

**Determining Sensitivity to Change in Outcome Measures used to
Evaluate Arthritis Community Hydrotherapy Programs**

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EXECUTIVE SUMMARY

The prevalence of arthritis in the adult population in Ontario is estimated at over 18%. People with arthritis report high levels of pain, high use of pain medications and high health care utilization. The effects can be long-term and severe, often causing changes in employment, lifestyle and ability to function independently. Hydrotherapy is a frequently employed component of the management of clients with arthritis. Controlled studies of hydrotherapy interventions have often shown inclusive results or have shown few, if any benefits over land exercises. Those studies that have shown changes, report modest improvements at best and it has been suggested that failure to demonstrate the impact of hydrotherapy interventions may be due to the lack of client-relevant or responsive outcome measures. The purpose of this pilot study was to identify outcome measures which demonstrate sensitivity to change as a result of community based hydrotherapy programs for people with rheumatic diseases.

Focus group methodology was used to identify the client-relevant outcomes of community-based hydrotherapy programs. Based on this process, standardized outcome measures (AIMSII, WOMAC, SF-36, a numerical pain rating scale (NPRS)) and questions on balance, flexibility and stiffness were selected to evaluate change following 10 weeks of group exercises in warm water and at 3 months following discharge. Paired t-tests were used to analyse the changes from baseline at discharge and follow-up. The level of significance was adjusted for multiple analyses. Effect sizes were calculated to assess clinically important changes.

Thirty-one women, most reporting OA, RA or fibromyalgia, participated in 11 different programs (median length: 9 weeks). Ninety percent of participants attended once per week. There were significant improvements in pain severity in the past week (NPRS) and SF-36 pain ($p < .001$) with effect sizes of .7 and .9 respectively. Important clinical changes were also seen for impact of arthritis (AIMSII) and SF-36 health perception and physical functioning subscales (effect sizes .5). All improvements were maintained at 3 month follow-up ($p < .05$). The WOMAC function and stiffness subscales and the VAS for pain severity in the morning showed a trend towards improvement at the follow-up assessment ($p = .02, .05$ and $.03$ respectively). There were also important clinical improvements in SF-36 health perception, AIMS self-care and WOMAC pain subscales, and the VAS for difficulty moving the joints in the morning, with all effect sizes $> .4$ at follow-up.

Questions on pain severity, either the SF-36 pain subscale or the NPRS, appear to be the most sensitive measures to evaluate clinically important short-term changes resulting from community hydrotherapy interventions. Although not the primary purpose of this study, our results add evidence to the growing body of knowledge which supports the benefit of hydrotherapy as a safe and effective intervention for people with arthritis. It appears that some of the benefits associated with hydrotherapy are a result of a long term commitment to exercise (longer than 6 months). Further studies are needed to address this hypothesis.

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TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY	i
ACKNOWLEDGEMENTS	ii
LIST OF TABLES AND APPENDICES	iii
INTRODUCTION	1
Hydrotherapy and Arthritis	1
METHODS	
Focus Groups	2
Pilot Study	2
Outcome Measures:	
i) Multipurpose Arthritis Impact Measurement Scales 2 (AIMS 2) ⁴⁴	2
ii) Visual Analogue Scales ^{45, 46}	3
iii) University of Western Ontario, McMaster University Osteoarthritis Index (WOMAC) ⁵⁰	3
iv) Mobility/Balance Questions	3
v) Centre for Epidemiologic Studies - Depression Scale (CES-D) ⁵²	3
vi) SF-36 ⁵³	3
vii) Morning Stiffness	3
viii) Exercise Behaviour	4
ix) Other Measures	4
RESULTS	4
Changes in Outcome Measures	5
Exercise Behaviour	7
Other Outcomes	7
DISCUSSION	8
CONCLUSIONS	9
REFERENCES	10

LIST OF TABLES AND APPENDICES

Table 1: Program Descriptions (n=11)

Table 2: Demographics (n=31)

Table 3: Outcome Measure Scores at Baseline, 10 weeks (n=31) and 3 month follow-up (n=22)

Table 4: Changes attributed to hydrotherapy at discharge (%)

Appendix 1: Hydrotherapy Outcomes Identifies from Focus Groups and Outcome Measures for Testing

Appendix 2: Health Status Questionnaire - SF36

INTRODUCTION

The term arthritis encompasses a range of conditions affecting the joints and spine and includes rheumatoid arthritis and osteoarthritis. The prevalence of arthritis in the adult population in Ontario is estimated at over 18% and is higher in women than in men^{1,2}. In the Ontario Health Survey, 15% of adults aged 16 years and older reported arthritis as a chronic health problem, rising to over 50% of those aged 75 years or older². People with arthritis report high levels of pain, high use of pain medications and high health care utilization^{2,3,4,5}. The effects can be long-term and severe, often causing changes in employment, lifestyle and ability to function independently²⁻¹². The projected increase in the proportion of elderly people in the population will translate into a growing need to provide care for people with arthritis¹³. Ongoing reform of long-term care services emphasizes the need for increased community-based support services for senior citizens and people with physical disabilities¹⁴.

A strategic planning process in 1989 led The Arthritis Society, Ontario Division to expand its mandate to include increased support of client services and education. Using a similar process, The Arthritis Society, Consultation and Rehabilitation Service (CARS) identified needs and gaps in services in Ontario for people with arthritis. One major goal resulting from this process was to reach more people with arthritis with appropriate care. The methods proposed for fulfilling this goal included a major redirection of priorities and resources to concentrate on an increase in CARS *group* interventions at the community level and an increased staff role as consultants to lay-run programs for people with arthritis. These new priorities were approved by the Ontario Ministry of Health in the fall of 1990¹⁵.

Hydrotherapy and Arthritis

Hydrotherapy, whether therapeutic or recreational, is a frequently employed component

of the management of clients with arthritis¹⁶⁻²⁹. A variety of hydrotherapy programs exist varying from aquafit programs in cool water in community pools to formal physiotherapist-led programs in specialized pools with warm water (90° F degrees or greater). Therapist-led programs are expensive in terms of both facilities and professional time. A review of the CARS database showed that 181 people had received hydrotherapy led by Arthritis Society therapists in the twelve-month period April 1996 - March 1997³⁰. In addition, many clients were assessed by Arthritis Society therapists and referred to hydrotherapy programs run by lay leaders.

Controlled studies of hydrotherapy interventions have often been inconclusive or have shown few, if any benefits over land exercises³¹⁻³⁹. Those studies that have shown changes, report modest improvements at best³⁶⁻³⁸ and it has been suggested that failure to demonstrate the impact of hydrotherapy interventions may be due to the lack of client-relevant or responsive outcome measures^{37,39}. The focus of formal evaluations has been primarily on impairments. Although measures of impairment (physical fitness, pain, morning stiffness, number of active joints, grip strength, anxiety and depression), are important outcomes in terms of symptom relief, impairment-based measures may not reflect client-relevant outcomes in terms of improved function or quality of life. As well, most community programs do not have the resources to evaluate many of these outcomes and most research findings cannot be generalized to the majority of community hydrotherapy programs, where sessions occur less frequently and which typically include clients with all types of arthritis. It is therefore important to identify simple, low-cost, client-relevant outcomes that can be easily incorporated into community-based programs. The purpose of this pilot study was to identify outcome measures which demonstrate sensitivity to change as a result of community based hydrotherapy programs for people with rheumatic diseases.

