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Questionnaire assessment of patient satisfaction with lower limb orthoses from a district hospital

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Abstract

A questionnaire survey of patient satisfaction with the provision of lower limb orthoses from a district general hospital was conducted. Lower limb orthoses included "made-to-measure" footwear, knee braces and ankle-foot-orthoses (AFO's). Prescriptions for footwear and AFO's during a one year period, and knee braces over a two year period were assessed. The survey did not confine itself to a single medical condition. The level of patient dissatisfaction with the various orthoses was as follows: AFO's 16%, footwear 24%, knee braces 42%. This level of dissatisfaction amounts to considerable financial waste. Although several recommendations can be made on the basis of these results, this study highlights the need for more detailed audit and research into the prescription and provision of orthoses in order to reduce this wastage.

Introduction

There has been increasing awareness of the need for audit of medical practices. Surgical techniques and therapeutics are two subjects which receive close attention and are well researched. Conversely, the physical management of many rheumatic conditions is still poorly researched. One specific area which has received scant attention is that of orthotics. An official report on the Artificial Limb and Appliance Service in England and Wales in 1987 was critical of the organization and mentioned similar inadequacies in the provision of orthoses (Review of artificial limb and appliance services, 1986).

In view of the lack of basic information it was decided to conduct a simple study of patient satisfaction with a variety of orthoses prescribed for the lower limb from a district general hospital over a specified period of time. The orthoses chosen were made-to-measure footwear, ankle-foot orthoses and knee braces. Surgical footwear consitutes the "lion's share" of the Appliance Department budget and previous studies report levels of patient dissatisfaction varying from 17 to over 50 per cent (Bainbridge, 1979; Dixon and Franklin, 1968; Haslock and Wright, 1969; Park and Craxford, 1981; Klenermam and Hughes, 1986). There have been few reports of patient satisfaction with AFO's or knee braces (Butler et al, 1983; Jawad and Goodwill, 1986).

Methods

Information was obtained from Appliance Request forms (AOF1) held at a central Appliance Office for the district. Details were obtained of all patients receiving made-to-measure footwear and AFO's in a one year period (July 1983 to June 1984 inclusive), and for knee braces over a two year period (July 1983 to June 1985). In some instances the requests for footwear were for repeat prescriptions. Questionnaires were sent to all patients except those under 16 years of age.

The questionnaire sought information about delays in the provision of the orthosis and the number of times alterations had been necessary. Details about the appliance included its comfort, fit, cosmetic acceptability and frequency of wear. Patients were asked reasons for either continuing or stopping using the orthosis. Finally, a general question was asked about satisfaction with the orthosis and the service.

None of the patients had to pay anything towards the cost of the orthosis.

In view of the problem of under-reporting from questionnaire surveys a percentage of patients who were satisfied, and all the patients who were dissatisfied were invited to attend for a personal interview.

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Table 1. Return rates and details obtained from questionnaires

	MTM footwear	Knee braces	AFO's
No. of forms sent	291	136	98
No. of forms received	181 (62%)	78 (57%)	55 (56%)
No. of patients died or moved from district	46 (16%)	20 (15%)	21 (21%)
Details not specified on AOF1 forms			
Clinician's name	47 (24%)	30 (38%)	18 (27%)
Diagnosis	44 (24%)	27 (35%)	11 (16%)
Affected side	N.A.	25 (35%)	13 (24%)

Results

The return rate of completed questionnaires and the quality of information provided on the standard Appliance forms is shown in Table 1. Information was often inadequate with basic details such as the name of the referring clinician, patients' medical diagnosis and even the side of the affected limb frequently omitted. In some instances the writing on the form was illegible. Details about the presence of oedema or ulcers and sites of pain or tenderness were not mentioned in the majority of cases. Similarly, in virtually no instance was the aim of the appliance stated; for example whether the knee brace was primarily to afford stability or relieve pain.

This study did not confine itself to a single diagnostic group. The frequency with which each appliance was prescribed for different diagnostic groups (where known) is shown in Table 2.

