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## What are the costs to NHS Scotland of self-referral to physiotherapy? Results of a national trial

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### Abstract

**Background** Recent healthcare policies have encouraged increasing interest in the concept of patient self-referral, specifically with regard to physiotherapy. However, what has not been known until recently is the efficacy of this mode of access within the National Health Service (NHS), including the cost implications on which to reliably base the provision of future service models.

**Aim** To establish the costs to NHS Scotland of differing modes of access to physiotherapy in primary care.

**Design** Cost-minimisation analysis, multi-centred national trial.

**Setting** Twenty-six general practices throughout Scotland.

**Participants** Three-thousand and ten patients.

**Method** Self-referral was introduced in each site in parallel with referral by a general practitioner (GP). NHS-associated cost data were collated over a full year by referral type, i.e. self-referral, GP-suggested and GP-referral groups. A cost-minimisation analysis was performed and the main outcome measures were the number of GP and physiotherapy contacts, prescribing of non-steroidal anti-inflammatory drugs and analgesics, and referral for X-ray, magnetic resonance imaging and/or secondary care. Costs were established for 2004.

**Results** The data from 3010 patients identified significant associations between referral group and prescribing, referral for X-ray and to secondary care, and GP and physiotherapy contacts ( $P < 0.001$ ). The average cost of an episode of care was established as £66.31 for a self-referral, £79.50 for a GP-suggested referral and £88.99 for a GP referral. Extrapolated to identify national implications, the average cost benefit to NHS Scotland was identified as being approximately £2 million per annum.

**Conclusion** There are significant positive implications associated with self-referral to physiotherapy that represent added value for NHS Scotland. These implications are also of relevance to the rest of the NHS in the UK.

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**Keywords:** Self-referral; NHS costs; Physiotherapy; National trial; Primary care; GP workload

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## 31 Introduction

32 The benefits associated with physiotherapy provided in  
33 primary care settings are well documented [1–4]. The concept  
34 of patient self-referral generally and specifically with regard  
35 to physiotherapy in primary care settings is strongly sup-  
36 ported by professional bodies and healthcare policies [5–7].  
37 However, what has not been known until recently is the effi-  
38 cacy of this mode of access within the National Health Service  
39 (NHS), including the cost implications on which to reliably  
40 base the provision of future service models.

41 In an attempt to address some of these issues, a national  
42 multi-centred trial was conducted in Scotland between 2003  
43 and 2005. The findings endorsed those of earlier work which  
44 suggested that self-referral was feasible and that offering  
45 patients the option of self-referral, regardless of geographical  
46 or socio-economic setting, was a viable proposition [8–10].  
47 The national trial reported that self-referral did not appear  
48 to result in an increase in the overall referral rate to physio-  
49 therapy, except in settings where there was a history of  
50 under-provision. A national mean referral rate of 53.5 per  
51 1000 of the population was identified and 22% were self-  
52 referrers. It was also reported that there were historic dif-  
53 ferences in the referral rates to physiotherapy experienced  
54 in urban, semi-rural and rural settings, but that deprivation  
55 appeared to have little influence. All patients were deemed to  
56 be appropriate for physiotherapy intervention, although dif-  
57 ferences in their profiles were identified (Table 1). Patients  
58 who self-referred presented with a similar range of conditions  
59 of the same severity but in differing proportions compared

60 with patients referred by their general practitioner (GP). It  
61 was also established that in terms of outcome of physio-  
62 therapy intervention as determined by both physiotherapist  
63 and patient, there were no differences between the modes of  
64 access (Table 1). Whilst offering self-referral did not provide  
65 immediate access to physiotherapy, it did provide a point of  
66 entry that removed some of the barriers and hence allowed  
67 speedier access.

68 The results of the pilot study identified that there were  
69 significant positive implications for the workloads of gen-  
70 eral practitioners associated with self-referral, although no  
71 attempt was made to attribute costs to this or other elements  
72 of NHS-related expenditure [8]. As part of the subsequent  
73 national trial, the authors were keen to ensure that key infor-  
74 mation was collated to allow exploration of these important  
75 considerations. Given that there was no difference in out-  
76 come between the modes of access, the economic evaluation  
77 proceeded as a cost-minimisation analysis. This paper will  
78 present a comparison of the costs to NHS Scotland associ-  
79 ated with patient self-referral, GP-suggested referral and GP  
80 referral to physiotherapy, adopted from an NHS perspective  
81 and based on costs for 2004.