METHODS

Focus Groups

Focus groups with clients attending seven community arthritis hydrotherapy programs were held in the spring of 1995 to identify client-relevant outcomes of hydrotherapy. Questions explored reasons for joining the program, differences between exercise on land and exercise in water, and the short and long-term benefits of hydrotherapy. A complete report of this work is available as a working paper⁴⁰. Based on the results of these focus groups, several outcomes were identified for evaluating group hydrotherapy programs and were classified as impairments, activity limitations or limited participation based on the International Classification of Impairment, Activity and Participation framework (ICIDH-2) for the classification of the consequences of disease⁴¹. Impairments included general stiffness and flexibility, depression, balance problems and pain (joint pain and pain on movement). Activity limitations included difficulty walking, climbing stairs and bending and reaching. Participation outcomes included decreased social activity and mobility in the community. Appendix 1 summarizes the outcomes identified from the focus groups and the measures chosen to evaluate those outcomes in the pilot study described below.

Pilot Study

Using the outcome measures identified through the focus groups, a pilot project was designed to assess the sensitivity of these measures following a 10 week community-based group hydrotherapy program for people with arthritis. *For the purpose of this study, we defined hydrotherapy as any type of directed group exercise in warm water.* This study received ethics approval from the Wellesley Central Hospital Research Ethics Board.

This study used a prospective uncontrolled pre/post design. Adults aged 17 years or older, with self-reported musculoskeletal diseases, who could read and write English, who were available for the length of the study, and who registered for

a course of group hydrotherapy at several Arthritis Society therapist and lay-run programs across Ontario, were asked to participate in this study. Clients were excluded if they had conditions precluding hydrotherapy: uncontrolled high or low blood pressure, athlete's foot, infections, shortness of breath, asthma, plantar's warts, bladder or bowel problems, anaemia, open sores or wounds, epilepsy/seizures, rashes or using nitroglycerine.

The content of The Arthritis Society pool programs was based on two documents, the Arthritis Foundation guidelines⁴² which emphasize exercises to increase range of motion, and guidelines developed by ACREU in 1994⁴³ which include ROM exercises and add an aerobic component to the program.

A musculoskeletal examination was completed by CARS therapists prior to the pool program to ensure the presence of musculoskeletal disease. The examination consisted of standard clinical measures of disease activity routinely collected by the therapists for all clients referred for hydrotherapy (joint count, grip strength and fibromyalgia tenderness points). These assessments were done in the home or in the office, in the month prior to starting the pool program.

Clients were assessed using a battery of outcome measures listed in Appendix 1, before and within one week after the completion of the ten week intervention and at three months post intervention. Data including sex, age, marital status, occupational status and educational level were collected for each client. The self-administered questionnaire is attached (Appendix 2).

Outcome Measures

*i) Multipurpose Arthritis Impact Measurement Scales 2 (AIMS 2)*⁴⁴

The AIMS2 is an arthritis-specific self-administered questionnaire that assesses physical, emotional and social well-being. In particular, the AIMS2 includes the domains of "walking and

bending", "mobility level", "arm function" (including reaching activities), "self-care tasks" (including transfers), "household tasks" (including mobility in the community), "social activity", "support from family and friends", "mood", "level of tension" and a subscale on pain. Subscale scores range from 0 to 10 with 10 representing poor health status. Within the questionnaire, information about the severity of disease, health perception, other significant illnesses, medications and sociodemographics is also gathered.

ii) Visual Analogue Scales^{45,46}

A series of visual analogue scales were developed to assess several outcomes based on the participants' experiences over the past week (general pain, joint pain, pain on movement both in and out of the water, pain during activities, pain on weight-bearing, stiffness, flexibility). Participants were asked to make a mark on the 100 mm line that best indicated their average experience over the past week. The line was then measured from the left end to provide a score from 0 to 100, with a lower score representing less pain. Visual analogue scales (VAS) are reliable and valid measures of pain, especially when comparing subjects to themselves over time⁴⁷. They have good test-retest reliability and have been shown to correlate with established methods of assessment of affective symptoms. VAS scales are usually more effective in measuring change over brief periods such as one week or one month than they are over 6 months or a year⁴⁸.

A numerical pain rating scale (NPRS) for pain in the past week (scored 1 to 7, with a lower score representing less pain) developed for a large population study in the UK was also included⁴⁹.

iii) University of Western Ontario, McMaster University Osteoarthritis Index (WOMAC)⁵⁰

The WOMAC is a reliable and valid measure of pain, stiffness and function in patients with OA of the lower extremities and includes mobility items (walking, climbing stairs, transfers, shopping, getting in and out of the car) and activities

involving bending and reaching (putting on/taking off socks, bending to the floor).

iv) Mobility/Balance Questions

Specific mobility and balance questions were drawn from a previous population study⁴⁹. The mobility questions were designed to measure mobility handicap, which reflects the impact of disability on an individual's mobility, taking into account the use of assistance or adaptations, the physical environment and the social and cultural situation of the individual⁵¹.

v) Centre for Epidemiologic Studies - Depression Scale (CES-D)⁵²

The CES-D is a short (20-question, 10 minute) questionnaire measuring psychological distress over a one week period and has been used mostly for research purposes in non-psychiatric populations. This measure weights the symptoms reported by their frequency or duration. The total possible score is 60 with a higher score indicating greater psychological distress. Moderate test-retest reliabilities over different time intervals (two to eight weeks) have been reported (from .51 to .67). Good internal consistency has been reported (Cronbach's alpha: .84-.90).

vi) SF-36⁵³

The SF-36 is a self-administered generic questionnaire measuring a patient's general health and well-being. It covers several domains of health: limitations in physical activities, limitations in social activities because of physical or emotional problems, limitations in usual role activities because of physical and emotional problems, bodily pain, mental health, vitality and general health perceptions. A higher score indicates better health status.

vii) Morning Stiffness

Several methods of measuring morning stiffness (using VASs and a verbal rating scale (VRS)) were tested in the context of this study.

viii) Exercise Behaviour

Exercise behaviour (type of activity, frequency, duration and level of exertion) was assessed at

baseline, discharge and follow-up.

ix) Other Measures

At discharge and at 3 months post-discharge, patients were asked to complete a series of questions (rated from (1) decreased a lot to (5) increased a lot) on perceived changes resulting from the hydrotherapy intervention (attribution to hydrotherapy) in the following areas: global assessment, their arthritis or pain medication; their dependence on others for help, their use of mobility devices (e.g. cane, walker, etc.); and visits to their physician, rheumatologist, physiotherapist or chiropractor. Questions were also asked about changes in flexibility, joint pain, pain on movement and pain during activity resulting from their participation in the pool program. Participants were asked if they had joined or intended to join an ongoing community program in order to continue their hydrotherapy or if they had increased their participation in other forms of exercise.

Patient characteristics, exercise behaviours and follow-up questions were analysed using descriptive statistics. Paired t-tests were used to

analyse the differences between the outcome measures at baseline and discharge (approx. 10 weeks). The level of statistical significance was adjusted a priori for the multiple outcomes assessed ($p < .001$). Effect sizes were calculated for each outcome measure, with an effect size of $> .3$ being considered a clinically important change.

