

Cover Page



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**Author:** Meesters, Jorit

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# chapter FIVE

Functional disability in patients with rheumatoid  
arthritis admitted for multidisciplinary rehabilitation  
from 1992-2009

Jorit J.L. Meesters  
John Verhoef  
Gerard J. Tijhuis  
Thea P.M. Vliet Vlieland

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## **ABSTRACT**

### **Objectives**

Advances in pharmacological care for rheumatoid arthritis (RA) have in general reduced functional disability. Subgroups of patients may however need treatment by a multidisciplinary team. This study aimed to describe levels of functional ability and outcomes of patients with RA admitted for multidisciplinary rehabilitation in the past 20 years.

### **Methods**

Data from 3 observational studies including 4 cohorts (1:1992, 2a:2001, 2b:2003 and 3:2008) on outcomes of multidisciplinary rehabilitation for RA patients conducted in one Dutch rheumatology clinic were used. Baseline and change scores of the Health Assessment Questionnaire (HAQ) were compared by using a One-Way ANOVA with Post-Hoc Multiple Comparisons (Bonferroni-correction).

### **Results**

The mean HAQ scores were 1.94 (SD 0.74) for cohort 1, 1.40 (0.74) and 1.39 (0.66) for cohorts 2a/2b, and 1.49 (0.59) for cohort 3, with the difference between cohort 1 on the one side and cohorts 2a/2b and 3 on the other side being statistically significant ( $p < 0.01$ ). The mean changes in HAQ scores between admission and discharge were 0.24 (SD 0.50) for cohort 1, 0.17 (0.49) for cohort 2a, 0.15 (0.37) for cohort 2b and 0.25 (0.46) for cohort 3, respectively.

### **Conclusions**

The level of functional disability of RA patients admitted for multidisciplinary rehabilitation decreased between 1992 and 2001. The magnitude of improvement of functional ability during admission was in the same range in all three periods. These results suggest that in the era of methotrexate and biologicals there are patients with RA who have considerable disability and benefit from multidisciplinary rehabilitation.

## INTRODUCTION

In patients with rheumatoid arthritis (RA) who have persistent or progressive disability care provided by a team of professionals is recommended [1;2]. Formal multidisciplinary rehabilitation programmes include the involvement of health care providers with different professional backgrounds and the patient. These programmes can be provided in an inpatient, outpatient or day patient care setting. In a number of studies the benefits of multidisciplinary rehabilitation has been described [3-7].

Advances in pharmacological care for RA in the past decades have reduced its consequences in terms of disease activity, radiological damage and functional disability [8-12]. This raises the question whether and/or to what extent the characteristics of patients admitted for multidisciplinary rehabilitation as well as the benefits of the intervention have changed over time.

This study aims to describe baseline functional disability levels and treatment outcomes in patients with RA who were admitted for multidisciplinary rehabilitation by over two decades using the data of 3 observational studies. The periods in which these studies were conducted correspond with the methotrexate era (1991 – 2000) and the biological era (after 2000) [12].

## METHODS

### Study designs and patient selection

For this study the data from 3 observational studies (comprising 4 cohorts) on the outcomes of multidisciplinary rehabilitation for patients with a diagnosis of RA according to the 1987 American Rheumatism Association criteria [13] conducted in the rheumatology clinic Sole Mio at the Leiden University Medical Center (LUMC) were used.

The first study was judged to be non-medical research according to the Medical Research Involving Human Subjects Act by the Medical Ethics Review Committee of the LUMC since assessments were done in concordance with usual care. In line with this decision individual informed consent was not obtained (the participants were free to either participate or not). For the other two studies approval from the medical ethics committee of the Leiden University Medical Center was obtained and all patients gave written informed consent. No additional ethical approval was requested for the current comparison since all separate studies were judged by the Medical Ethics Review Committee. Only anonymous datasets were used in the current comparison.

The first study was a prospective observational study conducted between March 1992 and June 1993 [14]. This study aimed to describe the clinical course of RA patients admitted for inpatient multidisciplinary rehabilitation. All consecutive RA patients who were admitted for a disease flare not responding to outpatient management were included. Patients with RA who were admitted for rehabilitation after orthopaedic surgery were excluded.

