



## Supervised exercise for intermittent claudication – an under-utilised tool

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### ABSTRACT

**INTRODUCTION** The use of supervised exercise in the management of intermittent claudication is well supported by level I evidence upon which are based grade A recommendations by the TASC II Inter-Society Consensus for the Management of Peripheral Arterial Disease and the Scottish Intercollegiate Guidelines Network (SIGN). These include that supervised exercise should be made available as part of the initial treatment for all peripheral arteriopathies.

**SUBJECTS AND METHODS** A questionnaire, comprising 10 questions, was drawn up to address the issues pertinent to supervised exercise in intermittent claudication. This was distributed by post, along with a pre-stamped return envelope, to all ordinary members of the Vascular Society of Great Britain and Ireland (VSGBI). All returned and received questionnaires had their responses entered onto a pre-prepared spreadsheet.

**RESULTS** Of the 186 questionnaires posted to UK resident surgeons, 84 were returned. This equates to a response rate of 45%. Of the responders, only 24% had access to supervised exercise. There was a large spread in the proportion of eligible patients which were referred to a programme, with only 14% of VSGBI members recommending 100% of eligible patients. Rates of non-compliance varied greatly. Contra-indications to supervised exercise included cardiac (27%), and vascular, musculoskeletal, geographic, and respiratory (8% each). Most supervised exercise sessions (85%) were 1 h in duration. The majority (65%) of programmes comprised one session per week. With regards the duration of programme, 55% were 3 months. Almost all classes were led by either a physiotherapist (41%) or a nurse (48%). In centres where no supervised exercise programme was available, verbal advice was given by 63%, with 34% offering leaflets. A supervised exercise set up has not been achieved due to lack of resource in 72%.

**CONCLUSIONS** These results are contrary to the recommendations offered by the TASC II Inter-Society Consensus and SIGN, in particular in terms of availability and referral to supervised exercise, as well as frequency of the classes where programmes were in place. The offer of information either verbally or via leaflet is commended; however, this has been shown as inferior to supervised exercise. Quoting resource as the reason for non-implementation goes against the published quality-of-life and pharmaco-economic data, which promote supervised exercise as both functionally and financially effective. This work highlights the importance of translating the results of research into evidence-based clinical practice.

### KEYWORDS

Exercise – Intermittent claudication – Peripheral vascular diseases – Questionnaires – Evidence-based medicine

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Much research has been undertaken on the subject of exercise in the context of patients with symptomatic peripheral arterial disease manifesting as intermittent claudication. This includes level I evidence by way of randomised, controlled, clinical trials,<sup>1–3</sup> systematic review,<sup>4</sup> meta-analysis,<sup>5</sup> and Cochrane Database Reviews in 2000<sup>6</sup> and 2006,<sup>7</sup> all of which demonstrate statistically significant benefits for those enrolled onto a supervised exercise programme. The mechanisms underlying such benefit have also been thoroughly investigated and widely published.

### Subjects and Methods

A questionnaire, comprising 10 questions, was drawn up to address the issues pertinent to supervised exercise in intermittent claudication (Appendix 1). This was comprised of closed questions for the most part, thus allowing for ease of completion and facilitation of the compilation of data. However, some questions allowed for open responses, permitting free text such that the completing clinician was able to voice his or her own opinion in relation to defined aspects of supervised exercise. Note that some questions allow for multiple answers.