## 82 Methods

83 Twenty-six practices representing a range of geographi-  
84 cal and socio-economic settings throughout Scotland were  
85 recruited to the study (Fig. 1). Self-referral was introduced  
in each location in parallel with the existing system of GP

Table 1  
Summary of key patient profile findings by referral type category

	Self-referral 22% (n = 648)	GP-suggested referral 18% (n = 542)	GP referral 60% (n = 1795)	P value
Male:female	38:62	39.5:60.5	41.5:58.5	NS 0.246
Waiting <2 weeks	44%	35%	36%	
Median, S.D., range (days)	19.0, $\pm$ 31.4, 0 to 146	32.0, $\pm$ 29.5, 0 to 153	23.0, $\pm$ 33.2, 0 to 235	<0.001
Category				
Lower limb	16%	11%	14%	<0.001
Low back and neck	54%	55%	43%	
Condition severity				
Mild	28%	30%	27%	NS
Moderate	54%	56%	53%	0.027
Severe	18%	14%	20%	
Work absence	20%	28%	28%	
Mean, S.D., range (days)	2.5, $\pm$ 10.6, 0 to 120	6.0, $\pm$ 22.3, 0 to 320	6.0, $\pm$ 19.6, 0 to 300	0.048
Treatment completed by	76%	69%	72%	0.002
Contacts				
Median, range	4; 1 to 22	4; 1 to 20	4; 1 to 22	<0.001
Outcome				NS
Goals achieved	67%	71%	65%	0.82
VAS				
Initial mean	56.8	56.5	55.0	NS
Initial S.D., range	23.2, 1 to 100	$\pm$ 23.0, 1 to 100	$\pm$ 23.6, 1 to 100	0.186
Final mean	18.5	20.0	18.5	
Final S.D., range	21.7, 0 to 100	23.5, 0 to 90	22.0, 0 to 100	0.314

VAS, visual analogue scale; S.D., standard deviation; NS, not significant.

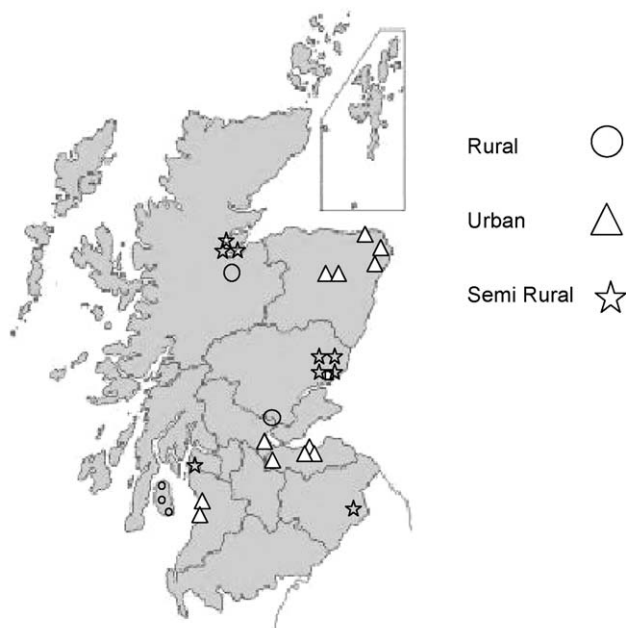


Fig. 1. Location of self-referral sites throughout Scotland.

referral. Demographic and clinical data were collated for consenting adult patients over a 1-year period. Participating physiotherapists in each site were provided with training in all aspects of the study, including the application of data definitions and method of data collection, to minimise variation. Full details of the methodology were reported previously [9,10].

#### Referral type categories

It was noted after the pilot work that, in some circumstances, patients did visit their GP who, rather than completing a written referral, would just suggest to the patient that they should refer themselves [8]. The authors were keen to capture the extent of this understandable practice. Patients were therefore categorised as either GP referrals, self-referrals or 'GP-suggested referrals'. This was to ensure that the 'true' self-referral rate could be identified.

#### Main outcome measures

##### Data collection

A specifically designed data collection sheet was devised to record demographic and clinical information, including the required cost-associated data, on one side of an A4 sheet. As far as possible, completion of the sheet was by means of ticking the relevant choice box associated with each data item. Carbonised pads of the data sheets were provided to each site so that the physiotherapists only had to record the required assessment and discharge information once, as the data sheets were used as part of the integral physiotherapy record. After discharge, one copy was retained within the patient physiotherapy notes and the carbon duplicate was returned to the

study centre for entry into an Access database. This approach was adopted to avoid duplication and to minimise any additional workload for clinical staff involved in the study. Data validation checks were built into the database design where possible, in addition to regular validation checks of the actual data sheets on a random sample basis by site.

#### Outcome of intervention

Outcome measures of the intervention were determined by both patients and physiotherapists. Patients were asked to record how severely their problem was affecting them by completing a 10-cm visual analogue scale at their initial and final contact; an approach recognised for measuring semantics and for its ease of use and reliability [11]. The rationale for the choice of outcome tool used by the physiotherapists has been described previously [8,10]. It focuses on the extent to which patients achieve the goals set for treatment in the timescale predicted, and can reflect the impact of physiotherapy intervention for the range of conditions encountered in primary care settings.

#### NHS Scotland cost data

Key variables relating to cost to NHS Scotland (Box 1) were identified and extracted from the overall clinical dataset. The specific cost associated with each of the elements was ascertained from validated national sources, professional bodies and the Information and Statistics Division of the Scottish Executive (ISD). Costs were based on the information available for 2004; the year in which the majority of physiotherapy contacts took place. Non-steroidal anti-inflammatory

#### Box 1: Key data relating to costs to National Health Service (NHS) Scotland in 2004

Cost element	Cost
GP appointment costs per appointment [23]	Average cost = £18
Physiotherapy costs per contact [24,25]	Senior 1, mid point, £26 340 (40-week service, plus NHS employers costs @ 24% and overheads @ 12%, first contact = 30 minutes, subsequent contacts = 20 minutes). Average cost = £9.10
Magnetic resonance imaging: cost per item [26]	£152.35
X-ray: cost per item [26]	£54.50
NSAIDs: average cost per item [12]	£10.39
Analgesia: average cost per item [12]	£7.50
Referral to secondary care: cost per outpatient referral [16]	£82

GP, general practitioner; NSAIDs, non-steroidal anti-inflammatory drugs.