The second study was a prospective pre-test post-test study including 2 cohorts: cohort 2a. from January 2001 to December 2001 and cohort 2b. January 2003 to December 2003 [15]. This study aimed to determine the impact of the introduction of a rehabilitation tool on the effectiveness on multidisciplinary rehabilitation provided in an inpatient and day patient care setting. This study included consecutive RA patients over 18 years of age who had sufficient physical and emotional health status to take part in assessments and complete questionnaires (judged by the treating rheumatologist). Exclusion criteria were admission after total joint replacement surgery or for medical complications of RA.

The third study was an observational study conducted between June 2008 and July 2009. This study was part of an international multi-centre study that aimed to describe a common framework for rehabilitation in terms of structure, process and outcome of the rehabilitation care process [16]. In this study consecutive adult RA patients who were admitted for day patient multidisciplinary rehabilitation were included. The exclusion criterion was not being able to understand Dutch.

Two randomised controlled trials including RA patients and conducted in the same clinic by Tijhuis et al. [17] and Vliet Vlieland et al. [3] were omitted because these did not include consecutive patients but included patients based on specific criteria regarding disease activity or functional decline. These studies were therefore likely to introduce selection bias in the current comparison.

### **Multidisciplinary rehabilitation**

The multidisciplinary rehabilitation programme was delivered at the inpatient (cohort 1, 2) and day patient (cohort 2, 3) wards of the Rheumatology Rehabilitation Clinic of the Leiden University Medical Center. This clinic is the only setting in the region delivering both inpatient and day patient rehabilitation specifically for patients with rheumatic diseases. The patients in the inpatient ward received multidisciplinary rehabilitation from Monday-Friday during their admission. The patients in the day patient ward received multidisciplinary rehabilitation on 2-3 days per week in consecutive weeks. Both with inpatient and day patient rehabilitation the duration depended on individual needs and goals.

The multidisciplinary team comprised a rheumatologist, an occupational therapist, a physical therapist, a social worker and a clinical nurse specialist. For every patient individual treatment goals were set and discussed during weekly multidisciplinary team conferences. The programme consisted of individual treatments by the rheumatologist and health professionals depending on the patients' individual needs. In addition, most patients participated in supervised, standardized group exercise sessions (hydrotherapy and land-based aerobic and muscle strengthening training).

### **Assessments**

In all three studies clinical assessments were performed and questionnaires were administered, among other time points, at admission and discharge from the rehabilitation clinic.

*Sociodemographic, disease and rehabilitation characteristics*

At baseline age, gender, disease duration, rheumatoid factor, presence of erosions, current medication, status of living (i.e., living alone), education level (low: up to and including lower technical and vocational training; medium: up to and including secondary technical and vocational training; and high: up to and including higher technical and vocational training and university) and employment status (i.e. having paid work) were collected.

*Primary outcome*

Primary outcomes for the present analysis were the baseline score and the change score between admission and discharge of the Health Assessment Questionnaire (HAQ). The HAQ measures functional ability and comprises 20 questions regarding eight domains of activities of daily living with the total score ranging from 0 (no functional limitations) to 3 (serious functional limitations) [18].

**Data and data analysis**

Corresponding data from the 3 studies (variables registered in all 3 studies) were collected into a single database for data analysis. Raw data for age, disease duration and length of rehabilitation were only available from study 2a, 2b and 3. Descriptive statistics were used for the baseline data and means (standard deviation) or medians (minimum to maximum) were calculated where appropriate.

Continuous baseline variables including HAQ-scores at admission, discharge and the change scores were compared among the cohorts by means of a One-Way ANOVA with Post-hoc Multiple Comparisons using Bonferroni-correction. Within the cohorts the HAQ scores between admission and discharge were compared by using the paired samples t-test. All dichotomous variables were compared among the cohorts by means of the Kruskal Wallis test.