RESULTS

Thirty-one women participated in 11 different programs across Ontario (median length: 9 weeks). A summary of the programs is presented in Table 1. The programs were heterogeneous, representing a variety of settings and intensity of intervention. Ninety percent of the participants attended the program once per week only. Demographic data are presented in Table 2. Most participants reported OA (42%), RA (32%) or fibromyalgia (26%) (or a combination of these) and 84% reported taking daily medications for conditions other than their arthritis. Twenty-nine percent of the participants ($n=9$) reported surgery or replacement of at least one hip or knee joint.

Table 1: Program Descriptions (n = 11)

Program length: median (range)	9 weeks (6 - 16 weeks)
Sessions attended: median (range)	9 (4 - 15)
Times per week range	1 - 5
once per week (%)	90
Pool location	
Hospital	5
Community centre	3
YMCA	1
Hotel	1
Private pool	1

Table 2: Demographics (n = 31)

female (%)	100
diagnosis (%)*	
RA	32%
OA	42%
fibromyalgia	26%
other	19%
daily arthritis medications (%)	77
comorbidity (other daily medications) (%)	84
disease duration (years)	12.9 (range: .5 - 45)
age (years)	57 (range: 30 -78)
race: % white	94
marital status: % married	61
education level: % high school grad or higher	63
income level (% < \$20,000/year)**	13

*allowed to report >1 diagnosis

**5 missing responses

Changes in Outcome Measures

Baseline, 10 week and 3 month scores are presented in Table 3. At 10 weeks, the SF-36 pain subscale and the NPRS were the most sensitive to change ($p = .001$) with corresponding important effect sizes of .9 and .7 respectively. These two pain measures were highly correlated at baseline ($r = .86$, $p = .000$) and moderately correlated at discharge ($r = .46$, $p = .011$). There were also important clinical improvements in SF-36 health perception questions, physical functioning, emotional functioning and energy subscales, and the AIMS overall impact of arthritis item and tension subscale, with effect sizes .4. There were no changes in any of the balance questions ($p > .2$).

Twenty-two participants completed the 3 month follow-up questionnaires. Reasons for study drop-

out included: 8 lost to follow-up, one refusal. Study completers were somewhat younger (mean(SD): 54.9(12.9) years versus 61.9(13.4) years) and reported shorter disease duration (mean(SD): 13.2(10.8) years versus 21.3(30.6) years) than those who did not complete the follow-up questionnaire, however these differences were not significant. All improvements were maintained at follow-up ($p = .05$). The WOMAC function and stiffness subscales and the VAS for pain severity in the morning showed a trend towards improvement at the follow-up assessment ($p = .02$, .05 and .03 respectively). There were important clinical improvements in SF-36 change in health perception, AIMS self-care, and WOMAC pain subscales, and the VRS for difficulty moving the joints in the morning with all effect sizes .4.

Table 3: Outcome Measure Scores at Baseline, 10 weeks (n = 31) and 3 month follow-up(n = 22)

Outcome Measure	Baseline	10 weeks	p value*	Effect size+	3 months	p value**	Effect size++
	mean (SD)	mean			mean		
SF 36 physical functioning	15.9(3.5)	17.4(4.3)	.011	.5	17.0(4.1)	.573	.1
role function (physical)	.5(1.2)	.8(1.3)	.164	.3	1.3(1.5)	.330	.2
role function (emotional)	1.2(1.3)	1.9(1.3)	.014	.5	1.5(1.4)	.614	.3
mental health	21.4(5.0)	22.4(5.0)	.136	.2	21.3(5.2)	.624	.2
health perception	14.1(4.2)	15.4(4.7)	.017	.5	15.2(5.1)	.216	.3
pain	5.1(1.5)	6.2(1.7)	<.001	.9	6.5(1.9)	.365	.2
change in health energy	3.0(1.1)	3.4(1.0)	.12	.048	3.6(1.0)	.110	.4
energy	11.1(4.0)	12.3(4.3)	.068	.4	12.7(4.7)	.733	.1
NPRS (pain severity)	4.9(1.5)	4.2(1.6)	.001	.7	4.3(1.3)	.796	.1
AIMSII: impact of arthritis	5.3(2.4)	4.5(2.6)	.010	.5	4.4(3.2)	.418	.2
tension	4.6(2.3)	4.0(2.1)	.082	.4	4.5(2.9)	.130	.3
satisfaction	5.0(2.0)	4.7(2.3)	.396	.2	4.5(2.7)	.418	.2
mobility	2.0(1.6)	2.1(2.0)	.562	.1	2.5(1.8)	.600	.1
walking	6.2(2.1)	6.3(2.5)	.713	.1	6.0(2.6)	.156	.3
hand function	3.3(2.5)	3.1(2.3)	.511	.1	3.2(2.2)	.374	.2
arm function	2.3(2.0)	2.4(2.0)	.790	.0	2.4(1.7)	.302	.2
self-care	4.6(1.2)	4.4(1.1)	.917	.0	1.4(2.8)	.075	.4
household tasks	2.4(2.5)	2.1(2.1)	.220	.2	2.1(2.1)	.608	.1
social	5.9(1.9)	5.5(2.0)	.110	.3	5.8(2.0)	.397	.2
Flexibility	4.9(1.1)	4.6(1.3)	.083	.3	4.2(1.4)	.216	.3
WOMAC function	30.9(12.2)	29.8(13.1)	.564	.1	25.7(11.7)	.021	.7
stiffness	4.1(1.5)	3.9(1.8)	.234	.2	3.3(1.4)	.045	.5
pain	7.7(3.6)	7.5(4.3)	.727	.1	6.7(4.1)	.064	.4
VAS pain severity in the morning	45.7(31.1)	44.9(30.5)	.826	.0	38.7(26.2)	.033	.5
CES-D	15.6(11.0)	16.4(13.4)	.659	.1	19.3(14.1)	.249	.3
VAS current stiffness	44.3(27.4)	42.6(25.4)	.679	.1	37.7(26.4)	.376	.2
Morning symptoms (VAS)							
-difficulty							
moving joints	54.2(29.0)	52.4(30.5)	.636	.1	45.0(27.5)	.255	.3
doing things	48.5(29.9)	47.4(28.2)	.804	.0	42.1(27.1)	.395	.2
walking	48.3(28.8)	47.8(31.5)	.908	.0	40.4(29.1)	.152	.3
using hands	37.8(28.9)	36.5(30.9)	.617	.1	36.2(29.0)	.956	0.00
moving joints	2.9(1.0)	3.0(.9)	.477	.1	2.7(1.1)	.110	.4
(VRS***)							

*p value between baseline and 10 week scores, paired t-test

**p value between 10 week and 3 month follow-up scores, paired t-test

+effect size between baseline and 10 week scores

++effect size between 10 weeks and 3 month follow-up scores

***VRS =verbal rating scale (1=not difficult at all, 5=unable to do)

fitness, ASMP, etc). Half of the participants indicated that they were still participating in a pool program.

Exercise Behaviour

At baseline, 19 participants (61%) indicated that they did regular activity for exercise and of those, 58% were exercising more than twice a week. At discharge, 19 of 30 participants (63%) reported regular activity, with 57% exercising more than twice a week. Seventeen percent of the 30 participants indicated that they had joined another pool program in the community and 17% indicated that they intended to join another pool program. Seventeen percent indicated that they had joined another exercise program in the community and 10% indicated that they would be joining another program in the future. Many patients (70%) indicated that they were exercising more at home.

