

# A method for self-assessment of disability before and after hip replacement operations

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## Summary and conclusions

**A standardised form was developed to review the daily problems suffered by patients with arthritis of the hip and provide clinicians with information for planning treatment and in judging subsequent progress. The reports made by various patients in a preliminary study provided 81 statements on pain, restricted movements, and restricted activities that were then tested to identify the most reliable. The responses of 32 patients waiting for hip replacements and 66 patients who had undergone operation were compared with independent assessments of pain and physical limitations. The 33 statements eventually selected were chosen mainly on the basis of their sensitivity to differences between preoperative and postoperative patients and their correlation with the independent assessments.**

**The final questionnaire provides a valid and concise summary of a patient's disabilities and is simple enough for the patient to complete while waiting to see the doctor.**

## Introduction

The success of joint replacement in patients with chronic arthritis of the hip has led to longer waiting lists and problems in allocating priorities for the operation. The reasons for deciding whether or not (and how urgently) to operate vary widely: pain, mobility, handicap, and rank on the waiting lists have all been discussed.<sup>1-4</sup> Wood<sup>1</sup> has suggested that there are no accepted criteria of eligibility for operation; indeed, the actual objectives for performing the operation may require clarification. This uncertainty may explain the wide variation in operation rates among the different regions of England and Wales.<sup>1</sup>

The resolution of these problems is complicated by the uncertain natural history of arthritis. The decision to operate cannot, therefore, be taken on the basis of a physical examination of the hip or from radiographic evidence alone. Other important indications include less easily quantifiable features such as pain and the severity of the overall limitations which result from the hip disorder and any other coexisting conditions. Furthermore, different patients may react differently to apparently similar levels of physical impairment, so that the actual effect of the condition (rather than simply a clinical assessment of the physical condition) represents an important element in assessing the need for operation, as well as in monitoring progress after operation.

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We describe here the development and testing of a simple, standardised method for assessing the problems encountered by patients because of their hip disorder. The aim was to provide clinicians with a method that could be applied routinely, to help them decide the most suitable form of treatment and make a more complete review of the patient's subsequent progress. Because of the constraints of time in a typical outpatient clinic we decided that the most valuable approach would be through a self-assessment form, which the patient would complete on arriving at the clinic. This would then be given to the doctor before the consultation, while the same information could also be used for research. The form is not intended to replace the consultation but rather to give the doctor more time to listen and discuss what is relevant to the patient.

## Method

To ensure that the assessment form would be relevant to the patients' problems, all the topics covered in it were selected from the reports made by a varied sample of patients, including 110 arthritics, in a preliminary study. The assessment form tested in the present study comprised 81 statements describing specific types of problems—for example, "I can only walk slowly," or "I find it hard to get dressed by myself." The statements were drawn from the results of the preliminary study, and covered pain, restriction in walking, difficulty in kneeling and bending, and the problems this caused, such as in bathing or dressing; comments on sleep and emotional problems were also included.

We aimed to select from the 81 statements those that were the most reliable and valid and to produce a questionnaire containing only 35, which would be brief enough to be completed by the patient while waiting to see the doctor. We therefore applied the full questionnaire to patients with osteoarthritis of the hip who had undergone operation and those waiting for an operation and compared their responses with independent assessments of pain and of physical functioning.

Preoperative patients were sampled from those waiting for hip replacement operations in Nottingham, and the postoperative patients came from among those whose operation had been performed during the previous three years. In all 160 patients were identified, while a sample size of 100 was considered adequate for the study. Cluster sampling was used, by which patients from certain parts of the city alone were selected. All the 116 patients from 13 city wards were contacted by letter and asked to take part. Three did not reply, three had moved away, three had died, six were in hospital, one was in too much pain to be interviewed, and two were willing to be included but were not available when the study was being conducted. This left 98 patients: 32 were waiting for operation and 66 had had an operation. All were interviewed in their homes by a physiotherapist, who made a standard physical assessment, and by an interviewer, who applied the assessment form and a pain questionnaire.