Table 2. Medical diagnoses of patients provided with lower limb orthoses

Condition	MTM footwear	Knee braces	AFO's
Inflammatory arthritis	84	20	4
Osteoarthritis	19	17	6
Cerebrovascular accident	9	4	16
Lower motor neurone lesion	1	0	11
Trauma	0	7	2
Diabetes or ulceration	6	0	0
Miscellaneous	18	3	5
Not specified	44	27	11
Total	181	78	55

Table 3. Delay in provision of orthoses.

	MTM footwear	Knee braces	AFO's
Delay			
(mean wks.)	8	1	3.8
(range)	2–52	0–12	0–13
Alterations			
×0	85 (48%)	67 (86%)	40 (74%)
×1	45 (26%)	6 (8%)	12 (22%)
×2 or >2	45 (26%)	5 (6%)	2 (4%)
Not known	6	0	1

Delay in provision of orthoses

The delay in provision and frequency of alterations prior to the supply of the orthosis is shown in Table 3. Most of the knee braces and some of the "cosmetic" AFO's were "off-the-shelf" and hence incurred minimal delay in provision. This contrasted with the long delay of two to three months in providing made-to-measure footwear, the custom-made knee braces and some of the calipers.

Patient satisfaction with the three different orthoses will be dealt with separately.

Made-to-measure footwear

Patient satisfaction with made-to-measure footwear is shown in Table 4. Dissatisfaction with the footwear was expressed by 39 (21.7%) patients, 15 of whom were also dissatisfied with the delay in provision of the footwear. The total number of patients dissatisfied with some aspect of the provision of this type of orthosis was 43 (24%). The medical conditions of these dissatisfied patients is also shown.

Table 4. Patient satisfaction with made-to-measure footwear.

	Satisfied (%)	Not satisfied (%)
Provision of footwear*	160 (89)	19 (11)
MTM footwear*	141 (78)	39 (22)
Condition		
Inflammatory arthopathy	70	14 (17)
Osteoarthritis	8	11 (58)
CVA	6	3 (33)
Diabetes mellitus	5	1 (2)
Miscellaneous	17	1 (6)
Not specified	35	9 (19)

** One patient did not reply about satisfaction with the footwear and 2 patients did not comment about satisfaction with the providing service.*

Females constituted 18 of the 19 patients dissatisfied with the delay in provision of shoes and 35 of the 39 patients dissatisfied with the footwear. The ages of the 39 dissatisfied patients varied from 23 to 85 years and did not show any difference from the total group. There appeared to be a proportionately higher number of patients with osteoarthritis who were dissatisfied compared with patients with rheumatoid arthritis. Many of the patients who were dissatisfied had more than one criticism. There were also some patients who, although describing themselves as generally satisfied, nevertheless passed criticisms or made suggestions about ways to improve the footwear. The main criticisms were that the footwear did not fit (14), were too heavy or clumsy (16) and were cosmetically unacceptable (10). Seven patients complained that the footwear had rubbed sores or ulcers on the toes and foot, and a further six patients claimed that the footwear increased the discomfort in the foot and reduced their walking ability.

Other suggestions that were made included a request for a greater choice of styles, colours and types of material by making a wider selection of catalogues available. Another frequent comment was the lack of suitable footwear in the summer months, when the weight, bulk and colour of "winter" footwear became cosmetically unsuitable and uncomfortably hot.

The frequency of wear of made-to-measure footwear is shown in Table 5. The frequency of wear reflected the patient satisfaction with the footwear in the majority of cases but at least 10 patients continued to wear the footwear regularly i.e. for sometime every day, despite their dissatisfaction and having major criticisms. The reasons for this varied but in some cases patients could not obtain any alternative footwear.

Table 5. Frequency of wear of made-to-measure footwear.