At 3-month follow-up, 15/22 patients (68%) reported regular exercise and 50% of these patients were exercising more than twice a week. Overall, the most commonly mentioned activities were: swimming/aquatics/pool therapy; general exercise or stretching; and walking or treadmill. Many respondents (49%) indicated that they were participating in some form of community program specifically for their arthritis (e.g. weight loss,

Other Outcomes

Table 4 reports the results of questions asking patients about changes attributed to hydrotherapy at discharge. Overall, two thirds of participants indicated they were somewhat or much better as a result of their participation in the hydrotherapy program. Improvements in symptoms included less joint pain, pain on movement and with activity and better flexibility. At baseline, most participants were taking either pain (90%) or arthritis medications (86%). Of those, 41% reported decreasing their pain medications and 31% reported decreasing their arthritis medications. Approximately one third (36%) of participants reported that they needed less help from others. Half of the respondents reported using walking devices at baseline. Of those, 33% reported that they decreased their use of those devices as a result of the hydrotherapy program. A few participants indicated that they decreased their visits to health care professionals: family doctor (n=6), rheumatologist (n=2), physiotherapist (n=2) and chiropractor (n=1).

Table 4: Changes attributed to hydrotherapy at discharge (%)

	n**	% of patients with each response option		
		decreased a little/lot	no change	increased a little/lot
help from others	25	36	60	4
use of walking devices	15	33	67	0
visits to family doctor	29*	21	79	0
visits to rheumatologist	20	10	85	5
visits to physiotherapist	15*	13	87	0
visits to chiropractor	5	20	80	0
use of pain pills	27	41	52	07
use of arthritis medication	26	31	65	4
joint pain	30	60	33	7
pain on movement	30	63	33	4
pain during activities	30	63	37	0
		somewhat/much better	the same	somewhat/much worse

global impact	30	67	30	3
flexibility	30	77	23	0

*1 missing

** number of patients responding, not applicable responses removed

DISCUSSION

This pilot study was carried out to identify appropriate client-centred outcome measures for evaluating community-based hydrotherapy programs. Our focus groups suggested that several impairment outcomes (pain, stiffness, depression, balance) might improve as a result of a hydrotherapy intervention⁴⁰. In this sample of patients with musculoskeletal diseases, two impairment measures (SF-36 bodily pain and NPRS for pain in the past week), were the most sensitive to change following the 10 week program. The two pain measures were moderately well correlated, suggesting that either could be used in randomized controlled trials to assess the efficacy of hydrotherapy, for program evaluation or to clinically evaluate an individual's response to hydrotherapy. The SF-36 (bodily pain) has shown improvement in another study of community hydrotherapy evaluating a 12-week program of flexibility and strength training exercises⁵⁴.

We did not find changes in general stiffness, morning stiffness or flexibility. However, at 10 weeks, 77% of participants indicated that their flexibility improved as a result of hydrotherapy. There was a trend towards improvement in the WOMAC stiffness subscale at the three-month follow-up and an important clinical improvement in moving the joints in the morning (VRS), suggesting that these benefits may be derived from a long-term commitment to exercise. We did not find any improvements in balance. A larger sample may have been needed to demonstrate changes in these areas. As well, we did not find changes in depression. However, on average, the group was not depressed at baseline, with a mean CES-D score of less than 16⁵².

Our focus groups suggested that we might also

see improvements in health status and functional measures (disability)⁴⁰. We did not find these changes. However, at 10 weeks, there were clinical improvements in SF-36 physical functioning, general health and health perception subscales and AIMS impact of arthritis subscale, and at follow-up, there were improvements in the SF-36 general health, AIMS self-care and WOMAC functional subscales again suggesting that these benefits may require a long term commitment to exercise. If this is so, then programs need to be available on an ongoing basis. This is usually not possible with therapist-run programs, and resources for ongoing hydrotherapy need to be available in the community following discharge.

Although not the primary intent of this study, our results add support to the growing body of evidence that suggests that hydrotherapy is a safe and effective way of decreasing symptoms in people with arthritis^{16,27,28,31,35-38,54} and in the elderly population generally^{55,56}. As well, in chronic diseases, *maintenance* of function and *prevention* of deterioration may be important outcomes in themselves. Further studies need to address these issues and the long term benefits of hydrotherapy for people with arthritis.

At discharge, two thirds of the participants attributed improvement to the hydrotherapy intervention. Improvements included symptom relief (decreased pain and improved flexibility), decreased use of pain and arthritis medications and assistive devices, decreased health care utilization (visits to health professionals) and decreased demand on others. Further controlled studies need to examine how this intervention might reduce health care costs and caregiver burden.

There were several features of this study design which may have impacted on our ability to detect

change with these outcome measures. Our sample included a heterogeneous group of patients and similarly, a heterogeneous sample of community programs in terms of leaders, program content and the intensity of the exercises. Water temperature may have varied as well. This heterogeneity helps to ensure that we identified measures that would be relevant to a variety of community settings. However, outcomes may be content specific i.e. improvement in walking ability may only be reflected when the program content emphasizes walking in the water. Our results may therefore be a conservative estimate of change in a more homogeneous sample of patients attending a standardized and controlled hydrotherapy intervention.

In this study, most participants attended hydrotherapy once a week only. Most hydrotherapy interventions reported in the literature required participation two or more times per week^{16,27,28,31,32,35-38,55,56}. Again, this suggests that changes in the measures used in this study may be conservative estimates if patients attend hydrotherapy more frequently.

Our results must be viewed with caution because

of several factors. We had no control group, therefore these changes may be due to the normal course of the disease over time or to concurrent treatments such as medication changes, other types of therapy or other exercise interventions. However, it is noteworthy that 67% of follow-up patients attributed some improvement to the hydrotherapy intervention.

CONCLUSIONS

Questions on pain severity, either the SF-36 pain subscale or the NPRS, appear to be the most sensitive measures to evaluate clinically important short-term changes resulting from community hydrotherapy interventions. It appears that some of the benefits associated with hydrotherapy may be the result of a long term commitment to exercise (longer than 6 months). Further studies are needed to address this hypothesis. Although not the primary purpose of this study, our results add evidence to the growing body of knowledge which supports the benefit of hydrotherapy as a safe and effective intervention for people with arthritis.

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Appendix 1
Hydrotherapy Outcomes Identified from Focus Groups and Outcome Measures for Testing

Outcome	Outcome Measure
Impairments	
General Pain	AIMS2 pain subscale, #38, VAS (pain on waking), Calderdale #41, SF-36 #21
Joint Pain	AIMS2 (arthritis pain subscale), #40, #60(i)
Pain on Movement	WOMAC (pain subscale)
Pain during function	SF-36 #22 WOMAC (function subscale)
Stiffness	WOMAC (stiffness subscale) AIMS2 (arthritis pain subscale) Morning stiffness questions
Depression	CES-D AIMS2 (mood and level of tension subscales) SF-36 #23-32, 38-40
Activities	
walking/transfers/climbing stairs	AIMS2 (walking and bending and self-care tasks subscales) WOMAC (pain and function subscales) SF-36 #6,7,9-11
bending	AIMS2 (walking and bending subscale) WOMAC (function subscale) flexibility question (SF-36 #31 added) Calderdale #52 SF-36 #8
reaching	AIMS2 (arm function subscale) WOMAC (function subscale)
Participation	
social support	AIMS2 (social activity and support from family and friends subscales) SF-36 #20, 33

Appendix 1
Hydrotherapy Outcomes Identified from Focus Groups and Outcome Measures for Testing

mobility	AIMS2 (mobility level subscale) Calderdale mobility questions #41-47 WOMAC (function subscale)
quality of life/health status	SF-36 AIMS2 #61-63,66
Other	
pain medications	WOMAC #5-7, therapist drug diary, AIMS2 #69
use of health services	to be developed for follow-up only
global perception of change	to be developed - add to SF-36 #2
need for help	Calderdale #43 AIMS2 #4,10, self-care and household tasks subscales
use of assistive devices	AIMS2 #10
exercise behaviour	perceived level of exertion
balance	Calderdale #48-52

ID #: _____ Date: ____/____/____

Health Status Questionnaire

Instructions:

This survey asks for your views about your health. The information will help your health care provider track how you feel and how well you are able to do your usual activities.