143 drugs (NSAIDs) and analgesic drugs were specifically identified  
144 as they are the most commonly prescribed drugs for  
145 musculoskeletal conditions [12], although information relating  
146 to other drugs prescribed for physiotherapy-related conditions  
147 was also collated. There are national tariffs for each  
148 of the major drug groups, including NSAIDs and analgesics,  
149 calculated annually by the ISD and these were used in this  
150 analysis.

#### 151 *GP workload data*

152 The GP workload associated with each of the referral type  
153 categories was ascertained by comparing the number of GP  
154 appointments that were directly related to the physiotherapy  
155 condition over a 6-month period (3 months prior to and 3  
156 months after physiotherapy intervention); a time scale previously  
157 identified as capturing the required data in 98% of  
158 cases [8]. Collation of this information involved examination  
159 of patients' medical records and manual recording of  
160 the total number of related GP appointments for each time  
161 period by physiotherapists. This information was returned to  
162 the study centre on a specifically designed proforma. As the  
163 proportion of GP workload associated with each referral type  
164 remained constant during the initial 6 months, it was judged  
165 that it was only necessary to collate the workload data associated  
166 with the first 8 months of the study year. This avoided  
167 postponing the analysis until 3 months after the physiotherapy  
168 intervention of the last patients included in the year-long  
169 data collection period.

#### 170 *GP and physiotherapy costs*

171 The costs associated with each GP appointment are established  
172 annually by UK Department of Health organisations and are made  
173 widely available through a variety of sources in the public domain.  
174 The calculation includes the consideration of GP salary costs and  
175 overheads provided over 40 weeks per year. The cost associated  
176 with each GP appointment in 2004 was established. In contrast,  
177 there were no nationally published rates for an outpatient  
178 physiotherapy contact, so the authors had to undertake this  
179 calculation based on average salary costs for 2004, using the same  
180 approach as that used to calculate GP appointment costs.  
181

#### 182 *Cost-minimisation analysis*

183 Economic evaluations of healthcare interventions or approaches  
184 can be undertaken using a number of methods [13]. In cases where  
185 it has been established that there is no statistical difference in  
186 the outcome, the method of choice is cost-minimisation analysis  
187 which focuses on costs alone. As it had already been established  
188 that, in terms of patient- and physiotherapist-determined  
189 outcome, there were no differences between each of the referral  
190 type categories, cost-minimisation analysis was identified as the  
191 most appropriate approach. Summary statistics were produced for  
192 each cost element (mean, median and standard deviation), and the  
193 mean cost was multiplied by the number of referrals per referral  
194 type category.

#### *Statistical analyses*

195 A statistician was consulted at all stages throughout the  
196 project. The views of a health economist were also provided to  
197 assure the validity of the approach adopted and the methodology  
198 used. Demographic and clinical data were entered into an  
199 Access database before being analysed using SPSS (Version  
200 10.1). Data were subjected to non-parametric testing with the  
201 level of significance set at 5%. Relationships between the categorical  
202 variables were assessed using  $\chi^2$ -tests. The average contact  
203 time variables were analysed across groups using the Kruskal–  
204 Wallis test and, where appropriate, post hoc tests with Bonferroni  
205 correction factors.  
206

## 207 **Results**

208 Cost data from 26 GP practices and 3010 patients were  
209 collated and analysed. The GP workload analysis was undertaken  
210 on data relating to the first 8 months of the study year. This  
211 included 1770 patients after excluding those who had left the  
212 practice, died or whose notes were unavailable ( $n = 52$ ). This  
213 subset represented 60% of all patients (60.9% GP referrals,  
214 17.3% GP-suggested referrals and 21.8% self-referrals).

#### *Referrals for or to additional NHS services*

215 **Table 1** shows that the majority of patients were not referred  
216 for or to additional NHS services, although there were significant  
217 differences between the referral type categories ( $P < 0.001$ ).  
218 Self-referring patients were much less likely to be referred for  
219 X-ray (7.3% versus 13.6%) or to secondary care than patients  
220 referred by their GP (3.1% versus 1.4%).  
221  
222

#### *Prescribing of NSAIDs and analgesics*

223 Significant differences were found in the level of prescribing  
224 of NSAIDs and analgesics ( $P < 0.0001$ ) (**Table 2**). Self-referring  
225 patients were prescribed far fewer drugs compared with patients  
226 referred at the suggestion of or by their GP (32.2%, 42.7% and  
227 44.1%, respectively). Although similar proportions were only  
228 prescribed NSAIDs, fewer self-referring patients were prescribed  
229 analgesics compared with patients referred at the suggestion of  
230 or by their GP (9.7%, 13.5% and 15.8%, respectively), or both  
231 NSAIDs and analgesia (9.7%, 14.8% and 15.6%, respectively).  
232 A small proportion (<0.4%) were prescribed 'other' drugs for  
233 their physiotherapy-related condition, the majority of whom were  
234 prescribed amitriptyline which can be used for the management  
235 of neurogenic pain in musculoskeletal conditions.  
236  
237

