# Management of Sick Leave due to Musculoskeletal Disorders

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# Management of Sick Leave due to Musculoskeletal Disorders

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# Chapter 1

# General introduction

## Background

Musculoskeletal disorders are a common problem with almost three quarter of the Dutch population older than 25 years reporting musculoskeletal pain in the past year[1]. Musculoskeletal disorders can lead to functional limitations at work and severe cases may lose their ability to perform their job. About 5% of Dutch people with musculoskeletal disorders in a paid job also reported more than 4 weeks of sick leave due to their disorder[1]. For a small proportion of employees the sick leave period will be much longer. In 2003 25% of all new disability pensions in The Netherlands, granted after one year of sickness absence, were due to musculoskeletal disorders[2]. Sick leave has a high economical impact: for low back pain (LBP) indirect costs due to sick leave, disability pensions, and production loss at work account for 93% of the total costs[3] and for neck pain these indirect costs account for 77% of the total costs[4].

In the Dutch health care system the tasks and responsibilities of curative health care and occupational health care are divided; curative health care providers advise on and give medical treatment and occupational health care providers manage work rehabilitation. The general practitioner is responsible for diagnosis, treatment and, if necessary, referral to (para)medical care. The occupational physician has direct access to the employer, evaluates fitness for work, gives advice on work rehabilitation, and, since 2004, can refer patients to specialist care. Since medical treatment and work rehabilitation are separated in the Netherlands, the GP in primary care and the medical specialist in specialist care do not interfere with work rehabilitation and do not provide certification for sickness absence. In the Dutch occupational disability system, no difference is made between disorders caused by work and disorders with causes outside of the work. A disorder is considered work relevant when it has consequences for work.

Due to the different roles of occupational and curative health care, several physicians can be involved in the management of workers on sick leave and, consequently, the patient may experience some differences in advice.

## Treatment of work relevant musculoskeletal disorders

The International Classification of Functioning, Disability and Health[5] states that physical functioning and disability are important consequences of the presence of a disease. In studies among low-back pain patients it has been well documented

that patients are often not completely recovered on both pain and functional limitations when they returned to work[6]. Several studies among LBP-patients have demonstrated that pain, functional limitations, and sickness absence are related, but return to work after a sick leave episode due to LBP does not necessarily imply full recovery on one of the other dimensions[7-11].

Effectiveness of preventive interventions and treatments is usually measured in pain and/or functional disability. Work disability is a less common outcome measure, even though it causes over 75% of all costs related to neck pain[4] and low back pain[3].

Recovering from a musculoskeletal disorder and concomitant return to work is influenced by several factors. Not only the treatment chosen can have a large impact on the recovery, but also physician activity and work recommendations can influence this process[12].

## Different physicians in the management of work relevant musculoskeletal disorders

The fact that several physicians can advise patients on sick leave due to a musculoskeletal disorder is considered to be one of the factors influencing time to return to work[13-15]. These physicians will advise the patient on functional limitations, however, this advice is given from different points of view. The occupational physician has return to work as his main outcome measure and the curative physician has pain reduction and functional restoration as outcome measures. This can result in different or even conflicting advices to the patient. The curative physician usually does not have enough knowledge of a patient's work and possible adaptations, but he does know the medical background of a patient. The occupational physician knows how and where the work can be modified to the patient's possibilities but might not be aware of the patient's complete medical history.

Since 1998 almost every Dutch employee has access to occupational health care and this has increased the discussion on the need for information exchange between occupational and curative health care. In 1997 the Dutch Association of General Practitioners and the Netherlands Society for Occupational Medicine signed a covenant in which they stated that more collaboration is essential. This was the start of several initiatives to improve the collaboration between curative

and occupational health care. It is believed that better collaboration and better information exchange may limit long-term sick leave due to better-adjusted care[16-19].

## Objectives of this thesis

The primary objectives of this thesis are:

1. What is the association between return to work after a treatment for a musculoskeletal disorder and improvement in pain or functional limitations?
2. What is the effect of a training and protocol in order to improve collaboration between general practitioners and occupational physicians on pain, functional limitations and return to work?
3. How can information exchange between specialist and occupational care be improved?

## Outline of this thesis

Following this general introduction, the thesis is divided into two parts. The first part is more quantitative, whereas the second part is more qualitative in nature. The first part of this thesis concerns factors influencing duration of sick leave for patients with musculoskeletal disorders. Research question 1 is addressed in a systematic review in chapter 2 and in a cohort study in chapter 4. Research question 2 is addressed in a controlled trial in chapter 3.

In chapter 2 a systematic review is presented with the goal to evaluate the effectiveness of different treatments for impingement syndrome on functional limitations and return to work. Impingement syndrome was selected as a relevant disorder since shoulder problems are a well-known cause for medical consultation and sickness absence and, yet, difficult to diagnose. Furthermore, it not known what treatment leads to the best prognosis for return to work for this disorder.
Research question 2 is addressed in a controlled trial in chapter 3. In this trial we studied the effectiveness of a training to improve collaboration between general practitioners and occupational physicians in the management of patients with low back pain.

Chapter 4 describes a cohort study of patients on sick leave due to low back pain. The goal of this study was to clarify if prognostic factors for the course of low back pain and consequent functional limitations were similar to prognostic factors for return to work. Low back pain is often treated within primary care. The

primary goal of health care is to relieve symptoms, work is often mainly considered as the reason for the complaints and not as an important outcome measure.

The second part of this thesis addresses the role of the orthopedic surgeon in the treatment of work relevant musculoskeletal disorders and addresses the third research question.

In chapter 5 we discuss the contribution of the orthopedic surgeon to the management of work relevant musculoskeletal disorders, based on an analysis of referral patterns and the likelihood that the orthopedic surgeon is the principal physician asked about work ability of the patient.

Chapter 6 describes the development of an information exchange form to facilitate and improve information exchange between occupational physicians and orthopedic surgeons. Ten orthopedic surgeons agreed to use this form in practice. In a qualitative study the form was evaluated on functionality and usefulness.

Chapter 7 is a qualitative study, where occupational physicians and orthopedic surgeons were interviewed about collaboration. Topics of the interviews were how they see collaboration as it is now and whether and how it can be improved.

The last chapter of this thesis is a general discussion of the results from the different studies.

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# Chapter 2

# Treatment of impingement syndrome, a systematic review of the effects on functional limitations and return to work

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## Abstract

### Introduction

The goal of this systematic review is to evaluate the effectiveness of different treatments for impingement syndrome and rotator cuff tear on the improvement in functional limitations and concomitant duration of sick leave.

### Methods

A systematic search for clinical trials or controlled studies was conducted with the following text words: should*, rotator cuff, impingement, work, sick leave, disabilit*, function*.

### Results

Nineteen articles were included in this review. For functional limitations, there is strong evidence that extracorporeal shock-wave therapy is not effective, moderate evidence that exercise combined with manual therapy is more effective than exercise alone, that ultrasound is not effective, and that open and arthroscopic acromioplasty are equally effective on the long term. For all other interventions there is only limited evidence.

### Conclusion

We found many studies using range of motion and pain as outcome measures but functional limitations were less often used as an outcome measure in this type of research. Duration of sick leave was seldom included as an outcome measure.

## Introduction

Impingement syndrome (or rotator cuff syndrome) of the shoulder is a common disorder. The cumulative incidence of shoulder complaints in general practice is estimated to be 11.2/1000 patients per year, with impingement being the most frequently recorded disorder; rotator cuff tendonitis and chronic subacromial bursitis account for almost 40%[1].

Many treatments are available for impingement syndrome such as physical therapy, shock-wave therapy, medication, and surgery. In the last decade, several (systematic) reviews on treatment for impingement syndrome were published[2–8]. These reviews compared the effectiveness of treatments on a variety of outcome measures, including pain, range of movement, functional limitations, and return to work. Pain was the most common outcome measure, and some studies also had functional limitations as an outcome measure. Hence, the conclusion on effectiveness of various treatments was primarily based on the combination of these outcome measures. Only one review included return to work as a relevant outcome measure[3].

The International Classification of Functioning, Disability and Health (ICF)[9] demonstrates that physical functioning and disability are important consequences of the presence of a disease. Shoulder complaints are often associated with pain, muscle weakness, or restricted range of motion, and these health outcomes may have an impact on the ability of a patient to function in daily life, e.g. return to work. In studies among low-back pain (LBP) patients, it has been well documented that patients were not completely recovered on both pain and functional limitations when they returned to work[10]. Several studies among LBP patients have demonstrated that pain, functional limitations, and sickness absence are related, but return to work after a sick leave episode due to LBP does not necessarily imply full recovery on one of the other dimensions[11–15]. These results and the ICF model show that functional limitations and work capacity might be more important outcome parameters than the pain experienced by a patient.

Patients frequently ask their occupational physician and medical specialist about their work capacity and what treatment is best to be able to return to work. Many patients may not feel that they can work full time. In one study, 81 patients with a chronic shoulder impingement were asked about their ability to work, and preoperatively 73% felt that they were not able to work full time at their usual job[16]. In order to be able to answer questions on work capacity and time to return

to work, information is needed on the effect of treatment on the patient's functional abilities as well as on the likelihood of return to work.

Pain and range of motion are very important outcome measures for the involved patients. However, the ICF shows that functional limitations and being able to work are also important effect measures. Since pain, function, and return to work do not improve in the same way, it is important to separate these outcome measures and look at the individual and societal impacts of functional limitations and duration of sick leave. Therefore, the goal of this systematic review is to evaluate the effectiveness of different treatments for impingement syndrome on the improvement in functional limitations and concomitant duration of sick leave.

## Methods

### Identification and Selection of the Literature

We conducted a systematic search of literature in Pubmed (1966–April 2004), Embase (1980–April 2004), and Cinahl (1982–April 2004). The following text words were used in the search strategy: should* (truncated), rotator cuff, impingement, work, sick leave, disabilit* (truncated), function* (truncated). We only included clinical trials or controlled studies on impingement syndrome. Excluded were studies reporting on osteoarthritis, rheumatoid arthritis, calcifying tendonitis, or frozen shoulder, and studies on professional athletes, cancer, child [mesh], or animal [mesh].

Impingement syndrome was defined as impingement of the rotator cuff, ranging from tendinosis and bursitis to a rotator cuff tear. This is a combination of stages II and III as defined by Neer[17]. These stages represent a continuum of complaints whereby stage III, the rotator cuff tear, can result from a prolonged stage II; tendinosis or bursitis.

Two reviewers (EF and HM) independently screened the abstracts for potential inclusion. References of retrieved articles and review articles were checked for additional studies to be included.

Two reviewers (EF and JK) independently checked whether all selected studies complied with the inclusion criteria: randomized controlled trials (RCTs), quasi-randomized trials, and controlled trials (CTs) that compare treatments or rehabilitation methods after a treatment for impingement syndrome of the shoulder and have sick leave and/or return to work and/or functional limitations as out-

come measure. Functional limitations were limited to activities of daily living and, thus, range of motion was not considered to be a functional limitation measure.

**Quality Assessment**

For each included study, two reviewers (EF and JK) independently assessed the methodological quality. For methodological quality assessment, a list[18] combining the criteria of the lists of Jadad[19] and Verhagen[20] was used. This list includes criteria on selection bias, performance bias, attrition bias, and detection bias. These are all criteria for the internal validity of a study. Disagreements between both reviewers were solved by consensus. If disagreements persisted, a third reviewer (HM) made the final decision. A study was regarded to be of high quality when a positive score was given to at least 50% of the items.

**Data Extraction and Analysis**

Two reviewers (EF and JK) independently extracted data regarding the sample size, population characteristics, outcome measures on functional limitations and return to work, follow-up, and loss to follow-up. Since the studies were not clinically homogeneous, the results were analyzed using a rating system with levels of evidence[18]. These levels are the following:
Strong evidence: consistent findings among multiple high quality RCTs;
Moderate evidence: consistent findings among multiple low quality RCTs, CCTs and/or one high quality RCT;
Limited evidence: one low-quality RCT and/or CCT; and
Conflicting evidence: inconsistent findings among multiple trials.

Data were analyzed on the improvement in functional limitations and duration to return to work. Also the interaction between functional limitations and return to work was investigated.

Table 1
Methodological Quality Assessment

| Reference | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | Quality score (total '+') | Relative score (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (27) | ? | ? | + | + | - | + | + | + | + | + | + | 8 | 73 |
| (28) | + | + | - | + | + | + | ? | ? | + | + | + | 8 | 73 |
| (21, 22) | + | ? | ? | + | - | + | ? | + | + | + | + | 7 | 64 |
| (25) | ? | ? | + | ? | ? | ? | + | + | + | + | + | 6 | 55 |
| (31) | + | - | - | - | - | + | + | + | + | + | ? | 6 | 55 |
| (24) | + | ? | + | + | - | + | ? | ? | - | + | + | 6 | 55 |
| (37) | + | ? | + | - | - | ? | ? | + | + | + | - | 5 | 45 |
| (32) | + | ? | + | - | - | - | ? | ? | + | + | + | 5 | 45 |
| (35) | ? | ? | + | - | - | ? | ? | + | + | + | + | 5 | 45 |
| (34) | ? | ? | + | - | - | + | ? | + | + | - | + | 5 | 45 |
| (39) | + | + | - | ? | ? | + | ? | ? | + | + | - | 5 | 45 |
| (36) | + | + | + | - | - | ? | ? | ? | - | + | ? | 4 | 36 |
| (33) | ? | ? | + | - | - | ? | ? | + | + | + | - | 4 | 36 |
| (30) | + | - | - | - | - | - | ? | - | + | + | + | 4 | 36 |
| (29) | ? | ? | - | + | + | + | ? | ? | - | + | ? | 4 | 36 |
| (23) | ? | ? | + | + | - | + | ? | + | ? | - | ? | 4 | 36 |
| (26) | ? | ? | ? | ? | ? | ? | ? | + | - | + | + | 3 | 27 |
| (38) | + | ? | + | - | - | - | ? | ? | - | + | ? | 3 | 27 |

1: Was the method of randomization adequate? 2: Was the treatment allocation concealed? 3: Were the groups similar at baseline regarding the most important prognostic indicators? 4: Was the patient blinded to the intervention? 5: Was the care provider blinded to the intervention? 6: Was the outcome assessor blinded to the intervention? 7: Were co-interventions avoided or similar? 8: Was the compliance acceptable in all groups? 9: Was the drop-out rate described and acceptable? 10: Was the timing of the outcome assessment in all groups similar? 11: Did the analysis include an intention-to-treat analysis?

## Results

The literature search resulted in 94 articles. Screening of title and abstract of these articles resulted in 33 relevant articles. Nineteen articles were included in this review. Two articles[21,22] were about the same study, and were thus regarded as one in the analysis, resulting in 18 included studies. Functional limitations were an outcome measure in 16 of the included studies, and the ability to work or return to

work was an outcome measure in four studies, only two studies used both outcome measures.

Several interventions were used in the selected studies; four studies used some form of medication as intervention, seven had a physical therapy intervention of which one study compared this to an operative intervention, three other studies compared two types of operative interventions, and four studies looked at different postoperative physical therapy protocols.

A total of 14 studies were excluded for the following reasons: not about impingement syndrome (N=3), no controlled trials (N=4), and neither sick leave nor functional limitations as outcome measure (N=7).

Table 1 shows the scores on the methodological quality assessment of the included studies; six studies scored a high methodological quality, ranging from six to eight (55–73%) positive items. The remaining 12 studies were of low quality, ranging from three to five (27–45%) positive items. Table 2 presents an overview of all the outcome measures used in the selected studies. Table 3 gives an overview of the included studies and their results, illustrating that the interventions ranged from exercises to surgical procedures.

**Physical Therapy**

Seven studies were found on physical therapy interventions. Two studies compared extracorporeal shock-wave therapy (ESWT) to placebo, two studies compared laser to placebo, and three studies compared exercise therapy to no intervention, to manual therapy, and to both surgery and placebo.

There is strong evidence that extracorporeal shock-wave therapy (ESWT) is no more effective than placebo[21,22,27], moderate evidence that ultrasound therapy is no more effective than placebo[28], and limited evidence that laser is no more effective than placebo[29] with regard to functional limitations.

With regard to the improvement in functional limitations there is limited evidence that exercise is more effective than no intervention[30], and moderate evidence that exercise combined with manual therapy is more effective than exercise alone[31].

Table 2
Instruments used in included studies

| Name | Range | Interpretation |
|---|---|---|
| Constant score | 0 - 100 | Higher score indicates increased function |
| Shoulder Pain and Disability Index (SPADI) | 0 - 100 | Higher score indicates more disabilities and pain |
| Shoulder Rating Questionnaire (SRQ) | 17 - 100 | Higher score indicates increased function and less shoulder symptoms |
| University of California, Los Angeles Shoulder Scale (UCLA) | 2 - 35 | Higher score indicates increased function and decreased pain |
| University of Pennsylvania Shoulder Score (UPenn) | 0- 100 | Higher score indicates increased function |
| VAS functional limitations* | 0 - 10 | Higher score indicates more disabilities |
| Functional Assessment Questionnaire* | 0 - 45 | Higher score indicates increased function |
| 5 ADL-activities: use back pocket; wash opposite axilla; eat with utensils; wash/comb hair; perform toilet functions* | 0 - 2 | |
| Functional limitations scale* | 0 - 3 | Higher score indicates more disabilities |
| Patients reporting difficulties with: sleeping; dressing; working; grooming; sporting* | Yes/no | |
| Work related disability questionnaire * | 1 - 10 | Higher scores indicates more disabilities at work |
| Shoulder function questionnaire* | 0 - 50 | Higher score indicates increased function |

* Self constructed or modified questionnaire

There is limited evidence that for the patients who received treatment as planned there is no difference between exercise, arthroscopic acromioplasty and placebo laser on work status[32]. However, in this study, 25% of the patients receiving exercise and 36% of the patients receiving placebo laser had surgery after 6 months. Their improvement after surgery was comparable to those randomized to surgery.

### Operative Interventions

Three studies were found on operative interventions. All three studies compared open acromioplasty to arthroscopic acromioplasty. With regard to functional disability there is limited evidence that on the short-term arthroscopic acromioplasty is more effective than open acromioplasty[33], and moderate evidence that on the long term there is no difference[34, 35].
There is limited evidence that arthroscopic acromioplasty is more effective than open acromioplasty with regard to time to return to work[33].

### Postoperative Rehabilitation

Four studies were found on postoperative interventions. All four studies compared different forms of exercise therapy. There is limited evidence that there is no difference with regard to functional limitations and duration of sick leave between postoperative supervised exercise therapy and self-training[36]. Also, there is limited evidence with regard to functional disability that there is no difference for the compared forms of postoperative therapy; instruction from a physical therapist compared to video instruction for postoperative self-training[37], for postoperative passive continuous motion compared to manual passive range-of-motion[38], and for postoperative physical therapy with passive continuous motion compared to postoperative physical therapy[39].

## Results - Comparing functional limitations with return to work

The four studies with duration of sick leave or work status at follow-up as a primary outcome measure provided similar evidence with regard to effectiveness as the studies using functional limitations as outcome measure.

Table 3

Results of included studies

| Reference | % quality assessment | Participants | | | | Interventions | Outcomes | Results |
|---|---|---|---|---|---|---|---|---|
| | | N | Mean age (year) | Gender (% male) | Symptom duration (months) | | | |
| **Medication** | | | | | | | | |
| (23) | 36 | 40 | 56.5 | 20 | 8 | (1) Steroid injection N=19 (2 ml 40 mg triamcinolone + 4 ml 1% lidocaine)<br>(2) injection with analgesic N=21 (6 ml 1% lidocaine) | **Functional limitations:**<br>5 ADL-activities[a]<br>Measured at baseline & 30 months.<br>Mean<br>Use back pocket:<br>(1) 0.8, 1.7<br>(2) 0.8, 1.4<br>Wash opposite axilla:<br>(1) 1.2, 1.8<br>(2) 1.2, 1.7<br>Eat with utensils:<br>(1) 1.6, 1.9<br>(2) 1.8, 1.9<br>Wash/comb hair:<br>(1) 1.3, 1.8<br>(2) 1.4, 1.4<br>Perform toilet functions:<br>(1) 1.5, 1.9<br>(2) 1.7, 1.9 | No significant difference |

| Reference | % quality assessment | Participants | | | | Interventions | Outcomes | Results |
|---|---|---|---|---|---|---|---|---|
| | | N | Mean age (year) | Gender (% male) | Symptom duration (months) | | | |
| (24) | 55 | 60 | 53.3 | 36.7 | 2 | (1) Steroid injection N=20 (triamcinolone)<br>(2) oral NSAID N=20 (diclofenac)<br>(3) injection with analgesic N=20 (lidocaine) | **Functional limitations:**<br>Functional limitations scale[b]<br>Measured at baseline & difference baseline-4 wks. Mean (sd).<br>(1) 1.25 (0.19); 0.85 (0.15)<br>(2) 1.55 (0.16); 0.85 (0.11)<br>(3) 1.25 (0.16); 0.30 (0.10) | Steroid (1) improved significantly more than analgesic (3) (p<=0.01)<br>NSAID (2) improved significantly more than analgesic (3) (p<=0.05)<br><br>No significant difference between (1) & (2) |
| (25) | 55 | 78 | 61.0 | 70.5 | 5 | (1) Steroid injection N=40 (38% satisfied, 62% unsatisfied)<br>(2) Injection with sodium hyaluronate N=38 (42% satisfied, 58% unsatisfied) | **Functional limitations:**<br>UCLA<br>Measured at baseline, 4 & 24 weeks.<br>Mean (sd).<br>(1) Satisfied: 11.9 (3.6); 26.5 (2.0); 25.3 (2.5)<br>Unsatisfied: 12.6 (3.9); 15.0 (4.0)<br>(2) Satisfied: 13.6 (2.6); 27.6 (3.1); 26.2 (3.1)<br>Unsatisfied: 12.8 (3.5); 14.9 (4.4) | No significant difference between satisfied groups, satisfied groups improved significantly more than unsatisfied groups (p<0.001)<br><br>No significant difference between number of satisfied patients |

| Reference | % quality assessment | Participants | | | | Interventions | Outcomes | Results |
|---|---|---|---|---|---|---|---|---|
| | | N | Mean age (year) | Gender (% male) | Symptom duration (months) | | | |
| (26) | 27 | 31 | 58.5 | 41.9 | Chronic | (1) Steroid injection N=17 (5ml 0.5% mepivacainhydrochlorid) + 20 mg triamcinolone)<br>(2) Injection with analgesic N=14 (5 ml 0.5% MVH) | RTW:<br>Able to work<br>Measured at 1 year. Percentage.<br>(1) 86%<br>(2) 18% | Significant difference in favor of steroid injection |
| **Physical therapy** | | | | | | | | |
| (21, 22) | 64, 36 | 34 | 52 | 50 | >6 | (1) ESWT N=17 (71% satisfied, 29% unblinded)<br>(2) Placebo N=17 (53% satisfied, 47% unblinded + ESWT) | **Functional limitations:**<br>Adapted Constant Score[c]<br>Measured at baseline, 6 & 12 wks & 1 year. Mean (sd)<br>(1) 40.7 (13.3); 61.0 (29.6); 66.5 (37.9); satisfied: 106.4 (32.6) unblinded: 47.94 (40.6)<br>(2) 42.2 (13.0); 64.2 (25.2); 64.4 (32.7); satisfied: 109.52 (18.7) unblinded + ESWT: 66.44 (41.4) | After 12 weeks no significant difference between ESWT-group and placebo-group.<br>After 12 weeks: unsatisfied patients were unblinded and received ESWT if first treatment was placebo (partial crossover).<br><br>After 1 year no significant difference between the satisfied groups. |

| Reference | % quality assessment | Participants | | | | Interventions | Outcomes | Results |
|---|---|---|---|---|---|---|---|---|
| | | N | Mean age (year) | Gender (% male) | Symptom duration (months) | | | |
| (27) | 73 | 74 | 52.6 | 41.9 | 23 | (1) ESWT N=40<br>(2) Placebo N=34 | **Functional limitations:**<br>SPADI<br>Measured at baseline; 1; 2; 3; & 6 months. Mean (sd).<br>(1) 53.6 (20.2); 48.7 (21.0); 46.1 (22.4); 34.7 (26.6); 24.1 (22.9)<br>(2) 59.5 (16.1); 58.5 (19.7); 48.6 (23.8); 39.7 (27.7); 34.9 (31.7) | No significant difference |
| (28) | 73 | 20 | 53.1 | 40 | 6 | (1) Ultrasound N=11<br>(2) Placebo N=9 | **Functional limitations:**<br>Patients reporting difficulties.<br>Measured at baseline & 4 weeks.<br>Percentage reporting difficulties.<br>sleeping: (1) 64%; 27%<br>(2) 100%; 44%<br>dressing: (1) 73%; 45%<br>(2) 89%; 44%<br>working (1) 45%; 36%<br>(2) 78%; 33%<br>grooming: (1) 73%: 36%<br>(2) 89%: 33%<br>sporting: (1) 73%; 55%<br>(2) 67%; 44% | No significant difference |