Frequency of wear	*No. of patients*
Most of the time, every day	92
Every day, for some time	42
A few days every week	20
Rarely or never	24
Not specified	3

Personal interview

Ten patients who had expressed satisfaction with the made-to-measure footwear provided were seen. The interview did not uncover any new criticisms or problems. Most of the patients had such severe foot deformities that it was impossible for them to find ordinary "shop" shoes to fit. The provision of made-to-measure footwear had resulted in greater comfort and improved mobility. Eighteen of the 30 dissatisfied patients agreed to attend. It is impossible to draw any firm conclusions from such a small number but the interviews served to highlight some important points. First, for some patients the cosmetic appearance of shoes is more important than comfort. Second, some people are prescribed made-to-measure footwear unnecessarily. There were several instances of patients with hallux valgus and wide feet but no other toe deformities being provided with "surgical shoes" when simple advice about commercial shops stocking a range of wider fitting shoes would have been adequate and more appropriate. Third, although it was not the remit of this study to compare one contractor with another, there was an impression that considerable differences in quality of made-to-measure footwear did exist between firms. It is felt that this area needs to be investigated further.

Finally, patients described feeling very vulnerable and frustrated when they received unsatisfactory footwear. In several instances the footwear had been back and forwards for alterations so many times that the patient felt "pressurised" into accepting it even though it was clearly unsatisfactory. Complaints to the prescribing doctor tended to result in a resumption of the endless alterations. Two patients requested an independent referee to help identify the problem and suggest a solution. This is one of the areas where the employment of an independent orthotist might improve the service to patients.

Knee orthoses

The knee braces most commonly supplied were "off-the-shelf" type such as the simple hinged brace e.g. Cinch splint, or the Telescopic Varus/Valgus Splint (T.V.S.). Only 9 of the 78 patients had received specialized custom-made braces.

There was a high level of dissatisfaction with

Table 6. Patient satisfaction with knee braces.

Type of knee brace	*Satisfied (%)*	*Dissatisfied (%)*
Hinge e.g. Cinch splint	32 (57)	24 (43)
T.V.S.	6 (46)	7 (54)
Lennox-Hill	4 (80)	1 (20)
Swedish knee cage	1	0
Custom-made hinged brace	2	1
Total	45 (58)	33 (42)

knee braces as shown in Table 6. Patient dissatisfaction with the orthosis did not appear to be associated with medical diagnosis (where this was known).

The most common reasons for dissatisfaction and rejection of the brace were that it was heavy, cumbersome and cosmetically unacceptable. In many cases the brace tended to slip down and chafe the opposite knee. This criticism was also mentioned by patients who expressed themselves as satisfied with the splint. Other criticisms were the difficulty in applying the orthosis securely, especially in the presence of arthritis of the upper limb e.g. patients with rheumatoid arthritis. Personal interview with approximately 20% of the respondents did not identify any new problems. It did, however, highlight that virtually no patient was asked to return the brace if unsuitable, or attend themselves for the orthotist to check that it was satisfactory. Most patients signed to accept the brace before they had had a chance to give it a trial. Patients who were dissatisfied with the splint had usually decided not to wear it within the first two weeks. The frequency of wear of the knee brace usually mirrored the level of satisfaction. The exceptions to this observation were the four patients provided with Lennox-Hill splints for ligamentous injuries who only wore the orthosis during sport or vigorous activities i.e. only for a few hours each week.

An informal discussion with junior medical doctors working in the Department of Rheumatology revealed a patchy knowledge about knee braces. Some doctors were not aware of the range of different knee orthoses, their uses and limitations. Most doctors had had no formal education about orthoses and expressed a desire for more information on this topic.

Table 7. Patient satisfaction with ankle foot orthoses.

	Satisfied (%)	*Dissatisfied (%)*
Provision of AFO	52	3 (7)
AFO	46	9 (16)
Type of AFO		
"Cosmetic" AFO	18	4
Below-knee caliper	26	5
Not specified	2	0

Ankle foot orthoses

The types of AFO provided included 31 calipers and 22 "cosmetic" plastic drop foot splints. In two cases the type of AFO was not specified. Patient satisfaction with the AFO's is shown in Table 7.

Only three patients (7%) were dissatisfied with the delay in providing the AFO, and these three were included in the nine (16.4%) who were dissatisfied with the orthoses.

