

---

## SUMMARY

---

## **Chapter 1: General introduction**

In the Netherlands, non-surgical management of patients with hip and knee osteoarthritis (OA) is not optimal despite several existing guidelines. Possible explanations for this suboptimal care are the lack of recommendations about the indication for and timing of treatment options and the poor incorporation of guideline recommendations in clinical practice. A stepped care model has been suggested to use limited resources to the greatest extent, by presenting the optimal order of treatment options. This model could be used as a framework for the management of hip or knee OA by both patients and health care providers. Before starting an implementation of a stepped care strategy (SCS), the implementation process should be tested and evaluated on a limited scale first. In this thesis, we describe the development and implementation of a SCS regarding the management for hip or knee OA in clinical practice. We will identify targets to improve this implementation that is focused on different target groups, i.e. patients, health care providers, and organization.

## **Chapter 2: Development of the SCS**

A national, multidisciplinary, steering group developed the SCS through a consensus procedure in three phases. The first phase included a literature search to identify recently published systematic reviews about the management of OA. Then, the steering group formulated a first draft on the basis of consensus. In the second phase, 23 representatives of patient organizations and professional associations involved in OA care were asked to comment to a set of questions on the first draft, by means of a written consultation. In the third phase, participants of an invitational conference could give feedback on the draft in two discussion rounds, both performed by five panels. The final SCS presents, in three tiers, the optimal order for non-surgical treatment modalities. The SCS recommends that more advanced options should only be considered if options listed in previous steps failed to produce satisfactory results. Hence, the first step treatment options can be offered to all patients but may also be provided through self-care. The treatment options in the second and third step can be considered for people with persisting complaints. The SCS also presents recommendations regarding the diagnostic procedures and evaluation. The diagnosis should be based on medical history and physical examination. In step 2, radiological assessment is recommended only if there is a discrepancy between medical history and physical examination. Also, mutual goals setting, systematic monitoring, evaluation, and if necessary, adjustment to the previously set goals are advocated.

## **Chapter 3: General practitioners' agreement with the SCS**

The implementation of the SCS was focused on general practitioners (GPs), as non-surgical treatment of patients with hip or knee OA is mainly performed in primary health care. Clearly, a negative attitude of GPs could hamper a successful implementation. In this survey among Dutch GPs, we studied GPs' attitudes towards the two key elements of the

SCS: their attitude concerning the appropriate treatment and their attitude concerning the optimal sequence for care. Therefore, we assessed which of the frequently-used treatment modalities were found to be effective in the treatment of hip or knee OA by the GPs. Furthermore, we assessed whether GPs agreed with the sequence for care that is presented in the SCS-recommendations. For that matter, we calculated an agreement score regarding 7 statements that were based on the SCS-recommendations. The majority of the GPs considered 7 of the 11 recommended modalities (i.e. oral Non-Steroidal Anti-Inflammatory Drugs, physical therapy, glucocorticoid intra-articular injections, education, lifestyle advice, acetaminophen, and tramadol) effective in the treatment of hip or knee OA. Their mean agreement score, based on a 5-point scale, was 2.8 (SD=0.5). A linear regression revealed that GPs' attitude regarding the effectiveness of treatment modalities, working in a solo practice and having structural collaboration with other disciplines regarding OA care were associated with the GPs' agreement with the SCS. Identified starting points to focus implementation activities were the prescription of pain medication and use of X-rays. However, based on these results we do not expect that a nationwide implementation will be hampered by a negative attitude of GPs towards recommendations of the SCS.

#### **Chapter 4: Patients' reported barriers and facilitators for using the self-management booklet**

Implementation of the SCS also focused on patients with hip or knee OA, as their role in the management of a chronic condition like OA is very important. We developed the self-management booklet "Care for Osteoarthritis", based on the SCS. This booklet was introduced to GPs and their patients in a region of the Netherlands. The aim of the booklet was to educate patients about OA, to enhance the patient's active role in the treatment course, and to improve the communication with health care providers. Patient's views regarding the content and use of this booklet were assessed in a qualitative study using semi-structured interviews. We identified patients' perceived barriers and facilitators to use the booklet regarding three themes: 1) the role of health care providers, 2) the patients' perceptions about OA and its manageability, and 3) the patients' perceptions about the usefulness of the booklet and patients' information needs. Regarding the first theme, the lack of encouragement during the treatment course from health care providers was reported by patients as a barrier to use the booklet. Moreover, patients had doubts concerning the health care providers' endorsement of non-surgical treatment for OA. Identified barriers from the second theme were thinking that OA is not treatable or thinking that being pro-active during the treatment course is not important. In contrast, being convinced that an active participation in the treatment course is important was reported as a facilitator. Regarding the third theme, patients' perceptions about the usefulness of the booklet and patients' information needs were both identified as barrier and facilitator for booklet use.