**Table 1 Summary of questionnaire responses**

<b>Question 1.</b> Does unit have SE?		Yes 20 (24%)										No 64 (76%)									
Total	84																				
<b>Question 2.</b> Proportion referred		10–19%		20–29%		30–39%		40–49%		50–59%		60–69%		70–79%		80–89%		90–99%		100%	
Total	22	2	2	3	3	1	1	4	4	1	1	1	1	2	2	0	0	3	3	1	1
		9%	9%	14%	14%	5%	5%	18%	18%	5%	5%	5%	5%	9%	9%	0%	0%	14%	14%	5%	5%
<b>Question 3.</b> Rate of non-compliance		10–19%		20–29%		30–39%		40–49%		50–59%		60–69%		70–79%		80–89%		90–99%		100%	
Total	18	1	4	3	3	0	0	6	6	0	0	0	0	1	1	0	0	0	0	0	0
		6%	22%	17%	17%	0%	0%	33%	33%	0%	0%	0%	0%	6%	6%	0%	0%	0%	0%	0%	0%
<b>Question 4.</b> Contra-indications		Angina/IHD/ACS/MI		Musculoskeletal/ arthritis		Geographic/ transport/ distance to/ Hospital		COPD/ reduced PFTs/ respiratory compromise		Employment constraints		Mobility problems		Hypertension		Poor compliance		Other			
Total	48	13	4	4	4	4	4	4	4	2	2	2	2	2	2	2	2	11	11	23	23
		27%	8%	8%	8%	8%	8%	8%	8%	4%	4%	4%	4%	4%	4%	4%	4%	23%	23%	4%	4%
<b>Question 5.</b> Session duration		< 1 h		> 2 h		> 3 h		> 4 h		> 5 h		> 6 h		> 7 h		> 8 h		> 9 h		> 10 h	
Total	20	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
		15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%
<b>Question 6.</b> Frequency of sessions		< 1x/week		1x/week		2x/week		3x/week		4x/week		5x/week		6x/week		7x/week		8x/week		9x/week	
Total	20	2	13	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		10%	65%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
<b>Question 7.</b> Duration of programme		< 3 months		3 months		4 months		5 months		6 months		7 months		8 months		9 months		10 months		11 months	
Total	20	4	0	0	0	0	0	0	0	4	4	4	4	4	4	4	4	4	4	4	4
		20%	0%	0%	0%	0%	0%	0%	0%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
<b>Question 8.</b> Class leader		Physiotherapist		Nurse		Doctor		Other healthcare professional		Non-healthcare professional		Researcher		Other							
Total	29	12	14	1	1	3	3	0	0	2	2	2	2	2	2	2	2	2	2	2	2
		41%	48%	3%	3%	0%	0%	0%	0%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
<b>Question 9.</b> If no service, advice given		Verbal		Leaflet		Video		Demonstration		Other											
Total	73	46	25	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0
		63%	34%	0%	0%	0%	0%	3%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
<b>Question 10.</b> If no service, existing obstacles		Belief		Resource		Patient compliance		Other													
Total	65	1	47	6	6	11	11	17	17	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%
		2%	72%	9%	9%	17%	17%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%

SE, supervised exercise; IHD, ischaemic heart disease; ACS, acute coronary syndrome; MI, myocardial infarction; CLI, critical limb ischaemia; COPD, chronic obstructive pulmonary disease; PFTs, pulmonary function tests.

A list of ordinary members of the Vascular Society of Great Britain and Ireland (VSGBI) was obtained from the Society Secretariat. This included the workplace postal addresses of these individuals. The questionnaire, with a short introductory and explanatory covering letter, was sent to these addresses by post. A pre-stamped envelope marked with the investigators' address was also provided. All returned and received questionnaires had their responses entered onto a pre-prepared spreadsheet.

## Results

Of the 186 questionnaires posted to UK resident surgeons, 84 were returned. This equates to a response rate of 45%, which is similar to the response rates of recently conducted postal questionnaire surveys involving clinicians in the UK.<sup>8</sup> The results are summarised in Table 1. Of the responders, only 20 (24%) had access to a supervised exercise. Of those which had the facility, there was a large spread in the proportion of eligible patients who were referred to a programme, with only three VSGBI members recommending 100% of eligible patients (14%). One responder referred patients only under the umbrella of research activity (5%). Rates of non-compliance varied between < 10% (6%) and 70–79% (6%), with 33% of responders reporting non-attendance in the order of 50–59%.

Contra-indications employed in the decision to refer to supervised exercise include cardiac (27%), vascular (8%), musculoskeletal (8%), geographic, transport-related and distance to hospital (8%), respiratory (8%), employment-related (4%), impaired mobility (4%), hypertension (4%), and poverty of compliance (4%).

Most supervised exercise sessions (85%) were 1 h in duration, with the remainder (15%) reported as less than 1 h in length. The majority (65%) of programmes comprised one session per week, with 10% of programmes meeting less and 25% of the remaining groups congregating more frequently than once a week. With regards the duration of programme, 55% were 3 months, with 20% less than 3 months, and a further 25% more; this latter group including the 5% of groups who offer a continuous supervised exercise programme. The classes were led by a nurse in just under half of cases and physiotherapist-led in 41%. Of note, of the remaining classes, one group was headed by a doctor, one by a personal trainer, and one by a fitness instructor.

In centres where no supervised exercise programme was available, in 63% of cases verbal advice on the benefit of exercise was given, 34% of members offered leaflets outlining exercise advice, and in 3% of responses a demonstration on exercise was conferred. The responses outlining the reasons why a supervised exercise set up has not been achieved were dominated by issues of resource (72%). Other obstacles were patient compliance (9%) and belief (2%).

## Discussion

The extensive level I evidence has formed the basis for the grade A recommendations made by the TASC II Inter-Society

Consensus for the Management of Peripheral Arterial Disease<sup>9</sup> and the Scottish Intercollegiate Guidelines Network (SIGN).<sup>10</sup> These recommendations include that supervised exercise should be made available as part of the initial treatment for all peripheral arteriopathies. As such, 76% of responders and/or their units were deviating from prescribed guidelines. Additionally, one responder gave lack of belief in the value of supervised exercise in claudication as an obstacle to their implementation of a programme. The TASC II Consensus recommendation concluded by stating that the most effective programmes use treadmill or track-walking such as to induce claudication, followed by rest, during a 30–60-min session typically three times per week, and that the duration should be for 3 months is in keeping with earlier evidence that the optimal programme should last for at least 2 months.<sup>11</sup> Of those members prescribing supervised exercise, the majority met the guidelines with regards duration of session and duration of programme. However, only 5% had an adequate frequency of classes representing a mere 1% of all responders.