| Reference | % quality assessment | Participants | | | | Interventions | Outcomes | Results |
|---|---|---|---|---|---|---|---|---|
| | | N | Mean age (year) | Gender (% male) | Symptom duration (months) | | | |
| (29) | 36 | 35 | 54.4 | 28.6 | 15 | (1) Laser N=19<br>(2) Placebo N=16 | **Functional limitations:**<br>VAS functional limitations.<br>Measured at baseline, 4 & 8 weeks.<br>Mean (sd)<br>(1) 6.5 (0.6); 2.9 (0.6); 3.6 (0.9)<br>(2) 5.7 (0.6); 2.0 (0.8); 2.9 (1.1)<br><br>* Outcomes measured at 4 and 8 weeks are presented as changes with baseline measurements. | No significant difference |
| (30) | 36 | 67 | 48.6 | 100 | - | (1) Home exercise therapy N=34<br>(2) Control group N=33 | **Functional limitations:**<br>Shoulder Rating Questionnaire<br>Measured at baseline & 8-12 weeks.<br>Mean (sd)<br>(1) 65.9 (2.0); 78.0 (2.3)<br>(2) 72.5 (2.0); 71.1 (2.2)<br>Work related disability questionnaire<br>Measured at pretest, posttest (10 weeks)<br>(1) 4.1 (0.3); 2.5 (0.3)<br>(2) 3.8 (0.3); 3.7 (0.3) | SRQ (1) improved significantly more than (2)<br><br>Work related disability: (1) improved significantly more than (2) |

| Reference | % quality assessment | Participants | | | | Interventions | Outcomes | Results |
|---|---|---|---|---|---|---|---|---|
| | | N | Mean age (year) | Gender (% male) | Symptom duration (months) | | | |
| (31) | 55 | 52 | 43.4 | 57.7 | 5 | (1) Supervised exercise therapy with manual therapy N=28<br>(2) Supervised exercise therapy N=24 | **Functional limitations:**<br>Functional Assessment Questionnaire<br>Measured at baseline & 2 months.<br>Mean (sd).<br>(1) 28.3 (4.8); 38.2 (4.7)<br>(2) 28.5 (5.5); 33.3 (7.8) | (1) improved significantly more than (2) (p=0.005) |
| (32) | 45 | 125 | 47.6 | 52.8 | >3 | (1) Supervised exercise therapy N=30<br>(2) Arthroscopic acromioplasty N=45<br>(3) Placebo laser N=50 | **RTW:**<br>Absent from work<br>Measured at baseline, 6 months & 2½ year. Percentage.<br>(1) 43%; 31%; 20%<br>(2) 53%; 38%; 41%<br>(3) 55%; 43%; 36% | No significant difference between groups<br>Differences only for patients who received treatment as planned. After 6 months, 25% of exercise group and 36% of placebo group had surgery. Their improvement after surgery was comparable to those randomized to surgery. They were not included. |

| Reference | % quality assessment | Participants | | | | Interventions | Outcomes | Results |
|---|---|---|---|---|---|---|---|---|
| | | N | Mean age (year) | Gender (% male) | Symptom duration (months) | | | |
| **Operative interventions** | | | | | | | | |
| (33) | 36 | 41 | 49.9 | 56 | 18.7 | (1) Arthroscopic acromioplasty N=22<br>(2) Open acromioplasty N=19 | **Functional limitations:**<br>Return to activities of daily living. Mean.<br>(1) 4 days<br>(2) 9 days<br>**RTW:**<br>Return to work. Mean.<br>(1) 36 days<br>(2) 54 days | No information given on significance |
| (34) | 45 | 62 | 40.9 | - | 40.4 | (1) Arthroscopic acromioplasty N=32<br>(2) Open acromioplasty N=30 | **Functional limitations:**<br>UCLA<br>Measured at baseline & postoperatively[d]. Mean.<br>(1) 17.8; 28.8<br>(2) 16.7; 28.1 | UCLA: no significant difference |
| (35) | 45 | 20 | 43.5 | 65 | 52.8 | (1) Arthroscopic acromioplasty N=10<br>(2) Open acromioplasty N=10 | **Functional limitations:**<br>UCLA<br>Measured at 2 year. Mean (range).<br>(1) 29 (14-35)<br>(2) 29 (21-35) | No significant difference |

| Reference | % quality assessment | Participants | | | | Interventions | Outcomes | Results |
|---|---|---|---|---|---|---|---|---|
| | | N | Mean age (year) | Gender (% male) | Symptom duration (months) | | | |
| **Post operative** | | | | | | | | |
| (36) | 36 | 43 | 46.6 | 60.5 | 40 | (1) Supervised exercise therapy N=21<br>(2) Self training N=22 | **Functional limitations:**<br>Constant<br>Measured at baseline, 3, 6 & 12 months Mean (range).<br>(1) 54 (20-90); 66 (19-92); 76 (42-100); 80 (40-96)<br>(2) 53 (26-81); 69 (30-99); 77 (32-95); 79 (45-100)<br>**RTW:**<br>Sick leave. Mean.<br>(1) 8.0 weeks<br>(2) 8.5 weeks | No significant difference |
| (37) | 45 | 108 | 58.0 | 63.9 | - | (1) Self training with instruction from PT N=54<br>(2) Self training with instruction video N=54 | **Functional limitations:**<br>Measured at baseline, 12, 24 & 52 weeks. Mean (sd).<br>SPADI<br>(1) 52.3 (21.6); 26.7 (18.8); 15.3 (15.2);12.4 (14.4)<br>(2) 60.4 (22.1); 32.0 (19.7): 18.1 (16.1); 12.3 (14.3)<br>UPENN<br>(1) 40.9 (16.3); 66.2 (17.5); 79.6 (17.3); 85.9 (16.7)<br>(2) 37.9 (15.7); 62.6 (17.7); 79.4 (15.5); 85.6 (13.8) | No significant differences |

| Reference | % quality assessment | Participants | | | | Interventions | Outcomes | Results |
|---|---|---|---|---|---|---|---|---|
| | | N | Mean age (year) | Gender (% male) | Symptom duration (months) | | | |
| (38) | 27 | 32 | 63.3 | 43.8 | - | (1) Passive continuous motion N=17<br>(2) Manual passive range-of-motion N=15 | **Functional limitations:**<br>SPADI<br>Measured at most recent follow-up[e]. Percentage in quartiles of the score.<br>(1) Excellent: 88%; good: 6%; fair: 6%; poor: 0%<br>(2) Excellent: 80%; good: 7%; fair: 7%; poor: 7% | No significant difference between groups both on quartiles and on continuous SPADI-score. |
| (39) | 45 | 26 | 55.8 | 69.2 | - | (1) Physical therapy + passive continuous motion N=14<br>(2) Physical therapy N=12 | **Functional limitations:**<br>Shoulder function questionnaire<br>Measured at baseline & 3 months. Mean.<br>(1) 68; 81<br>(2) 75; 88 | No significant difference |

a Five ADL activities (0: unable; 1: able, but with difficulties; 2: able).

b Functional limitations scale (0: no limit; 3: severe limits).

c Adapted constant score: An age- and gender-corrected score was used. Here a score of 105 means a constant-score 5% above the average constant-score for this age group and gender.

d Postoperative measurements took place between 12 and 25 months from baseline measurements.

e Most recent follow-up: mean 22 months (range 6–45).

## Discussion

This review evaluated the effectiveness of different treatments for impingement syndrome on the improvement in functional limitations and concomitant duration of sick leave.

For exercise therapy after an operation for impingement syndrome, several forms of exercise have been compared to each other. All studies showed similar results on functional limitations, suggesting that the presented exercise programs are equally effective.

In the initial search of literature, we found many studies using range of motion and pain as outcome measures, but functional limitations were less often used as an outcome measure in this type of research. Duration of sick leave was seldom included as an outcome measure. Hence, we could compare improvement in functional limitations and duration to return to work for only a few interventions for impingement syndrome. Although recovery on functional limitations is not equal to return to work[11–15], the effectiveness of interventions with regard to ability to work or duration of sick leave does not seem to differ from the effectiveness on functional limitations.

Sick leave is not only a very costly matter for the patient, his employer, and, in the long term, society, it is also expected to have other consequences for the patient. Potential negative consequences include onset of other disorders like depression, impact on career opportunities, and social relationships. A recent review[40] on the consequences of sick leave found that scientific evidence regarding these consequences is insufficient since there are only a few studies on these matters. In this regard, it is recommended to include duration of sick leave more often as an outcome measure. Several studies have compared the use of self-reported data on sick leave duration and data from company records[41–45]. When available, data from company records is more accurate. Self-report questionnaires can be sufficient if the recall period is not too long.

The International Classification of Functioning, Disability and Health (ICF)[9] was published in 2001 as a revision of the International Classification of Impairment, Disability and Health (ICIDH). The ICF presents a complex system of the patient and his environment and shows that a questionnaire or measure for functional disability should measure what one is capable to do as well as the influences of this capability on other measures such as ability to work and autonomy. These different aspects of functional disability can be measured by domains like pain,

symptoms, physical functioning, emotional functioning, and social functioning. The review by Bot[46] showed that most questionnaires do not cover all domains, and some only cover part of these domains. Different questionnaires measure functional disability in different ways, thus many constructs to measure functional limitations are available. The included studies used six available questionnaires and seven self-constructed questionnaires. The Neer-classification[17] was not used in this study. This classification was used in some articles, but in clinical practice this distinction is not that clear.

A combination of clinical shoulder tests[47] or MRI or ultrasound[48] can be used to correctly diagnose a full thickness rotator cuff tear, but partial tears were less accurately diagnosed by these tests. The diagnostic accuracy of physical examination tests varies for the different stages[49]. These tests also lack specificity in comparison with arthroscopic findings[50]. The studies used in this review used a combination of diagnostic tests, and described the diagnosis, not the stage within the Neer-classification. Most of the studies were on impingement; only four studies compared an intervention only for tears of the rotator cuff. In this review, the diagnosis of impingement is regarded to be a continuum, also because similar interventions were used for tears and impingement.

**Methodological considerations**

Similar to previous reviews, this review did not result in sound evidence indicating the best treatment for patients with impingement syndromes. This review was not limited to a specific type of treatment, but to the outcome measures functional limitations and return to work.

We chose to include only clinical trials in our review, since these studies often have a better methodological quality than prognostic studies. However, only 6 of the 18 studies were regarded to be of high quality. All included studies were randomized controlled trials. In 60% of the studies where we could not assign a positive score to an item, we were unable to retrieve the necessary information from the article. The treatment allocation and co interventions were most often not mentioned in the article. Not blinding the care providers occurred in 70% of the studies.

Since there is a lack of high-quality studies with regard to the used outcome measures to answer our research question, it might be useful to do a prognostic review to give an indication of time to functional recovery and time to return to work after a certain intervention.

### Conclusion

Since pain, functional disability, and ability to work do not improve in the same way, it is important to distinguish pain from functional disability and ability to work. The aim of this review was to give an indication of the course of improvement in functional limitations and of the duration to return to work after a treatment for impingement syndrome. Contrary to our expectations, functional limitations were not a common outcome measure. We found many studies using range of motion and pain as outcome measures but functional limitations were less often used as an outcome measure in this type of research. Also duration of sick leave or work status was seldom included as an outcome measure. Future studies on the effectiveness of a treatment for impingement syndrome should include functional limitations and duration of sick leave more often as an outcome measure.

There is moderate evidence that exercise combined with manual therapy is more effective than exercise alone. There is limited evidence for the effectiveness of the following interventions: exercise is more effective than no intervention on functional limitations, oral diclofenac is more effective than analgesic injections, both on functional limitations and on ability to work after 1 year. On the short term, arthroscopic acromioplasty is more effective than open acromioplasty with regard to functional limitations and return to work. However, moderate evidence exists that on the long term open and arthroscopic acromioplasty are equally effective with regard to functional limitations.

There is strong evidence that extracorporeal shock-wave therapy is not effective and moderate evidence that ultrasound is not effective. For all other interventions there is only limited evidence that the interventions do not differ in their effect on the improvement in functional limitations.

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# Chapter 3

# In a controlled trial training general practitioners and occupational physicians to collaborate did not influence sick leave of patients with low back pain

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## Abstract

### Objective

The objective of this study was to determine the effectiveness of a training to increase collaboration between general practitioners and occupational health physicians in the treatment of patients with low back pain (LBP) because more collaboration might improve a patient's recovery and shorten sick leave.

### Methods

In a controlled trial, the intervention in one region was compared with usual care in a control region. Participating physicians enrolled patients with LBP on sick leave for 3–12 weeks. Patients filled out three questionnaires: at inclusion, at 3 months, and at 6 months. Information on sick leave was gathered from occupational health services. All analyses were performed on an intention-to-treat basis.

### Results

Fifty-six patients with LBP were enrolled in each region. There was little collaboration between physicians during the project. Patients in the intervention region returned to work significantly later ($P = .005$) but were significantly more satisfied with their occupational health physician ($P = .01$). No differences were found between the intervention and control patients for pain, disability, quality of life, and medical consumption.

### Conclusion

Our study does not show a positive effect of the training to increase collaboration between general practitioners and occupational health physicians. The training may not have improved collaboration enough to influence the prognosis of LBP.

## Introduction

Low back pain (LBP) is a common reason for sick leave and work disability. In The Netherlands, the period prevalence during 12 months of self-reported LBP in the general population was 44% in 1998; 6% of these people were on sick leave for more than 4 weeks in the past year because of LBP[1].

Each company in The Netherlands is obliged to offer their employees access to occupational health care. The occupational health physician (OP) is usually only consulted by employees on sick leave. The OP evaluates fitness for work and is required by law to make a proposal for reintegration activities if the expected sick leave will exceed 6 weeks. Every person is registered with a general practitioner (GP), usually in his or her hometown. People consult their GP on their own initiative. The GP is responsible for diagnosis, treatment, and, if necessary, referral to (para)medical care. It is not their task to provide certification for sickness absence or to evaluate fitness for work resumption[2]. Due to the different roles of the OP and the GP, most people on sick leave because of LBP visit the GP and the OP and may experience some differences in advice.

Because the GP and the OP give advice to people on sick leave on different aspects of their health problems, several studies have recommended more collaboration between these physicians[3-5]. When physicians collaborate more and coordinate their treatment and rehabilitation, the patient receives coordinated advice. It is expected that this will improve the recovery of the LBP patient and, as a consequence, may shorten the sick leave period. The Dutch Association of General Practitioners and the Netherlands Society for Occupational Medicine signed a covenant in 1997 in which they stated that more collaboration is desirable and essential. In practice, however, there is hardly any collaboration[3, 4], although physicians have stated that they appreciate its potential benefits, believe that the quality of their own work could improve, and that collaboration may lead to a shorter duration of sick leave for the patient[3]. There are various reasons for the observed lack of collaboration in the Netherlands. One important reason is the difference in professional responsibility between the GP and the OP. Other reasons are more practical, such as lack of time or not knowing whom to call, and social psychological reasons, such as a mutual lack of trust[3, 4, 6].

Few evaluation studies on collaboration are available. A recent systematic review on interprofessional education[7] confirmed this lack. Therefore the current study aimed to determine the effectiveness of a training designed to increase col-

laboration between GP and OP in the treatment of patients with LBP in a controlled clinical trial.

## Methods

### Participants

All GP and OP in two regions in the province Zuid Holland were sent a letter explaining the purpose of this study and asking them to participate. Within 4 weeks after this mailing, we telephoned all GP and OP to provide additional information. In each region we anticipated that 25 GP and 25 OP would enroll patients in the study. We asked the physicians to prospectively select patients for the study according to the following inclusion criteria: (1) Employees on sick leave due to nonspecific LBP, (2) duration of sick leave of at least 3 weeks and at most 12 weeks, (3) first sick leave for this episode of LBP, and (4) before this episode of LBP at least one pain-free month.

### Intervention

The intervention consisted of a 4-hour training course for GP and OP. In this joint course the physicians learned to work together based on a collaboration protocol for the treatment of patients with LBP.

This protocol was derived from the clinical guidelines on LBP for GP[8] and OP[9] and a primary version of a guideline for collaboration between GP and OP[10]. It defines the moments at which collaboration is useful. Both sets of clinical guidelines are similar with respect to diagnosis and options for curative interventions. According to these guidelines, the physicians will treat patients with LBP time contingent and focus on activation and reintegration.

The protocol was distributed in two versions, one for GP and one for OP. Each protocol described the policy for the physician according to his or her own guidelines and suggested moments and context of collaboration. The indication for collaboration was the same in both versions. During the first 6 weeks of LBP, collaboration was regarded necessary when the physician was uncertain about the policy of the colleague physician or about the prognosis of the complaints. Collaboration was recommended after 6 weeks of LBP unless the policy of the other physician was clear or the LBP had resolved sufficiently. The physicians should always contact each other about additional interventions if a patient had LBP for more than 12 weeks.

After the training course in which the physicians learned to work with the protocol, two noncompulsory follow-up sessions of 2 hours each were offered. In these sessions the physicians could practice using the protocol with case studies and were given the opportunity to discuss their daily practice and difficulties encountered with regard to patients with LBP or to the proposed collaboration.

**Design**

The present study involved a controlled clinical trial in two comparable industrial regions in one county in the Netherlands separated by a distance of 30 km. It was not possible to randomize the patients' level because the intervention was targeted at physicians. It was also not possible to randomize the physicians because occupational health services have a regional structure and because typically within one region an OP has contacts with several GP. To avoid contamination in the control group, two separate regions were selected.

In the intervention region, the GP and OP received the joint training course. In the control region, we asked the physicians to continue working according to their usual procedures. They were informed that they would receive the same training course as the one given to the intervention group, albeit after the follow-up period.

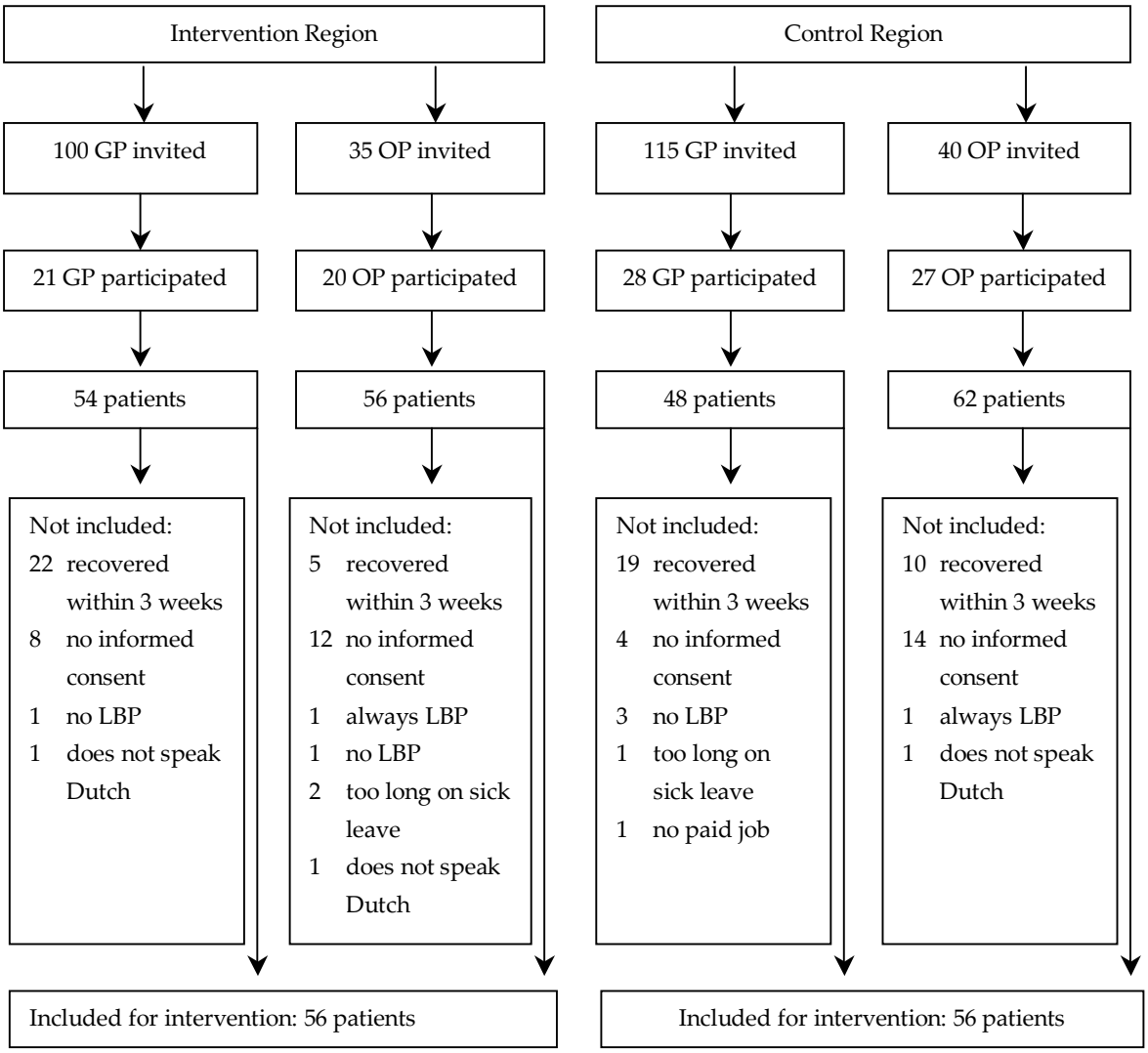
All patients with a new episode of LBP visiting a participating GP or OP were informed about the project by their physician and were given written information. If the patients agreed, their name and telephone number were faxed to the researchers, who telephoned the patient and checked whether the patient met the inclusion criteria. If so, he or she received a questionnaire and an informed consent form.

The patients in both regions were followed for 6 months. During this period, the patients received three questionnaires: one at inclusion, one after 3 months, and one after 6 months. The physicians completed a checklist at each consultation with a participating patient.

The patients were not informed whether their physician had followed the course or not; the researcher was not blinded for this information.

Figure 1

Recruitment of physicans and patients, and reasons for exclusion of patients




**Baseline and outcome measures**

The patient's characteristics were recorded at baseline. Outcome measures were recorded at baseline and at 3- and 6-month follow-up. The baseline characteristics were age, gender, weight, level of education, sporting activities, driving a vehicle, psychological factors (General Health Questionnaire[11]), coping (Utrecht Coping List[12]), fear of movement (Tampa questionnaire[13]), history of LBP, and work characteristics. Work characteristics included type of work, number of working hours per week, psychosocial job characteristics (Karasek Questionnaire[14]), physical job characteristics, and physical effort (Borg Scale[15]). The physicians registered their prognosis on the patient's LBP complaints.

The primary outcome measures were severity of back pain (VAS[16]), functional disability (Roland-Morris Disability Questionnaire[17]), and duration of sick leave. Data on the duration of sick leave were collected from occupational health services, and time to return to work was defined as the period between inclusion and return to work in the original job without reduced duties. Frequency of collaboration was derived from the physicians' checklists. Secondary outcome measures included general health status (EuroQol[18]), patient satisfaction[19], and medical consumption. Medical consumption was assessed as number of visits to the GP, number of visits to the OP, number of visits to a physical therapist, use of medication, receiving an x-ray, and visits to complementary medicine.

**Statistical analysis**

SPSS version 10.01 and SAS version 8.02 were used for the statistical analyses of the data. All statistical tests were two-sided, and all P-values were set at .05 before study and analysis. All analyses were performed on an intention-to-treat basis and were adjusted for age and gender.

All continuous variables were tested with the Student's *t* test and with the Mann-Whitney test in cases of non-normal distributions. All categorical variables were tested with the chi-square test.

Linear mixed model for analysis of variance with repeated measures was used to compare the outcome measures disability, quality of life, and severity of pain at the two follow-up moments. To determine which variables influenced the outcome measure, we performed a manual backwise selection procedure ($P < .20$) with region, age, and gender and with those variables on which the groups at baseline differed with $P < .20$. Disability, quality of life, and severity of pain at follow-up were analyzed for every patient returning at least one follow-up questionnaire.