The main source of information against which to compare the disability questionnaire results (and hence to guide the selection of the most appropriate items) was the physiotherapist's assessment. She observed the patient's limp and gait and whether sticks, crutches, or walking frames were used; recorded leg lengths; performed the Trendelenburg test; and measured any fixed deformity and the range of motion (flexion, abduction, adduction, and rotation). These values were combined in accordance with Harris's recommendations<sup>5</sup> to provide a physical score—an overall estimate of the patient's range of movement, with an "emphasis on the functionally important aspects of motion."<sup>5</sup>

Pain exerts an important restricting effect, and we wanted the questionnaire to indicate its influence in producing physical impairment. To make an independent assessment of pain, part of the McGill Pain Questionnaire<sup>6</sup> was used. This comprises groups of adjectives

describing pain, and from each group the patient was asked to select the word which best described his pain. The method of scoring proposed by Melzack was followed to produce an overall pain score.<sup>6</sup>

The validity of the method was analysed several ways. As the ultimate version was to be used to indicate progress after treatment, the first part of the analysis was designed to indicate the extent to which patients before and after operation did differ, as shown by contrasts in physical and pain scores. Then the contrast in response rates of the two types of patient on each statement was studied to identify the statements most sensitive to the differences between the groups. Next, the responses to each statement were correlated with the pain and physical scores for all cases. A perfect agreement was not expected; rather, the intention was to identify statements that corresponded poorly with the independent assessments, and such statements were scrutinised further. A factor-analytic method was finally used to identify those that did not cluster into interpretable groups.

**Results**

The characteristics of the patients are shown in table I. Table II summarises the contrast between the two groups of patients in terms of their physical abilities and pain scores. Each of the scores indicated a strong contrast between the two groups, each of the differences being significant beyond the 0.01% level using Student's *t* test.

TABLE I—Age and sex composition of sample of patients with osteoarthritis of the hip

	Men		Women		Total	
	No	Mean age (years)	No	Mean age (years)	No	Mean age (years)
Preoperative patients	11	65.1	21	69.0	32	67.7
Postoperative patients	29	71.2	37	70.3	66	70.7

TABLE II—Comparison of physical assessment and pain scores in patients waiting for operation for arthritis of the hip and in those who had undergone operation. Values are mean scores ± SD

	Preoperative patients	Postoperative patients
<i>Physical</i>		
Abduction	9.6 ± 5.6	18.6 ± 7.1
Adduction	9.2 ± 6.2	13.9 ± 6.5
External rotation	16.7 ± 14.0	29.8 ± 11.8
Overall score	69.0 ± 22.8	95.0 ± 15.6
<i>Pain</i>		
Sensory	17.7 ± 5.0	6.3 ± 8.1
Affective	7.0 ± 5.4	1.7 ± 2.6
Evaluative	3.0 ± 1.2	0.9 ± 1.1
Overall pain rating	27.7 ± 11.6	8.8 ± 11.2

Table III presents results of the item analyses for 33 statements that were ultimately retained as the most adequate of the original 81.\* Most of those retained were chosen on the basis of their response rates and their correlations with the independent assessments; clinical considerations, however, modified this purely numerical basis for selection so that certain statements (“I cannot use stairs at all,” “I can’t cope with getting meals ready”) were retained because of their importance as indicators of dependency. Comments made by the respondents and by the interviewers led us to simplify the language used in some statements. In the final version (obtainable from the authors) certain statements have been made more specific (“Pain affects my sleep” was altered to “Pain keeps me awake at night”). The fourth statement in table III was subdivided into three separate items to provide more detailed information on mobility; while another statement describing difficulties in carrying things was added in response to comments by several patients. A trial of the final version has shown in the first 60 interviews that patients can use it successfully while waiting to see the doctor.