#### *Impact on GP workload*

238 There was a significant association between referral type and  
239 the number of GP appointments (**Table 3**) ( $P < 0.001$ ). Only  
240 18% of self-referring patients visited their GP on more  
241

Table 2  
Referrals for and to additional National Health Service Scotland services by referral type

	Self-referral group 22% (n = 648)	GP-suggested group 18% (n = 542)	GP-referral group 60% (n = 1795)	Total*
No additional referral (%)	90.3 (578)	88.3 (477)	82.3 (1462)	85.1 (2518)
Magnetic resonance imaging (%)	0.9 (6)	0.9 (5)	1.0 (17)	0.9 (281)
X-ray (%)	7.3 (47)	9.4 (51)	13.6 (242)	11.5 (340)
Secondary care (%)	1.4 (9)	1.3 (7)	3.1 (55)	2.4 (71)
Totals (%)	100 (640)	100 (540)	100 (1776)	100 (2956)

GP, general practitioner. Missing data 1.8% (n = 54).

\*  $P < 0.001$ .

Table 3  
Level of prescribing of non-steroidal anti-inflammatory drugs (NSAIDs), analgesia and other physiotherapy condition-related drugs by referral type

	Self-referral group 22% (n = 648)	GP-suggested group 18% (n = 542)	GP-referral group 60% (n = 1795)	Total*
No prescription (%)	67.8 (432)	57.3 (309)	55.9 (992)	58.7 (1733)
NSAIDs (%)	12.4 (79)	13.9 (75)	12.3 (219)	12.6 (373)
Analgesia (%)	9.7 (62)	13.5 (73)	15.8 (281)	14.1 (416)
NSAIDs and analgesia (%)	9.7 (62)	14.8 (80)	15.6 (276)	14.2 (418)
Other drugs (%)	0.3 (2)	0.4 (2)	0.3 (6)	0.3 (10)
Totals (%)	100 (637)	100 (539)	100 (1774)	100 (2950)

GP, general practitioner. Missing data 2.0% (n = 60).

\*  $P < 0.001$ .

242 than one occasion, compared with 38% and 39% of patients  
243 referred at the suggestion of or by their GP, respectively  
244 (Fig. 2).

#### 245 Cost per episode of physiotherapy care by referral type

246 The individual cost-associated elements and the total cost  
247 for each episode of physiotherapy care per referral type cate-  
248 gory are presented in Table 4. The total cost was calculated by  
249 applying the costing data (Box 1) to the proportions included  
250 within Tables 2 and 3 and the identified mean number of GP  
251 and physiotherapy contacts. It clearly shows a lower average  
252 cost per episode for self-referring patients compared with  
253 patients referred at the suggestion of or by their GP (£66.31,  
254 £79.50 and £89.99, respectively).

#### 255 What does this mean for practices and NHS Scotland?

256 In an attempt to quantify what these costs could mean  
257 in terms of both individual practices and for NHS Scotland  
258 per annum, the average cost for each referral type has been  
259 applied to referral rates found nationally per geographical set-  
260 ting and in the proportions experienced. This calculation has  
261 also been applied to national population statistics [14] to pro-  
262 vide an indication of the average cost implications for NHS  
263 Scotland (Table 5). The figures clearly show that in a 'mixed  
264 economy', i.e. one where self-referral is available in paral-  
265 lel with GP referral, there are lower costs to NHS Scotland  
266 regardless of the geographical setting of practices. The over-  
267 all average cost to NHS Scotland identified considerable cost  
268 benefits associated with self-referral calculated to be nearly  
269 £2 million.

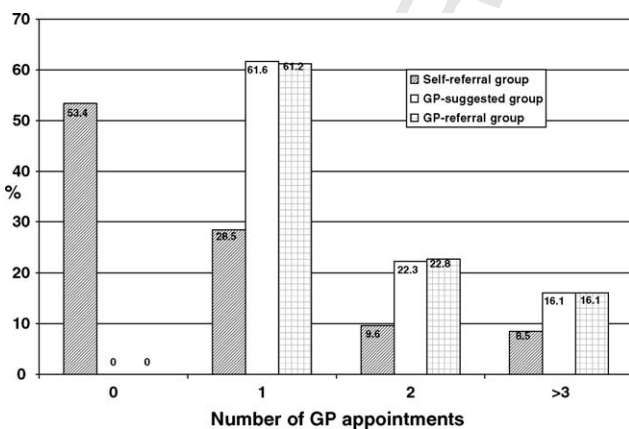


Fig. 2. Total general practitioner (GP) appointments by referral group type.

## 270 Discussion

### 271 Summary of main findings

272 This national trial identified that there are significant cost  
273 implications for NHS Scotland associated with self-referral  
274 to physiotherapy that could be as much as £2 million per  
275 annum. The cost-minimisation analysis identified that self-  
276 referral incurred lower costs overall and that the major factors  
277 that contributed to this difference related to GP workload, the  
278 prescribing of analgesics and NSAIDs, and referral for X-ray  
279 and to secondary care.