## **Chapter 5: Health care use after implementation of the SCS**

Several implementation activities, aligned to patients and health care providers, were executed to implement the SCS in the region Nijmegen in the Netherlands, e.g. educational outreach visits, reminder material, seminars, and a self-management booklet for patients. These activities were based on previous identified effective implementation strategies and were selected by a regional expert panel based on the feasibility. In a 2-year observational prospective cohort, 313 patients with a new episode of (symptomatic) hip or knee OA were included by their GP. These patients received biannual surveys regarding their health care use and outcome of care. We calculated the cumulative percentage users for each treatment modality. The most frequently used modalities were education, acetaminophen, lifestyle advice, and exercise therapy, which were used by 242 (82%), 250 (83%), 214 (73%), and 187 (63%) patients respectively. It seems that most non-surgical modalities were well used after implementation of the SCS in clinical practice. However, only 14% of the overweight patients reported being treated by a dietician. Being female, having an active coping style, using the self-management booklet “Care for Osteoarthritis”, and having limitations in functioning were recurrently identified as determinants of health care use. Starting points on which to focus activities for a nationwide implementation are providing dietary therapy in overweight patients and making more effort to encourage patients with a passive coping style to use non-surgical modalities.

## **Chapter 6: Consistency between health care use and the SCS**

After implementation of the SCS, it would be useful to identify the remaining gaps between health care and the SCS-recommendation. Furthermore, it would be interesting to identify those factors that can influence this consistency. Data from the abovementioned 2-year observational prospective cohort study was used to assess the consistency between clinical practice and the SCS regarding three aspects of care; 1) timing of radiological assessment, 2) sequence of non-surgical treatment options, 3) making follow-up appointments. Less than half of the patients who reported to have had an X-ray, received it in line with the SCS. The sequence of treatment was inconsistent with the SCS-recommendations in 58% of the patients, which was mainly caused by the under-use of lifestyle advice and dietary therapy. In 57% of the GP-consultations, the patient reported to have been advised to make a follow-up appointment. Using multilevel logistic backward regression models we found being a female and having more than 1 year symptoms as determinants of receiving X-ray well timed. An optimal sequence of non-surgical treatment was associated with smaller number of comorbidities or painful joints, having an additional health insurance, having a female GP, and having a GP who had a positive attitude about the non-evidence based modalities. Receiving the advice to make a follow-up appointment was associated with lower scores in active pain coping, having fewer limitations in functioning, and having a GP who had a negative attitude about the evidence-based modalities. Health care can be

further optimized by encouraging GPs to use X-rays more appropriate and to make more use of lifestyle advice, dietary therapy, and follow-up appointments.

## **Chapter 7: The impact of the SCS on the outcome of care**

We hypothesized that care that is provided in line with the SCS-recommendations is associated with better physical and psychological health outcomes, like pain, physical functioning, self-efficacy, and using an active coping style. Again, data from the above-mentioned 2-year observational prospective cohort study were used. We considered care *SCS-consistent* if all advised modalities in the previous steps of the SCS were offered to the patient before more advanced modalities in the subsequent steps. We estimated crude and adjusted associations between SCS-consistent care and outcomes with generalized estimating equations. Differences in changes over a 2-year period in pain and physical function between patients who received SCS-inconsistent care ( $n=163$ ) and patients who received SCS-consistent care ( $n=117$ ) were not statistically significant, also after adjusting for possible confounders, i.e.  $-4.3$  ( $-10.3$  to  $1.7$ ) and  $-1.9$  ( $-7.0$  to  $3.1$ ) respectively. Furthermore, no differences in changes over time between groups were found in self-efficacy and pain coping. Therefore, our results suggest that providing SCS-consistent care is not associated with better health outcomes at two years after implementation of the SCS in primary care. Without any doubt, the evaluation of a complex intervention such as the SCS seems to be challenging as it brings various problems in addition to the practical and methodological difficulties that any successful evaluation must overcome. Further research is necessary to assess physicians' reasons for providing SCS-inconsistent care, the long-term effects, and the effects on costs and side-effects.

## **Chapter 8: General discussion**

The SCS was developed using a consensus procedure and mainly based on existing national and international guidelines regarding the management of hip or knee OA. Although the proposed SCS presents in our opinion the optimal sequence for OA management, we do not have direct evidence about the efficacy of the SCS. Meanwhile there are new insights in the efficacy of several treatment modalities and, thus we suggest a regular update of the SCS. The multilevel and multifaceted interventions aligned to both patients and health care providers seemed to be suitable for implementation of the SCS but should be adjusted based on our results. Although patients were positive regarding the developed self-management booklet "Care for Osteoarthritis" (in Dutch: "Zorgwijzer Artrose<sup>®</sup>"), it was only used by 61% of the patients. GPs reported the first two sections of the booklet as most important. Outreach visits and the multidisciplinary seminar may not be feasible in this format, but the content of these could be embed in existing education for GPs and post-graduate training. The patient-related factors explained by far most the variance in health care use after implementation of the SCS in clinical practice. We suggest that a tailored approach

is necessary to improve implementation at the level of the patient. In general, GPs' attitude regarding SCS-recommendations was positive, although it was in discrepancy with the patients' view as they perceived no endorsement for recommended modalities from their GPs. Organizational-oriented implementation activities such as community-based care for patients with OA and installing multidisciplinary (regional) networks can be considered to enhance implementation of the SCS at the organizational level. With the results of this thesis we could not confirm our hypothesis that receiving care that is in line with the SCS-recommendation has a positive impact on the outcomes of care over a period of two years after implementation. However, this lack of effect does not suggest that we do not longer need to explore the effects of an optimal sequence for care on the outcomes. Further research is needed to explore these effects after a longer follow-up period or other health outcomes like the number of side effects and the cost-benefits. Moreover, an observational study is not the ideal design to find potential associations between SCS-consistent care and health outcomes. Maybe other designs like (cluster) randomized trials or using propensity score technique could counterbalance these problems.