Differences in time to return to work were assessed with Cox regression analysis. First, we performed univariate analyses with different baseline variables. Only variables that influenced time to return to work in the univariate analyses with $P < .20$ were included in the multivariate analysis. To determine which of these variables influenced the outcome measures, a multivariate Cox regression analysis was performed with a stepwise selection procedure ($P < .20$), with region, age, gender, and the independent variables that were related to the outcome in the univariate analyses.

Table 1

Baseline characteristics of the study population

| Characteristic | | Intervention group (n=56) | Control group (n=56) |
|---|---|---|---|
| *Patient characteristics* | | | |
| Age in years, mean (SD) | | 42 (11.0) | 42 (9.3) |
| Male, n (%) | | 40 (71) | 44 (79) |
| Quetelet index, mean (SD) | | 26 (2.9) | 26 (4.5) |
| Sporting, n (%) | | 19 (34) | 18 (32) |
| Education, n (%) | Low | 34 (62) | 46 (82) |
| | Medium | 13 (24) | 8 (14) |
| | High | 8 (15) | 2 (4) |
| *Psychological characteristics* | | | |
| Fear of movement (Tampa), mean (SD) | | 39 (6.9) | 40 (6.0) |
| General health questionnaire, mean (SD) | | 2 (1.8) | 2.6 (2.4) |
| Utrecht Coping List | | | |
| Handle active, mean (SD) | | 10 (3.0) | 10 (3.7) |
| Seek social support, mean (SD) | | 8 (1.8) | 8 (2.0) |
| *LBP-related characteristics* | | | |
| Recurrent LBP, n (%) | | 32 (57) | 35 (63) |
| Radiating LBP, n (%) | | 42 (75) | 40 (71) |
| Duration of LBP in weeks, median (IQR) | | 8 (4.1–93.6) | 6 (3.9–18)[a] |
| Other complaints on the musculoskeletal system, n (%) | | 31 (55) | 36 (64) |
| Functional disability (Roland Dis. Quest.), mean (SD) | | 13 (4.2) | 13 (4.1) |
| Physician's prognosis: LBP shorter than 12 wk, n (%) | | 43 (75.4) | 49 (86.0) |
| Medical consumption, last 6 wk | | | |
| Visits to GP, mean (SD) | | 2.37 (1.1) | 2.45 (1.5) |
| Visits to OP, mean (SD) | | 1.43 (1.0) | 1.79 (1.1) |
| Visits to exercise therapy, median (IQR) | | 5.0 (2.0–9.0) | 4.0 (1.0–7.8) |
| *Work-related characteristics* | | | |
| Working hours, mean (SD) | | 37 (9.1) | 37 (11.7) |
| Years experience with current employer, median (IQR) | | 7 (3–13.5) | 12 (5.3–18)[b] |
| Blue-collar workers, n (%) | | 50 (89.3) | 43 (76.8) |
| Score on job control (Karasek), mean (SD) | | 97 (29.1) | 101 (33.5) |
| Score on job demand (Karasek), mean (SD) | | 43 (12.9) | 44 (14.6) |
| High demand/low control at work (Karasek), number (%) | | 13 (23) | 17 (30) |
| Shift work, n (%) | | 11 (20) | 20 (36)[a] |
| *Physical workload* | | | |
| Regular lifting, n (%) | | 11 (20) | 17 (30) |
| Awkward posture, n (%) | | 17 (30) | 28 (50)[b] |
| Static load, n (%) | | 40 (71) | 36 (64) |
| High effort, n (%) | | 33 (59) | 42 (75)[a] |

[a] Significant difference between intervention and control group ($P < .1$).

[b] Significant difference between intervention and control group ($P < .05$).

## Results

### Participants

A total of 21 GP and 20 OP in the intervention region and 28 GP and 27 OP in the control region agreed to participate. In the intervention region, one GP did not participate in the joint training but was informed by his colleague in the shared practice. All OP participated in the training. The first follow-up sessions were attended by 11 GP (52%) and 15 OP (75%), and the last follow-up sessions were attended by five GP (25%) and nine OP (45%).

Patients were enrolled in the study by 35 (85%) of the physicians in the intervention region and by 35 (64%) of the physicians in the control region; in total they enrolled 220 patients. Of these patients, 112 met the inclusion criteria and returned an informed consent form. Figure 1 shows the reasons and number of patients excluded from each group. The intervention group and the control group included 56 patients each.

The baseline characteristics of the included patients are given in Table 1. Although the groups were similar in most aspects, there were some significant differences. Compared with the control group, patients in the intervention group reported LBP over a longer period before inclusion, worked for a shorter period of time with their current employer, conducted irregular shift work less often, worked in awkward postures more often, and had a greater physical effort.

Data on sick leave were available for all participating patients. However, not all patients completed all three questionnaires (baseline and 3-month and 6-month follow-up). In the intervention group, 77% ($n = 43$) of the included patients completed all three questionnaires, and 14% ($n = 8$) completed only two. In the control group, 79% ($n = 44$) of the patients completed all questionnaires, and 14% ($n = 8$) of the patients completed only two. In total, 51 (91%) patients in the intervention group and 52 (93%) patients in the control group returned at least one follow-up questionnaire. In the intervention region, the patients who did not return any follow-up questionnaire were significantly younger than the patients who did return follow-up questionnaires ($P < .01$). In the control region, there was no difference between the four patients not returning follow-up questionnaires and those returning questionnaires.

Table 2

Results of the general linear mixed model for pain, functional disability, quality of life, and satisfaction of patients

| Variable | Intervention group (n = 51) Mean (SD) | Control group (n = 52) Mean (SD) | Estimate difference for regions (SE) | P value |
|---|---|---|---|---|
| **Pain last week** | | | 0.91 (4.30) | 0.83 |
| Baseline | 59.0 (20.1) | 61.5 (16.8) | | |
| 3 months | 36.1 (25.3) | 37.0 (25.4) | | |
| 6 months | 29.9 (22.0) | 35.8 (25.6) | | |
| **Pain last 24 hr** | | | 3.86 (4.12) | 0.35 |
| Baseline | 50.5 (22.0) | 53.9 (16.2) | | |
| 3 months | 35.9 (24.2) | 35.9 (25.9) | | |
| 6 months | 26.6 (23.8) | 35.7 (26.6) | | |
| **Functional disability** | | | 0.56 (1.12) | 0.62 |
| Baseline | 13.4 (4.2) | 12.8 (4.1) | | |
| 3 months | 7.2 (5.5) | 6.5 (6.1) | | |
| 6 months | 5.4 (5.6) | 6.4 (5.8) | | |
| **Quality of life** | | | −0.005 (0.05) | 0.93 |
| Baseline | 0.64 (0.22) | 0.56 (0.27) | | |
| 3 months | 0.70 (0.25) | 0.70 (0.26) | | |
| 6 months | 0.76 (0.21) | 0.71 (0.30) | | |
| **Satisfaction with GP** | | | −2.40 (3.07) | 0.44 |
| 3 months | 70.7 (12.9) | 67.0 (14.2) | | |
| 6 months | 73.6 (20.6) | 65.0 (18.4) | | |
| **Satisfaction with OP** | | | −11.71 (4.07) | 0.01 |
| 3 months | 65.8 (16.9) | 51.0 (17.2) | | |
| 6 months | 65.9 (13.4) | 53.9 (21.3) | | |

Variables are adjusted for: time of measurement, age, gender, level of education, duration of low back pain before inclusion, shift work, and the baseline value for the outcome variable (except for satisfaction which was not measured at baseline). Other baseline characteristics did not influence the outcome measure.

### Frequency of collaboration between physicians

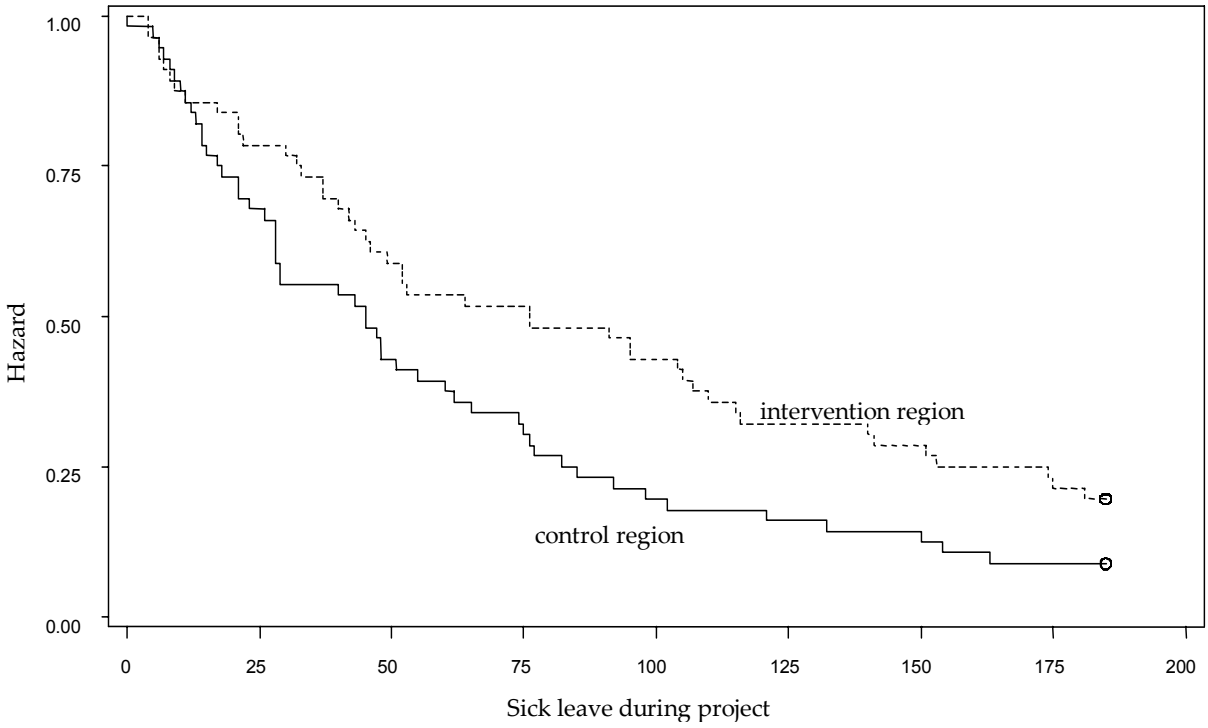
During the 6-month follow-up period, no GP contacted an OP in either region for any of the participating patients. In the intervention region, OP contacted

a GP concerning seven patients (12.5%), whereas in the control region contact was made concerning two patients (3.5%). The difference was not significant.

**Duration of sick leave**

Figure 2 shows the return-to-work curves for the two patient groups. Table 3 shows the results of the Cox regression analysis. The control group had a significantly quicker return to work than the intervention group. In the control group, the median duration for sick leave during the project was 45 (range 17–83) days, compared with 76 (range 33–164) days in the intervention region. The hazard ratio (HR) for return to work differed significantly between both groups (HR = 0.52) in favor of the control group after adjustment for age, gender, duration of sick leave before inclusion, high demand/low control at work, recurrent LBP, quality of life, duration of LBP before project, functional disability, and fear of movement. Other baseline characteristics had no influence on the duration of sick leave.

Figure 2
Kaplan-Meier survival curve. Time to return to work for patients in the intervention region and the control region, univariate.



**Back pain, disability, quality of life, and satisfaction with treating physician**

Pain, disability, quality of life of patients, and patient satisfaction with the treating physician are presented in Table 2. Both groups improved equally on pain, disability, and quality of life during the 6-month follow-up period. These variables were adjusted for time of measurement, age, gender, level of education, duration of LBP before inclusion, and shift work. The variables pain, disability, and quality of life were also adjusted for the baseline value for the outcome variable. Other baseline characteristics had no influence on the outcome measure during follow-up. Patients in the intervention region were significantly more satisfied with their OP than patients in the control region, with a difference of 14.8 points after 3 months and 12.0 points after 6 months on a 100-point scale. This difference was not explained by baseline characteristics.

Table 3
Hazard ratios for sick leave during project: comparison between the intervention region and the control region[a]

| **Variable** | Univariate | | Multivariate | |
|---|---|---|---|---|
| | Hazard Ratio[b] | P value | Hazard Ratio | P value |
| Intervention region | 0.63 | 0.03 | 0.52 | 0.01 |
| Age | 1 | 0.97 | 1 | 0.98 |
| Male | 1.47 | 0.12 | 1.49 | 0.15 |
| Sick leave before inclusion | 0.99 | 0.11 | 0.99 | 0.23 |
| High demand/low control at work (Karasek) | 0.63 | 0.06 | 0.64 | 0.08 |
| Recurrent LBP | 1.34 | 0.17 | 1.44 | 0.12 |
| Quality of life (0–1; higher means better health state) | 1.78 | 0.15 | 1.74 | 0.2 |
| LBP acute, subchronic, or chronic | 0.84 | 0.17 | 0.83 | 0.15 |
| Functional disability (0–24; higher means more disabled) | 0.92 | 0.00 | 0.93 | 0.01 |
| Fear of movement (17–68; higher means more fear of movement) | 0.98 | 0.15 | 0.97 | 0.08 |

[a] Intervention group, $n = 56$; control group, $n = 56$.

[b] Hazard ratio >1 means that the mentioned covariate has a positive impact on return to work.

### Medical consumption

Data on medical consumption during the 6-month follow-up period are given in Table 4. Almost all patients visited their GP and OP during the project, and almost all patients visited a physical therapist. More than 80% of patients used some kind of medication, and more than 40% of patients received an x-ray for their LBP. None of these outcomes differed significantly between the intervention group and the control group.

Table 4
Medical consumption during the project

| Variable | Intervention group (n = 51) | Control group (n = 52) | P value |
|---|---|---|---|
| Patients visiting GP, n (%) | 49 (96.1) | 49 (94.2) | .57 |
| Patients visiting OP, n (%) | 50 (98.0) | 50 (96.2) | .66 |
| Patients visiting physical therapist, n (%) | 49 (96.1) | 49 (94.2) | .66 |
| Patients visiting specialized RTW intervention; n (%) | 4 (7.8) | 3 (5.8) | .68 |
| Patients receiving x-ray, n (%) | 25 (49.0) | 19 (36.5) | .28 |
| Patients using medication, n (%) | 42 (82.4) | 45 (86.5) | .56 |
| Patients using complementary medicine, n (%) | 4 (7.8) | 3 (5.8) | .68 |
| Visits to GP, median (IQR) | 4.0 (2.0–5.0) | 4.0 (2.0–6.0) | .89 |
| Visits to OP, median (IQR) | 3.0 (2.0–6.0) | 4.0 (2.0–6.0) | .78 |

## Discussion

This was the first controlled study on a training program aimed to increase collaboration between GP and OP for the management of LBP patients. The results of this study do not indicate positive effects of the training on patient-related outcomes.

There was somewhat more contact between the physicians in the intervention region than in the control region, but this was less than expected according to the protocol. In the intervention region, there was contact concerning seven patients, whereas 15 patients visited a participating GP or OP when their LBP had persisted for more than 12 weeks. In the control region, the physicians had contact concerning two patients. Here, 13 patients visited their physician when their LBP

persisted for more than 12 weeks. According to the protocol, we expected at least 15 contacts in the intervention region because the physicians should have contacted a colleague physician to discuss additional interventions for these patients. Studies have shown that one of the main reasons for noncollaboration is that GP may misunderstand the role and priorities of OP[3-5]. In another study, the OP held the view of the treating physician regarding return to work for the patient as an important inhibitory factor[20]. We aimed to address these two factors in our training program. The intervention in this study might have changed the view of the participating physicians about each other's occupation but did not result in a real change in behavior. The GP's management of LBP in The Netherlands already meets the LBP guideline to a large extent[21], and this may make it more difficult to improve LBP management. Another recently published study on promoting active sick leave showed that it is not likely that an education workshop for GP would result in measurable economic benefits or improved health outcomes at the population level[22]. Overall, changing behavior is difficult and takes time. A more intensive intervention or a different implementation strategy may be required to improve the collaboration.

We observed no effect of the intervention on the improvement of complaints over time, which can be explained by the fact that the GP is responsible for the treatment of complaints. The OP does not treat the patient but compiles a reintegration plan together with the patient and gives advice about work adaptations and reintegration interventions, such as graded activity or back schools. Because the intervention was directed to the physicians and not to the patient, the lack of difference on disease-specific outcomes might be expected. The two groups of patients, unexpectedly, differed significantly regarding the duration of sick leave, with patients in the control group returning to work significantly earlier than patients in the intervention region. Because we conducted a nonrandomized controlled trial, we carefully analyzed prognostic indicators influencing the course of LBP and related disability. We measured, among others factors, psychological factors, history of LBP, the physician's prognosis of the complaints at inclusion, and work characteristics at baseline. Similar characteristics have shown to predict LBP outcomes[23]. However, these characteristics did not explain the observed difference in duration of sick leave. Another possible explanation is that physicians in the intervention region included patients with expected longer duration of sick leave because those patients would require collaboration between the GP and the OP. Such differential inclusion is not likely because duration of sick leave at the time of

inclusion did not differ between intervention and control region and between GP and OP. The physician's prognosis of the patient's LBP at baseline was the same in the intervention and the control groups. Overall, we argue that both groups at baseline had similar profiles, and we were able to adjust for the few variables on which the groups differed. However, it is possible that the groups might have differed on factors that we did not measure (e.g., existing attitudes within the companies toward sick-listed employees). Our finding might also indicate that our and similar interventions do not shorten the duration of sick leave of patients because the process of collaboration may induce longer management periods and waiting times. This hypothesis needs further investigation.

The intervention may have influenced a more care-related outcome: Patients in the intervention group were significantly more satisfied with the treatment from their OP than patients in the control group. There was no difference between the groups on their satisfaction with the GP. Because we did not measure the satisfaction with the physicians before the intervention, we do not know whether this was a pre-existing difference or a result of the intervention. Another possible explanation might be that appreciation of the role of OP increases with prolonged sickness absence, as was observed in the intervention group, because the difference in satisfaction over treatment only occurred toward the OP.

**Methodological considerations**

We were not able to randomize on the patients' level due to the kind of intervention we wanted to test (i.e., a training for physicians who were supposed to collaborate in one region). Also, we were not able to randomize at the physicians' level to avoid contamination in the control group. In one region, typically, an OP has contacts with various GP. In a nonrandomized design, the probability that there is a difference between the two groups is much larger than in a randomized design. The methodologically most correct design for studying the effects of the intervention under study is to randomize regions, for which a huge nation-wide trial would be needed. We used a more feasible, methodologically second-best, controlled-trial design.

In our study the intervention did not have a positive impact on the prognosis of patients with LBP. Given the limitations in our controlled trial, additional randomized trials may be needed to corroborate our findings.

### Conclusion

The results of this study show that the training given to the physicians did not result in an improvement on the prognosis of LBP patients. We do not know whether the observed differences between the patient groups regarding sick leave were due to the effect of the intervention or to unaccounted differences between both regions. For improvement of the prognosis of patients with LBP, we do not recommend to implement the intervention in its present form into clinical practice. However, more intense or varied programs may need to be developed and evaluated in future trials to see whether such collaboration improves the prognosis of patients with LBP.

## Acknowledgments

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# Chapter 4

# Determinants for improvement in different back pain measures and their influence on the duration of sickness absence

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## Abstract

### Study Design.

Prospective cohort study.

### Objective.

To identify the determinants for improvement in pain, functional limitations, and quality of life in low back pain (LBP) patients, and to evaluate whether return to work (RTW) can be predicted by these factors and associated improvement in health-related aspects.

### Summary of Background Data.

It is unclear to what extent prognostic factors for the course of LBP and consequent functional limitations are similar to prognostic factors for RTW.

### Methods.

A total of 103 LBP patients on sickness absence for 3 to 12 weeks filled out three questionnaires: at inclusion, and after 3 and 6 months. Information on the duration of sickness absence was gathered from occupational health services.

### Results.

Different personal characteristics determined pain, functional limitations, and quality of life at baseline. These dimensions all improved over time, significantly during the first 3 months. Working at 3 months had a positive impact on all three dimensions. In the multivariate model, RTW was positively associated with male gender and recurrent LBP, whereas it was negatively associated with the level of functional limitations at baseline.

### Conclusion.

Except for male gender, the primary determinants for improvement in pain, functional limitations, and quality of life were not associated with RTW. Although there is a large coherence in the improvement in the outcome measures, RTW seems primarily determined by the level of experienced functional limitations.

## Introduction

Low back pain (LBP) is a common cause of morbidity and associated functional limitations. In the Netherlands, the 12-month period prevalence of self-reported LBP in the general population was estimated to be 44%, about one third of these patients visited their general practitioner (GP) for this complaint, and almost 25% reported sickness absence due to this complaint in the past year[1]. Among those visiting their GP, about 90% will have stopped consulting their GP after 1 month. However, only 25% of LBP patients who have visited their GP are free of complaints 1 year later[2]. A review of the long-term course of LBP showed that about 62% of the patients still experienced some pain after 12 months[3]. Of all patients on sickness absence due to LBP, 80% are usually back to work within 6 weeks[4]. However, Evanoff[5] showed that return to work (RTW) is not necessarily the same as being free of complaints. These findings illustrate that not consulting a GP does not mean that a person no longer has LBP, and that returning to work is not the same as being fully recovered from an LBP episode.

When RTW is not the same as recovery, then what is their relationship? Several studies among LBP patients have demonstrated that pain, functional limitations, and sickness absence are related[6–8], but improvement in one dimension of LBP does not necessarily imply a better status on another dimension. Although pain intensity and functional limitations predicted prolonged duration of sickness absence[9] little is known about the opposite effect whereby RTW may have a positive influence on further improvement in health status. Wasiak[10] found that longer durations of the initial episode of care or work functional limitations were powerful predictors of recurrence, thus implying that shorter episodes of care and early RTW contributes to better outcomes. Evanoff[5] reported that many workers experienced continuing difficulties in performance at work after return to full duty. Quality of life, experienced pain, and functional limitations showed further improvements after RTW, albeit the latter two parameters remained lower than expected. These studies suggest that RTW and full recovery are different outcomes of an LBP episode. Therefore, it is important to identify to what extent determinants for the course of LBP and consequent functional limitations are similar to prognostic factors for RTW. When full recovery of LBP and RTW share prognostic factors, the treatment of LBP and the management of sickness absence due to LBP will be closely intertwined.

Therefore, we conducted a prospective study among LBP patients on the

prognosis of LBP and its interrelation with RTW. The two objectives of this study were: 1) to identify the determinants for improvement in pain, functional limitations, and quality of life; and 2) to evaluate whether RTW can be predicted by these factors and associated improvement in health-related aspects.

## Methods

### Participants

Data collection was undertaken prospectively as part of another study [11]. In total, 49 GP and 48 occupational health physicians in two regions in the Dutch province Zuid Holland participated in this study. We asked them to prospectively select patients for the study according to the following inclusion criteria: (1) employees on sickness absence due to nonspecific LBP; (2) duration of sickness absence of at least 3 and at most 12 weeks; (3) first sickness absence for this episode of LBP; and (4) at least 1 month free of LBP before this episode.

### Design

All patients with a new episode of LBP visiting a participating GP or occupational health physicians were informed about the project by their physician and were given written information. If a patient agreed, the name and telephone number were faxed to the researchers, who telephoned the patient to check whether inclusion criteria were met. If so, the patient received the baseline questionnaire and an informed consent form. After returning this questionnaire and the informed consent form, the patient was included.

The included patients received three questionnaires in total, one at inclusion, one after 3 months, and one after 6 months. For the duration of these 6 months, information on the duration of sickness absence was collected from occupational health services.