The medical diagnosis of the nine dissatisfied patients was as folllows: upper motor neurone lesions (3), lower motor neurone lesion (2), and inflammatory joint disease (1). The diagnosis was not specified in three of the nine.

The commonest criticism was that the caliper was heavy and cosmetically unacceptable, or that it failed to improve mobility. The "cosmetic" AFO's were criticized for not fitting into the shoe or for being poorly moulded to the foot.

Discussion

There has been little research of patient satisfaction with various orthoses or into standards of provision of orthoses from different manufacturers. Several studies on patient satisfaction with made-to-measure footwear have been reported usually assessing a single diagnostic group such as rheumatoid arthritis, but there is very limited audit of knee braces or AFO's.

The cost of made-to-measure footwear constitutes the greater part of the general orthosis budget. It has been estimated that the cost of "surgical" shoes to the National Health Service in Britain is over £12 million each year. (Klenerman and Hughes, 1986). For many patients the provision of specialized footwear is essential. It can improve the comfort of the foot and prevent a deformed foot from developing pressure sores. Consequently, against the initial high cost of providing footwear should be set

the long durability of such shoes and the reduced patient morbidity.

The Department of Health studied the problem of the provision of footwear in the U.K. for the whole range of medical conditions in 1978 (Bainbridge, 1979). Dissatisfaction with the orthotics service varied from 13% as a result of delays in provision, to 35% due to a criticism about insufficient pairs of shoes. Most of the other reports looking at this subject have studied a single diagnostic group, usually patients with rheumatoid arthritis. Dixon and Franklin in 1968 found over 50% of 70 patients with RA to be dissatisfied with their footwear. Haslock and Wright (1969) however, found the level of dissatisfaction to be lower at 17.5% of 90 patients with RA. A further study by Park and Craxford (1981) found that over 90% patients of 71 RA patients experienced relief from foot symptoms but that 50% had some criticism. A recent report by Klenerman and Hughes (1986) looked at patient satisfaction with "ready-made" extra depth shoes and made-to-measure shoes. Direct comparison between the shoes is difficult because of selection bias. Ready-made shoes reduce the long delay in supply, but do not appear to provide greater comfort than MTM shoes and are not worn as frequently.

There have been few studies which looked at knee braces. A review by Butler et al (1983) suggested that approximately 50% of knee braces are rejected within the first 2 weeks, but failed to specify how this result had been obtained. The review dealt with the mechanical problem of knee braces and analysed a selection of those most frequently prescribed. Their general conclusion was that apart from the full length knee-ankle-foot orthosis, the short "arm" knee braces provide little benefit in mechanical terms.

Jawad and Goodwill (1986) reported the use of the T.V.S. brace in 31 patients, 18 had osteoarthritis (OA) and 13 had rheumatoid arthritis (RA). All patients had varus or valgus deformity. The brace helped to reduce pain on weight bearing in 78% of the OA patients but only 38% RA patients. The T.V.S. brace was not helpful in patients who had significant rest pain, or whose knees were grossly swollen or unstable.

The study reported here set out to assess the level of patient satisfaction with selected lower limb orthoses provided in a District Hospital. There are many difficulties and limitations in the type of study described here. Firstly, the questionnaire allows large numbers of people to be assessed but the quality of information is limited by the poor return, or inadequate completion of the forms. In particular, in this survey it was designed to leave at least 12 months after the prescription of the orthosis before issuing a questionnaire to give the patient adequate time for assessment. The consequence was that questionnaires were often sent 2 to 3 years after prescription of an orthosis by which time a significant number of patients had either moved home or died. It has not been possible to trace any of the non-responders. They did not appear to differ significantly from the responders with regard to age, sex or medical diagnosis. Another problem is the under-reporting of complaints on a questionnaire form, although the personal interview did not uncover any new criticisms.