In most cases where a supervised exercise programme was not available, advice on exercise training was offered, whether verbal, or in the form of an information leaflet or demonstration. Often, patients were given advice taking more than one form. Despite this, supervised exercise has clearly been shown to be more beneficial than non-supervised home-based training.<sup>12–15</sup>

Supervised exercise has been shown to have a positive effect on quality of life. Looking at disease-specific quality of life, by way of the PAVK-86 questionnaire, 12 weeks of supervised exercise and education afforded statistically significant improvements in all dimensions assessed.<sup>16</sup> As measured using the SF-36 generic tool, a 0.027 quality adjusted life year (QALY) gain over conservative medical therapy was seen in the first year post-treatment with supervised exercise.<sup>17</sup> This equated to a cost per QALY gain with supervised exercise of £1780 at one year, with the cost per QALY threshold in the UK currently set at £20,000. A review of the pharmaco-economic aspects of treatment in intermittent claudication concluded that supervised exercise is the most effective non-invasive intervention to improve walking capacity, but may have elevated indirect costs.<sup>18</sup> Non-supervised, home-based programmes have been shown to be a safe, low-cost alternative to supervised exercise,<sup>15</sup> perhaps for consideration where resources are limited.

The implementation of supervised exercise should be target driven. There is an extensive network of cardiac rehabilitation programmes in place and established in the UK. Can, and should, supervised exercise for claudication be integrated with these cardiac programmes?

## Conclusions

Supervised exercise is a proven evidence-based early step in the management of intermittent claudication. Despite being recommended by consensus guidelines, having a strong basic science rationale and commanding other

health benefits, it remains a largely under-utilised tool. This work highlights the importance of translating the results of research into evidence-based clinical practice.

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Appendix 1: Questionnaire

1. Does your unit have access to supervised exercise for claudicants?
 

Yes	No
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2. What proportion of mild/moderate claudicants are referred to this service?
 

<input type="checkbox"/> < 10%	<input type="checkbox"/> 10–19%	<input type="checkbox"/> 20–29%	<input type="checkbox"/> 30–39%	<input type="checkbox"/> 40–49%	<input type="checkbox"/>
<input type="checkbox"/> 50–59%	<input type="checkbox"/> 60–69%	<input type="checkbox"/> 70–79%	<input type="checkbox"/> 80–89%	<input type="checkbox"/> 90–99%	<input type="checkbox"/> 100%
3. What rate of non-compliance exists within patients referred for supervised exercise?
 

<input type="checkbox"/> < 10%	<input type="checkbox"/> 10–19%	<input type="checkbox"/> 20–29%	<input type="checkbox"/> 30–39%	<input type="checkbox"/> 40–49%	<input type="checkbox"/>
<input type="checkbox"/> 50–59%	<input type="checkbox"/> 60–69%	<input type="checkbox"/> 70–79%	<input type="checkbox"/> 80–89%	<input type="checkbox"/> 90–99%	<input type="checkbox"/> 100%
4. What contra-indications do you employ when considering referral for supervised exercise?
5. What is the duration of each session?
 

<input type="checkbox"/> < 1 h	<input type="checkbox"/> 1 h	<input type="checkbox"/> 2 h	<input type="checkbox"/> > 2 h
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6. How frequent are the sessions?
 

<input type="checkbox"/> < Once weekly	<input type="checkbox"/> Once weekly	<input type="checkbox"/> Twice weekly	<input type="checkbox"/> Thrice weekly	<input type="checkbox"/> > Thrice weekly
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7. What is the duration of the exercise programme?
 

<input type="checkbox"/> < 3 months	<input type="checkbox"/> 3 months	<input type="checkbox"/> 4 months	<input type="checkbox"/> 5 months	<input type="checkbox"/> 6 months	<input type="checkbox"/> > 6 months	<input type="checkbox"/> Continuous
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8. Who leads the exercise classes? (please indicate all that apply)
 

<input type="checkbox"/> Physiotherapist	<input type="checkbox"/> Nurse	<input type="checkbox"/> Doctor	<input type="checkbox"/> Other healthcare professional	<input type="checkbox"/> Non-healthcare professional
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9. If no service is available, do you give exercise advice? If so, what are the details of this advice? (please indicate all that apply)
 

<input type="checkbox"/> Verbal information leaflet	<input type="checkbox"/> Video demonstration	<input type="checkbox"/> Other _____
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10. If no service is available, what obstacles to setting up such a service exist in your unit? (please indicate all that apply)
 

<input type="checkbox"/> Belief	<input type="checkbox"/> Resource	<input type="checkbox"/> Patient compliance	<input type="checkbox"/> Other _____
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