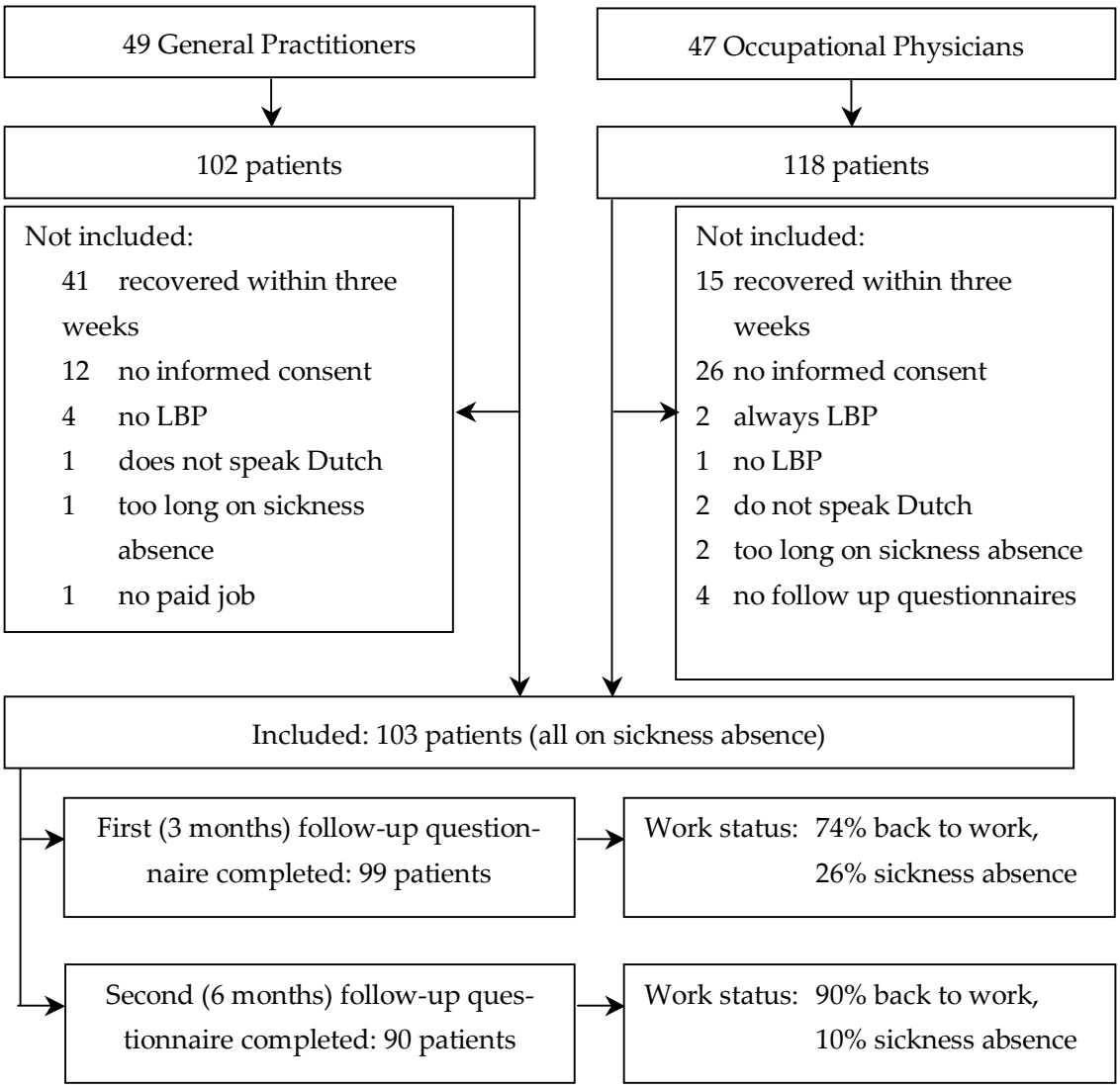
### Baseline and Outcome Measures

The patient's characteristics were recorded at baseline. Outcome measures were recorded at baseline and at 3- and 6-month follow-up.

The baseline characteristics were age, gender, level of education, body mass index (BMI), fear of movement, LBP characteristics, and work characteristics. BMI is a measure for the relation between a person's length and weight; people with a BMI higher than 30 were regarded as obese. Fear of movement is measured with

the Dutch version of the Tampa questionnaire for kinesophobia[12], a 17-item questionnaire with a score ranging from 17 (no pain related fear of movement) to 68 (maximum pain-related fear of movement). LBP characteristics included recurrence of LBP (complaints more than 1 year before the start of the project), radiating LBP, and having other complaints to the musculoskeletal system. Work characteristics included number of working hours per week, shift work, job demand and job control (Karasek Questionnaire[13]), the presence of lifting in the job, and perceived physical effort measured with the Borg Scale[14]. Economic measures, such as compensation, are not included. In the Netherlands, every employee on sick leave receives full wages during the first year of sick leave, regardless of the cause of sick leave.

Figure 1
Recruitment of patients and reasons for exclusion.



Four primary outcome measures were measured. Intensity of back pain during the past week was measured with a 10-cm long visual analogue scale[15] with a score ranging from 0.0 (no pain) to 10.0 (unbearable pain). Functional limitations were measured with the Roland-Morris Disability Questionnaire[16], a 24-item questionnaire with yes/no questions about limitations due to LBP. The score on this questionnaire ranged from 0 (no limitations) to 24 (all limitations). Quality of life was measured with the VAS scale of the EuroQol[17], with a score ranging from 0.0 (worst imaginable health state) to 10.0 (best imaginable health state). Information on duration of sickness absence was collected from occupational health services. Sickness absence was defined as complete sickness absence or working in reduced time or duties. Time to RTW was defined as the period from inclusion in the study to RTW in the original job or another job without reduced time or duties. When RTW was shorter than 1 week before a new episode of sick leave, this was not regarded as complete RTW and the original period of sickness absence was extended.

Several measures are self-report measures; for the baseline measures, these are fear of movement, job demand, job control, and perceived physical effort. The outcome measures intensity of back pain, functional limitations, and quality of life are self-report measures. These measures reflect the experiences of the patient with this factor.

**Statistical Analysis.**

The first step in the analysis was a cross-sectional analysis of the baseline data. Its goal was to evaluate which individual characteristics and work-related factors determined the outcome measures pain, functional limitations, and quality of life of subjects at the start of the study. Linear regression analysis was used with these outcome measures as dependent variables. Independent factors were selected through a manual backwise selection procedure with a significance level of $P < 0.10$ as criterion to retrieve a particular factor in the final multivariate model.

Table 1

Baseline characteristics of the study population: workers with sickness absence due to LBP

| **Characteristic** | | **(N=103)** |
|---|---|---|
| **Patient Characteristics** | | |
| Age; number (%) | 20-39 | 39 (38) |
| | 40-49 | 32 (31) |
| | 50-65 | 32 (31) |
| Male; number (%) | | 78 (76) |
| Sporting; number (%) | | 34 (33) |
| Education; number (%) | Low | 75 (73) |
| | Medium/High | 27 (26) |
| **LBP Related Characteristics** | | |
| Recurrent LBP; number (%) | | 61 (59) |
| Radiating LBP; number (%) | | 79 (77) |
| Other complaints on the Musculoskeletal System; number (%) | | 62 (60) |
| Fear of movement (17 - 68: higher means more fear of movement); mean (SD) (range) | | 39.6 (6.2) (16-53) |
| Functional limitations (0 - 24; higher means more disabled); mean (SD) (range) | | 13.2 (4.1) (2-20) |
| Pain last week (0-10; higher means more pain); mean (SD) (range) | | 6.0 (1.8) (1.6-10) |
| Quality of Life (0 - 10; higher means better health state); mean (SD) (range) | | 4.9 (2.0) (0-9.4) |
| **Work-Related Characteristics** | | |
| Working hours per week; mean (SD) | | 36.6 (10.8) |
| Score on job control (0 - 200; higher is less control); mean (SD) | | 97.9 (31.6) |
| Score on job demand (0-100; higher is more demand); mean (SD) | | 43.9 (13.5) |
| High demand/low control at work (Karasek); number (%) | | 27 (26) |
| Sickness absence before inclusion in weeks; median (IQR) | | 3 (3-4) |
| Shift work; number (%) | | 28 (27) |
| Physical workload | Regular lifting; number (%) | 27 (26) |
| | High perceived exertion; number (%) | 70 (68) |

In the second step, a linear mixed model for analysis of variance with repeated measures was used to identify the factors influencing the course of pain, functional limitations, and quality of life during the 6-month follow-up period. This analysis corrects for the dependency of repeated observations within subjects[18]. Since we were interested in the improvement in pain intensity, functional limitations, and quality of life over two consecutive 3-month periods, each period of 3 months was considered a fixed effect. The covariance structure among and within subjects was evaluated, demonstrating a good fit for a restricted model with the assumptions that the variance between subjects is equal across the fixed factors and both regions and that the variance within subjects is equal across all subjects in the same region. To determine which variables influenced the outcome measures, we performed a manual backwise selection procedure in which we excluded the variables that had a P value larger than 0.10. In all mixed models, the significant variables were corrected for age and gender.

In the third step, prognostic factors influencing time to RTW were assessed with a Cox regression analysis. Of particular interest was the role of the three selected outcome measures on RTW. First, we performed univariate analyses with all baseline variables. Only those variables that influenced time to RTW in the univariate analyses with $P < 0.10$ were considered in the multivariate analysis. A multivariate Cox regression analysis with a priori inclusion of age, gender, and duration of sick leave before inclusion was performed. A stepwise selection procedure ($P < 0.10$) was performed for the independent variables that were included in the multivariate analyses.

## Results

### Participants

A total of 220 patients were enrolled in the study by 70 physicians (72%). Of these patients, 103 met the inclusion criteria and returned an informed consent form, the baseline questionnaire, and at least one follow-up questionnaire. A total of 86 patients (83%) completed both follow-up questionnaires and 17 (17%) completed only one follow-up questionnaire. Figure 1 shows the reasons and number of patients excluded from the study and the work status of the included patients. The baseline characteristics of the 103 included patients are given in Table 1.

Table 2

Determinants of pain, functional limitations, and quality of life at baseline in workers with sickness absence due to LBP

| | **Pain last week** | | **Functional limitations** | | **Quality of Life** | |
|---|---|---|---|---|---|---|
| | estimate (sd) | p-value | estimate (sd) | p-value | estimate (sd) | p-value |
| Intercept | 2.43 (1.29) | 0.03 | 7.96 (2.61) | 0.00 | 4.48 (0.60) | 0.00 |
| Age 20-39 yrs | 0.61 (0.40) | 0.13 | -0.91 (0.97) | 0.35 | -0.49 (0.48) | 0.31 |
| Age 40-49 yrs | 1.12 (0.41) | 0.01 | -0.27 (0.99) | 0.79 | -0.44 (0.49) | 0.38 |
| *Age 50-65 yrs (ref)* | . | . | . | . | . | . |
| Male | -1.28 (0.38) | 0.00 | -0.49 (0.92) | 0.59 | 0.94 (0.45) | 0.04 |
| Fear of movement (17-64: higher = more fear) | 0.10 (0.03) | 0.00 | 0.17 (0.06) | 0.01 | [-0.05 (0.03) | 0.15] |
| Sporting in the past year: yes | [-0.12 (0.35) | 0.73] | -1.58 (0.84) | 0.06 | 1.31 (0.41) | 0.00 |
| BMI >= 30: yes | [-0.26 (0.44) | 0.55] | -2.13 (1.11) | 0.06 | [-0.38 (0.54) | 0.49] |
| Other musculoskeletal complaints: yes | [-0.05 (0.33) | 0.87] | [-0.36 (0.81) | 0.66] | -0.68 (0.39) | 0.09 |
| Recurrence: yes | [-0.41 (0.32) | 0.21] | [-1.25 (0.79) | 0.12] | [0.10 (0.401) | 0.80] |
| High job demand: yes | [0.17 (0.32) | 0.60] | [0.54 (0.80) | 0.50] | [-0.43 (0.39) | 0.28] |
| High job control: yes | [0.35 (0.32) | 0.28] | [0.04 (0.80) | 0.96] | [-0.54 (0.39) | 0.17] |

Linear regression analysis, manual back wise selection procedure: $p < 0.10$

The intercept is the value for the reference population in which all risk factors are absent (=0).

The estimates in brackets indicate the effect of a non-significant excluded variable when this variable was added to the multivariate model.

### Pain, Functional Limitations, and Quality of Life at Baseline

At inclusion of the subjects in the study, different factors determined perceived pain, level of functional limitations, and overall quality of life (Table 2). Fear of movement was associated with higher perceived pain and more functional limitations but not with quality of life. Active participation in sports had a positive association with quality of life and functional limitations but did not affect pain intensity. A BMI of 30 or more was positively associated with functional limitations but was not associated with perceived pain and quality of life. Having other muscu-

loskeletal complaints than just low back pain was negatively associated to the quality of life but was not associated with functional limitations and perceived pain.

Figure 2

Improvements in pain intensity, functional limitations, and quality of life for workers with sickness absence due to LBP.

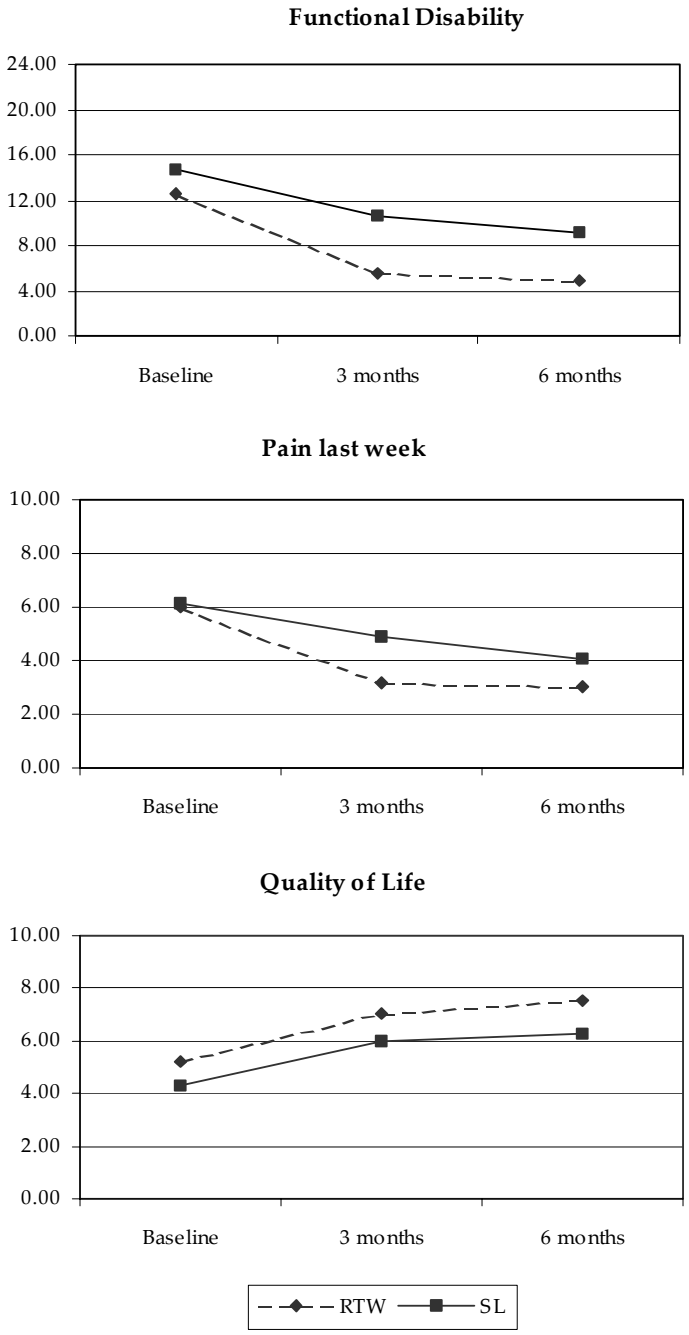


Table 3

Determinants of 6-month improvement in pain intensity, functional limitations, and quality of life during 6-month follow-up for workers with sickness absence due to LBP

| | **Pain last week** | | **Functional limitations** | | **Quality of Life** | |
|---|---|---|---|---|---|---|
| | estimate (sd) | p-value | estimate (sd) | p-value | estimate (sd) | p-value |
| Intercept | 3.11 (1.16) | 0.01 | 7.50 (2.37) | 0.00 | 3.99 (0.45) | 0.00 |
| *Time since inclusion:* | | | | | | |
| 3 months | -2.37 (0.24) | 0.00 | -6.11 (0.58) | 0.00 | 1.80 (0.23) | 0.00 |
| *Time since inclusion:* | | | | | | |
| 6 months | -2.73 (0.25) | 0.00 | -7.21 (0.61) | 0.00 | 2.24 (0.23) | 0.00 |
| Work status at 3 months; | | | | | | |
| sickness absence | 0.84 (0.38) | 0.03 | 3.06 (0.83) | 0.00 | -0.78 (0.34) | 0.02 |
| Age 20-39 yrs | 0.07 (0.40) | 0.86 | -1.98 (0.88) | 0.03 | 0.18 (0.36) | 0.62 |
| Age 40-49 yrs | 0.93 (0.42) | 0.03 | 0.16 (0.89) | 0.86 | -0.01 (0.37) | 0.99 |
| *Age 50-65 yrs (ref = 0)* | . | . | . | . | . | . |
| Male | -1.21 (0.39) | 0.00 | -0.88 (0.83) | 0.29 | 0.87 (0.34) | 0.01 |
| Fear of movement | 0.08 (0.03) | 0.01 | 0.17 (0.06) | 0.00 | NA | NA |
| Sporting in the past year: yes | NA | NA | -1.59 (0.76) | 0.04 | 1.10 (0.32) | 0.00 |

Linear mixed model for analysis of variance with repeated measures, manual back wise selection procedure: $p<0.10$

The intercept is the value for the reference population in which all risk factors are absent (=0).

NA = not applicable in this analysis since this variable did not contribute significantly to the multivariate model.

Independent variables were selected through a manual backwise selection procedure with a significance level of $P < 0.10$. The variables that did not contribute significantly to the final multivariate model were added separately to this model to show their nonsignificant effect on perceived pain, level of functional limitations, and overall quality of life.

Improvement in Pain Intensity, Functional Limitations, and Quality of Life Figure 2 shows that pain intensity, functional limitations, and quality of life all improved over time, albeit at a different pace between those workers that returned to work within 6 months and those staying sick listed.

In Table 3, the determinants of improvement in pain intensity, functional limitations, and quality of life are shown. The multivariate models explained 32%, 39%, and 28%, respectively, of the variance in these measurements. During the first 3months, there was a strong recovery with significant improvements in pain (average reduction of 2.4 points), functional limitations (average reduction of 6.1 points), and quality of life (average increase of 1.8 points). After the first 3 months, further improvements were seen, although at a slower pace with a decrease in pain intensity of 0.4 points (P=0.15), a decrease in functional limitations of 1.1 points (P=0.07), and an increase in quality of life of 0.4 points (P=0.06). Working at 3 months had a positive impact on all three health outcomes. Younger workers and those with less fear of movement reported quicker improvement in pain intensity and functional limitations. Male workers showed more improvement in pain intensity and quality of life than female workers. Active participation in sporting activities supported a quicker improvement in functional limitations.

**Prognostic Factors Predicting RTW**

In Table 4, the prognostic factors for RTW are presented. In the multivariate model, being a man and having recurrent LBP had a positive impact on RTW, whereas the level of functional limitations at baseline had a negative impact on RTW. Pain intensity and quality of life at baseline did not predict RTW.

## Discussion

Among workers on sickness absence for LBP between 3 and 12 weeks, pain intensity, functional limitations, and quality of life improved strongly during the first 3 months of follow-up, and thereafter improvements still occurred but at a substantially lower pace. A quicker recovery was determined by younger age, less fear of movement, male gender, sports participation, and RTW within 3 months. Work resumption was primarily determined by male gender and level of functional limitations at baseline.

The improvement in health-related aspects in the first 3 months of follow-up was significant for both the group returning to work in this period and the group with prolonged sickness absence. A further improvement was observed in the second period of 3 months, although not statistically significant. This is in line with the findings of Pengel[19], who showed that the recovery of LBP is more substantial in the first months. Also, it is in agreement with the results of Evanoff[5] that people

continue to improve, even after RTW. In this regard, it is of interest to note that the average improvements in health related aspects among all workers in the first 3 months were significantly larger than the differences between workers that had returned to work and those still sick listed after 3 months. Most patients do not wait until they are completely recovered from their LBP but RTW in an earlier stage. Their decision to RTW seems to be based more on a relative improvement in health, partly depending on their personal characteristics, rather than on an improvement toward a fixed level of the health related aspects. The continuing improvements in health related aspects after RTW also suggests that in this study population RTW without complete recovery is not more harmful than staying on sickness absence.

Table 4

Hazard ratios for duration of sickness absence during 6-months follow-up in workers with sickness absence due to LBP

| **Variable** | **Univariate** | | **Multivariate** | |
|---|---|---|---|---|
| | hazard ratio | p-value | hazard ratio | p-value |
| Male | 1.64 | 0.06 | 1.84 | 0.03 |
| Age (20-39 yr, 40-49 yr, 50-65yr) | 0.99 | 0.91 | 0.91 | 0.52 |
| Sickness absence before inclusion (weeks) | 0.93 | 0.13 | 0.96 | 0.39 |
| Recurrent LBP (more than 12 months ago) | 1.45 | 0.10 | 1.69 | 0.03 |
| Functional limitations (0 - 24; higher means more disabled) | 0.92 | 0.00 | 0.90 | 0.00 |
| Quality of life (0 - 10; lower means better quality of life) | 1.19 | 0.00 | - | - |
| Sporting (during previous year) | 1.54 | 0.06 | - | - |
| High job demand (Karasek questionnaire) | 0.99 | 0.07 | - | - |
| High job control (Karasek questionnaire) | 0.99 | 0.08 | - | - |
| Pain last week (0-10; higher means more pain) | 0.95 | 0.43 | - | - |
| Fear of movement (17-64: higher = more fear) | 0.98 | 0.12 | - | - |
| BMI >= 30 | 0.75 | 0.31 | - | - |
| Other complaints | 0.96 | 0.83 | - | - |

Cox regression analysis.

Age, gender, and duration of sick leave before inclusion were adjusted for in the multivariate model. Additional variables were only included in the multivariate model when they had a significance level of $p \leq 0.10$.

Hazard ratio > 1 implies a quicker return to work

Most of the personal characteristics that were significantly associated with the health status characteristics at baseline also determined the improvement in health status over 6 months. Being a man had a significant positive association with the baseline level of pain and quality of life, as well as on the improvement in these outcome measures over 6 months. A higher level of fear of movement had a significant negative association with the baseline value of pain intensity and functional limitations as well as on their improvement. This is in line with the finding of Fritz[20], that fear-avoidance beliefs are related to increased disability. Participation in sporting activities had a significant positive association with the baseline level and improvement of functional limitations and quality of life. Brown[21] also showed that regular physical activity has a positive effect on the overall health-related quality of life.

People with a high BMI (>30) reported less functional limitations due to their LBP at baseline. It is hypothesized that people with a high BMI may already experience more general functional limitations than average; thus, their level of disabilities might be less influenced by their LBP.

The duration of sickness absence was positively influenced by male gender and recurrent LBP. Participants who have had previous LBP episodes seem to RTW earlier than those who did not have it before. They might be more experienced with LBP, thus knowing how to handle it. Physical factors, such as a high BMI or other complaints, and psychosocial factors such as job demands, job control, and fear of movement were not determinants of the duration of sickness absence in the multivariate model. In this study, RTW was mainly influenced by functional limitations, which is consistent with most LBP guidelines that recommend a time-contingent approach instead of a pain-contingent approach.

Of the three main outcome measures, only functional limitations turned out to have a statistically significant impact on RTW; however, it remains unclear how they are related. The question remains whether people RTW when they feel less disabled, or whether they feel less disabled when they are able to perform at work, or whether the association is mediated through other variables.

Recovery in pain, in functional limitations, and improvement in quality of life have partially the same determinants, while there is little correspondence with the prognostic factors of RTW. However, functional limitations were the most important prognostic factor of RTW. This means that full recovery of LBP and RTW do not share similar prognostic factors toward which treatment should be di-

rected. However, when treatment of LBP is mainly directed to diminishing functional limitations, it might also result in faster RTW.

Furthermore, we do realize that our study population is quite small, with only 103 patients in it and incomplete data sets for 17 of them. However, our results are in line with several other studies and add new information on the relation between pain, functional limitations, and quality of life and RTW. Both Evanoff[5] and Lötters[22] found that patients are not completely recovered when returning to work. When several studies point in the same direction, this suggests that extra attention in the treatment of patients is needed after work resumption.

**Methodological Considerations**

The outcome measures were determined at fixed moments. However, RTW is not fixed. The group of patients that had returned to work at the second measurement (3 months) had returned to work during the preceding 3 months. Some of them might just have returned, while others may have worked for more than 10 weeks. The majority of the patients in the project returned to their work during the 6-month follow-up, only 10% of all participants were still on sickness absence after this period.

The three main outcome measures pain, functional limitations, and quality of life are all self-report instruments, based on the experiences of the patient. Functional limitations seemed to be important for the patient's readiness to RTW. In a qualitative study[23] on recovery of musculoskeletal disorders, the researchers found that being better, or recovered, is not only due to a change in the state of the disorder, it is also due to adjustments of life or work around the disorder.