All statistical analyses were performed using the Statistical Package for the Social Sciences (IBM SPSS Statistics 20.0 for Windows, <http://www-01.ibm.com/software/analytics/spss/>) with  $p < 0.05$  is considered to be statistically significant. Tests were all two-sided.

**RESULTS****Baseline sociodemographic and clinical**

The baseline characteristics of the patients in the 4 cohorts are presented in Table 1. Patients in the different cohorts had a similar average age and disease duration, with the majority being female. With time, the proportion of patients with erosive disease decreased. Over time there was a shift from inpatient to day patient care and a decrease in number of rehabilitation days. The use of DMARDs remained stable whereas biologicals were only used in study 3 from 2008. The proportions of patients using NSAIDs and corticosteroids at admission increased in particular between 1992 and 2001.

**Table 1.** Sociodemographic and disease characteristics of RA patients admitted for multidisciplinary rehabilitation from 1992-2009

|                                      | 1.            | 2a.                      | 2b.                      | 3.                       |             |
|--------------------------------------|---------------|--------------------------|--------------------------|--------------------------|-------------|
| Study Year                           | 1992-1993     | 2001                     | 2003                     | 2008-2009                | p-value     |
| Number of patients                   |               |                          |                          |                          |             |
| Inpatient                            | 63            | 28                       | 29                       | 0                        |             |
| Day care                             | 0             | 52                       | 56                       | 49                       |             |
| Total                                | 63            | 80                       | 85                       | 49                       |             |
| Age, years; Mean (SD) *              | 62 (15.7)     | 60 (15.3)                | 60 (14.9)                | 58 (13.7)                | 0.56        |
| Disease duration, years; Mean (SD) * | 11.3 (11.7)   | 11.2 (11.4)              | 9.3 (9.9)                | 8.3 (10.5)               | 0.27        |
| Rehabilitation days; Mean (SD) *     | 47            | 11 (11.2)                | 9 (9.8)                  | 9 (2.8)                  | 0.24        |
| Females; Number (%) **               | 47 (75)       | 49 (61)                  | 65 (77)                  | 34 (69)                  | 0.15        |
| Rheumatoid factor; Number (%) **     | 56 (89)       | 57 (71)                  | 58 (73)                  | 36 (74)                  | 0.06        |
| Erosions present; Number (%) **      | 55 (87)       | 59 (74)                  | 49 (61)                  | 31 (63)                  | <b>0.00</b> |
| Paid work; Number (%) **             | n/a           | 18 (23)                  | 17 (20)                  | 14 (29)                  | 0.52        |
| Use of medication; Number (%)        |               |                          |                          |                          |             |
| NSAIDs **                            | 19 (30)       | 59 (74)                  | 49 (61)                  | 31 (63) #                | <b>0.00</b> |
| DMARDs **                            | 42 (67)       | 58 (73)                  | 69 (81)                  | 35 (71)                  | 0.24        |
| Prednisone **                        | 6 (10)        | 24 (30)                  | 21 (25)                  | 15 (31)                  | <b>0.02</b> |
| Biologicals                          | -             | -                        | -                        | 15 (31)                  | -           |
| HAQ admission (0-3); Mean (SD) ***   | 1.94 (0.74)   | 1.40 (0.74) <sup>1</sup> | 1.39 (0.66) <sup>1</sup> | 1.49 (0.59) <sup>1</sup> | <b>0.00</b> |
| HAQ discharge (0-3); Mean (SD) ***   | 1.71 (0.78)   | 1.21 (0.62) <sup>1</sup> | 1.22 (0.62) <sup>1</sup> | 1.27 (0.69) <sup>1</sup> | <b>0.00</b> |
| HAQ Change scores ***                | 0.21 (0.50) † | 0.17 (0.49) †            | 0.15 (0.37) †            | 0.25 (0.46) †            | 0.69        |

# including paracetamol

\* One-way ANOVA with post hoc Bonferroni correction between studies 2a, 2b, and 3

\*\* Kruskal Wallis test between studies 1, 2a, 2b, and 3

\*\*\* One-way ANOVA with post hoc Bonferroni correction between studies 1, 2a, 2b, and 3