Answer every question by circling the appropriate number 1,2,3,.. If you are unsure about how to answer a question, please give the best answer you can and make a comment in the left margin.

1. In general, would you say your health is:

(circle one number)

- Excellent 1
- Very Good 2
- Good 3
- Fair 4
- Poor 5

2. **Compared to one year ago**, how would you rate your health in general now?

(circle one number)

- Much better now than one year ago 1
- Somewhat better now than one year ago 2
- About the same 3
- Somewhat worse now than one year ago 4
- Much worse now than one year ago 5

ID #: _____

The following questions are about activities you might do during a typical day. Does **your health** now limit you in these activities? If so, how much?

(circle one number on each line)

	Yes, limited a lot	Yes, limited a little	No, not limited at all
3. Vigorous activities , such as running, lifting heavy objects, participating in strenuous sports.....	1	2	3
4. Moderate activities , such as moving a table, pushing a vacuum cleaner, bowling, or playing golf.....	1	2	3
5. Lifting or carrying groceries.....	1	2	3
6. Climbing several flights of stairs.....	1	2	3
7. Climbing one flight of stairs.....	1	2	3
8. Bending, kneeling, or stooping.....	1	2	3
9. Walking more than a mile	1	2	3
10. Walking several blocks	1	2	3
11. Walking one block	1	2	3
12. Bathing or dressing yourself.....	1	2	3

During the **past 4 weeks**, have you had any of the following problems with your work or other regular daily activities **as a result of your physical health**?

(Circle one number on each line)

	Yes	No
13. Cut down the amount of time you spent on work or other activities.....	1	2
14. Accomplished less than you would like.....	1	2
15. Were limited in the kind of work or other activities.....	1	2
16. Had difficulty performing the work or other activities (for example, it took extra effort).....	1	2

ID #: _____

During the past **4 weeks**, have you had any of the following problems with your work or other regular daily activities as a result of any **emotional** problems (such as feeling depressed or anxious)?

(circle one number on each line)

- | | Yes | No |
|--|-----|----|
| 17. Cut down the amount of time you spent on work or other activities..... | 1 | 2 |
| 18. Accomplished less than you would like..... | 1 | 2 |
| 19. Didn't do work or other activities as carefully as usual..... | 1 | 2 |
| 20. During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups? | | |

(circle one number)

- Not at all 1
- Slightly 2
- Moderately 3
- Quite a bit 4
- Extremely 5

21. How much **bodily pain** have you had during the **past 4 weeks**?

(circle one number)

- None 1
- Very mild 2
- Mild 3
- Moderate 4
- Severe 5
- Very severe 6

22. During the **past 4 weeks** how much did **pain** interfere with your normal work (including both work outside the home and housework)?

(circle one number)

- Not at all 1
- A little bit 2
- Moderately 3
- Quite a bit 4
- Extremely 5

ID #: _____

These questions are about how you feel and how things have been with you during the **past 4 weeks**. For each question, please give the one answer that comes closest to the way you have been feeling.

How much of the time during the **past 4 weeks**.....

(circle one number on each line)

	All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time
23. Did you feel full of pep?.....	1	2	3	4	5	6
24. Have you been a very nervous person?.....	1	2	3	4	5	6
25. Have you felt so down in the dumps that nothing could cheer you up?.....	1	2	3	4	5	6
26. Have you felt calm and peaceful?.....	1	2	3	4	5	6
27. Did you have a lot of energy.....	1	2	3	4	5	6
28. Have you felt downhearted and blue?.....	1	2	3	4	5	6
29. Did you feel worn out?.....	1	2	3	4	5	6
30. Have you been a happy person?.....	1	2	3	4	5	6
31. Have you felt flexible/limber?.....	1	2	3	4	5	6
32. Did you feel tired?.....	1	2	3	4	5	6

33. During the **past 4 weeks**, how much of the time has your **physical health or emotional problems** interfered with your social activities (like visiting with friends, relatives, etc.)?

(circle one number)

- All of the time 1
- Most of the time 2
- Some of the time 3
- A little of the time 4
- None of the time 5

ID #: _____

How **TRUE** or **FALSE** is each of the following statements for you?

(circle one number on each line)

	Definitely true	Mostly true	Don't know	Mostly false	Definitely false
34. I seem to get sick a little easier than other people.....	1	2	3	4	5
35. I am as healthy as anybody I know.....	1	2	3	4	5
36. I expect my health to get worse.....	1	2	3	4	5
37. My health is excellent.....	1	2	3	4	5

Please answer **YES** or **NO** for each question by circling "1" or "2" on each line.

	Yes	No
38. In the past year, have you had 2 weeks or more during which you felt sad, blue or depressed; or when you lost all interest or pleasure in things that you usually cared about or enjoyed?.....	1	2
39. Have you had 2 years or more in your life when you felt depressed or sad most days, even if you felt okay sometimes?.....	1	2
40. Have you felt depressed or sad much of the time in the past year?.....	1	2

ID #: _____

Arthritis Questions (Calderdale)

41. How much pain have you had because of your **arthritis** in the **past week**? (Please circle **one** number)

None			Moderate		Extreme	
1	2	3	4	5	6	7

42. **WITH HELP** from another person, are you **usually** able to:

	Yes	No	Does not apply
Move from room to room.....	1	2	
Go out of your home.....	1	2	
Leave the immediate surroundings of your home (yard, sidewalk).....	1	2	
Move to another floor in your home.....	1	2	3

43. **On your own**, or using any assistive devices/equipment that you normally use, are you **usually** able to:

	Yes	No	Does not apply
Move from room to room.....	1	2	
Go out of your home.....	1	2	
Leave the immediate surroundings of your home (yard, sidewalk).....	1	2	
Move to another floor in your home.....	1	2	3

44. Do you have access to a car in your household, as either a driver or a passenger? (Excluding taxis)

Yes	No
1	2

ID #: _____

45.	Do you use:	Yes	No
	Taxis.....	1	2
	Public Transit.....	1	2
	Transportation for people with disabilities.....	1	2
	Rides from family/friends who do not live with you...	1	2

46. Where do you usually go, when you go out? (Please check all that apply)

- | | | |
|---|--|---|
| <input type="checkbox"/> Shop/do errands | <input type="checkbox"/> Work outside of home | <input type="checkbox"/> Overnight trips |
| <input type="checkbox"/> Visit friends/relatives | <input type="checkbox"/> Religious institution | <input type="checkbox"/> Meetings/club |
| <input type="checkbox"/> Hairdresser/barber | <input type="checkbox"/> Walk the dog | <input type="checkbox"/> Medical appointments |
| <input type="checkbox"/> Recreational activities (e.g. movies, sports, theatre) | <input type="checkbox"/> Volunteer | <input type="checkbox"/> Take the children to school/day care |