**Conclusion**

Both groups of workers, those who were back at work within 3 months and those still on sickness absence at that moment, strongly improved with regard to pain intensity, functional limitations, and quality of life in the first 3 months of follow-up. Those returning to work improved faster; however, the average improvements in the group of participants who were sick listed were significantly larger than the difference in health status between those returning to work and those being sick listed. Except for male gender, the primary determinants for improvement in the dimensions pain, functional limitations, and quality of life were not associated with RTW. Although the participants improved on all three outcome measures, the decision of returning to work seems primarily determined by

the level of experienced functional limitations. As a result, there seems to be no absolute criterion to determine workability.

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# Chapter 5

# Qualitative evaluation of a form for standardized information exchange between orthopedic surgeons and occupational physicians

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## Abstract

### Background

Both occupational physicians and orthopedic surgeons can be involved in the management of work relevant musculoskeletal disorders. These physicians hardly communicate with each other and this might lead to different advices to the patient. Therefore, we evaluated a standardized information exchange form for the exchange of relevant information between the orthopedic surgeon and the occupational physician. The main goals of this qualitative study are to evaluate whether the form improved information exchange, whether the form gave relevant information, and to generate ideas to further improve this information exchange.

### Methods

The information exchange form was developed in two consensus meetings with five orthopedic surgeons and five occupational physicians. To evaluate the information exchange form, a qualitative evaluation was set up. Structured telephone interviews were undertaken with the patients, interviews with the physicians were face-to-face and semi-structured, based on a topic list. These interviews were recorded and literally transcribed. Each interview was analyzed separately in Atlas-Ti.

### Results

The form was used for 8 patients, 7 patients agreed to participate in the qualitative evaluation. All three orthopedic surgeons involved and three of the six involved occupational physicians agreed to be interviewed. The form was transferred to 4 occupational physicians, the other 3 patients recovered before they visited the occupational physician. The information on the form was regarded to be useful. All orthopedic surgeons agreed that the occupational physician should take the initiative. Most physicians felt that the form should not be filled out for each patient visiting an orthopedic surgeon, but only for those patients who do not recover as expected. Orthopedic surgeons suggested that a copy of the medical information provided to the general practitioner could also be provided to occupational physicians.

**Conclusions**

The information exchange form was regarded to be useful and could be used in practice. The occupational physician should take the initiative for using this form and most physicians felt the information should only be exchanged for patients who do not recover as expected. That means that the advantage of giving information early in the treatment is lost.

## Background

Several physicians may be involved in the management of work relevant musculoskeletal disorders in the Netherlands; these are the general practitioner, the occupational physician and sometimes a medical specialist. A worker with musculoskeletal complaints usually starts care seeking by a visit to his general practitioner (GP). The GP is responsible for diagnosis and treatment and may refer to a medical specialist. In the Dutch health care system every employee has also access to occupational health care. The occupational physician usually becomes involved when a worker is on sick leave and will advise on necessary adaptations in work or at the workplace. Hence, a patient may receive advice from several physicians for the same health problem. These advices can differ from each other or even conflict with each other, since the medical specialist and the occupational health physician have different goals and advise the patient on different aspects of the musculoskeletal disorder.

Different or conflicting advices might lead to a prolonged duration of sick leave. Several studies[1-3] indicate that visiting a medical specialist is associated with a longer duration of sickness absence, even after adjustment for nature and severity of the musculoskeletal complaint. In another study occupational physicians reported that they felt that treatment by a general practitioner or medical specialist sometimes was an obstacle for return to work[4]. It is believed that better collaboration and better information exchange between physicians may limit long-term sick leave[5-7].

In 2000 a study showed that there is little communication between medical specialists (amongst others orthopedic surgeons) and occupational physicians. When communication took place, it was usually the occupational physician initiating the contact and most of the time it concerned an information request by mail. Although more than 80% of the participating orthopedic surgeons reported that they wanted to improve their collaboration with occupational physicians, it proved to be difficult in practice[8]. Hence, we designed an intervention to facilitate communication and to overcome some of the known barriers. The barriers involved in interdisciplinary collaboration range from not knowing how to reach each other to not finding the other party an equal collaboration-partner[9-12]. To improve information exchange and collaboration, it should be made as easy as possible, possibly even with standard guidelines[6, 7, 13]. The importance of administrative

formalization initiatives has been stressed as an essential tool to enhance collaboration[14].

This study consists of two parts; first we developed a standardized information exchange form for the exchange of relevant information between the orthopedic surgeon and the occupational physician, in order to facilitate the latter in return to work management. The practical use of this form was evaluated in a qualitative study. The goal was to evaluate whether the patients and physicians appreciated the information exchange by means of the form, whether the form provided relevant information to the occupational physicians, and to generate ideas to further improve this information exchange.

## Methods

### Development of communication form

The information exchange form was developed in two consensus meetings with five orthopedic surgeons and five occupational physicians. We developed three versions of the form, related to frequent disorders with an established impact on sick leave: non-specific low back pain, impingement syndrome of the shoulder, and meniscal tears and knee ligament injuries [form included after references]. The three forms are equal in the kind of information they provide, but the details are specific for the injured part of the body.

In the information exchange form the following information is provided: contact information of the orthopedic surgeon, general information about the patient, the preliminary diagnosis, the proposed trajectory (additional diagnostics and therapy), current functional limitations, and provisional prognosis on recovery. The functional limitations section was based on a list used by insurance physicians to decide whether a patient is entitled to receive a work disability pension[15]. The participating physicians agreed on the fact that the information exchange form should be filled out as soon as possible in the treatment trajectory. The short-term disabilities and preliminary diagnosis should be given early in the treatment trajectory, e.g. the first or second consultation.

The information exchange form complies with the regulations of the Royal Dutch Medical Association for exchange of information between curative care and occupational health care. This entails that the patient always has to provide written consent for the information that will be exchanged. The form asks for the sig-

nature of the patient that he was informed appropriately and agrees with the exchange of the information on the form. All participants agreed with the patient being the information carrier, since the patient visits both the orthopedic surgeon and the occupational physician and this provides an easy way of reaching each other.

**Evaluation of the information exchange form**

The feasibility of the information exchange form was evaluated in a qualitative study. Originally a controlled trial was set up with ten orthopedic surgeons using the information exchange form and ten orthopedic surgeons giving care as usual. The orthopedic surgeons informed new patients who were referred by a general practitioner for a first consult for knee (meniscal tears, ACL), shoulder (impingement) or non-specific back pain about the project. Only patients who had a paid occupation, were on sick leave or had a high risk for sick leave, and required treatment were included. Exclusion criteria were severe co-morbidity, sick leave due to another cause, arthritis, and practicing top sport (national competition). Patients willing to participate were asked to return the informed consent form prior to their next visit to the OS. This trial was in compliance with the Helsinki Declaration and was approved by the medical ethical committee of Erasmus MC.

After an inclusion period of 9 months, the information exchange form was used for only 8 patients, therefore a quantitative evaluation was not feasible. To evaluate the use of the information exchange form, a qualitative evaluation was set up. All included patients and their orthopedic surgeon and occupational physician, were asked to participate in an interview. The medical ethical committee of Erasmus MC approved with the interviews with physicians and patients in addition to the larger trial.

Structured telephone interviews with each of the patients were undertaken lasting approximately 15 minutes and the answers given by the patients were written down. Each patient was asked the same questions. The interviews with each physician were face-to-face and semi-structured, based on a topic list. These interviews lasted approximately 45 minutes and were recorded and literally transcribed. All interviews took place in the fall of 2005. Table 1 shows a summary of the questions and topics in the interviews.

Each interview was analyzed separately in Atlas-Ti. The analysis was primarily based on the topics from the topic lists. EF and AS did the analysis of the inter-

views. First, all data were coded and based on these codes the information was structured and analyzed[16]. A member check was performed by sending this manuscript for approval to the participating physicians.

## Results

The form was used for only 8 patients by three orthopedic surgeons. The other 7 orthopedic surgeons did not include patients in the study and, therefore, did not use the form. Of 8 patients, 7 agreed to participate in the qualitative evaluation. These 7 patients were treated by 3 orthopedic surgeons and 6 occupational physicians. All three orthopedic surgeons and three occupational physicians agreed to be interviewed. Figure 1 is a diagram in which all participants are schematically represented. Most patients had knee disorders and one patient had non-specific low back pain.

Table 1 – topic list for interviews

| | |
|---|---|
| Patients | Is it correct that you visited your orthopedic surgeon on <date> because of your <knee/back> complaints?<br>How is your <knee/back> now?<br>If I am correct, your orthopedic surgeon filled out a form for your occupational physician, do you remember this?<br>Did you receive this form?<br>Did you give this form to your occupational physician?<br>When and how did you give it / why did you not transfer it?<br>What did the occupational physician do with this information?<br>What did you think of the fact that your orthopedic surgeon informed your occupational physician in this way?<br>Did your orthopedic surgeon contact your occupational physician?<br>Do you have other questions or information on this topic? |
| Orthopedic surgeons and occupational physicians | Assessment of the form<br>Usability of the form<br>Impact of using the form on the management of the disorder<br>Impact of the form on communication<br>When is communication useful |

**Did the form improve information exchange?**

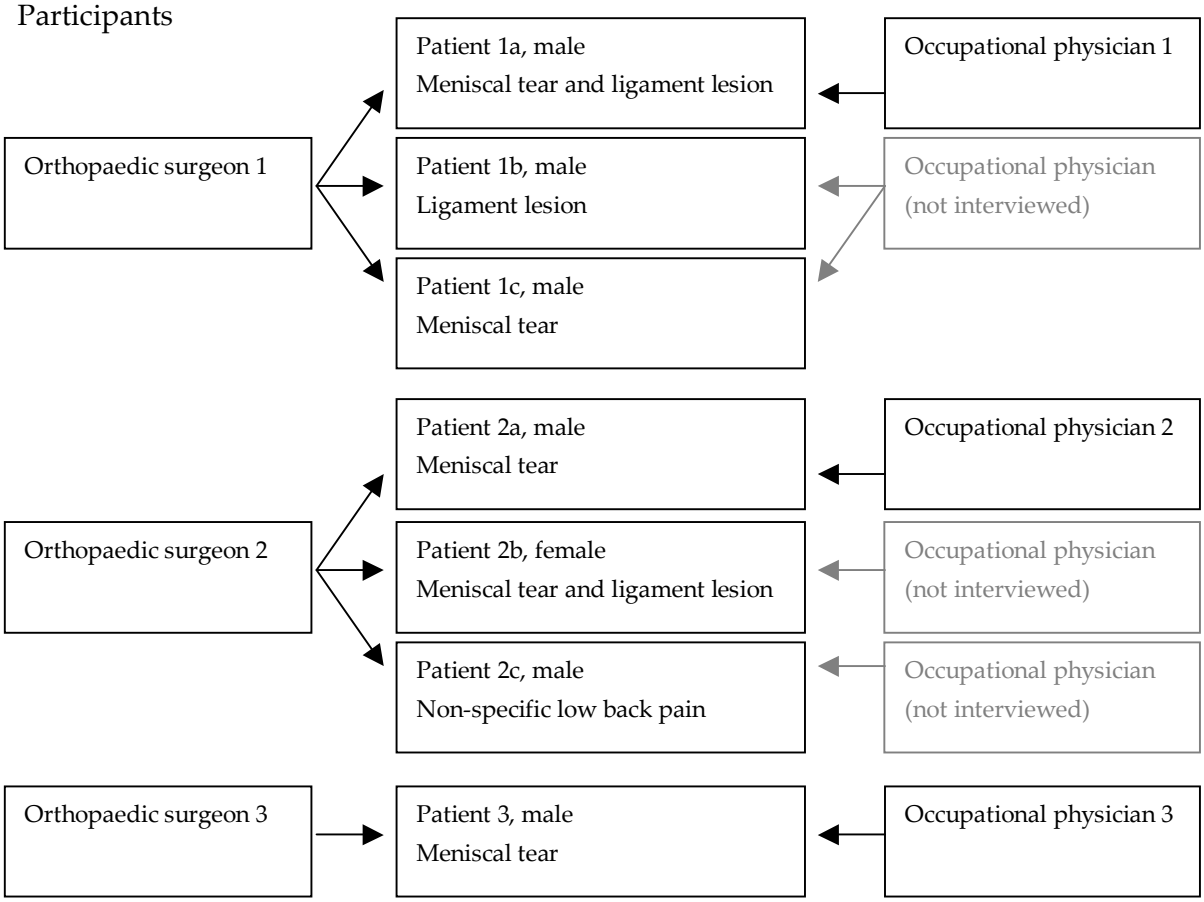
Of the 7 patients in this evaluation, all remembered that their orthopedic surgeon mentioned or filled out the form. However, three forms did not reach the occupational physician. Two patients (1c, 2b) had not visited their occupational physician and also not mailed the form. Patient 3 said that his orthopedic surgeon had sent the form to his occupational physician, however, the occupational physician had not received the form. In all cases where the occupational physician had not received the form, the patient was recovered before a consultation with the occupational physician was planned. Four forms were given or mailed to the occupational physician; patient 2c had send it over mail, even though he did not have an appointment with his occupational physician, and the other three patients handed the form over to their occupational physician.

The form was given to two of the three interviewed occupational physicians. The occupational physician not receiving the form was the one referring his patient to another orthopedic surgeon for second opinion. His opinion on the form was ambiguous: *"The form passes the role of the occupational physician with regard to the functional limitations. However, my thoughts are ambiguous since I have just said that when I am unsure about the functional limitations, that is just the information I need from the orthopedic surgeon"* (OP3). The two occupational physicians who had received the form answered that it gave them enough information to plan the patient's rehabilitation to work: *"It was, for me, a guide to plan the work rehabilitation relatively fast and easy"* (OP1).

Patient 2a answered that he felt that the form had resulted in better communication, since the occupational physician now knew which orthopedic surgeon to contact. His occupational physician referred patient 3 to another orthopedic surgeon; in this case the occupational physician did not need information from the first orthopedic surgeon and had not received the form either. Patients 1a and 1b assumed that the form was read, but did not know whether it resulted in anything else.

None of the orthopedic surgeons remembered to be contacted by the occupational physicians for additional information. Since only a few patients per orthopedic surgeon were included, they could not answer the question whether the form improved information exchange.

Figure 1
Participants




**Did the information exchange form provide relevant information?**

The three orthopedic surgeons considered the forms to be complete and useful. They had no difficulties filling out the form, and all answered that the five minutes necessary to fill it out was a reasonable amount of time. Two of them had instructed their secretaries to inform the patients about the form and the research in order to save time during the consultation. They felt that the information exchange form asked similar information as usually asked by occupational physicians.

The forms gave the occupational physicians information on functional limitations, which helped them to help the patient return to work: *"A clinician gives clinical, health related information on specific functional limitations. <…> That gives an estimation, when an orthopedic surgeon can give this information that is important information. It takes questions away"* (OP2). Besides the information provided on the form, there was another reason that made it useful: *"It gives you the opportunity to contact the treating specialist"* (OP3).

Two occupational physicians wanted to add information to the form. One occupational physician (OP3) said that the form might be too strict; he answered that it should provide room for extra information or explanation. Another occupational physician (OP2) felt that information about a patient's medical history and how he recovered from possible earlier treatments was missing. The third occupational physician found the information on the form complete: *"It is more than I would have expected. Usually, when I ask similar questions I do not receive the answers this complete. Especially not regarding the functional limitations. May be it is so easy, because all the orthopedic surgeon needs to do is to put the crosses in the right squares"* (OP1).

One of the orthopedic surgeons did not want to fill out the part on functional limitations: *"Once it is on paper, it is regarded as a fact. … Also I do not know where the patient works and what his job is. To me that is part of the job of an occupational physician. My predecessor always told me: you have to be able to defend everything you write down"* (OS3).

When asked whether the use of the form made orthopedic surgeons more aware of the fact that a patient also has a role as a worker, only one of them agreed: *"You are more aware of the fact that the patient also has a function in life"* (OS2). However, all three surgeons said that they usually asked their patients about their job. Asking questions about a patient's job does not mean that they also inform the patient on their functional limitations at work. The participating surgeons only discussed functional limitations when the patient asks for information on what he can and cannot do. Two of the surgeons preferred not to give direct information about consequences for the patient's work: *"Yes, when they ask for it. In activities of daily live. Never for their work, and that is because I do not know the company and workplace"* (OS1).

**Ideas to further improve this information exchange.**

All participants, both physicians and patients, agreed with the patient being the information carrier. One orthopedic surgeon said: *"There is no reason, for me, to keep the information on the forms secret for the patient. He is allowed to see all information in his medical file, including this information"* (OS1). Both occupational physicians and most orthopedic surgeons felt that the patient would take better care of the forms than when it is sent with regular mail. However, one orthopedic surgeon questioned whether the forms would reach the occupational physician. He had no

objections against giving the form to the patient, but would also send it separately to the occupational physician.

All interviewed physicians would not mind using the form in future, as one of the occupational physicians said: *"It gives you the possibility to contact each other"* (OP3). In this study the orthopedic surgeon took the initiative to inform the occupational physician. However, all orthopedic surgeons said that the occupational physician should take the initiative since it is their responsibility to manage the patient's work rehabilitation: *"I think that the occupational physician should take the initiative, be more active. That is his work. Our work is to cure people. And we have nothing to do with the fact whether this man works or not"* (OS1).

Another option mentioned was that the occupational physician could ask for a copy of the letter written to the general practitioner, with medical information on the diagnosis and treatment instead of using this form. *"The letter to the general practitioner is a moment when you already exchange information. So if you can limit information exchange to one moment it is no extra effort"* (OS2).

All orthopedic surgeons and 2 occupational physicians felt that the form should not be filled out for each patient visiting an orthopedic surgeon, but only for those patients who do not recover as expected. *"In cases with chronic musculoskeletal complaints or when there is a complication in the recovery"* (OP2).

## Discussion

The results show that the information on the information exchange form was regarded to be useful. Two participating occupational physicians stated that it was useful and that it helped them to plan the reintegration to work. The orthopedic surgeons answered that the information provided through the forms could be useful for the occupational physicians. However, the form was hardly used by the participating orthopedic surgeons since only 8 patients were included. Of these patients, only 4 gave the form to their occupational physician and one patient answered that it had resulted in better communication.

The fact that the form was only used for 8 patients can have several reasons. One possible reason is that the inclusion criteria for the study were too strict. However, in an additional survey among new patients visiting an orthopedic outpatient clinic we have estimated that approximately 4% of all new patients matched the inclusion criteria. This gives reason to believe that our inclusion criteria were not too strict. Other reasons can be lack of time, or the fact that the form

had to be filled out before the treatment had taken place. Also, orthopedic surgeons might not see work as an important factor to take into consideration for their treatment; they treat the disorder and advice the patient on functional limitations in general.

It was decided that the form should be filled out early in the treatment trajectory since it was expected that patients would have had their complaints for a longer period already and early intervention can help a worker to return to work faster. This meant that the orthopedic surgeon filled out the form without an information request from the occupational physician, in the same way as the letter they normally send to the general practitioner. The participating orthopedic surgeons stated that the occupational physicians should take the initiative for the use of the form and both orthopedic surgeons and occupational physicians felt that it should only be used in those cases where the patient does not recover as expected. This would save time and occupational physicians will usually only ask for information when recovery does not work out as expected. Hence, the structured form may be used better at a later stage in the treatment trajectory and limited to those patients where it becomes clear that recovery will be delayed. The disadvantage of this timing may be that for some patients the orthopedic surgeon no longer is in charge of the treatment.

The fact that the patient was the carrier of the information was seen as a good and effective way to reach the colleague-physician. Since 2002 a new law has been implemented in the Netherlands, the Gatekeeper Improvement Act (Wet Verbetering Poortwachter), giving responsibility for the duration of sick leave not only to the employer and occupational physician, but also to the employee on sick leave. In this study we gave the patient the responsibility to transfer the information exchange form to the occupational physician, and thereby to transfer medical information on the disorder. In this study, only four forms were given or sent to the occupational physician. The patients not transferring the form to their occupational physician recovered before their first visit to the occupational physician was planned and, thus, the information on the form was not needed to plan the rehabilitation. We have no indication that patients would object against the transfer of medical information from the specialist to the occupational physician. We do not think it is an important barrier in most cases, since in the before mentioned Act patients have the obligation and responsibility to fully cooperate with regard to return to work. Most patients are motivated to support all actions that are necessary for that, including information transfer to the occupational physician. How-

ever, a minority of patients could be reluctant to give permission for information transfer to the occupational physician, because they are afraid this information will be given to the employer. Although this is forbidden under Dutch privacy and physician-patient legislation, this fear is sometimes present and is enhanced by the fact that the employer pays for the work of the occupational physician directly or indirectly (via an occupational health service).

In the Dutch health care system the tasks and responsibilities of curative health care and occupational health care are strictly divided. Curative health care providers advice on and give medical treatment and occupational health care providers manage work rehabilitation. An occupational physician is an expert in translating functional limitations to limitations and possibilities at work. The main goal of the information exchange form was to inform the occupational physician on the diagnosis, treatment and functional limitations from a medical point of view. Due to the fact that the occupational physician is responsible for work rehabilitation, the information exchange form was directed to convey information from the orthopedic surgeon to the occupational physician. In other health care systems clinical health care providers can have the responsibility for return to work or the decision that a patient is fit for work. In those cases the information exchange might be directed both to and from the occupational health care in order to provide all parties involved in the management of the disorder and sick leave with necessary information.

Many patients visiting an orthopedic surgeon ask for information about their limitations in daily life related to the diagnosis and prognosis. Work is part of the daily life activities of many patients. However, most orthopedic surgeons, just as general practitioners, are not trained in occupational health[17, 18]. They might perceive difficulties when asked for advice on the workability of a patient, without knowing the specific capabilities required to work in a specific work situation. In this study, one of the orthopedic surgeons did not want to give information on functional limitations due to fear of possible legal consequences. However, Dasinger[19] showed that workers with a worker's compensation claim for low back injury are more likely to get off disability-benefit status when they were informed on their readiness to return to work by their treating physician. Early intervention by a treating physician can help a worker to resist the negative effects of a system that discourages early return to work[20, 21]. Since orthopedic surgeons treat a disorder and do not usually seem to consider work as part of this treatment, this may hamper collaboration.

The question remains whether using this form can improve information exchange. The form was only used for eight patients in this study, of which only four transferred it to their occupational physician. The form is easy to fill out for the orthopedic surgeon and provides the occupational physician with medical information, planning of treatment and information on functional disabilities. However, for orthopedic surgeons filling out the form is extra work in addition to the information on diagnosis and treatment they provide to the referring physician, usually the general practitioner. Two orthopedic surgeons suggested to also giving a copy of this information to the occupational physician. This is not common practice right now and usually does not include information on functional limitations, while the occupational physicians appreciated this information on the form.

In this study the orthopedic surgeons had to add the procedure of filling out the form to their usual work, diagnosing and treating the patient. Since the form was only applicable for a small proportion of patients and will in most cases not change the treatment given by the orthopedic surgeon, implementing it into the routine of medical specialists will be difficult. In the interviews, the suggestion was given to let the occupational physicians take the initiative for information exchange; they need in the information in some cases in order to manage an employee's rehabilitation to work. Furthermore, according to the Gatekeeper Improvement Act, the occupational health service has to give an advice on the prognosis and the possibilities for reintegration for those employees on sick leave for six weeks and who will probably not return to work on short notice. At this moment the occupational physician needs the information as provided on the form, information on diagnosis and prognosis, in order to complete the advice.

The developed information exchange form does not leave room for specific questions regarding the disorder or the patient. Whether using a form on initiative of the occupational physician is more useful than a written request for information or providing the occupational physician with a copy of the letter send to the general practitioner cannot be answered in this study. Further research is needed to answer this question.

**Methodological considerations**

Data triangulation was performed by means of interviewing both patients and physicians and by means of a member check: the interviewed physicians were asked whether the results as they are written down were a correct rendering of the information they provided. No medical files or other documentation was used; the

data collected in the study was limited to the experience of the patients and physicians with the exchanged forms.

In this study it was decided that the orthopedic surgeon should use the information exchange form early in the treatment trajectory for all patients on sick leave with certain disorders. There was no difference between patients at risk for long term sick leave and patients who would only call sick for some days. However, when patients are on sick leave for only a few weeks, they might not visit their occupational physician. In this study that resulted in three forms not being transferred to the occupational physician. The suggestion to leave the initiative for using the form to the occupational physician might overcome this issue.