280 Although the overall proportion of patients referred to  
281 secondary care was less than 2.4%, patients referred by

Table 4  
Average costs to National Health Service Scotland per episode of physiotherapy care by referral type in 2004

	Self-referral group 22% (n = 648)	GP-suggested group 18% (n = 542)	GP-referral group 60% (n = 1795)
<b>GP appointments</b>			
Mean	0.82	1.70	1.71
Range	0 to 9	1 to 10	1 to 9
S.D.	1.27	1.24	1.21
Average cost per episode (£)	14.82	30.60	30.82
<b>Mean physiotherapy contact</b>			
Numbers per episode	4.6 (1.7 hours)	4 (1.5 hours)	4.6 (1.7 hours)
Range	1 to 22	1 to 20	1 to 22
Average cost per episode (£)	41.86	36.20	41.86
<b>Magnetic resonance imaging</b>			
Average cost per episode (£)	1.43	1.41	1.46
<b>X-ray</b>			
Average cost per episode (£)	4.00	5.15	7.43
<b>Prescribed NSAIDs</b>			
Average cost per episode (£)	2.26	2.97	2.86
<b>Prescribed analgesia</b>			
Average cost per episode (£)	0.81	2.12	2.32
<b>Referral to secondary care</b>			
Average cost per episode (£)	1.13	1.05	2.24
Total average cost per episode (£)	66.31	79.50	88.99

GP, general practitioner; S.D., standard deviation; NS, not significant; NSAIDs, non-steroidal anti-inflammatory drugs.

Table 5  
Costed examples by geographical setting of practice and mode of referral, and costs to National Health Service (NHS) Scotland and mode of referral

All practices fictitious use of practice population for demonstration purposes only	Total average annual NHS cost in practice with GP referral to physiotherapy only	Total average annual NHS cost in practice with self- and GP-referral to physiotherapy: the 'mixed economy' option	Average annual cost difference per mode
<b>An urban practice pp 8000 patients</b>			
356 referrals per annum	356 GP referrals × £88.99 per episode of care	22% Self-referrals 78 × £66.31, 18% GP-suggested referrals 64 × £79.50, 60% GP referrals 214 × £88.99	
Average national referral rate 44.5/1000 <sup>11</sup>	Total cost = £31680.44	Total cost = £29304.04	£2376.40
<b>A semi-rural practice pp 8000 patients</b>			
393 referrals per annum	393 GP referrals × £88.99 per episode of care	22% Self-referrals 86.5 × £66.31, 18% GP-suggested referrals 71 × £79.50, 60% GP referrals 235.5 × £88.99	
Average national referral rate 49/1000 <sup>11</sup>	Total cost = £34973.07	Total cost = £32337.45	£2635.62
<b>A rural practice pp 8000 patients</b>			
528 referral per annum	528 GP referrals £88.99 per episode of care	22% self-referrals 116 × £66.31, 18% GP-suggested referrals 95 × £79.50, 60% GP referrals 317 × £88.99	
Average national referral rate 66/1000 <sup>11</sup>	Total cost = £46986.72	Total cost = £43454.29	£3532.43
<b>NHS Scotland: average costs</b>			
	Total cost to NHS Scotland of a system of GP referral to physiotherapy	Total cost to NHS Scotland of a system of self- and GP-referral to physiotherapy	
Based on national average referral rate of 53.5/1000 and population of 5078400 <sup>20</sup>	Cost per episode 270988 × £88.99	22% Self-referrals 59617 × £66.31, 18% GP-suggested referrals 48778 × £79.50, 60% GP referrals 162593 × £88.99	
Total number of primary care referrals to physiotherapy in Scotland per annum 270988	Total average cost to NHS Scotland = £24115222.12	Total average cost to NHS Scotland = £22300205.34	£1815016.77

GP, general practitioner. Based on 2004 costs.

282 their GP experienced over twice the referral rate compared  
 283 with the other referral type categories (3.1% versus 1.3%  
 284 and 1.4%), despite there being no difference between the  
 285 categories with regard to the severity of the condition. An  
 286 examination of the reasons given for these referrals identi-  
 287 fied that the majority of patients were referred for specialist  
 288 orthopaedic opinion for non-resolving symptoms. Interest-  
 289 ingly, a few patients were identified as being referred specifi-  
 290 cally for corticosteroid injection, a procedure that many GPs  
 291 and now physiotherapists perform routinely in primary care.  
 292 This may have been due to the fact that neither GP nor phys-  
 293 iotherapist were accomplished in this procedure, but does  
 294 support the case for having local access to a competent prac-  
 295 titioner on a cost basis alone. The estimated cost in 2004 of a  
 296 physiotherapist or a GP administering a corticosteroid injec-  
 297 tion (triamcinolone acetonide or triamcinolone hexacetonide  
 298 20 mg/mL and one physiotherapy contact [15]) was calcu-  
 299 lated to be approximately £25 or £35, respectively; a much  
 300 lesser cost than the £82 attributed to a specialist secondary  
 301 referral.