**Bold** statistical significant difference ( $p < 0.05$ ) between the studies (1, 2a, 2b, and 3)<sup>1</sup> significant difference ( $p < 0.05$ ) with study 1, One-Way ANOVA after post hoc Bonferroni† significant change ( $p < 0.05$ ) in HAQ score within the study, t-test for paired samples

SD: standard deviation; NSAIDs: Non Steroid Anti Inflammatory Drugs; DMARDs: Disease Modifying Anti Rheumatic Drugs; HAQ: Health Assessment Questionnaire

### Admission HAQ scores

There was a statistically significant ( $p < 0.001$ ) difference between the baseline HAQ score in cohort 1 with 1.94 (SD 0.74) and the baseline HAQ scores in cohorts 2a, 2b and 3; 1.40 (SD 0.74), 1.39 (SD 0.66) and 1.49 (SD 0.59), respectively. All other comparisons among cohorts 2a, 2b and 3 did not reach statistical significance.

### Discharge HAQ scores

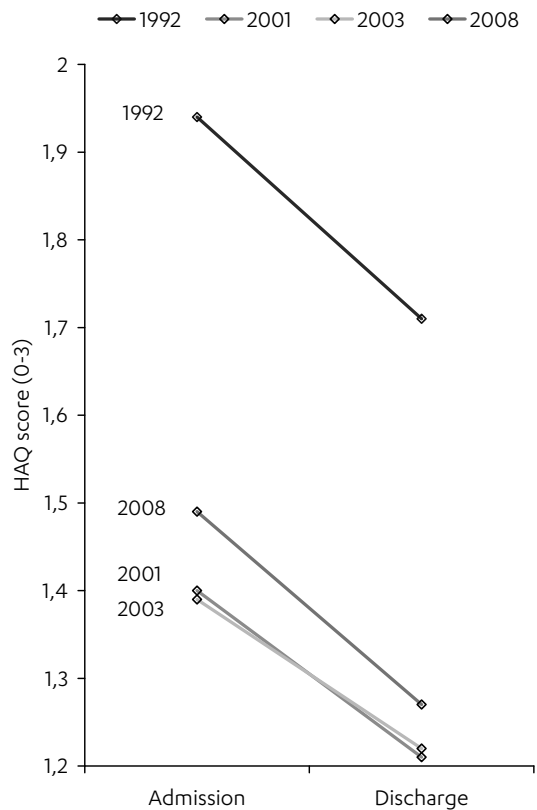
The HAQ score at discharge was significantly higher in cohort 1 with 1.71 (SD 0.78) than in cohorts 2a, 2b and 3; 1.22 (SD 0.79), 1.22 (SD 0.62) and 1.27 (SD 0.69), respectively. The comparisons of discharge HAQ scores among cohorts 2a, 2b and 3 were not statistically significant.

Changes in HAQ scores

Table 1 shows that in all four cohorts, the difference in HAQ score between admission and discharge was statistically significant (cohort 1  $p=0.004$ , cohort 2a  $p=0.005$ , cohort 2b  $p=0.001$ , cohort 3  $p=0.001$ ). None of the differences between the mean change scores among the 4 cohorts reached statistical significance ( $p=0.69$ ). The decrease in mean HAQ scores during admission within the 4 different cohorts is illustrated in figure 1.

FIVE

**Figure 1.** HAQ scores between admission and discharge in four cohorts on multidisciplinary rehabilitation for RA patients



DISCUSSION

This study comparing the levels of functional disability of RA patients admitted for multidisciplinary team in one centre in the Netherlands shows that HAQ scores decreased substantially and significantly between 1993 and 2001 but not thereafter. Whereas the absolute improvements of the HAQ scores between admission and discharge remained constant.

The decrease in HAQ score at admission of RA patients between 1992 and 2001-2003 who are eligible for multidisciplinary rehabilitation is in agreement with the literature showing a decrease over time of disability in comparable cohorts of RA patients [11;12].