**Conclusion**

The form provided occupational physicians with information on diagnosis, treatment, functional limitations, and prognosis of their patients treated by an orthopedic surgeon. According to the physicians and patients participating in this qualitative evaluation the form was useful and could be used in practice. Since the form was only used for a few patients, the question whether the form can be useful in the general practice cannot be answered satisfactorily. An important consideration for further exploration is whether usefulness of the application of the form is limited to the relatively small proportion of patients that do not recover as expected.

## Information form for knee disorders

## Information exchange from orthopedic surgeon to occupational physician

| **Patient:** | **Orthopedic surgeon:** |
|---|---|
| Name: …….. | Name: …… |
| Date of birth: ….……/……/19…… | Hospital: …… |
| | Place: …… |
| | Telephone: …… |

**Dear colleague,**

Today, ……/……/200… (date) I saw your patient, who is currently working / on sickleave*

In order to start rehabilitation / to prevent sickleave* I would like to give you the following information:

**(Provisional) diagnosis:**

❑ Meniscal tear ❑ Ligament tear ❑ Arthrosis ❑ Patellar femorale syndrome

❑ Other/explanation* ……

**Proposed trajectory:**

**<u>Additional diagnostics</u>** Expected date / Explanation

❑ MRI ……

❑ Other/explanation* ……

**<u>Therapy</u>**

❑ Expectative

❑ Conservative ❑ Rest during ……weeks

❑ Exercise therapy Physical therapy / Excercise therapy*

❑ Medication, viz. ……..

❑ Injection, viz. ……..

❑ Invasive, arthroscopic operation ……..

❑ Other/explanation* ……..

**Current functional limitations, from medical perspective:**

| | not limited | limited | not allowed |
|---|---|---|---|
| Kneeling or squatting | ❑ | ❑ | ❑ |
| Walking stairs | ❑ | ❑ | ❑ |
| Sitting during workday | ❑ ± 8 hrs | ❑ | ❑ |
| Standing during workday | ❑ 6-8 hrs | ❑ | ❑ |
| Walking during workday | ❑ 6-8 hrs | ❑ | ❑ |

Other disabilities / explanation* ……

……

Regular change of posture ❑ wanted ❑ not necessary

**Provisional prognosis:**

I expect this patient to recover completely / almost completely / limited* within …… weeks

I expect that this patient can perform his usual activities after …… weeks

Next appointment with the patient: ❑ not ❑ within…… weeks

**Authorization:**

…… (name patient)

hereby declares to give permission for exchanging the above information to his/her occupational physician. This permission regards only consultation necessary to gain sufficient information for adequate support during sick leave or for a rehabilitation plan and is only valid during the current episode of complaints. This information can only be used by the above mentioned physicians and the researchers. This information can not be distributed to third parties without my permission. The purpose of this information exchange is clear to me.

Signature: ……

City: …… Date ……/……/ 200……

* Strike through what is not applicable

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# Chapter 6

# Can optimal collaboration between orthopedic surgeons and occupational physicians influence duration of sick leave due to musculoskeletal disorders?

Translated version.
Dutch version accepted for publication in Tijdschrift voor Bedrijfs- en Verzekeringsgeneeskunde
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## Abstract

Musculoskeletal complaints are an important reason for sick leave. In the Netherlands both an orthopedic surgeon and an occupational physician can be involved with workers on sick leave due to these complaints.

The goal of this study was to evaluate the percentage of patients in a group of new patients in an orthopedic outpatients clinic and in a group of scaffolders on sick leave due to musculoskeletal complaints whereby both the orthopedic surgeon and the occupational physicians is involved.

Of the 209 new orthopedic patients 45% had a paid job, 16% was on sick leave and 11% had consulted their occupational physician. Of the 164 scaffolders on sick leave 5% had consulted an orthopedic surgeon.

In both populations only a small proportion consulted both an orthopedic surgeon and an occupational physician. Better collaboration might lead to shorter sick leave for some of these patients. This will probably not have significant effects on the duration of sick leave in the working population.

## Introduction

Musculoskeletal disorders are a common reason for sick leave and work disability. In a study among the Dutch general population almost 75% reported musculoskeletal pain during the past 12 months, About 20% to 30% of this group contacted a medical specialist, 8% to 16% reported a sick leave period of one week or longer, and about 30% reported limitations in their daily life[1]. Musculoskeletal disorders also have a strong long-term impact on society: in a Swedish study 60% of the disability pension and long-term sick leave was related to the musculoskeletal conditions[2]. Regarding the impact of these complaints on daily life and work, many physicians will encounter patients hindered in their work by musculoskeletal symptoms. A recent review showed that the incidence rates of consulting a general practitioner for potentially work-related diseases were high and that musculoskeletal disorders were the main reasons for work-related consultations in general practice[3]. If treatment in primary care is not successful, a general practitioner will consider a referral to specialized care.

In low back pain, referral to a medical specialist is only indicated when red flags are present[4, 5]. In many international guidelines on back pain, both clinical and occupational, patients are advised to stay active and to progressively increase their activity level. Also, remaining at work or (gradual) return to work should be encouraged and supported. The Dutch general practitioners' guidelines for knee and shoulder complaints show similar advices for treatment and referral.

One of the frequent consulted specialists about musculoskeletal disorders is the orthopedic surgeon. In the Netherlands a patient can be referred by his general practitioner, and since 2004 also by his occupational physician. The cost of treatment initiated by a referral of the occupational physicians is, like for the general practitioner also financed by the insurer of the patient.

Since 1998 every employee has access to occupational health care. This provides an opportunity for all medical specialists to communicate directly with an expert on work-related disorders. The occupational physician has direct access to the employer, evaluates fitness for work, and may advise on necessary adaptations in work or at the workplace. Since 2004 an occupational physician can also refer patients to medical specialists, exercise therapy, or other treatment. The medical specialist is responsible for diagnosis and treatment. It is not the task of a medical specialist to provide certification for sickness absence or to evaluate fitness for work resumption.

Due to the differences in tasks between occupational physicians and other physicians in the Dutch health care system a discussion is ongoing on whether and how to improve collaboration between these professions since the late nineties. In 1998 a report was published by a governmental agency (Platform Aanpak Wachttijden) that stated that treating physicians do not always have enough insight in the relation between the complaints and the specific position of the patient in his role as employee[6]. Furthermore, the lack of collaboration was said to hinder adequate sick leave management and would result in sick leave longer than necessary. Improved collaboration and information exchange between the occupational physicians and other physicians was expected to lead to better care or ergonomically adjusted workplaces or work tasks until treatment could be started. This would reduce the duration of sick leave.

Collaboration between occupational physicians and medical specialists is not common (yet) in the Netherlands. A recent report on this collaboration[7] concluded that existing contacts were little and mainly aimed at receiving information instead of interprofessional consultation. However, both occupational physicians and orthopedic surgeons stated the importance of the issue, and expressed the wish to improve the collaboration.

Little knowledge is available about how often patients are consulting both the orthopedic surgeon and the occupational physician about the same musculoskeletal disorder. The above-mentioned reports do not give insight in the size of the problem. Therefore, we performed a descriptive study with two questions: (1) how many patients are on sick leave during their first consult to an orthopedic surgeon and (2) how many patients consulting an occupational physician consulted an orthopedic surgeon.

## Methods

In spring 2005 we asked 200 consecutive new patients of two orthopedic outpatient clinics at an academic and a general hospital in Rotterdam, the Netherlands, to participate in a cross sectional study. The participants were interviewed while they were waiting for their consult. Questions were asked about work, sick leave and demographic details. The data collection was conducted according to the Dutch Code of Conduct for Health Research.

Additional, data from a cohort study of workers from a scaffolding company was used. This occupational population was chosen for its reputed high

physical demands with frequent manual material handling due to manual lifting, lowering, and carrying of heavy materials such as scaffolding poles. High physical load is a well-known risk factor for work-related musculoskeletal injuries and associated sickness absence[8]. The expectation was that in this type of work more severe musculoskeletal injuries will occur which indicated a need to seek care through a medical specialist, such as an orthopedic surgeon[9, 10], compared to less physically demanding jobs. In the period from 1998 to 2001, the occupational health service in the scaffolding company recorded the occurrence, duration, and cause of every sickness absence episode. All employees with a first episode of sick leave due to musculoskeletal disorders were sent a short questionnaire immediately after return to work. Questions were asked about the duration of sick leave (in calendar days), reason for sick leave and whether they visited an orthopedic surgeon. This cohort was part of a larger cohort[8], which study design was approved by the medical ethical research board of Erasmus Medical Center.

## Results

### Patients in orthopedic outpatient clinics

In total, 209 patients participated in the orthopedic outpatient clinics and the response was high (almost 90%). All participating patients visited the orthopedic surgeon for the first time for their current complaints. There were no statistically significant differences between the patient groups from the two clinics on age, sex, paid job, sick leave and occupational physicians consultations. Table 1 shows the characteristics of the patients. About half of the patients had a paid job, of this group 36% were on sick leave and 23% contacted their occupational physician. Little more than half of these patients were not on complete sick leave, but either worked fewer hours or in different tasks. These patients were unable to perform their regular job due to their musculoskeletal complaints.

The presentation of complaints at the different joints did not differ among workers and non-workers. The most frequently presented complaints were knee complaints, 30% among paid workers and 36% among the non-workers, and arm-neck-shoulder complaints, 25% in both groups.

Table 1
New patients in the orthopedic outpatient clinic and scaffolders on sick leave due to musculoskeletal disorders.

| | | New patients in the orthopedic outpatient clinic | | Scaffolders on sick leave due to musculoskeletal disorders |
|---|---|---|---|---|
| | | All patients (N=209) | Patients with a paid job (N=95) | Scaffolders (N=164) |
| Male % (N) | | 47% (98) | 53% (50) | 100% (164) |
| Age – Average (sd) | | 46.1 (19.4) | 40.0 (12.4) | 34.6 (9.1) |
| Paid job % (N) | | 45% (95) | 100% (95) | 100% (164) |
| Sick leave % (N) | Total | 16% (34) | 36% (34) | 100% (164) |
| | Complete sick leave | 7% (15) | 16% (15) | - |
| | Partial sick leave | 9% (19) | 20% (19) | - |
| Contact with OP % (N) | | 11% (22) | 23% (22) | 46% (76) |
| Consult OS % (N) | | - | - | 5% (8) |
| Presented complaints % (N) | Arm-neck-shoulder | 25% (52) | 25% (24) | 36% (59) |
| | Back | 8% (16) | 7% (7) | 39% (64) |
| | Hip | 14% (29) | 10% (9) | 5% (3) |
| | Leg – ankle – foot | 23% (48) | 22% (21) | 18% (11) |
| | Knee | 30% (63) | 36% (34) | 18% (11) |
| | Rheumatoid arthritis | 1% (1) | 0% (0) | 0% (0) |

**Scaffolders on sick leave**

In the scaffolder cohort we had information from 164 male scaffolders with an episode of sick leave due to musculoskeletal disorders in the period January 1998 until June 2001. Back pain (39%) was the most reported cause of absence followed by arm-neck-shoulder pain (36%) (see table 1). The median duration of sick leave was 12 days with a minimum of 1 day and a maximum of 263 days. Almost half of the population was on sick leave for at least two weeks. The majority visited their general practitioner (73%). The occupational health service contacted all sick listed employees within two to three weeks of sick leave.

Only eight of the sick listed scaffolders (5%) visited an orthopedic surgeon. These scaffolders had a longer duration of sick leave with a median duration of 71 calendar days. Among these 8 scaffolders visiting an orthopedic surgeon, 3 sub-

jects had knee complaints, 3 subjects had back complaints, and another 2 scaffolders had arm-neck-shoulder-complaints, of which 1 had a fracture.

## Discussion

The results of the study in waiting room of the orthopedic outpatient clinics showed that 16% of all new patients were on sick leave during their first consultation. One in every ten patients reported contact with an occupational physician. In the cohort study of sick listed scaffolders, more than half of these scaffolders returned to work within two weeks. Less than 5% of the workers on sick leave consulted an orthopedic surgeon. Thus, only a small percentage of the new patients in the orthopedic outpatient clinic and in the group of scaffolders on sick leave had had contact with both an orthopedic surgeon and an occupational physician. As the orthopedic surgeon will advice about treatment and the occupational physicians about fitness for work, these patients risk that advice given about physical activity could be in discordance and therefore create uncertainties about fitness for work at the patient's side. Collaboration between the two professionals could help to create consistency in the advice given to the patient. This may lead to a shorter duration of sick leave. However, due to the fact that improved collaboration would affect only 5% of the scaffolders, reduction of sick leave for this group will probably not have a significant effect on the duration of sick leave on the level of the working population as a whole. Collaboration can also affect other outcome measures[11] such as continuity of care and patient satisfaction, these were not included in this study.

For many other professions, the share of sick leave due to musculoskeletal disorders will be smaller than found in this study, resulting in even fewer consultations with the orthopedic surgeon.

Two thirds of the new patients in the orthopedic outpatient clinic with a paid job were fit for work. Although the symptom severeness was enough to consult an orthopedic surgeon, they managed to stay at work. However, it is likely that these patients will experience difficulties in performing their work tasks. Something an occupational physician is well trained to advice on, but it is unlikely these patients will consult their occupational physician, as they were not absent the work. The orthopedic surgeons can advise these patients on how to deal with current limitations and prevent further disability. Dasinger[12] showed that a positive advice on

return to work from the treating physician to employees with a duration of complaints of more than 30 days lead to more return to work.

In the Netherlands, orthopedic surgeons and other curative physicians are not entitled to advise about fitness for work. They do inform their patients about the physical limitations their disorders may cause in daily life, how to prevent further injuries, and prognosis. Curative physicians usually have limited knowledge about the workload, physical work condition and capacities required to perform one's job, and also lack knowledge about possibilities to work with restrictions in time or tasks. Therefore, it might be difficult for these physicians to answer patients´ questions about work. In the fall of 2005 a report was presented by the Royal Dutch Medical Association on physicians and work[13]. An important topic in this report is that involved physicians need to pay attention to work in the history and treatment of a patient. When an orthopedic surgeon assesses that functional limitations will hamper the performance of the patient at work, or that the work incorporates tasks that should be avoided considering the complaints, the orthopedic surgeon can advise the patient to contact his occupational physician.

Occupational physicians consider the opinion of the treating physician about fitness for work and the waiting list as important obstacles to return to work. Nevertheless, only a few occupational physicians, who reported that the treating physicians had an inhibitory effect on return to work, actually sought contact[14]. Not only practical constraints hinder communication, also the neutral position of the occupational physician questioned by other physicians is an important social constraint. Occupational physicians play a special role in Dutch health care: they advice about return to work while their clients receive treatment from another physician. Since occupational physicians are often employed, or contracted, by the employer of a sick listed patient, treating physicians argue that their information not only will be used for the well-being of the patient, but also for the benefit of the company. In a survey among orthopedic surgeons almost one third of the orthopedic surgeons did not know whether the occupational physician acts on behalf of the patient or of the employer[7]. Also, in collaboration between general practitioners and occupational physicians trust is an important issue[15]. Improving collaboration between professionals requiring a change of behavior is difficult. Several theories and models show a multiplicity of factors that can determine whether implementation of guidelines requiring new behavior is successful, however the evidence for all these factors is still limited[16]. When a change of behavior is only

achieved in a small part of the population, it will be difficult to show its effects. This will hinder change of behavior.

**Methodological considerations**

This study included patients visiting the orthopedic surgeon in two hospitals in Rotterdam during a few days in the spring 2005. As no other studies exist we do not know whether the patients interviewed are representative for the population of patients who consult the orthopedic surgeon. However, only 10 percent of the patients refused to participate, so we expect that we included a normal cross section of orthopedic surgeon patients in our study. We also decided to include only new patients, as we were interested in the collaboration between the orthopedic surgeon and occupational physicians early in the treatment of patients by the orthopedic surgeon. When a patient is treated by the orthopedic surgeon, he or she will only return for appointments to monitor treatment.

The cohort study of scaffolders included data in the period between 1998 and 2001. Since 2001 the legislation about sickness absence and incapacity benefits changed. Important changes were the implementation of the new "Gatekeeper Improvement Law" (Wet verbetering poortwachter) in 2002 and the opportunity for occupational physicians to refer patients to primary and specialized care in 2004. We realize that the data used in this study are from the period before the changes in legislation, but we still think that the data is useful for the answering of our research questions. The employer already had a proactive sickness absence policy, which was reflected in early contact of the OH with the employee involved, within 2 to 3 weeks of the first day of absence. This policy is even more proactive than required by the new legislation. Furthermore, occupational physicians could already before they could refer directly to specialized care, ask the patient to contact their general practitioner for referral. And, the year after the implementation of direct referrals only a few occupational physicians did so[17]. The Netherlands Society of Occupational Medicine of occupational physicians advises occupational physicians to contact the general practitioner before referral to specialized care.

**Conclusion**

Only a small part of new patients in the orthopedic outpatient clinic and of the scaffolders on sick leave contacted both the orthopedic surgeon and the occupational physician. The expectation is that improved collaboration between ortho-

pedic surgeons and occupational physicians will not show large effects on the duration of sick leave in the working population. For a small number of individual patients collaboration may result in earlier return to work.

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# Chapter 7

# Information exchange between orthopedic surgeons and occupational physicians: what do they think? A qualitative study.

Submitted.

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## Abstract

### Purpose

Occupational physicians (OP) and orthopedic surgeons (OS) can both concurrently be involved in the management of work relevant musculoskeletal disorders. This may lead to dissimilar advices, collaboration may reduce this dissimilarity. The objective of this study was to evaluate the opinions of OP and OS on collaboration.

### Methods

Data collection took place in two steps. OP and OS filled out a short questionnaire. Thereafter interviews were held with some of the participants. These interviews were recorded, literally transcribed, and analyzed in Atlas-Ti.

### Results

The questionnaires were returned by 33 OS and 68 OP, and 6 OS and 5 OP were interviewed. Information exchange by regular mail is the most common form of collaboration. The OP is the initiator and requests mainly medical information. Not all physicians acknowledged barriers for collaboration, those who did mentioned practical barriers or social-psychological barriers like indistinctness on the position of the OP. Providing OP or patient with written medical information might improve information exchange.

### Conclusion

Requested information focused on medical information on diagnosis, treatment, and prognosis. Providing OP or patient with this information might improve information exchange. Indistinctness on the role and position of OP is regarded to be an important barrier for collaboration.

## Introduction

Musculoskeletal disorders are common problems that may lead to difficulties at work and even to work disability. In the Netherlands about one quarter of all disability benefits are due to musculoskeletal disorders[1]. Fortunately, most musculoskeletal disorders do not lead to long-term disabilities, but they might lead to transitory difficulties at work or sick leave[2]. In the Dutch health care system all employees have access to an occupational physician, who is paid by the patient's employer. The patient can contact the general practitioner and occupational physician. For insurance covering of specialist care a patient has to be referred to a medical specialist by a general practitioner, occupational physician, or other medical specialist. In the Netherlands, the tasks and responsibilities of occupational health care and curative health care are strictly divided; occupational health care providers manage work rehabilitation and curative health care providers advise on and give medical treatment. This also implies that physicians in the curative care do not certify sick leave and that patient's information can only be transferred between a curative physician and an occupational physician when the patient has given informed written consent. When the health condition is such that it requires the patient to be off work, it is the employer's responsibility to continue payment of salaries for up to two years until the patient returns to work, irrespective of whether the health condition is related to work or not. Many employers have insurance for this purpose.

Patients will visit their general practitioner for diagnosis and treatment of the disorder. Patients can also consult their occupational physician whenever they want. When they are on sick leave, they will be offered a consultation with an occupational physician after 3-6 weeks of sick leave. The occupational physician manages the return to work process. Some musculoskeletal disorders need an intervention by a medical specialist, such as orthopedic treatment. In that case, the patient has to be referred to an orthopedic surgeon by his general practitioner or occupational physician. In those cases the patient will discuss consequences of the disorder for daily functioning with both the orthopedic surgeon and the occupational physician. Patients might receive conflicting advice from these physicians, since they view the disorder from their respective points of view.

Anema[3] showed that occupational physicians consider the opinion of the treating physician regarding return to work of the patient and the clinical waiting period as important obstacles for return to work. However, only a small propor-

tion of the occupational physicians who reported these inhibitory effects on return to work actually sought contact with the treating physician. De Bono[4] showed that information received from other physicians influenced the management of the occupational physician, thereby confirming the importance of collaboration between occupational physicians and other physicians treating an injured worker.

The objective of the study that is presented in this paper was to evaluate the opinions of occupational physicians and orthopedic surgeons on collaboration: What information is exchanged, when and for which patients is information exchange needed, what are perceived barriers for collaboration, and how can the collaboration be improved.

## Methods

A mixed-methods approach[5] was used to get information from several sources; in this study a survey and interviews were used. Data collection took place in two steps. First, occupational physicians and orthopedic surgeons filled out a short questionnaire. Thereafter, the information from these questionnaires was used in interviews with some of the participants to collect more detailed views on the given answers.

For the interviews, a grounded theory methodology was used. In this methodology, the understanding of the opinions on the content and appreciation of collaboration between occupational physicians and orthopedic surgeons was generated from systematically obtained and analyzed data through the constant comparative method[6]. This implies that data collection and data analysis took place at the same time since during the data collection in an interview since a new concept may arise that requires immediate additional data collection during that interview and subsequent interviews. In principle, data collection and analysis will continue until no new concepts arise in the data collection. This also implies that later interviews will have topics based on information from earlier interviews and are used to confirm the issues raised.

### Survey

A short questionnaire was developed, based on earlier questionnaires on collaboration[7-9] and our own experience[10]. The topics of the questionnaire were: characteristics of patient population, frequency of collaboration, who initiates collaboration, and facilitators and barriers for collaboration.

The questionnaire contained statements on the role and position of the colleague-physician. The physicians had to indicate whether or not they agreed with the statement on a 5-point Likert-scale. A cut-off point was set between (partially) agree and neutral to disagree.

The questionnaire was distributed to all occupational physicians and orthopedic surgeons on national conferences of their own professional society in the summer of 2005. About 750 occupational physicians (both registered and in training) and 100-150 orthopedic surgeons (both registered and in training) visited the respective conferences. We aimed for 50 occupational physicians and 50 orthopedic surgeons to return the questionnaire anonymously, thus, a reminder to non-respondents was not possible. During the conference attention was given to the questionnaire at an information stand (OP) or during one of the sessions (OS).

**Interviews**

Interviews were held with occupational physicians and orthopedic surgeons who filled out the questionnaires and stated that they were willing to participate in an interview. In line with the grounded theory method, the interviews were used to add information to the different topics from the questionnaires, to get more detailed information on these topics, and to see whether we missed some topics. The interviews continued until the researchers felt that saturation of information was reached.

Interviews were conducted in the hospital or occupational health service where the physician worked. All interviews were recorded and literally transcribed. EF undertook and transcribed all interviews. The interviews were semi-structured, based on a topic list. When the physicians raised new topics, these were added to the topic lists of the subsequent interviews.

Each interview was analyzed separately in Atlas-Ti and the analysis was primarily based on the topics from the topic lists. EF did the analysis of the interviews. First, all data were coded and based on these codes the information was structured and analyzed[11]. The analysis and primary results were discussed between EF and HM to reach consensus on the results.

## Results - Questionnaires

In total, 69 occupational physicians and 34 orthopedic surgeons returned the questionnaires. One occupational physician and one orthopedic surgeon were excluded because they did not work in their original profession anymore.

The median duration of work experience was 13.8 years for the occupational physicians and 11.0 years for the orthopedic surgeons. Occupational physicians answered that about one third (median) of their patients have musculoskeletal disorders and that 7% (median) of their patients with musculoskeletal disorders are treated by an orthopedic surgeon. Thus, an orthopedic surgeon is involved in the treatment of only a very small group of the patient population of an occupational physician. Most orthopedic surgeons (79%) indicated that between one third and two thirds of their patients have paid jobs. All orthopedic surgeons answered that they ask their patients about their job and 91% ask whether or not they are on sick leave. More than one third of the orthopedic surgeons (39%) will give their working patients information about the consequences of the disorder for the job and a similar proportion gives advice to the patient on how to continue working with the disorder. More than half of the orthopedic surgeons answered that they often advise the patient to contact the occupational physician. Table 1 gives an overview of the patient population of the survey-respondents.

### Frequency and initiator of collaboration

Both orthopedic surgeons and occupational physicians answered that orthopedic surgeons almost never initiate contact. According to orthopedic surgeons, they are contacted by occupational physicians 15 times per year (median). According to occupational physicians on average they seek contact with an orthopedic surgeon 5 times per year (median). Almost all contacts are performed by regular mail.