Other (please specify) _____

47. Generally, how often do you usually go out? (Please check only one)

- | | | |
|---|---|---|
| <input type="checkbox"/> every day | <input type="checkbox"/> several times a month | <input type="checkbox"/> a few times a year |
| <input type="checkbox"/> several times a week | <input type="checkbox"/> once a month | <input type="checkbox"/> never |
| <input type="checkbox"/> once a week | <input type="checkbox"/> less than once a month | |

48. Do you suffer from falls or have great difficulty in keeping your balance?.....

Yes	No
1	2

49. In the **past three months**, have you ever lost your balance and fallen?.....

1	2
---	---

50. How many times have you fallen in the **past three months**?.....Number of falls: _____

ID #: _____

(CIRCLE ONE NUMBER ON EACH LINE)

	All the time	Quite often	Only occasionally	Not at all
51. Do you need to hold on to something to help you keep your balance?.....	1	2	3	4
52. Do you have difficulty bending down and straightening up again, even if you hold on to something?.....	1	2	3	4
53. Do you currently do any regular activity for exercise?.....			Yes 1	No 2

If yes, please go to question 54. If not, go to next page.

54. Please indicate below what type of activity(s) you do (eg: walking, running, bicycling, golf, curling, tennis, gardening, stationary bike). There is space to describe 2 activities, please use the back to record more if necessary.

ACTIVITY 1: _____ (print type here)

a. **How often do you do this activity?** Please circle the **best** answer.
daily 5-6 3-4 1-2 less than
 times/wk times/wk times/wk once/week

How many times each day? _____ times/day.

b. **For how long, on each occasion, do you do this activity?** Please circle the **best** answer.

over 30 minutes 21 to 30 11 to 20 6 to 10 under 5
 minutes minutes minutes minutes

c. **How hard do you work when you do this activity** (as determined by your breathing while doing the activity)? Please circle the **best** answer.

heavy breathing moderate breathing light breathing normal breathing
(unable to talk) (conversation possible (can talk with (able to talk
 but difficult) minimal effort) normally)

ACTIVITY 2: _____ (print type here)

a. **How often in a week, do you do this activity?** Please circle the **best** answer.

daily 5-6 3-4 1-2 less than
 times/wk times/wk times/wk once/week

How many times each day? _____ times/day.

ID #: _____

b. **For how long, on each occasion, do you do this activity?** Please circle the best answer.

over 30 minutes	21 to 30 minutes	11 to 20 minutes	6 to 10 minutes	under 5 minutes
-----------------	---------------------	---------------------	--------------------	--------------------

c. **How hard to you work when you do this activity** (as determined by your breathing while doing the activity)? Please circle the best answer.

heavy breathing (unable to talk)	moderate breathing (conversation possible but difficult)	light breathing (can talk with minimal effort)	normal breathing (able to talk normally)
-------------------------------------	--	--	--

ID #: _____

WOMAC

The following questions are about your ability to move around and to look after yourself. For each of the following questions, please indicate the degree of difficulty you experienced **during the past 48 hours** due to your knees/hips.

55. In the past 48 hrs, how much **difficulty** have your knees/hips caused you in...

(CIRCLE ONE NUMBER ON EACH LINE)

		None	A little	Some	A lot	Extreme	Not applicable
a.	Going down stairs?	1	2	3	4	5	N
b.	Going up stairs?	1	2	3	4	5	N
c.	Getting up from a sitting position?	1	2	3	4	5	N
d.	Standing?	1	2	3	4	5	N
e.	Bending to the floor?	1	2	3	4	5	N
f.	Walking on flat ground?	1	2	3	4	5	N
g.	Getting in or out of a car?	1	2	3	4	5	N
i.	Taking off your socks or stockings?	1	2	3	4	5	N
j.	Getting into bed?	1	2	3	4	5	N

ID #: _____

		None	A little	Some	A lot	Extreme	Not applicable
k.	Putting on your socks or stockings?	1	2	3	4	5	N
l.	Getting out of bed?	1	2	3	4	5	N
m.	Getting in or out of the bathtub?	1	2	3	4	5	N
n.	Sitting?	1	2	3	4	5	N
o.	Getting on or off the toilet?	1	2	3	4	5	N
p.	Doing heavy household chores?	1	2	3	4	5	N
q.	Doing light household chores?	1	2	3	4	5	N

The following questions concern the amount of **stiffness** (not pain) you are **currently** experiencing in your knees/hips. By stiffness we mean being able to move your knees/hips only slowly, or more restricted than you'd like.

56. How severe is your stiffness **when you first wake up?** (CIRCLE ONE NUMBER)

None	Mild	Moderate	Severe	Extreme
1	2	3	4	5

57. How severe is your stiffness after sitting, lying, or resting **later in the day?**
(CIRCLE ONE NUMBER)

None	Mild	Moderate	Severe	Extreme
1	2	3	4	5

ID #: _____

The following questions concern the amount of **pain** you are **currently** experiencing in your knees/hips.

58. In the past 48 hrs, how much **pain** have your knees/hip(s) caused you in...

(CIRCLE ONE NUMBER ON EACH LINE)

	None	Mild	Moderate	Severe	Extreme
a. Walking on a flat surface?	1	2	3	4	5
b. Going up or down stairs?	1	2	3	4	5
c. At night while in bed?	1	2	3	4	5
d. Sitting or lying?	1	2	3	4	5
e. Standing upright?	1	2	3	4	5

59. **How often within the last month** have you taken medicine for pain or swelling in the knees/hips?

(CIRCLE ONE NUMBER)

Did not take medicine for pain or swelling in the knees/hips	1
I took medicine less than once per week	2
I took medicine once per week	3
I took medicine more than once per week, but not every day	4
I took medicine every day	5

60. If you responded to question#59 above with any of numbers 2 to 5, **which medicine** do you take?

61. How many pills per day do you take (on average)? _____/day.

ID #: _____

62. Have you ever.. (CIRCLE ONE NUMBER ON EACH LINE)

	YES	NO
Had your right knee operated on or replaced?	1	2
Had your left knee operated on or replaced?	1	2
Had your right hip operated on or replaced?	1	2
Broken your right hip ?	1	2
Had your left hip operated on or replaced?	1	2
Broken your left hip ?	1	2

CESD Scale

Circle the number for each statement that best describes how often you felt or behaved this way- **DURING THE PAST WEEK**

	Rarely or none of the time (<1 day)	Some or a little of the time (1-2 days)	Occasionally or a moderate amount of time (3-4days)	Most or all of the time (5-7 days)
63. I was bothered by things that usually don't bother me	0	1	2	3
64. I did not feel like eating; my appetite was poor	0	1	2	3
65. I felt that I could not shake off the blues even with help from my family or friends	0	1	2	3
66. I felt that I was just as good as other people	0	1	2	3
67. I had trouble keeping my mind on what I was doing	0	1	2	3

ID #: _____

	Rarely or None of the time(<1 day)	Some or a little of the time (1-2 days)	Occasionally or a moderate amount of time (3-4 days)	Most or all of the time (5-7 days)
68. I felt depressed	0	1	2	3
69. I felt that everything I did was an effort	0	1	2	3
70. I felt hopeful about the future	0	1	2	3
71. I thought my life had been a failure	0	1	2	3
72. I felt fearful	0	1	2	3
73. My sleep was restless	0	1	2	3
74. I was happy	0	1	2	3
75. I talked less than usual	0	1	2	3
76. I felt lonely	0	1	2	3
77. People were unfriendly	0	1	2	3
78. I enjoyed life	0	1	2	3
79. I had crying spells	0	1	2	3
80. I felt sad	0	1	2	3
81. I felt that people disliked me	0	1	2	3
82. I could not 'get going'	0	1	2	3

ID #: _____

Arthritis Impact Measurement Scales 2

Please answer the following questions about your health. Most questions ask about your health during the **past month**. There are no right or wrong answers to the questions. Please answer every question.