The prescription and subsequent patient satisfaction of an orthosis depends on many factors. Firstly, the clinician has responsibility for assessing the patient's medical problem and prescribing the correct appliance. Secondly, the orthotist must fit the patient with either an "off-the-shelf " orthosis or take accurate measurements for a "custom-made" orthosis. Thirdly, the orthosis must be manufactured, usually at a site distant from the hospital by other workers relying on the specifications provided by the orthotist. The distance of the factory from the hospital has a direct effect on the time taken to provide the orthosis. Finally, satisfaction will depend on the patient's perception and ability to accept the orthosis.

This study was designed to report the level of patient dissatisfaction and detail specific complaints. It did not set out to analyse the reasons for dissatisfaction or apportion "blame" for the failure of an appliance, nor did it aim to compare performance of different manufacturers.

Most prescriptions were issued by the departments of Orthopaedics, Rehabilitation and Rheumatology. It was found that the orthotist was often given inadequate information on the AOF1 request form about the patient's medical condition and relevant associated disabilities. The writing on many forms was illegible or failed to mention essential details such as patient's age, hospital number,

referring consultant and side of the affected limb. The aim of the orthosis was rarely mentioned. The type of knee brace or AFO required was rarely specified and in such cases there was insufficient information on the form to assist the orthotist determine the appropriate orthosis. It is recognised that in some cases an orthotist will have been attending the clinic and have communicated directly with the prescribing doctor, but nevertheless, this is not a frequent event. An informal discussion with "junior" doctors suggested that they are not given any formal training about prosthetics or orthotics and are frequently not aware of the types of orthoses available or of their indications or limiting factors.

This survey found levels of patient dissatisfaction with the delay in providing orthoses ranging from 2% for knee braces, 7% for AFO's, and 11% for made-to-measure footwear. Patient dissatisfaction with the actual orthosis ranged from 16.4% for AFO's, 21.5% for made-to-measure footwear to 42% for knee braces.

In the patients dissatisfied with footwear there was a higher proportion of females and patients suffering from osteoarthritis than in the total group but no difference in the mean ages. There was no significant difference in sex, age or medical diagnosis between satisfied and dissatisfied patients provided with either knee braces or AFO's.

This level of dissatisfaction represents a considerable financial waste. For example a pair of made-to-measure footwear costs between £220 and £300, not including the cost of extra items such as wedges, raises or insoles.

Recommendations

On the basis of this and previous studies the following guidelines are recommended to cover the provision of lower limb orthoses:

1. Medical information given to the orthotist by the clinician must include the diagnosis and the aim of the orthosis.
2. Junior medical staff should be trained in the provision of orthoses before being allowed to issue prescriptions. The clinician should assess the orthosis and check that it is acceptable to the patient before payment is made to the supplying firm.
3. Patients should be given more information about the orthosis. This is especially important with regard to the appearance of made-to-measure footwear. Greater choice of styles, colour and materials for footwear should be made available. More effort should be made to identify the patients who will refuse to wear MTM shoes on cosmetic grounds *before* embarking on manufacture.
4. A statutory two-week period for non-custom-made knee braces should be negotiated with suppliers to give time for full assessment by the patient. No payment should be made until all modifications are complete.
5. A more detailed and extensive study of patient satisfaction with non-custom-made knee braces is urgently required with a view to improving clinical practice and the design and manufacture of such orthoses.
6. A controlled study to compare patient satisfaction with the service and orthosis provided by different orthotic contractors would be useful. Such a study would require random allocation of patients with the same medical condition by a single prescriber to different firms followed by a "blind" assessment.
7. The appointment of a hospital orthotist whose principal loyalty is to the patient rather than the manufacturer should be considered in all Health Districts.

Conclusions

This study has identified an unacceptably high level of patient dissatisfaction with lower limb orthoses supplied over a one year period (or two years in the case of knee braces) within the Southampton district. This dissatisfaction with orthoses, including dissatisfaction with delays in their provision, varies from 16% for AFO's, 24% for made-to-measure footwear to 42% for knee braces. This represents a considerable waste of resources. The greatest financial loss occurs with footwear due to its much higher unit cost compared to "off-the-shelf" knee braces. A number of simple administrative procedures would avoid some of the problems and more careful audit would enable the other problems to be addressed.

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