### 302 *Strengths and limitations of this study*

303 This trial was concerned with identifying the average costs  
 304 to NHS Scotland associated with different referral type cate-  
 305 gories using an approach appropriate for the purpose. How-  
 306 ever, it must be recognised that other cost considerations were  
 307 not considered.

### 308 *Costs to patients*

309 The direct costs to patients themselves were not con-  
 310 sidered. It would be reasonable to surmise that as self-  
 311 referrers utilised fewer GP appointments on average (0.82  
 312 versus 1.70 and 1.71), they may have incurred lesser costs  
 313 in travelling to the practice, taking time off work, etc. The  
 314 costs associated with employment were also not included,  
 315 although the authors previously reported that self-referrers  
 316 were absent from work in lower proportions (19.5% ver-  
 317 sus 27.5%) and for less than half of the time of those  
 318 referred by their GP ( $P=0.048$ ) [10]. Although not quan-  
 319 tified in terms of cost, this result must have implications for  
 320 patients as well as employers and the Work and Pensions  
 321 Agency.

322 The costs associated with analgesics and NSAIDs were  
 323 identified, but these only related to prescribed drugs. Pre-  
 324 scription drugs also currently incur a cost to the patient of  
 325 £6.50, but 92% of drugs are prescribed at no cost to the patient  
 326 in Scotland [16]. No attempt was made to quantify the costs  
 327 incurred by patients when buying ‘over-the-counter’ drugs  
 328 for physiotherapy-related conditions.

### 329 *Physiotherapy service costs*

330 One element of the cost attributed to the physiotherapy  
 331 workload component was based on the mean number of con-  
 332 tacts experienced by each of the referral groups (i.e. four

333 contacts) [10]. It was reported anecdotally by many sites that  
 334 self-referring patients attended more reliably than patients  
 335 referred by their GP, i.e. had lower levels of non-attendance  
 336 throughout the course of their episode of care despite present-  
 337 ing with similar conditions of a similar severity. Although  
 338 not quantified, it is fair to say that this would have resulted  
 339 in a more efficient use of physiotherapy time with fewer  
 340 ‘wasted’ physiotherapy appointments. A greater proportion  
 341 of self-referring patients also completed their full course of  
 342 treatment, particularly when compared with patients referred  
 343 at the suggestion of their GP (76% versus 69%) [10]. It  
 344 must be considered that the combined effect of these two  
 345 issues may well have an influence on the financial difference  
 346 between these groups; a cost that the authors were unable to  
 347 fully reflect. Guidance on undertaking this has been published  
 348 previously [10]. Although self-referral does not seem to result  
 349 in an unacceptable increase in the referral rate, this premise  
 350 is based on national referral rates. Historical under-provision  
 351 will undoubtedly have cost and demand implications for ser-  
 352 vices.

353 The information provided in Table 5 was developed for  
 354 demonstration purposes only; it is based on a set of assump-  
 355 tions and must be read as such. The calculations were mod-  
 356 elled on average 2004 data derived from validated sources  
 357 and nationally identified referral rates to physiotherapy [9].  
 358 The costs for the ‘mixed economy’ option are based on a self-  
 359 referral rate of 22%, a GP-suggested referral rate of 18% and a  
 360 GP-referral rate of 60%. However, it must be emphasised that  
 361 these are average costs and that future costs cannot be pre-  
 362 dicted, particularly if the overall referral rate to physiotherapy  
 363 were to rise. Worldwide, there is a paucity of evidence that  
 364 informs this consideration meaningfully, but the only avail-  
 365 able data seem to suggest that there is no cause for alarm.  
 366 Acknowledging the differences and therefore the direct appli-  
 367 cability of findings from other global healthcare systems, a  
 368 consistent rate of self-referral to physiotherapy of less than  
 369 30% has been experienced in both the USA and Australia for  
 370 a number of years [17–19].

371 Although every effort was made to ensure its completeness  
 372 and validity, this study relied on data supplied by numerous  
 373 individuals, which, in itself, represents an increased vul-  
 374 nerability. It also has to be considered that although every  
 375 effort was made to ensure that the approach adopted in each  
 376 site was consistent, local variations in traditional physio-  
 377 therapy and GP practice and culture may have influenced  
 378 the results. These results represent the experience of intro-  
 379 ducing self-referral in a number and variety of settings in  
 380 Scotland and therefore have direct relevance to the rest of  
 381 the UK.

### 382 *Comparison with existing literature*

383 No published evidence could be found that relates to a con-  
 384 sideration of the costs associated with patient self-referral to  
 385 physiotherapy, with the exception of the GP workload analy-  
 sis undertaken during the pilot work reported previously [8].

386 *Impact on GP workload*

387 The implications for GP workload demonstrated within  
 388 this trial are similar to those found within the pilot work  
 389 [8]. At that time, it was reported that patient self-referral to  
 390 physiotherapy had a significant impact on GP workload, with  
 391 these patients utilising, on average, 8 minutes less of a GP's  
 392 time compared with patients referred by their GP (11 minutes  
 393 versus 3 minutes;  $P < 0.001$ ). Similarly, the national trial identified that self-referring patients were utilising less GP time  
 394 (8 minutes versus 17 minutes;  $P < 0.001$ ). Based on the self-  
 395 referral rate experienced nationally (22%), 97.2 hours of GP  
 396 time were saved throughout the study period. Extrapolated  
 397 further to gain a national picture, this could account for  
 398 8739.3 hours or 400 weeks of GP appointment time each year  
 399 (calculation based on 20 hours of direct patient consultation  
 400 time per whole-time GP per week).