\*A full summary of the results for all 81 statements is available on request.

TABLE III—Results of item analyses for 33 statements retained for final version of hip assessment form

	Rates of affirmative response		Kendall correlations of each item with:		Factor on which item is grouped
	Before operation	After operation	Pain score	Physical score	
I am in pain when I walk	0.97	0.22	0.66	0.40	A
Pain affects my sleep	0.84	0.25	0.60	0.38	A
I am in pain even when I am sitting down	0.59	0.11	0.48	0.38	A
I need a walking aid to get around in the house (eg, crutches, stick, or frame)	0.58	0.11	0.38	0.40	B
I cannot use stairs at all	0.10	0.02	0.21	0.17	B
I can't go up and down stairs without help	0.37	0.06	0.34	0.30	B
I can't walk about outside	0.22	0.02	0.28	0.24	B
I go outdoors, but stay close to the house	0.56	0.14	0.40	0.40	B
I stop to rest often on walks	0.93	0.24	0.52	0.40	CC
I feel lonely at times	0.50	0.27	0.27	0.22	CG
The days seem to drag	0.31	0.05	0.29	0.17	CG
I can only go out when somebody takes me	0.32	0.11	0.34	0.32	F
I don't get out as much as I'd like to	0.76	0.27	0.45	0.33	F
I sleep very little at night	0.56	0.17	0.35	0.20	D
Sometimes I am unable to sleep at all	0.50	0.12	0.30	0.23	D
I cannot sleep without tablets	0.52	0.26	0.26	0.26	D
I cannot take a bath at all	0.22	0.05	0.22	0.23	
I find getting in and out of a bath a problem	0.72	0.33	0.40	0.47	C
I have trouble getting shoes, socks, or stockings on	0.91	0.33	0.45	0.45	C
It takes me a long time to get dressed by myself	0.79	0.14	0.47	0.45	C
I stand unsteadily	0.59	0.17	0.43	0.43	B
I am unable to stand for very long	0.79	0.32	0.50	0.41	B
I can't cope with getting meals ready	0.08	0.06		0.16	
I only do leisure activities involving little effort—watching TV, listening to the radio, etc	0.59	0.18	0.35	0.36	F
I become tired easily	0.81	0.39	0.46	0.35	E
I get frustrated because I can't do what I want to do	0.78	0.23	0.47	0.46	E
I cannot get up from a kneeling position	0.60	0.21	0.44	0.27	
I am unable to get out of a chair without arms by myself	0.38	0.11	0.33	0.30	B
I find it difficult to pick things up from the floor	0.75	0.40	0.48	0.39	C
I have difficulty getting on or off a bed	0.67	0.16	0.49	0.44	C
Things get me down	0.53	0.14	0.37	0.33	H
I worry about my condition	0.53	0.20	0.41	0.36	E
I no longer know what it's like to feel well	0.53	0.13	0.44	0.29	H

**Discussion**

Attempts to measure the social and psychological impact of illness—to construct “sociomedical indices”<sup>7</sup>—have increased in recent years. The principal focus of our sociomedical index is on the patient’s handicap, which, following Harris,<sup>8</sup> is taken to represent the effects of a patient’s medical problems on his ability to carry out his normal activities. Sackett *et al*<sup>9</sup> have proposed that the adequacy of health indices should be judged on their comprehensiveness, their ability to identify good as well as poor functioning; on their general applicability, their sensitivity, simplicity, and precision; and on their ability to provide numerical scores to represent the results.

Our results indicate the sensitivity of each of the items and show that they are capable of reflecting real contrasts in health status.† The index has been designed primarily to be simple; its routine application in an outpatient clinic has been shown to be feasible with a minimum of intervention from the clinic staff, and elderly patients take about 10 minutes to complete it. The form has been printed on carbonised paper so that the responses are summarised on a single sheet, which may be stored with the patient’s notes, enabling comparisons with later responses. The clinician’s review of the responses is made easier by printing the summary sheet so that only the affirmative responses are transferred to it by the carbonised paper. A more sophisticated method for analysing the responses could be obtained by scoring each statement differently, to reflect their varying severity. This

†Statistics on the internal consistency reliability of each item are available from the authors.