It was expected that disability in terms of HAQ continued to decrease between 2003 and 2008 [12]. However, this was not observed and can possibly be explained by the fact that the patients admitted for multidisciplinary rehabilitation concern a subgroup of patients who are experiencing higher levels of disability than the 'general' RA population. The persisting presence of these patients underpin the observation that despite recent pharmacological improvements and their effectiveness in targeting disease activity a considerable proportion patients does not achieve complete remission [19]. Although the present study makes it clear that there is still a group of RA patients with considerable disability, the design of the present study does not allow for an estimation of their absolute number. The number of patients per year included in the cohorts employing similar inclusion criteria does however not point into the direction of a decline.

Despite the decreased HAQ scores at admission the magnitude of the improvement of the HAQ was stable over time. In the literature a clinically relevant improvement of physical functioning is in concordance with an improvement of the HAQ score of 0.21 [20]. The change of the HAQ score seen in the three studies included in the present analysis was close to this improvement in all three studies. As the lower baseline HAQ scores in the later studies leave less room for improvement than the HAQ score of the oldest study the relative improvement in later years may be interpreted as larger than that in earlier studies.

Moreover, it shows that rehabilitation is effective in achieving its aims, more specific in improving functioning. Therefore, multidisciplinary rehabilitation should always be considered for patients with RA who experience problems in multiple important life domains. The HAQ remains an important and reliable instrument to detect pre-post changes in RA patients who receive rehabilitation.

## Limitations

This study has a number of limitations including the fact that the three studies were all conducted in one centre in the Netherlands hampering its generalisability. However, this could also be considered a strength because of the uniformity of the rehabilitation clinic and the indication setting for the included patients over the years.

Although it is likely that functional disability of RA patients has decreased since the introduction of more effective pharmacological therapy, the decrease of the baseline HAQ score with time does not exclude the possibility that the spectrum of problems that RA patients encounter in daily life has shifted. It remains to be established whether the overall burden of the disease has decreased. First the validity of some HAQ items such as the use of taps is debatable. Second the HAQ score mainly comprises items regarding daily activities, in particular self-care. Whereas activities related to employment or sports and leisure activities are underrepresented.

In conclusion, the present study shows that functional ability of RA patients admitted for multidisciplinary rehabilitation decreased between 1992 and 2001 but not between 2001 and 2008. Whereas the absolute magnitude of improvement remained the same.

These results underline the value of multidisciplinary rehabilitation for selected groups of RA patients.

### **Rheumatology key messages**

- Functional disability of RA patients admitted for multidisciplinary rehabilitation decreased between 1992 and 2001
- Improvement in RA patients' functional disability after rehabilitation remained constant between 1992 and 2009
- Even in the biologicals-era RA patients with considerable disability benefit from multidisciplinary rehabilitation