401 The fact that patients who referred themselves were less  
 402 likely to be referred for X-ray or to secondary care than those  
 403 referred by their GP ( $P < 0.001$ ) is consistent with physio-  
 404 therapy practice identified by others [20,21]. These authors  
 405 describe the evaluation of various aspects of physiotherapy  
 406 management of orthopaedic/musculoskeletal referrals but in  
 407 acute settings. Both identified that in comparison with sub-  
 408 consultant grade doctors, physiotherapists were less likely to  
 409 order X-rays or refer patients for surgery, and, in comparison  
 410 with consultant surgeons, physiotherapists had similar rates  
 411 of appropriate referral. However, the direct applicability of  
 412 these findings has to be questioned. More recently, there has  
 413 been increasing emphasis on developing the skills and scope  
 414 of practice of physiotherapists working in primary care set-  
 415 tings. However, it should be realised that this is not universal  
 416 practice and the majority of those working in these settings  
 417 are not able to refer patients directly for investigations or  
 418 to secondary care. These referrals have to be made by the  
 419 patient's GP. Often, if the physiotherapist feels that further  
 420 investigation or referral is required, this is intimated to the  
 421 patient's GP who initiates the process, usually after seeing  
 422 the patient. Although not directly comparable, the similarity  
 423 of the findings may actually support the premise that physio-  
 424 therapists, regardless of setting, are less likely to refer patients  
 425 for X-ray or for specialist medical opinion, either directly or  
 426 indirectly, than many doctors, including GPs, especially as  
 427 no difference in the severity of condition was found between  
 428 the groups within this work.

430 *Implications for future research and future practice*

431 This work represents the first attempt to examine the cost  
 432 implications to NHS Scotland of self-referral to physiother-  
 433 apy. Self-referral has not been introduced earlier within NHS  
 434 services due to a concern that services would be unable to  
 435 cope with an overwhelming demand. In terms of physio-  
 436 therapy service costs, the authors strongly advocate that the  
 437 current level of provision should be established prior to intro-  
 438 ducing self-referral. The findings of this national trial refute

439 these concerns. Physiotherapists are extending the bound-  
 440 aries of their professional practice and assuming responsibil-  
 441 ity for ordering and interpreting investigations, prescribing  
 442 and issuing sickness certification, and listing for surgery  
 443 [22]. Until quite recently, these extended roles have tended  
 444 to be sited within secondary care settings. With an increasing  
 445 emphasis on the development of primary care, the extended  
 446 roles of physiotherapists are increasingly emerging in these  
 447 settings. As self-referral to physiotherapy and role extension  
 448 become more widespread, it will be vital to continue to evalu-  
 449 ate its impact from various perspectives including the costs  
 450 and any associated benefits.

451 **Conclusions**

452 On the basis of the cost-minimisation analyses undertaken,  
 453 this multi-centred national trial identified that there are sig-  
 454 nificant positive implications for NHS Scotland. Providing  
 455 patients with choice and widening access to interventions in  
 456 primary care that aim to prevent, manage or improve their  
 457 wellbeing are at the heart of modern healthcare delivery  
 458 throughout the UK. The authors are confident that the find-  
 459 ings of this trial are wholly in keeping with these aspirations  
 460 and represent added value for NHS Scotland.

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473 **References**

- 474 [1] Fordham R, Hodkinson C. A cost benefit analysis of open access to  
 475 physiotherapy for GPs: discussion paper 29. York: Centre for Health  
 476 Economics Health Economics Consortium, University of York; 1998.  
 477 [2] Robert G, Stevens A. Should general practitioners refer patients  
 478 directly to physical therapists? *Br J Gen Pract* 1997;47:314–8.  
 479 [3] Minns C, Bithell C. Musculoskeletal physiotherapy in general prac-  
 480 tice fundholding practices. *Physiotherapy* 84;84–92.  
 481 [4] O'Cathain A, Froggett M, Taylor MP. General practice based phys-  
 482 iotherapy: its use and effect on referrals to hospital orthopaedics and  
 483 rheumatology outpatient departments. *Br J Gen Pract* 1995;45:352–4.  
 484 [5] Chartered Society of Physiotherapy. Annual report 2004/05. London:  
 485 Chartered Society of Physiotherapy; 2004.  
 486 [6] Scottish Executive. Department of health fair for all. Edinburgh:  
 487 HMSO; 2004.