Please circle the most appropriate answer for each question.

These questions refer to mobility level During the past month...	All Days	Most Days	Some Days	Few Days	No Days
83. How often were you physically able to drive a car or use public transportation?	1	2	3	4	5
84. How often were you out of the house for at least part of the day?	1	2	3	4	5
85. How often were you able to do errands in the neighborhood?	1	2	3	4	5
86. How often did someone have to assist you to get around outside of your home?	1	2	3	4	5
87. How often were you in a bed or chair for most or all of the day?	1	2	3	4	5

These questions refer to walking and bending During the past month.....	All Days	Most Days	Some Days	Few Days	No Days
88. Did you have trouble doing vigorous activities such as running, lifting heavy objects, or participating in strenuous sports?	1	2	3	4	5
89. Did you have trouble either walking several blocks or climbing a few flights of stairs?	1	2	3	4	5
90. Did you have trouble bending, lifting or stooping?	1	2	3	4	5
91. Did you have trouble either walking one block or climbing one flight of stairs?	1	2	3	4	5

Please check the most appropriate answer for each question.

These questions refer to household tasks. During the past month	All Days	Most Days	Some Days	Few Days	No Days
107.If you had the necessary transportation, could you go shopping for groceries without help?	1	2	3	4	5
108.If you had kitchen facilities, could you prepare your own meals without help?	1	2	3	4	5
109.If you had household tools and appliances, could you do your own housework without help?	1	2	3	4	5
110.If you had laundry facilities, could you do your own laundry without help?	1	2	3	4	5

These questions refer to social activity. During the past month.....	All Days	Most Days	Some Days	Few Days	No Days
111.How often did you get together with friends or relatives?	1	2	3	4	5
112.How often did you have friends or relatives over to your home?	1	2	3	4	5
113.How often did you visit friends or relatives at their homes?	1	2	3	4	5
114. How often were you on the telephone with close friends or relatives?	1	2	3	4	5
115.How often did you go to a meeting of a church, club, team or other group?	1	2	3	4	5

These questions refer to support from family and friends. During the past month.....	Always	Very Often	Some times	Almost Never	Never
116.Did you feel that your family or friends would be around if you needed assistance?	1	2	3	4	5
117.Did you feel that your friends were sensitive to your personal needs?	1	2	3	4	5
118.Did you feel that your family or friends were interested in helping you solve problems?	1	2	3	4	5

**Please check the most appropriate answer for each question.
DURING THE PAST MONTH.....**

	Always	Very Often	Some Times	Almost Never	Never
119. Did you feel that your family or friends understood the effects of your arthritis?	1	2	3	4	5

These questions refer to arthritis pain. During the past month.....	Severe	Moderate	Mild	Very Mild	None
--	--------	----------	------	-----------	------

120. How would you describe the arthritis pain you usually had?	1	2	3	4	5
---	---	---	---	---	---

.....arthritis pain During the past month....	All Days	Most Days	Some Days	Few Days	No Days
--	----------	-----------	-----------	----------	---------

121. How often did you have severe pain from your arthritis?	1	2	3	4	5
--	---	---	---	---	---

122. How often did you have pain in two or more joints at the same time?	1	2	3	4	5
--	---	---	---	---	---

123. How often did your morning stiffness last more than one hour from the time you woke up?	1	2	3	4	5
--	---	---	---	---	---

124. How often did your pain make it difficult for you to sleep?	1	2	3	4	5
--	---	---	---	---	---

These questions refer to work. During the past month.....
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	Paid Work	House Work	School Work	Not employed	Disabled	Retired
125. What has been your main form of work?	1	2	3	4	5	6

If you answered not employed, disabled or retired, please skip the next four questions and go to question #130 (next page).

**Please check the most appropriate answer for each question.
DURING THE PAST MONTH.....**

These questions refer to work. During the past month.....	All Days	Most Days	Some Days	Few Days	No Days
126.How often were you unable to do any paid work, house work or school work?	1	2	3	4	5
127.On the days that you did work, how often did you have to work a shorter day?	1	2	3	4	5
128.On the days that you did work, how often were you unable to do your work as carefully and accurately as you would like?	1	2	3	4	5
129.On the days when you did work, how often did you have to change the way your paid work, house work, or school work is usually done?	1	2	3	4	5

These questions refer to level of tension. During the past month.....	All Days	Most Days	Some Days	Few Days	No Days
130.How often have you felt tense or high strung?	1	2	3	4	5
131.How often have you been bothered by nervousness or your nerves?	1	2	3	4	5
132.How often were you able to relax without difficulty?	1	2	3	4	5
133.How often have you felt relaxed and free of tension?	1	2	3	4	5
134.How often have you felt calm and peaceful?	1	2	3	4	5

These questions refer to mood. During the past month.....	All Days	Most Days	Some Days	Few Days	No Days
135.How often have you enjoyed the things you do?	1	2	3	4	5
136.How often have you been in low or very low spirits?	1	2	3	4	5
137.How often did you feel that nothing turned out the way you wanted it to?	1	2	3	4	5
138.How often did you feel that others would be better off if you were dead?	1	2	3	4	5
139.How often did you feel so down in the dumps that nothing would cheer you up?	1	2	3	4	5

	Very Satisfied	Somewhat Satisfied	Neither Satisfied Nor Dissatisfied	Somewhat Dissatisfied	Very Dissatisfied
	(1)	(2)	(3)	(4)	(5)
140. How satisfied have you been with each of these areas of your health?	Circle	one	number	on each	line
a. Mobility level (eg: do errands)	1	2	3	4	5
b. Walking and bending (eg: climb stairs)	1	2	3	4	5
c. Hand and finger function (eg tie a bow)	1	2	3	4	5
d. Arm function (eg comb hair)	1	2	3	4	5
e. Self-care (eg take a bath)	1	2	3	4	5
f. Household tasks (housework)	1	2	3	4	5
g. Social activity (eg visit friends)	1	2	3	4	5
h. Support from family (eg help with problems)	1	2	3	4	5
i. Arthritis pain (eg joint pain)	1	2	3	4	5
j. Work (eg reduce hours)	1	2	3	4	5
k. Level of tension (eg felt tense)	1	2	3	4	5
l. Mood (eg down in dumps)	1	2	3	4	5

	Not a Problem For Me	Due Entirely To Other Causes	Due Largely to Other Causes	Due Partly to arthritis and Partly to Other Causes	Due largely to my Arthritis	Due Entirely to my Arthritis
141. How much of your problem in each area of health was due to your arthritis?	(0)	(1)	(2)	(3)	(4)	(5)
	circle	one	number	on each	line	
a. Mobility level (eg: do errands)	0	1	2	3	4	5
b. Walking and bending (eg: climb stairs)	0	1	2	3	4	5
c. Hand and finger function (eg tie a bow)	0	1	2	3	4	5
d. Arm function (eg comb hair)	0	1	2	3	4	5
e. Self-care (eg take a bath)	0	1	2	3	4	5
f. Household tasks (housework)	0	1	2	3	4	5
g. Social activity (eg visit friends)	0	1	2	3	4	5
h. Support from family (eg help with problems)	0	1	2	3	4	5
i. Arthritis pain (eg joint pain)	0	1	2	3	4	5
j. Work (eg reduce hours)	0	1	2	3	4	5
k. Level of tension (eg felt tense)	0	1	2	3	4	5
l. Mood (eg down in dumps)	0	1	2	3	4	5

You have now answered questions about different areas of your health. These areas are listed below. Please check (X) **3 areas only** in which you would **most like to see improvement**. Please read all 12 areas of health choices before making your decision.