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would require the calculation of scale weights for each item following the methods outlined by Patrick.<sup>10</sup> Finally, the index is comprehensive, covering aspects of the patients' physical, emotional, and social problems.

In the light of these comments the index should be tested in as wide a range of settings as possible. While the method has been developed for assessing elderly patients with arthritis of the hip, it may be reasonable to test it on patients with other locomotor disorders. The additional information provided by the method should be valuable in planning the best course of treatment and in assessing the extent of progress made. This may be of particular value where, as with knee replacement operations, the prognosis is less certain than with hip replacement operations.

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# Screening for impaired visual acuity in middle age in general practice

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## Summary and conclusions

**Screening for impaired distant visual acuity was one component of a controlled trial of multiphasic screening in middle age carried out in two general practices. The prevalence of impaired visual acuity (6/18 or worse in the better eye) at the initial screening in 1967 was 9.6% overall, ranging from 5.9% in people aged 40-49 years to 16.3% in those aged over 60. The question "Do you have difficulty seeing distant objects?" had a low sensitivity and high specificity, rendering it unsatisfactory for use in mass population screening for visual impairment. The prevalences of impaired visual acuity in the screening and control groups at the survey in 1972 showed no significant differences in any age group.**

**Mass screening for defects of visual acuity in the course of a multiphasic examination is thus unlikely to reduce the prevalence of impaired distant visual acuity in the community.**

## Introduction

In summing up a series of papers Holland<sup>1</sup> suggested that screening might be more effectively aimed at identifying people with conditions such as disorders of vision that are amenable to alleviation rather than prevention or cure. Since 1967 a long-term study of multiphasic screening in middle age has been in progress in south London,<sup>2</sup> and screening for impaired visual

acuity was one component of the programme. The study therefore presented an opportunity to test Holland's hypothesis, as well as providing previously unavailable data on the prevalence of defective visual acuity in a middle-aged population.

## Methods

The design and methodology of the south-east London screening study has been reported in detail elsewhere.<sup>3</sup> Briefly, all people (n = 7229) aged 40-64 years who were registered in 1967 with two south London general practices were identified and randomly allocated into one of two groups, designated screening and control. The screening group (n = 3297) was invited by letter to attend an evening screening clinic at which a series of questions was asked and clinical tests carried out. Two years later this group was invited to a second, similar screening clinic. The control group (n = 3353) was not asked to either of these sessions. In 1972 both groups were invited to take part in a health survey so that direct comparisons of their clinical states could be made. The questions asked at the screening included: "Do you have difficulty in seeing distant objects (with spectacles if you have them)?" and "Do you normally wear glasses for distant vision?" The former question was self-administered and the latter asked by the interviewer.

Distant visual acuity was measured by using a standard Snellen card at six metres in moderate artificial lighting. Each eye was tested separately, with lens correction if available. The responses to the questions and the results of the tests were recorded, coded, punched on cards, and stored for analysis. The attention of the general practitioner was drawn to any abnormal result so that he might decide whether more definitive diagnosis or treatment (or both) was indicated.

## Results

In this analysis impaired visual acuity was defined according to the criteria of the World Health Organisation—that is, as 6/18 or worse in the better eye, both eyes using best correction.<sup>4</sup> The response rate at the initial screening was 73.4%, rising to 82.4% at the survey, for which more intensive efforts were made to contact non-responders. Response rates have previously been described in detail.<sup>5</sup> Table I shows the prevalence (9.6%) of impaired visual acuity found at the initial screening in 1967. There was a trend towards poorer visual acuity with age. No difference was found between the sexes. Table II shows the presence of a social-class gradient, people in social class V

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