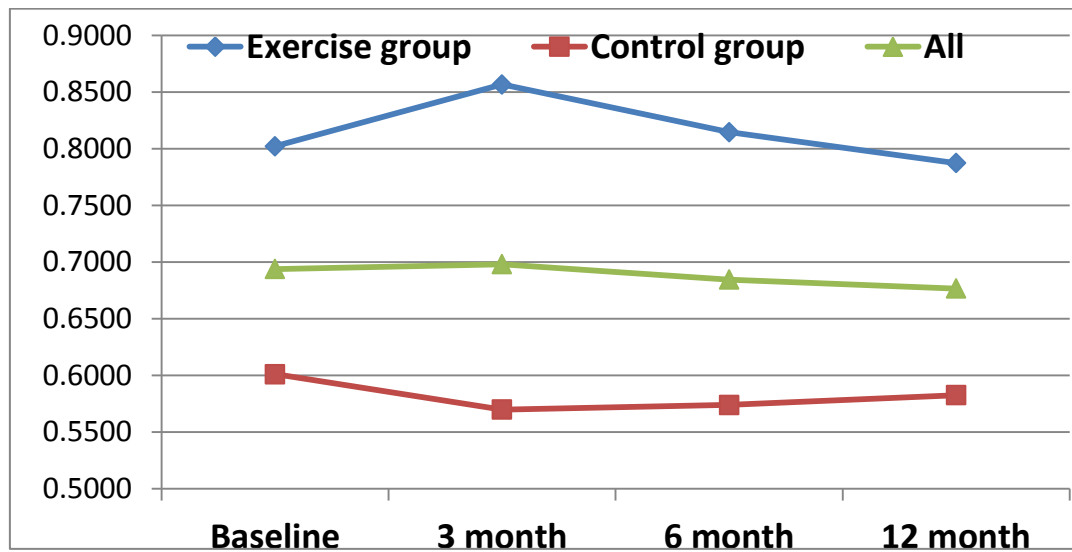




Figure A2: Mean VAS Scores