142. **AREAS OF HEALTH**

3 AREAS FOR IMPROVEMENT

- a. Mobility level (eg: do errands)
- b. Walking and bending (eg: climb stairs)
- c. Hand and finger function (eg: tie a bow)
- d. Arm function (eg: comb hair)
- e.. Self-care (eg: take a bath)
- f. Household tasks (eg: housework)
- g. Social activity (eg: visit friends)
- h. Support from family (eg: help with problems)
- i. Arthritis pain (eg: joint pain)
- j. Work (eg: reduce hours)
- k. Level of tension (eg: felt tense)
- l. Mood (eg: down in the dumps)

Please make sure that you have **not** checked **more** than **3 areas** for improvement.

These questions refer to CURRENT AND FUTURE HEALTH	
143. In general, would you say that your HEALTH NOW is excellent, good, fair or poor?	<input type="checkbox"/> Excellent <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor
144. How satisfied are you with your HEALTH NOW ?	<input type="checkbox"/> Very Satisfied <input type="checkbox"/> Somewhat satisfied <input type="checkbox"/> Neither satisfied nor dissatisfied <input type="checkbox"/> Somewhat Dissatisfied <input type="checkbox"/> Very Dissatisfied
145. How much of your problem with your HEALTH NOW is due to your arthritis?	<input type="checkbox"/> Not a problem for me <input type="checkbox"/> Due entirely to other causes <input type="checkbox"/> Due largely to other causes <input type="checkbox"/> Due partly to arthritis and partly to other causes <input type="checkbox"/> Due largely to my arthritis <input type="checkbox"/> Due entirely to my arthritis
146. In general, do you expect that your HEALTH 10 YEARS FROM NOW will be excellent, good, fair or poor?	<input type="checkbox"/> Excellent <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor
147. How big a problem do you expect your ARTHRITIS to be 10 YEARS FROM NOW ?	<input type="checkbox"/> not a problem at all <input type="checkbox"/> Minor problem <input type="checkbox"/> Moderate problem <input type="checkbox"/> Major problem
148. This question refers to OVERALL ARTHRITIS IMPACT . Considering all the ways that your arthritis affects you, how well are you doing compared to other people your age?	<input type="checkbox"/> Very Well <input type="checkbox"/> Well <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Very Poorly

<p>149. What is the main kind of arthritis that you have? (Check one)</p>	<p><input type="checkbox"/> Rheumatoid Arthritis <input type="checkbox"/> Osteoarthritis/Degenerative Arthritis <input type="checkbox"/> Systemic Lupus Erythematosus (SLE) <input type="checkbox"/> Fibromyalgia <input type="checkbox"/> Scleroderma <input type="checkbox"/> Psoriatic Arthritis <input type="checkbox"/> Reiter's Syndrom <input type="checkbox"/> Gout <input type="checkbox"/> Low Back Pain <input type="checkbox"/> Tendonitis/Bursitis <input type="checkbox"/> Osteoporosis <input type="checkbox"/> Other: _____</p>
<p>150. How many years have you had arthritis?</p>	<p>_____ years _____ months</p>
<p>151. DURING THE PAST MONTH... How often have you had to take MEDICATION for your arthritis?</p>	<p><input type="checkbox"/> All Days <input type="checkbox"/> Most Days <input type="checkbox"/> Some Days <input type="checkbox"/> Few Days <input type="checkbox"/> No Days</p>
<p>152. Is your health currently affected by any of the following medical problems? (Check all that apply)</p>	<p><input type="checkbox"/> High blood pressure <input type="checkbox"/> Heart disease <input type="checkbox"/> Diabetes <input type="checkbox"/> Cancer <input type="checkbox"/> Alcohol or drug abuse <input type="checkbox"/> Lung disease <input type="checkbox"/> Kidney disease <input type="checkbox"/> Ulcer or other stomach disease <input type="checkbox"/> Anemia or other blood disease <input type="checkbox"/> Other, please specify _____</p>
<p>153. Do you take medicine every day for any problem other than your arthritis?</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p>154. Did you see a doctor more than three times last year for any problem other than arthritis?</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>

Please provide the following information about yourself:

155. What is your age at this time?	_____ years
156. What is your sex?	<input type="checkbox"/> Male <input type="checkbox"/> Female
157. What is your racial background?	<input type="checkbox"/> Black <input type="checkbox"/> White <input type="checkbox"/> East Indian <input type="checkbox"/> Asian <input type="checkbox"/> N.American Indian, Metis, Inuit/Eskimo <input type="checkbox"/> Other _____
158. What is your current marital status?	<input type="checkbox"/> Married <input type="checkbox"/> Separated <input type="checkbox"/> Divorced <input type="checkbox"/> Widowed <input type="checkbox"/> Never married <input type="checkbox"/> Common-law
159. What is the highest level of education you received?	<input type="checkbox"/> less than 7 years of school <input type="checkbox"/> Grades 7 - 9 <input type="checkbox"/> Grades 10 - 11 <input type="checkbox"/> High school graduate <input type="checkbox"/> 1-4 years of college/university <input type="checkbox"/> College graduate <input type="checkbox"/> Professional or graduate school
160. What is your approximate family income including wages, disability payment, retirement income and welfare?	<input type="checkbox"/> Less than \$10,000 <input type="checkbox"/> \$10,000 - \$19,999 <input type="checkbox"/> \$20,000 - \$29,999 <input type="checkbox"/> \$30,000 - \$39,999 <input type="checkbox"/> \$40,000 - \$49,999 <input type="checkbox"/> \$50,000 - \$59,999 <input type="checkbox"/> \$60,000 - \$69,999 <input type="checkbox"/> More than \$70,000

168. How slow or difficult was it for you to move your joints when you first got out of bed this morning

Not difficult at all |-----| Unable to move my joints

169. How difficult was it for you to do the things you needed to do when you first got out of bed this morning?

Not difficult at all |-----| I was not able to do anything

170. How difficult was it for you to walk when you first got out of bed this morning?

Not difficult at all |-----| I needed help to walk

171. How difficult was it to do things with your hands when you first got out of bed this morning?

Not difficult at all |-----| I could not do anything with my hands

172. How difficult was it for you to move your joints when you first got out of bed this morning? (Please check [✓] one box only)

- not difficult at all
- a little difficult
- somewhat difficult
- very difficult
- unable to do

173. Think about how you felt **yesterday**

What time did you go to bed last night? _____

What time did you wake up yesterday? _____

What time did you get out of bed yesterday? _____

From the time you got out of bed yesterday, how long was it until you were moving at your best? _____ hours _____ minutes

174. How severe was your **pain** when you first got out of bed this morning?



COMMENTS:

Thank you for completing this questionnaire.