Table 1
Characteristics of the patient population of the survey-respondents

| **Orthopedic surgeons (N=33)** | | |
|---|---|---|
| Work experience – median (range) | | 11 yr (0.5 - 34) |
| Patients with paid jobs - % (#) | 0-33% | 9% (3) |
| | 33-67% | 79% (26) |
| | 67-100% | 12% (4) |
| Orthopedic surgeons about their working patients | | often/always % (#) |
| I ask my patient what job he practices | | 100% (33) |
| I ask my patient whether he is on sick leave due to his disorder | | 94% (31) |
| I ask my patient whether the disorder is (partially) caused by his job | | 61% (20) |
| I inform my patient on the consequences of his disorder for his job | | 39% (13) |
| I give my patient advice on how to continue working with his disorder | | 36% (12) |
| I give my patient advice to contact his occupational physician | | 55% (18) |

| **Occupational physicians (N=68)** | |
|---|---|
| Work experience – median (range) | 13.8 yr (4 - 25) |
| Occupational physicians about their patient population | median (range) |
| Duration of sick leave before visit to OP in weeks | 3 (0.5 – 5) |
| Percentage of patients with musculoskeletal disorders (MSD) | 30% (4 - 55) |
| Percentage of patients with MSD, treated by an orthopedic surgeon | 7% (0.5 - 30) |

**Advantages of collaboration**

Both occupational physicians (93%) and orthopedic surgeons (73%) think that collaboration has more advantages than disadvantages. The following advantages are most often mentioned: the treatment from the occupational physician can be matched with the prognosis of the disorder; the fact that the occupational physician is informed of the prognosis and diagnosis, and the fact that the patient will receive identical information from both his occupational physician and his orthopedic surgeon.

**Perceived barriers for collaboration**

Almost half of the orthopedic surgeons expressed concerns that the occupational physicians are not fully independent. Less than one third of the occupational physicians agreed with the statement that orthopedic surgeons may give advice on work(dis)ability and 50% agreed with giving advice with regard to the specific job of a patient.

Not all physicians answered the question on the most important disadvantages. About 34% (23) of the occupational physicians either gave no answer or wrote down that they see no disadvantages. However, the majority of 38% of the occupational physicians answered that it is difficult to communicate with the orthopedic surgeon, because the surgeon is not fully informed about the patient's working conditions The orthopedic surgeons mentioned the fact that the occupational physician is not independent or that their information might be used for sick leave control purposes. Both physicians mentioned the time investment as an important barrier for collaboration.

A further important barrier for the orthopedic surgeons was that patients often do not know the name of their occupational physician. Also, the fact that the patient has to give informed consent for information transfer hampers the initiation of contact by the orthopedic surgeon. Occupational physicians brought up specifically the difficulty to contact the orthopedic surgeon in order to communicate directly. Both physicians answered that not knowing the other physician personally is an important barrier. These figures are shown in table 2.

## Results - Interviews

In total, 5 occupational physicians and 6 orthopedic surgeons were interviewed. Both occupational physicians and orthopedic surgeons distinguished several types of collaboration or information exchange whereby the occupational physician is almost always the initiator. Written information requests from the occupational physician to the orthopedic surgeon is the most common type of communication. Occupational physicians also distinguished a request for an expert opinion on the diagnosis and referral to the orthopedic surgeon for diagnosis and treatment. Orthopedic surgeons also mentioned medical examinations for the degree of work disability; these examinations are usually requested in case of work disability pension.

Table 2

Questionnaire - Contact with other physician

| *Contact with other physician* | **Orthopedic surgeons (N=33)** | **Occupational physicians (N=68)** |
|---|---|---|
| | median (range) | |
| How often do you initiate contact per year | 0 (0-10) | 5 (0-24) |
| How often are you contacted per year | 15 (0-100) | 0 (0-15) |
| Which percentage of these contacts is performed by mail | 99 (0-100) | 90(0-100) |
| | % (#) agree | |
| OP are independent in their advises to the patient | 46% (15) | Not Asked |
| I agree with OP referring patients to medical specialists without consulting the general practitioner | 49% (16) | 64% (43) |
| I agree with OS giving advices on work(dis)ability. | 58% (19) | 28% (19) |
| I agree with OS giving advices on the patient's job | 61% (20) | 50% (34) |
| There are more advantages than disadvantages in collaboration between OS and OP | 73% (24) | 93% (62) |
| *What are the most important advantages?* | % (#)giving this answer* | |
| Treatment from OP can be matched with prognosis | 76% (25) | 82% (56) |
| OP knows prognosis and diagnosis | 70% (23) | 78% (53) |
| Patient receives similar information from OP and OS | 67% (22) | 65% (44) |
| *What are the most important disadvantages?* | % (#)giving this answer* | |
| OS is not informed about the patients working conditions | not asked | 38% (26) |
| OP is not independent, since he is paid by employer | 48% (16) | not asked |
| It takes to much time | 42% (14) | 32% (22) |
| My information might be used for control of sick leave | 36% (12) | not asked |
| *What are the most important barriers?* | % (#)giving this answer* | |
| I do not know the other physician | 33% (11) | 38% (26) |
| The patient does not know his OP | 48% (16) | not asked |
| The other physician is hard to contact | 21% (7) | 43% (29) |
| The patient has to give an informed consent | 42% (14) | not asked |

* More than one answer could be given.

**What information is exchanged?**

The information requested by occupational physicians focuses primarily on medical information on diagnosis, treatment, and prognosis. Both occupational physicians and orthopedic surgeons say that it is the task of the occupational physician to translate medical information into information that can be used to accommodate a patient's job and to evaluate the consequences of the medical treatment and the prognosis for the functional capacity of the patient and the rehabilitation process. Both the occupational physicians and orthopedic surgeons agreed that the orthopedic surgeon has too little insight on the job contents and workplace to give advice on work disability.

**When and for which patients is information exchange needed?**

Both the orthopedic surgeons and occupational physicians agreed on the fact that information exchange is only necessary in cases when the rehabilitation process takes more time than expected or when the occupational physician does not know whether and how the patient can continue to work given the disorder. Also, both groups of interviewed physicians felt that information exchange could help in the management of sick leave and reduce the duration of sick leave.

**Perceived barriers for collaboration**

When asked for barriers or other disadvantages of collaboration or information exchange, some of the interviewed physicians answered that there were no real barriers or disadvantages. Others mentioned the following barriers: the amount of time it takes to answer the letters (orthopedic surgeons), the delay in getting an answer (occupational physicians), the difficulty to reach each other, and the amount of administrative work involved. The fact that orthopedic surgeons (and their patients) often do not know the involved occupational physicians was also mentioned. Some of the orthopedic surgeons also mentioned that it was not always clear how the information would be used: they felt that they had to take into account that the given information might have consequences for the patient's work perspectives or work disability pension.

**Suggestions for improvement**

Orthopedic surgeons inform their patients on functional limitations, which is mutually regarded as a good way to give information that can be translated by the

occupational physician into functional capacity or possible work task modifications. However, the patient does only receive oral information on the diagnosis, the treatment and consequences for daily living during the consultation. The orthopedic surgeon always writes a letter about the diagnosis and treatment to the referring physician, usually the general practitioner. A copy of this letter is often included when an occupational physician requests for information, since it answers most questions. Occupational physicians said that receiving a copy of this letter with medical information might reduce the number of information requests and will give them information they need for the development of the return to work plan. This return to work plan is legally required after 8 weeks of sick leave. Orthopedic surgeons felt that this information might help occupational physicians.

## Discussion

Information exchange by regular mail is the most common form of collaboration and the occupational physician almost always initiates it. The information requested by occupational physicians focuses primarily on medical information on diagnosis, treatment, and prognosis, and it is the task of the occupational physician to translate this information to the workplace. Information exchange is only regarded to be necessary in cases when the rehabilitation process takes more time than expected or when the occupational physician does not know whether and how the patient can continue to work given the disorder. Some of the physicians said that there were no actual barriers for collaboration. Those who mentioned barriers mentioned practical barriers (time, effort), not knowing each other, and lack of clarity on the role and position of the occupational physician. Routinely providing patients or occupational physicians with written information on the diagnosis and treatment was regarded as a possible improvement. .

Occupational physicians answered that they seek contact with an orthopedic surgeon about 5 times per year and orthopedic surgeons said that they are contacted about 15 times a year (median). This is in line with the number of orthopedic surgeons and occupational physicians in the Netherlands: in 2005 there were about 500 registered orthopedic surgeons and about 1900 registered occupational physicians according to the Individual Health Care Professions Act [www.bigregister.nl].

In the interviews it was mentioned that the patient does not receive written information to transfer to his occupational physician when the occupational phy-

sician does not request this. During the initial consultation, the patient is only orally informed about his diagnosis and possible treatment options. However, when the patient visits both an orthopedic surgeon and an occupational physician, he will be the first source of information for the occupational physician on information regarding diagnosis and treatment. Without written information it might be difficult for patients to give the occupational physician accurate information on the diagnosis, prognosis and expected timeframe. When the patient has difficulties explaining the provided information, the occupational physician should contact the treating physician in order to get the relevant information. Since this will usually take some time, the information provided by the patient is the basis for the occupational physician's management and this might result in misinterpretations.

In the Netherlands the tasks of occupational physicians and curative health care providers such as orthopedic surgeons are strictly divided. The orthopedic surgeon treats the patient, but is not eligible to certify sick leave. The initiative for an information request lies therefore with the occupational physician. In the interviews a suggestion was given that the letter to the referring physician could be transferred to either the occupational physician or to the patient in an earlier stage. Usually this letter contains a short overview of the medical information on diagnosis and treatment and is often included in a response to an information request. When patients would receive a copy of this letter, they can transfer it to their occupational physician. The orthopedic surgeon does not need to look up contact information of the occupational physician and delay in informing the occupational physician can be diminished. As soon as the patient consults the occupational physician, the medical information can be used for the development of the rehabilitation plan. Furthermore, providing the patient with this information means that the patient also has written information on the information received during the initial consult.

The results in this study are in line with results from an earlier study among occupational physicians and orthopedic surgeons[8]. The view of the orthopedic surgeon regarding the occupational physician's position towards the employer does not seem to have changed since then. Occupational physician are still not seen as independent, since the occupational physician is paid by the employer of the patient on sick leave. Therefore, occupational physicians are thought to have to take the interests of both the employee and the employer into account.

Most interviewed physicians mentioned that not knowing the other personally can be a barrier. For information exchange, one does not have to know the

other physician. However, in all cases where personal, medical information is exchanged, trust in members of the other profession and their independent position towards the patient is necessary. Personal contacts add to the building of trust[9]. A common training program during vocational training of general practitioners and occupational physicians did help to build some trust between the professionals, although only for a short time[12]. This indicates that regional, common training or meetings might help to get to know the other profession and professionals better and therewith to start building trust, but only if they are organized on a regular basis.

**Methodological considerations**

In this study we asked orthopedic surgeons and occupational physicians visiting a conference of their own profession to answer our questionnaire. We could not send all participants to the conferences a reminder, so we probably only received answers from physicians who were interested in collaboration. Furthermore, the candidates for the interviews were selected from the group of physicians who answered the questionnaires and gave their contact information. They might have been biased since they already answered the questionnaires and since they were willing to participate in an interview on this topic.

A mixed methods approach was used to get information from different angles. However, the interviews were held after the survey was performed. The interviews raised new topics and suggestions for improvement that were not covered in the survey. These new topics could thus not be confirmed in a larger group.

**Conclusion**

Exchange of written information is the most common form of collaboration between occupational physicians and orthopedic surgeons. Requested information focuses primarily on medical information on diagnosis, treatment and prognosis and is only regarded necessary in cases when the rehabilitation process takes more time than expected. Providing patients with this information might enhance their responsibility for their rehabilitation process and opens the possibility to transfer this information to their occupational physician at their next consultation. In this way unnecessary delay in information exchange could be prevented and the occupational physician can be provided with the appropriate information to be included into the management of the rehabilitation.

Some physicians did not see barriers for collaboration, others mentioned practical barriers, such as time constraint, or more social-psychological barriers, such as the position of the occupational physicians and their independency. Occupational physicians will need to continue to convince other involved professions of treating physicians of their role and position and the various intervention options they have in the rehabilitation process of the patient.

Table 3
Quotations from the interviews

| |
|---|
| **What information is exchanged** |
| OP 3: In 99% of all cases we receive a copy of the letter to the general practitioner. But that is not what we asked for. We ask for specific information, but it is rare that we get our specific questions answered. |
| OS 3: Usually they (OP) ask what has happened. They do not usually receive a letter with medical information on a treatment. And how much information they ask depends, sometimes it is only on how we continue the treatment to what functional possibilities the patient has. |
| OP 4: I usually ask for the diagnostic results, and for the treatment and prognosis. Those three things are what I need to know. The medical specialist does not have to pass judgment on whether a patient can perform his work. That is my job. And I think that medical specialists often cannot judge how much the work asks from the patient. OP know the specific tasks in a job and can compare the pro's and cons of return to work. |
| **When and for which patients is information exchange needed** |
| OP 1: When I ask information it is preferably when the patient is on sick leave for a longer period of time, like a couple of months. That is when I want to have all information complete. And in other cases when I feel that certain functional disabilities might be long-term disabilities. Because the consequences might be larger and I want to make sure that I know exactly what treatment possibilities there are and what the expectation is of the outcome. |
| OP 4: I usually ask information when something is unusual. So an operation I only see once a year and I am not sure of the outcome. And I ask information when I see stagnation. When the recovery is not conform my expectations. |
| **What are perceived barriers for collaboration** |
| OP 3: I ask my information in the regular way. But that is not fast! That means that I have to get an informed consent, and I have to write and send a letter and then I have to wait, wait, wait. And finally I receive a copy of the letter to the general practitioner. So, when I am honest, it is not a great way. |
| OS 5: What the OP asks is all retrospective. It is too late to be of any use. But I understand that they get the instruction to find out the functional disabilities and when a patient can get back to work. And then they call it sick leave management. |
| OS 2: The difficult thing with OP is that you always have to keep in mind what the consequences are of the information you give. If you write it down one way, the patient can stay at home and go into work disability pension, if you write it down differently the patient might receive a change to return to work. But in both ways, you give similar information. |

OS3: I have absolutely no view on which OP treats which of my patients. And in the mean time I am busy with my work and treating my patients, I don't have the time or energy to find out which OP treats my patient. And the patients do not know it. They cannot give me the name of that physician, only "in that company" or "of that organization". <..>

**Information provided to the patient**

Interviewer: does the patient receive that information <on diagnosis and treatment> written or otherwise?

OS1: after the first consultation? No, not at all. We write down that information in a letter to the general practitioner, but that takes two to three weeks.

OS6: The patient does not normally receive written information on diagnosis, treatment and progress. But when they ask for it, or when I think that the patient might need it for his occupational physician, I give the patient a copy of my letter to the general practitioner.

**Suggestions for improvement**

OS1: We provide quit extended information on the first consult of a patient: anamnesis, research, the diagnosis and the plan of treatment. And if something happens, like a surgery, we provide new information on when it happened and how it went. And normally we only provide it to the general practitioner or the direct referrer.

Interviewer: And would it be possible to provide the OP with this information, after informed consent of the patient?

OS1: Yes. The OP then has the information directly <..> That is probably enough to answer 90-95% of his questions. And it is, let us say 80% more than what he receives right now.

OS2: In theory, if he (OP) would always receive a copy of the letter to the general practitioner, he has all information. And for an OP that would be an advantage I think, because than he knows whether it is a difficult problem or not. Imagine a patient has a disorder and he has a, well, let's say, chronic disease. He is rheumatic. Than the OP knows that he does not have to call the patient immediately. Or the patient has had a total hip replacement, because he was fallen and had a fracture, well, than he (OP) does not have to call to ask whether the patient can start again tomorrow because it will take several months. So I think that it might be an advantage for the OP. It is just, well, for us it is a lot of work to send this information to all those OP.

OP5: On the other hand, if it would be possible to, I can imagine that it is time-consuming <..> One should say that a patient has undergone surgery and the general practitioner receives that information, but one could say that the OP also needs that information. <..>

Interviewer: And with that information you mean information like it is provided to the general practitioner?

OP5: The letter to the general practitioner, one would say that the OS, that we receive a report of what has happened, what has been done.

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# Chapter 8

# General Discussion

## Introduction

The rationale for this thesis is based on the ongoing debate in The Netherlands whether collaboration between clinical and occupational physicians can reduce sick leave. In the Dutch health care system the tasks and responsibilities of curative health care and occupational health care are strictly divided; curative health care providers advise on and give medical treatment in order to resolve the functional limitations whereas occupational health care providers manage work rehabilitation. In policy documents from governmental agencies and advisory boards in the late 1990s, it was assumed that lack of collaboration would lead to unnecessary long sick leave, whereas better collaboration would lead to faster and more efficient treatment[1]. Based on this assumption we set up several studies and formulated three research questions in the introduction of this thesis:

1. What is the association between return to work after a treatment for a musculoskeletal disorder and improvement in pain or functional limitations?
2. What is the effect of a protocol and training in order to improve collaboration between general physicians and occupational physicians on low back pain, functional limitations, and return to work?
3. How can information exchange between specialists and occupational physicians improve care for patients with musculoskeletal disorders?

The purpose of this chapter is to answer these research questions, to reflect on the research findings, and to present recommendations for research and practice.

## Main findings

### What is the association between return to work after a treatment for a musculoskeletal disorder and improvement in pain or functional limitations?

The goal of the systematic review presented in chapter 2 was to evaluate the effectiveness of different treatments for impingement syndrome and rotator cuff tear on the improvement in functional limitations and concomitant duration of sick leave. Pain was not included as an outcome measure in this review. Eighteen (randomized) controlled trials were included in this review; functional limitations was a common outcome measure, duration of sick leave was only included in four studies. Hence, we could compare improvement in functional limitations and duration to return to work for only a few interventions on the impingement syndrome. Although recovery on functional limitations is not equal to return to work

(RTW), the effectiveness of interventions with regard to ability to work or duration of sick leave does not seem to differ from the effectiveness on functional limitations[2].

This result is in line with the main finding in the cohort study presented in chapter 4. This study showed that return to work seems primarily to be determined by the level of experienced functional limitations. In this study workers on sickness absence for LBP between 3-12 weeks showed an improvement over time on pain intensity, functional limitations, and quality of life. Working at 3 months had a positive impact on all three health outcomes. The determinants for recovery in pain, functional limitations, and improvement in quality of life were largely the same, while there was little correspondence with the prognostic factors of RTW. Hence, when treatment of LBP is mainly directed to diminishing functional limitations, it might also result in a faster RTW[3].

Both studies showed that return to work and improvement in functional limitations are correlated but return to work is not determined by a fixed level of functional limitations.

**What is the effect of a protocol and training in order to improve collaboration between general practitioners and occupational physicians on low back pain, functional limitations, and return to work?**

Since collaboration hardly exists in practice[4, 5], a collaboration protocol and training for the management of low back pain patients by occupational physicians and general practitioners was tested. The intervention consisted of a four-hour training course for GP and OP. In this joint course the physicians learned to work together based on a collaboration protocol for the treatment of patients with LBP. The collaboration protocol was derived from the clinical guidelines on LBP for GP[6] and OP[7] and a preliminary version of a guideline for collaboration between GP and OP[8]. It defines the moments at which collaboration is useful: at twelve weeks of low back pain the physicians should always contact each other about additional interventions. Before this time, collaboration was only recommended when the policy of the other physician was unclear or the LBP had not resolved sufficiently. In a controlled trial the intervention in one region was compared with usual care in another region. The physicians enrolled patients on sick leave for 3-12 weeks due to low back pain. Each patient was followed up for six months.

The physicians who were trained in working with the protocol collaborated somewhat more than the physicians who were not trained (13% versus 4%), how-

ever, the increase was not statistically significant. Patients in the intervention region had a significantly longer duration of sick leave but they were also significantly more satisfied with the treatment received[9].

This result was exactly the opposite of the assumed effect of the intervention. The process evaluation of collaboration showed that for most LBP patients occupational physicians and general practitioners did not contact each other. It was concluded that the training intervention has not improved collaboration enough to influence the prognosis of LBP.

**How can information exchange between medical specialists and occupational physicians improve care for patients with musculoskeletal disorders?**

An information exchange form was developed and evaluated (chapter 5). Since the form was hardly used in practice, the evaluation was qualitative. In this evaluation orthopedic surgeons and occupational physicians stated that the form in itself could be useful. However, the question remains whether a structured exchange of information by means of a standardized form will provide more timely and better information than a specific request from occupational physicians when information is needed.

Chapter 6 showed that there is little overlap in the patient population of occupational physicians and patients on a first consult with an orthopedic surgeon. Implementing structured information exchange was difficult in practice and, in addition, the majority of the group of patients visiting an orthopedic surgeon for the first time is not yet on sick leave.

So, questions remained as to how does collaboration take place in practice and what is the opinion of occupational physicians and orthopedic surgeons regarding this collaboration. In chapter 7 a qualitative study is presented. In this study a survey was performed, 33 orthopedic surgeons and 68 occupational physicians responded. Thereafter 5 occupational physicians and 6 orthopedic surgeons were interviewed. Information exchange by mail is the most common form of collaboration. The OP is the initiator and requests mainly medical information. Not all physicians acknowledged barriers for collaboration, however, mentioned barriers were either practical or psychosocial. At this moment it is not customary to inform the occupational physician or to give the patient written information on the diagnosis, treatment, and prognosis. With the patient being the first messenger, it was suggested that providing the patient with a copy of the medical information might lead to fewer information requests and could help occupational physicians

to manage rehabilitation taking into account the opinions on treatment and prognosis from the orthopedic surgeon.

## Methodological considerations

Four of the studies in this thesis have addressed type and content of collaboration between occupational physicians and other physician groups in curative care and investigated whether collaboration will reduce duration of sickness absence. Investigations into collaboration are confronted with several methodological problems, which will have a great impact on the results described in this thesis.

### Collaboration between general practitioners and occupational physicians

In the first of these studies we evaluated the effect of a protocol and training in order to improve collaboration between general practitioners and occupational physicians. This study had an unexpected outcome: the group of patients in the region where the physicians were trained had a longer median duration of sick leave (76 vs. 45 days). The trained physicians did not collaborate significantly more often than the physicians in the other region.

An important methodological issue of the study is that we used a cluster controlled trial design with only two clusters. We were not able to randomize at the patients' or physicians' level, since we needed to avoid contamination of the control group. In one region, typically, an occupational physician has patients visiting different general practitioners within that region. In a nonrandomized design, the probability that there is a baseline difference between the two groups is much larger than in a fully randomized design. Hence, the observed difference in duration of sick leave might have been an existing 'true' difference between the two regions. Furthermore, the change in behavior at the physician level was expected to lead not only to an effect in the treatment of the patients' disorder, but even to a shorter duration of sick leave. It seems that the required change in behavior could not be established in a measurable way within the study period. Several studies have already described barriers for implementation of changes in health care: changing behavior is difficult and this is not any different for healthcare professionals[10-13]. Implementing new ideas or guidelines takes time, and the participants will go through several phases before the change is realized[14]. The question remains whether these changes in behavior will influence not only the management of the disorder, but also the concomitant sick leave.

The protocol used in the intervention was based on the low back pain guidelines from the occupational physicians and general practitioners. The protocol advises physicians to collaborate six weeks after the onset of the episode when they have questions about the treatment of their colleague-physician. Twelve weeks after the onset collaboration should really take place. However, this means that a patient can be on sick leave for twelve weeks before collaboration has to be initiated. In a recent study, the median time to return to work after an episode of sick leave due to low back pain was 5 days and only 10% of the patients in that study were still on sick leave after one month[15]. This implies that the protocol of our intervention study will apply only to a small proportion of workers still on sick leave after 6-12 weeks and, thus, will have a limited effect on sickness absence patterns in occupational populations. Hence, the expected effect of the intervention would have been to minimal to be noticed in the design chosen.

When there is no consistency in the treatment or advice given to a patient, there is a need for collaboration. Also, when physicians do not know what treatment or advice the colleague-physician gives, collaboration might be needed. However, national and international guidelines on low back pain present similar treatment advices[16, 17]. When all physicians treat their patients according to these guidelines, there should be consistency in the treatment and collaboration seems only necessary for a few cases.