FIVE

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## REFERENCE LIST

1. Luqmani R, Hennell S, Estrach C, Basher D, Birrell F, Bosworth A et al. British Society for Rheumatology and British Health Professionals in Rheumatology guideline for the management of rheumatoid arthritis (after the first 2 years). *Rheumatology (Oxford)* 2009;48(4):436-9.
2. Forestier R, Andre-Vert J, Guillez P, Coudeyre E, Lefevre-Colau MM, Combe B et al. Non-drug treatment (excluding surgery) in rheumatoid arthritis: clinical practice guidelines. *Joint Bone Spine* 2009;76(6):691-8.
3. Vliet Vlieland TP, Zwiderman AH, Vandenbroucke JP, Breedveld FC, Hazes JM. A randomized clinical trial of in-patient multidisciplinary treatment versus routine out-patient care in active rheumatoid arthritis. *Br J Rheumatol* 1996;35(5):475-82.
4. Jacobsson LT, Frithiof M, Olofsson Y, Runesson I, Strombeck B, Wikstrom I. Evaluation of a structured multidisciplinary day care program in rheumatoid arthritis. A similar effect in newly diagnosed and long-standing disease. *Scand J Rheumatol* 1998;27(2):117-24.
5. Tijhuis GJ, Zwiderman AH, Hazes JM, Breedveld FC, Vlieland PM. Two-year follow-up of a randomized controlled trial of a clinical nurse specialist intervention, inpatient, and day patient team care in rheumatoid arthritis. *J Adv Nurs* 2003;41(1):34-43.
6. Christie A, Jamtvedt G, Dahm KT, Moe RH, Haavardsholm EA, Hagen KB. Effectiveness of nonpharmacological and nonsurgical interventions for patients with rheumatoid arthritis: an overview of systematic reviews. *Phys Ther* 2007;87(12):1697-715.
7. Momsen AM, Rasmussen JO, Nielsen CV, Iversen MD, Lund H. Multidisciplinary team care in rehabilitation: On overview of reviews. *J Rehabil Med* 2012.
8. Lard LR, Visser H, Speyer I, vander Horst-Bruinsma IE, Zwiderman AH, Breedveld FC et al. Early versus delayed treatment in patients with recent-onset rheumatoid arthritis: comparison of two cohorts who received different treatment strategies. *Am J Med* 2001;111(6):446-51.
9. Landewe RB, Boers M, Verhoeven AC, Westhovens R, Van de Laar MA, Markusse HM et al. COBRA combination therapy in patients with early rheumatoid arthritis: long-term structural benefits of a brief intervention. *Arthritis Rheum* 2002;46(2):347-56.
10. Krishnan E, Fries JF. Reduction in long-term functional disability in rheumatoid arthritis from 1977 to 1998: a longitudinal study of 3035 patients. *Am J Med* 2003;115(5):371-6.
11. Uhlig T, Kvien TK. Is rheumatoid arthritis really getting less severe? *Nat Rev Rheumatol* 2009;5(8):461-4.
12. Krishnan E, Lingala B, Bruce B, Fries JF. Disability in rheumatoid arthritis in the era of biological treatments. *Ann Rheum Dis* 2012;71(2):213-8.
13. Arnett FC, Edworthy SM, Bloch DA, McShane DJ, Fries JF, Cooper NS et al. The American Rheumatism Association 1987 revised criteria for the classification of rheumatoid arthritis. *Arthritis Rheum* 1988;31(3):315-24.
14. Vliet Vlieland TP, Zwiderman AH, Vandenbroucke JP, Breedveld FC, Hazes JM. In-patient treatment for active rheumatoid arthritis: clinical course and predictors of improvement. *Br J Rheumatol* 1995;34(9):847-53.
15. Verhoeef J, Toussaint PJ, Zwetsloot-Schonk JH, Breedveld FC, Putter H, Vliet Vlieland TP. Effectiveness of the introduction of an International Classification of Functioning, Disability and Health-based rehabilitation tool in multidisciplinary team care in patients with rheumatoid arthritis. *Arthritis Rheum* 2007;57(2):240-8.
16. Klokkeerd M, Hagen KB, Kjekken I, Bremander A, Horslev-Petersen K, Vlieland TV et al. Development of a framework identifying domains and elements of importance for arthritis rehabilitation. *J Rehabil Med* 2012;44(5):406-13.
17. Tijhuis GJ, Zwiderman AH, Hazes JM, van den Hout WB, Breedveld FC, Vliet Vlieland TP. A randomized comparison of care provided by a clinical nurse specialist, an inpatient team, and a day patient team in rheumatoid arthritis. *Arthritis Rheum* 2002;47(5):525-31.
18. Siegert CE, Vleming LJ, Vandenbroucke JP, Cats A. Measurement of disability in Dutch rheumatoid arthritis patients. *Clin Rheumatol* 1984;3(3):305-9.
19. de Punder YM, Fransen J, Kievit W, Houtman PM, Visser H, Van de Laar MA et al. The prevalence of clinical remission in RA patients

- treated with anti-TNF: results from the Dutch Rheumatoid Arthritis Monitoring (DREAM) registry. *Rheumatology (Oxford)* 2012.
20. Kosinski M, Zhao SZ, Dedhiya S, Osterhaus JT, Ware JE, Jr. Determining minimally important changes in generic and disease-specific health-related quality of life questionnaires in clinical trials of rheumatoid arthritis. *Arthritis Rheum* 2000;43(7):1478-87.