- 488 [7] Department of Health. Delivering the NHS plan. London: Depart- 515  
 489 ment of Health and Social Security; 2002. 516
- 490 [8] Holdsworth LK, Webster VS. Direct access to physiotherapy in pri- 517  
 491 mary care: now and into the future. *Physiotherapy* 2004;90:64–72. 518
- 492 [9] Holdsworth LK, Webster VS, McFadyen AK. Self referral to physio- 519  
 493 therapy: deprivation and geographical setting: is there a relationship? 520  
 494 Results of a national trial. *Physiotherapy* 2006;92:16–25. 521
- 495 [10] Holdsworth LK, Webster VS, McFadyen AK. Are patients who refer 522  
 496 themselves to physiotherapy different from those referred by GPs? 523  
 497 Results of a national trial. *Physiotherapy* 2006;92:26–33. 524
- 498 [11] Wade DT. Measurement in rehabilitation. Oxford: Oxford University 525  
 499 Press; 1992. 526
- 500 [12] Scottish Health Statistics Information & Statistics Division. 527  
 501 [http://www.isdscotland.org/ISD.DT\\_SearchResults\\_2.jsp/?submit.y=](http://www.isdscotland.org/ISD.DT_SearchResults_2.jsp/?submit.y=7&submit.x=15&pGetContentLength=250&pType=Pages&pStatus=PUBLISHED&pText=prescribing%20costs&pSearchBy=content-all&p_applic=CCC&p_service=Front.search&) 528  
 502 [7&submit.x=15&pGetContentLength=250&pType=Pages&pStatus=](http://www.isdscotland.org/ISD.DT_SearchResults_2.jsp/?submit.y=7&submit.x=15&pGetContentLength=250&pType=Pages&pStatus=PUBLISHED&pText=prescribing%20costs&pSearchBy=content-all&p_applic=CCC&p_service=Front.search&) 529  
 503 [PUBLISHED&pText=prescribing%20costs&pSearchBy=content-all](http://www.isdscotland.org/ISD.DT_SearchResults_2.jsp/?submit.y=7&submit.x=15&pGetContentLength=250&pType=Pages&pStatus=PUBLISHED&pText=prescribing%20costs&pSearchBy=content-all&p_applic=CCC&p_service=Front.search&) 530  
 504 [&p\\_applic=CCC&p\\_service=Front.search&](http://www.isdscotland.org/ISD.DT_SearchResults_2.jsp/?submit.y=7&submit.x=15&pGetContentLength=250&pType=Pages&pStatus=PUBLISHED&pText=prescribing%20costs&pSearchBy=content-all&p_applic=CCC&p_service=Front.search&) (accessed 19 November 531  
 505 2005). 532
- 506 [13] Drummond MF, O'Brien BJ, et al. Methods for the economic eval- 533  
 507 uation of health care programmes. 2nd ed. Oxford: Oxford Medical 534  
 508 Publications; 1997. 535
- 509 [14] Scottish Population Statistics. <http://www.gro-scotland.gov.uk>. 536
- 510 [15] Chartered Society of Physiotherapy. Clinical guideline for injec- 537  
 511 tion therapy. London: Chartered Society of Physiotherapy; 2003. 538  
 512 <http://www.csp.org.uk>. 539
- 513 [16] Scottish Health Statistics Information & Statistics Division. 540  
 514 [http://www.isdscotland.org/isd/files/Costs\\_Section9\\_2004.pdf](http://www.isdscotland.org/isd/files/Costs_Section9_2004.pdf) 541  
 (accessed 19 November 2005). 542
- [17] American Physical Therapy Association. Establishing the feasibil- 515  
 ity and advisability of direct access to physical therapists: a report 516  
 to the Medicare Payment Advisory Commission. Washington, DC: 517  
 American Physical Therapy Association; 2004. 518
- [18] Dennis JK. Decisions made by physiotherapists: a study of private 519  
 practitioners in Victoria. *Aust J Physiother* 1987;33:181–91. 520
- [19] Anecdotal evidence: discussion with American Physical Therapy 521  
 Association Executive. Washington, DC, 2004. 522
- [20] Carr AJ. Orthopaedic outpatient departments: an evaluation of appro- 523  
 priateness, effectiveness, cost effectiveness and patient satisfaction 524  
 associated with the assessment and management of defined refer- 525  
 rals by physiotherapists. London: Department of Health; 2003. p. 3– 526  
 31. 527
- [21] Daker-White G, Carr AJ, Harvey I, Woolhead G, Bannister G, Nel- 528  
 son I, et al. A randomised controlled trial shifting boundaries of 529  
 doctors and physiotherapists in orthopaedic outpatient departments. 530  
*J Epidemiol Commun Health* 1999;10:643–50. 531
- [22] Chartered Society of Physiotherapy. Extended scope practice: a brief- 532  
 ing paper. London: Chartered Society of Physiotherapy; 2005. 533
- [23] Scottish Primary Care. 2005;44:4. 534
- [24] Chartered Society of Physiotherapy. London: Chartered Society of 535  
 Physiotherapy; 2005. 536
- [25] Payment by results the new funding system for the NHS in England: 537  
 practical support for allied health professionals. London: Chartered 538  
 Society of Physiotherapy; 2005. p. 18. 539
- [26] Scottish Health Statistics Information & Statistics Division. 540  
[http://www.isdscotland.org/isd/files/Costs\\_Section6\\_2004.pdf](http://www.isdscotland.org/isd/files/Costs_Section6_2004.pdf) 541  
 (accessed 19 November 2005). 542  
 543

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