**Collaboration between medical specialists and occupational physicians**

Not only within primary care, but also between medical specialists and occupational physicians collaboration is regarded to be insufficient. Therefore, a similar study as the one between general practitioners and occupational physicians was set up. An information exchange form was developed together with occupational physicians and orthopedic surgeons. One important outcome of this process was that the information should be exchanged early in the treatment. Orthopedic surgeons would fill out this information exchange form for new patients referred by a general practitioner for knee (meniscal tears, ACL), shoulder (impingement), or non-specific back pain. Only patients who had a paid occupation, were on sick leave or had a high risk for sick leave, and required treatment were included. However, after an inclusion period of nine months, only eight patients in the intervention group and seven patients in the control group were included. These patients were treated by three out of ten participating orthopedic surgeons

in the intervention group and five out of nine orthopedic surgeons in the control group.

The form had to be filled out early in the treatment trajectory, which might have been a reason for the failure of this trial. Physicians have not yet started the treatment, and therefore do not have a clear view of the patient's prognosis on functional limitations. Furthermore, the orthopedic surgeons might not feel that duration of sick leave is an important outcome measure this early in the treatment trajectory. Due to the division in curative and occupational health care, return to work is the responsibility of the patient with his occupational physician.

The use of the form was evaluated in a qualitative study. The results of this evaluation showed that the form in itself was appreciated, but it also became clear that it will always be the occupational physician who will initiate the contact and thereby the early information exchange will be hampered. This problem is illustrated in the study in chapter 6; most patients with a paid job visiting an orthopedic surgeon are not on sick leave and have not consulted their occupational physician yet.

Based on the results from chapters 5 and 6, we set up a study to evaluate the opinion of orthopedic surgeons and occupational physicians on this information exchange. Within this study we performed interviews based on the information from questionnaires. The content of the questionnaires was based on information from earlier projects and personal experience with occupational physicians and orthopedic surgeons[5, 18]. The interviews also gave us new information that was not asked in the questionnaires. The suggestion from this qualitative study was to provide patients with written medical information. This has not been studied yet, so it is not clear whether it will influence the number of information requests and whether providing the patient with this information might have more consequences e.g. on the duration of sick leave or on their rehabilitation.

**Collaboration between occupational and curative care**

The qualitative studies were not performed before conducting the quantitative studies. This might have been more logical, since the information from the qualitative studies could then have been used in the subsequent quantative studies. However, at the start of the research project, the leading opinion in the Netherlands was that positive effects of collaboration on sick leave were to be expected and that these benefits only needed to be confirmed in research. Our research coincided with several studies and projects to improve collaboration. The outcome

measure in several of these studies was how often the participating physicians collaborated and the results were that they hardly did. Two recent studies[19, 20] on collaboration between occupational physicians and general practitioners have addressed reasons for this lack of collaboration. Lack of mutual trust was an important constraint for collaboration and practical barriers were also often mentioned as reasons for non-collaboration. In order to change behavior and to facilitate collaboration, physicians need to know that this change will actually improve the quality of care received by their patients. For most treating physicians return to work is not the reason for treating their patients, they focus on cure and care.

Even though the physicians want collaboration to take place more often[4, 5] and early in the treatment trajectory, it is usually only done when questions and indistinctness arise during the rehabilitation phase. Since most employees on sick leave will return to work within weeks, collaboration or information exchange may be needed in only a few cases. Even if the physicians would contact each other, the question remains whether this can lead to a measurable effect on the duration of sick leave in the working population. Not only because of the small group of patients, but also because patients might not be able to perform their job and not all employers can provide modified work. Furthermore, it is even possible that an attempt to collaborate hinders return to work. It takes time to exchange information; physicians are difficult to reach, patients have to give an informed consent for the information that will be exchanged and might await the outcome of collaboration before RTW, and the treating physician needs time to answer the questions and might not be able to answer all questions. Other studies also show no effect of improved collaboration on the duration of sick leave[21, 22]. In a recent study in Belgium[22] structured information exchange with communication forms between social insurance physicians and occupational physicians did not influence work resumption. Thus, serious doubts must be raised whether influencing communication between physicians can have an effect on duration of sick leave.

## Implications for practice

Collaboration is the act of working together[23]. Between health care professionals this means that they work together to address patients' health complaints. Collaboration as described in this thesis is usually limited to information exchange. Collaboration in terms of trying to solve a problem together will probably

only take place when the case is more complicated than usual or on occasions when the two physicians already know each other.

Information exchange between physicians can improve the continuity in care given to a patient. The different physicians will know the treatment and management of their colleagues and can advise the patient accordingly. This might lead to shorter sick leave for some patients, but most of all, to more realistic expectations for both the patient and his employer. Patients and treating physicians are not always aware of the possibilities for modified work that can be initiated by the occupational physician. Modified work may reduce duration of sick leave[24, 25].

This thesis shows that information exchange early in the sick leave episode will probably not reduce duration of sick leave for most patients since these patients will return to work within a short period of time. In the Netherlands, the Gatekeeper Improvement Act (Wet Verbetering Poortwachter) has set out minimum standards for the reintegration activities of employees, employers, and occupational health service. When an employee is on sick leave for six weeks and the expectation is that reintegration to work will not take place on short notice, the occupational health service has to give an advice on the prognosis and the possibilities for reintegration. At this time the occupational physician needs medical information and information on prognosis from the treating physician.

Return to work and improvement in functional limitations are closely related. The International Classification of Functioning, Disability and Health (ICF) shows that functioning and disability are important consequences of a disorder[26]. National and international guidelines for the treatment of low back pain already advise the patient to stay active and thereby aim more towards the disability than the pain[16, 17, 27]. Dutch guidelines for general practitioners on knee and shoulder complaints give similar advices. Since treating physicians usually do not know the possibilities for modified work, they should provide information based on functional limitations and their prognosis. The occupational physician can then translate this information into a patient's possibilities at work.

In summary, the recommendations for practice are to provide occupational physicians with medical information on the diagnosis, treatment and functional limitations when the patient is on sick leave for 6 weeks and will probably not return to work on short notice. The occupational physician can translate this information to the work situation and use it for the management of sick leave. Also, the medical information must be available for completion of the documentation in the patients' sick leave file.

## Recommendations for future research

As usual, research provides us with some answers but creates often more questions. The systematic review in this thesis showed that return to work is not an outcome measure in many studies on treatment for musculoskeletal disorders. To be able to manage return to work, and to be alert on abnormal rehabilitation patterns, information on the expected prognosis for return to work after treatment for musculoskeletal disorders is needed. When the effectiveness of treatments is tested or evaluated, duration of sick leave should be included as an important outcome measure.

Chapter 4 showed that predicting return to work based on prognostic factors for the course of low back pain is difficult. Not all patients who have returned to work are without functional limitations[28, 29]. If return to work is not based on a patient's capabilities, then what are reasons for prolonged sick leave? What is the influence of beliefs, expectations and needs of a disabled worker on the decision to return to work? The expectation of the patient is an indicator for the duration of sick leave[30, 31, 15], but what is this expectation based on? Prognostic models for the decision to return to work may help physicians to influence duration of sick leave[32].

Chapter 5 and 6 were set up based on the idea that most patients consulting an orthopedic surgeon would already be on sick leave. Chapter 5 shows that the majority of working patients in the orthopedic outpatient clinic are not on sick leave during their first consult. However, it is still not clear what the decision to call sick or to continue to work is based on. This decision seems not only to be based on pain or functional limitations, but is probably influenced by other factors. Models for this decision-making process might help physicians to interfere on this process.

In summary, based on this thesis, the following recommendations for future research are given:

- Presence and duration of sick leave should be included when studying the effectiveness of a treatment for a musculoskeletal disorder that might be work relevant;
- Prognostic models for the decision to return to work are needed;

- There is a need for more insight in the decision of workers to call sick or continue to work and factors in this decision process that are amenable to intervention

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## Summary

Musculoskeletal disorders are a common problem that may lead to functional limitations and (work) disability. It is not clear yet how improvement in pain or functional limitations is related to return to work after an episode of sick leave. Furthermore, several physicians are involved in the treatment and management of a patient is on sick leave. In the Netherlands a strict separation between treating physicians and occupational physicians exists, whereby the treating physician treats the disorder and the occupational physician manages return to work. Will a better collaboration between occupational health and curative care result in a quicker return to work?

Chapter 2 presents a systematic review of 19 articles of the effects of treatment of impingement syndrome on the associated functional limitations and return to work. For functional limitations, there is strong evidence that extracorporeal shock-wave therapy is not effective, and moderate evidence that exercise combined with manual therapy is more effective than exercise alone, that ultrasound is not effective, and that open and arthroscopic acromioplasty are equally effective on the long term. For all other interventions there is only limited evidence. We found many studies using range of motion and pain as outcome measures but functional limitations were less often used as an outcome measure in this type of research. Duration of sick leave was seldom included as an outcome measure. Although recovery on functional limitations is not equal to return to work (RTW), the effectiveness of interventions with regard to ability to work or duration of sick leave does not seem to differ from the effectiveness on functional limitations.

The controlled trial in chapter 3 evaluated a training for general practitioners and occupational physicians for patients on sick leave due to low back pain (LBP). The goal of this training was to improve collaboration which might improve a patient's recovery and shorten sick leave. In a controlled trial the intervention in one region was compared with usual care in a control region. In each region 56 LBP patients on sick leave for 3-12 weeks were included. These patients filled out three questionnaires; at inclusion, three and six months later. Information on sick leave was gathered from occupational health services. There was little collaboration between physicians during the project. Patients in the intervention region returned to work significantly later ($p=0.005$) but were significantly more satisfied with their occupational health physician ($p=0.01$). No differences were found between the intervention and control patients for pain, disability, quality of life, and medical consumption. This study does not show a positive effect of the training on an

increase in collaboration between general practitioners and occupational health physicians. It also does not show a positive effect on duration of sickness absence. Thus, the intervention was not effective.

The cohort study presented in chapter 4 aimed to identify the determinants for improvement in pain, functional limitations, and quality of life in LBP patients, and to evaluate whether return to work (RTW) can be predicted by these factors and associated improvement in health-related aspects. In total, 103 LBP patients on sickness absence for 3 to 12 weeks were included, data collection was undertaken as part of the study presented in chapter 2. Different personal characteristics determined pain, functional limitations, and quality of life at baseline. These dimensions all improved over time, significantly during the first 3 months. Working at 3 months had a positive impact on all three dimensions. In the multivariate model, RTW was positively associated with male gender and recurrent LBP, whereas it was negatively associated with the level of functional limitations at baseline. This cohort study shows that except for male gender, the primary determinants for improvement in pain, functional limitations, and quality of life were not associated with RTW. Although there is a large coherence in the improvement in the outcome measures, RTW seems primarily determined by the level of experienced functional limitations.

In chapter 5 a qualitative evaluation of a form for standardized information exchange between orthopedic surgeons and occupational physicians is presented. The information exchange form was developed in two consensus meetings with five orthopedic surgeons and five occupational physicians. Participating orthopedic surgeons filled out the form on the first or second consultation of included patients and the patient transferred the form to the occupational physician. To evaluate the information exchange form, structured telephone interviews were undertaken with the patients and face-to-face interviews were undertaken with the physicians. These latter interviews were semi-structured, based on a topic list. The form was used for 8 patients, 7 patients agreed to participate in the qualitative evaluation. All three orthopedic surgeons involved and three of the six involved occupational physicians agreed to be interviewed. The form was transferred to 4 occupational physicians, the other 3 patients recovered before they visited the occupational physician. The information on the form was regarded to be useful. All orthopedic surgeons agreed that the occupational physician should take the initiative. Most physicians felt that the form should not be filled out for each patient visiting an orthopedic surgeon, but only for those patients who do not recover as

expected. That means that the advantage of giving information early in the treatment is lost. Orthopedic surgeons suggested that a copy of the medical information provided to the general practitioner could also be provided to the occupational physician.

In chapter 6 we evaluated potential reasons why the information exchange form in chapter 5 was only used for 8 patients. In this study we evaluated the proportion of patients treated by two physicians in a group of new patients in an orthopedic outpatients clinic and in a group of scaffolders on sick leave due to musculoskeletal complaints. 209 new patients consulting an orthopedic surgeon were interviewed. Almost half of them had a paid job, 16% was on sick leave and 11% consulted their occupational physician. In the group of scaffolders on sick leave 5% consulted an orthopedic surgeon. In both populations only a small proportion consulted both an orthopedic surgeon and an occupational physician. Better collaboration might lead to shorter sick leave for some of these patients, but this will most likely not have a significant effect on the duration of sick leave in the working population.

In chapter 7 we present a qualitative evaluation on the opinion of orthopedic surgeons and occupational physicians on collaboration. Data collection took place in two steps. In a questionnaire survey, 68 occupational physicians and 33 orthopedic surgeons returned the questionnaire. Thereafter interviews were held with 6 orthopedic surgeons and 5 occupational physicians. Information exchange by mail is the most common form of collaboration. The OP is the initiator and requests mainly medical information. Information exchange can be improved by standard providing the occupational physician or the patient with a copy of the letter to the referring physician. When the patient receives this information he can transfer it to the OP. Not all physicians acknowledged barriers for collaboration, however, mentioned barriers were either practical or psychosocial. Indistinctness on the role and position of OP is still regarded to be an important barrier for collaboration

Chapter 8 reflects on the findings in this thesis and recommendations for practice and research are given. Recommendations for practice are to focus management of a musculoskeletal disorder and it's concomitant sick leave should on reducing functional limitations. Based on the results of this thesis, it is doubted whether collaboration between occupational and curative health care can reduce sick leave duration on population level. However, we do recommend to provide the occupational physician with information on the diagnosis, treatment and functional limitations when a patient is on sick leave for six weeks.

In order to provide more evidence on the duration of sick leave after a treatment, presence and duration of sick leave should be included when studying a treatment for a disorder that might be work relevant. Also models on the decision to return to work or stay sick listed are needed.

# Samenvatting

Klachten aan het houdings- en bewegingsapparaat komen veel voor. Deze klachten kunnen leiden tot functionele beperkingen en soms zelfs tot (tijdelijke) arbeidsongeschiktheid. Wanneer patiënten met deze klachten verzuimen, is het niet duidelijk op welk moment zij terugkeren naar het werk. Welke rol spelen verbeteringen in pijn of functionele beperkingen bij de beslissing om terug te keren naar het werk? Bovendien zien patiënten die verzuimen vanwege deze klachten vaak zowel een behandelend arts als een bedrijfsarts. In Nederland bestaat een strikte scheiding tussen behandelend (of curatieve) artsen en bedrijfsartsen, waarbij de behandelend arts de aandoening behandelt en de bedrijfsarts de patiënt begeleidt bij de terugkeer naar werk. De vraag is dan ook of een betere samenwerking tussen deze artsen ervoor kan zorgen dat patiënten na een verzuimperiode eerder terugkeren naar het werk.

Hoofdstuk 2 is een systematisch literatuuronderzoek waarin wordt gekeken naar de effecten van behandeling van impingement syndroom op functionele beperkingen en terugkeer naar werk. Negentien artikelen werden geïncludeerd. Voor functionele beperkingen is er sterk bewijs dat extracorporeal shock wave therapie niet effectief is en matig bewijs dat oefeningen gecombineerd met manuele therapie meer effectief zijn dan oefeningen alleen, dat ultrageluid niet effectief is en dat open en artroscopische acromioplastiek even effectief zijn op de lange termijn. Voor alle andere behandelingen is er slechts beperkt bewijs. Wij vonden veel studies met bewegingsuitslag en pijn als uitkomstmaat, maar functionele beperkingen werden minder vaak als uitkomstmaat gebruikt. De duur van ziekteverzuim werd zelden gebruikt als uitkomstmaat. Hoewel herstel op functionele beperkingen niet gelijk staat aan terugkeer naar werk, lijkt het erop dat de effectiviteit van de interventies vergelijkbaar is voor terugkeer naar werk en functionele beperkingen.

Het gecontroleerde onderzoek in hoofdstuk 3 laat een evaluatie zien van een training voor huisartsen en bedrijfsartsen. Het doel van deze training was om de samenwerking te verbeteren voor patiënten met ziekteverzuim vanwege lage-rugklachten (LRK). Betere samenwerking zou het herstel van de patiënt kunnen bevorderen en het ziekteverzuim kunnen verkorten. In dit onderzoek werd de interventie in één regio vergelijken met een controleregio waar de artsen niet werden getraind. In elke regio werden 56 patiënten met LRK en een verzuimduur van 3-12 weken geïncludeerd. Deze patiënten vulden driemaal een vragenlijst in: bij inclusie, drie en zes maanden later. Informatie over de duur van het verzuim werd verkregen van de arbodiensten. Er was weinig samenwerking tussen de

artsen gedurende het project. Patiënten in de interventie-regio keerden significant later terug naar het werk (p=0.005) maar waren significant meer tevreden met hun bedrijfsarts (p=0.01). Er werden geen verschillen gevonden tussen de patiënten inde interventie- en de controleregio met betrekking tot pijn, beperkingen, kwaliteit van leven en medische consumptie. Dit onderzoek laat geen positief effect zien van de training op het verbeteren van de samenwerking tussen huisartsen en bedrijfsartsen. Het laat ook geen positief effect zien op de duur van het verzuim. Geconcludeerd kan worden dat de interventie niet effectief was.

Het doel van het cohort-onderzoek in hoofdstuk 4 was het in kaart brengen van determinanten voor verbetering in pijn, functionele beperkingen en kwaliteit van leven voor LRK-patiënten en te evalueren of terugkeer naar werk voorspeld kan worden door deze determinanten en de verbetering in pijn, functionele beperkingen en kwaliteit van leven. In totaal werden 103 LRK-patiënten met een verzuimduur van 3-12 weken geïncludeerd, de dataverzameling vond plaats als onderdeel van de studie gepresenteerd in hoofdstuk 2. Pijn, functionele beperkingen en kwaliteit van leven bij baseline werd bepaald door diverse persoonlijke eigenschappen. Deze drie dimensies verbeterden allemaal gedurende de tijd, significant gedurende de eerste drie maanden. Terugkeren naar werk binnen drie maanden na inclusie had een positief effect op alle drie dimensies. In het multivariate model was terugkeer naar werk positief geassocieerd met het niveau van functionele beperkingen op baseline. Deze studie laat zien dat behalve geslacht (mannelijk), de primaire determinanten voor verbetering in pijn, functionele beperkingen en kwaliteit van leven niet voorspellend zijn voor terugkeer naar werk. Hoewel er een grote overeenkomst is in de verbetering van de uitkomstmaten, lijkt terugkeer naar werk vooral bepaald door het niveau van ervaren functionele beperkingen.

Hoofdstuk 5 is een kwalitatieve evaluatie van een formulier voor gestandaardiseerde informatie-uitwisseling tussen orthopedisch chirurgen en bedrijfsartsen. Het formulier is ontwikkeld in 2 consensusbijeenkomsten met 5 orthopedisch chirurgen en 5 bedrijfsartsen. Orthopedisch chirurgen die deelnamen aan de kwalitatieve evaluatie vulden het formulier in tijdens het eerste of tweede consult van geïncludeerde patiënten en de patiënten namen het formulier mee naar de bedrijfsarts. Om het formulier te evalueren zijn de patiënten telefonisch geïnterviewd aan de hand van een vragenlijst en zijn de artsen persoonlijk geïnterviewd. De interviews met de artsen waren gebaseerd op een onderwerpenlijst. Het formulier was gebruikt voor 8 patiënten, 7 patiënten

wilden deelnemen aan het kwalitatieve onderzoek. Alle drie betrokken orthopedisch chirurgen en drie van de zes betrokken bedrijfsartsen gingen akkoord met een interview. Vier patiënten gaven het formulier aan hun bedrijfsarts of stuurden het op, de 3 andere patiënten waren hersteld voor zij de bedrijfsarts bezochten. De informatie op het formulier werd bruikbaar gevonden. Alle orthopedisch chirurgen vonden dat de bedrijfsarts het initiatief zou moeten nemen voor informatie uitwisseling. De meeste artsen vonden dat het formulier niet voor elke patiënt zou moeten worden ingevuld, maar alleen voor die patiënten die niet herstellen volgens verwachting. Dat zou betekenen dat het voordeel van informatie uitwisseling vroegtijdig in het behandeltraject verloren gaat. Orthopedisch chirurgen suggereerden dat een kopie van de brief met medische informatie aan de huisarts ook aan de bedrijfsarts gegeven kon worden.

In hoofdstuk 6 evalueerden we waarom het formulier uit hoofdstuk 5 slechts voor 8 patiënten was gebruikt. In deze studie onderzochten we het aandeel van patiënten die door zowel een orthopedisch chirurg als een bedrijfsarts wordt gezien in een groep nieuwe patiënten op een orthopedische polikliniek en in een groep van 164 steigerbouwers met ziekteverzuim vanwege klachten aan het houdings- en bewegingsapparaat. In twee orthopedische poliklinieken werden 209 patiënten die voor een eerste consult kwamen geïnterviewd. Ongeveer de helft van hen had een betaalde baan, 16% was met ziekteverzuim en 11% had contact gehad met de bedrijfsarts. In de groep steigerbouwers met verzuim had 5% een orthopedisch chirurg geconsulteerd. In beide groepen had slechts een klein aandeel zowel een orthopedisch chirurg als een bedrijfsarts geconsulteerd. Betere samenwerking kan leiden tot een kortere verzuimduur voor een aantal van deze patiënten, maar het zal waarschijnlijk geen significant effect hebben op de duur van het ziekteverzuim in de werkende populatie.

De mening van orthopedisch chirurgen en bedrijfsartsen over samenwerken was het onderwerp van de kwalitatieve studie in hoofdstuk 7. De data werd in twee stappen verzameld. Een vragenlijst werd ingevuld door 68 bedrijfsartsen en 33 orthopedisch chirurgen. Daarna werden 6 orthopedisch chirurgen en 5 bedrijfsartsen geïnterviewd. De meest voorkomende vorm van samenwerking is het uitwisselen van informatie per post. De bedrijfsarts is de initiator en vraagt vooral naar medische informatie. Informatie uitwisseling kan worden verbeterd door standaard de patiënt, of de bedrijfsarts, te voorzien van een kopie van de brief aan de verwijzend arts. De patiënt kan deze informatie doorgeven aan de bedrijfsarts. Niet alle artsen vonden dat er belemmeringen waren voor

samenwerking. Belemmeringen die werden genoemd waren praktisch of psychosociaal. Onbekendheid met de rol van de bedrijfsarts wordt nog steeds gezien als een belangrijke belemmering voor samenwerken.

Hoofdstuk 8 is een reflectie op de resultaten van dit proefschrift en geeft aanbevelingen voor de praktijk en voor onderzoek. Aanbevelingen voor de praktijk zijn om de behandeling en begeleiding van klachten aan het bewegingsapparaat en bijkomend ziekteverzuim te richten op het verminderen van functionele beperkingen. Gebaseerd op de resultaten van dit onderzoek wordt betwijfeld of samenwerking tussen behandelend artsen en bedrijfsartsen de duur van ziekteverzuim op het niveau van de beroepsbevolking kan verminderen. Niettemin bevelen wij wel aan om de bedrijfsarts informatie te geven over de diagnose, behandeling en functionele beperkingen op het moment dat een patiënt zes weken verzuimt.

De aanwezigheid en duur van ziekteverzuim zou een uitkomstmaat moeten zijn wanneer onderzoek wordt gedaan naar een behandeling voor een aandoening die mogelijk werkrelevant is, dit om meer informatie te krijgen over de duur van verzuim na een bepaalde behandeling. Ook is er behoefte aan modellen over de beslissing om terug te keren naar werk of te blijven verzuimen.

## Curriculum Vitae

Elske Faber werd op 11 juli 1977 geboren in Groningen. In 1996 startte zij met de studie bewegingswetenschappen aan de Rijksuniversiteit Groningen en studeerde in 2001 af in de richting Arbeid en Gezondheid.

Na haar studie begon zij als onderzoeker bij het Nederlands Kenniscentrum voor Arbeid en Klachten Bewegingsapparaat in Rotterdam. Daar voerde zij het onderzoek uit dat heeft geleid tot dit proefschrift. Dit onderzoek is een samenwerkingsverband tussen het Nederlands Kenniscentrum voor Arbeid en Klachten Bewegingsapparaat en de afdelingen Huisartsgeneeskunde, Maatschappelijke Gezondheidszorg en Orthopedie van het Erasmus MC.

Op dit moment werkt zij als wetenschappelijk medewerker bij het Nederlands Huisartsen Genootschap te Utrecht. Zij werkt daar aan transmurale en eerstelijns samenwerkingsafspraken (LTA en LESA) en NHG-Praktijkaccreditering.

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