

“Beating osteoARThritis”: Development of a stepped care strategy to optimize utilization and timing of non-surgical treatment modalities for patients with hip or knee osteoarthritis

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Abstract Inadequacies in health care practices have been reported despite existing guidelines to manage hip or knee osteoarthritis. To facilitate guideline implementation and improve utilization of non-surgical treatment options a care strategy should be developed. This study describes the development of an evidence-based, multidisciplinary, patient-centered, stepped care strategy. A national, multidisciplinary, steering group developed the strategy in three phases: (1) consensus among steering group members (first draft); (2) written consultation of 23 representatives of patient organizations and professional associations involved in osteoarthritis care (second draft); (3) consensus of the final draft after discussion in two rounds during a conference with representatives from the different disciplines. The final stepped care strategy presents, in three tiers, the optimal order for non-surgical treatment modalities. It

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 (education, life style advice, and acetaminophen). The second step (exercise therapy, dietary therapy, and non-steroidal anti-inflammatory drugs) and third step treatment options (multidisciplinary care, intra-articular injections, and transcutaneous electrical nerve stimulation) can be considered for people with persisting complaints. Through a consensus procedure, we succeeded to develop a multidisciplinary, patient-centered, stepped care strategy based on national guidelines. This strategy provides a framework for health care providers and patients with hip or knee osteoarthritis to discuss the optimal timing of the various treatment options.

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Introduction

As there is no known cure for osteoarthritis (OA), treatment is based on controlling pain, improving function, and improving health-related quality of life. The potential of the various non-surgical treatment modalities is clearly demonstrated in several national and international guidelines to manage hip or knee OA [1–5]. In general, a combination of pharmacological and non-pharmacological treatment modalities is considered to be the best core treatment. However, despite the availability of these guidelines inadequate diagnostic procedures, referrals, and utilization of treatment modalities are seen in clinical practice, leading to suboptimal outcomes.

A possible explanation for these inadequacies is the lack of recommendations in current guidelines about the indication for and the timing of treatment options, which over time can impede optimal OA management. This explanation is supported by the findings that only 28% of OA patients who are scheduled to undergo total hip arthroplasty had actually ever been referred to a physical therapist during their OA history [6], and that non-pharmacological treatment options, such as patient education, weight reduction and exercise therapy are underutilized [7–10].

Another possible explanation is the poor incorporation of guideline recommendations in clinical practice. For example, half of the primary care physicians ordered inappropriate diagnostic tests in a hypothetical patient with knee OA [9]. Furthermore, interventions lacking evidence for efficacy (e.g., massage, traction, and stretching) are still utilized in approximately half of the OA patients who received physiotherapy [11].

To facilitate guideline implementation and improve utilization of non-surgical treatment options, a multidisciplinary and patient-centered approach is suggested, as different health care providers are involved in the non-surgical care of OA, and a central role of the patient in managing health in collaboration with providers is advocated [12–15]. This multidisciplinary and patient-centered approach could best be achieved by employing a “stepped” care model. A stepped care model provides a good framework for both health care providers as patients, as it presents the optimal order when a range of interventions is available and it uses limited resources to their greatest effect [16, 17]. For these reasons, it appeared most suitable to manage a heterogenic population like OA patients for a prolonged period. The first step of such a model suggests interventions that should be tried initially, while interventions in later steps are reserved for those whose condition

was not controlled by lower step treatment options. Thus, health care providers play an active role in monitoring and evaluating the previous performed treatment options. This model has been proven to be effective for several other chronic disorders, like diabetes mellitus [18], depression [19], and back pain [20].

To date, a few tools have been developed for health care providers to support decision making in the OA management. For instance, some clinical pathways describe diagnostic procedures and OA management [13], but lack recommendations about the timing for the different treatment modalities. While Porcheret et al. [21] did develop a stepped care strategy for older adults in primary care with knee pain or knee OA, there is no such comprehensive protocol to guide non-surgical management for patients with hip or knee OA.

In the Netherlands, therefore, several stakeholders took the initiative to develop a stepped care strategy [22], which takes into account the diverse presentation and progression of symptoms with the subsequent variation in treatment needs. This article describes the developmental process and the content of the multidisciplinary patient-centered, stepped care strategy for hip or knee OA, known as BART, i.e., Beating osteoARThritis.

Methods

The stepped care strategy was developed by a steering group in three phases. This steering group, appointed by the B&JD NL board, consisted of a patient representative and six experts representing the main disciplines involved in OA care: rheumatology (TPMV), orthopaedic surgery (BAS), primary care (SMAB, TBV), physiotherapy (CHME) and rehabilitation (JD).

The first phase started with studying the content of national and international guidelines and performing a literature search to identify recently published systematic reviews about the management of OA, not incorporated in guidelines. The steering group discussed and defined, in several meetings, the starting points, in order to set a preliminary focus for the content of the stepped care strategy. Finally, the steering group formulated a first draft of the stepped care strategy on the basis of consensus after an open broad discussion in which differences were resolved by discussion.

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 (see Table 1) on the first draft, by means of a written consultation (20 responded). These questions were used to aid the process of consensus by generating ideas for comments and suggestions. Subsequently, the steering

Table 1 Questions presented during the written consultation with 23 representatives

1. Do you agree with the board of the B&JD NL and the members of the national steering group that a more consistent and uniform management of the treatment for osteoarthritis is desirable?
2. Do you endorse the principles of the stepped care strategy created by the national steering group?

What is your opinion about this draft of stepped care strategy with regard to the following:

3. Is the stepped care strategy clearly formulated?
4. The stepped care strategy consist three steps. Do you think fewer or more steps are desirable?
5. Do you agree with the ranking of the treatment options?
6. Do you endorse the length of the evaluation period proposed for each step?
7. Do you want to add treatment options to this stepped care strategy?
8. Do you believe that specific treatment options mentioned in the stepped care strategy are not relevant? If so, which?
9. Do you believe that implementation of the stepped care strategy will indeed contribute to a more consistent and uniform management of the treatment of osteoarthritis?
10. Do you have other comments?

group summarised these comments and suggestions. Based on these results, a second draft of the stepped care strategy was made after differences were resolved by discussion.

Finally, during an invitational conference participants could give feedback on these results in two discussion rounds led by the chairman (TBV). Both rounds were performed by five panels. In the first round homogenous groups were made: one panel consisted of patient representatives and four panels of four different disciplines (general practitioners (GPs), physical therapists, orthopaedic surgeons and rheumatologists). After the first round the chairman made in a plenary session an inventory and summary of the main concerns and suggestions for change raised by the different panels. Then, those concerns and suggestions for change were discussed in a second round with five mixed panels. In the second plenary session, consensus was reached on the final version of the stepped care strategy.

Developmental process

Starting points

The steering group decided to build a three-step care strategy, each step consisting of recommendations for the timing of diagnostic procedures, treatment modalities, and evaluation. First, they reached consensus about the following starting points:

- The stepped care strategy is primarily based on the Dutch multidisciplinary guideline for the diagnosis and management of hip or knee OA [1]. While there is general consistency in the numerous recommendations among national and international guidelines as well as among monodisciplinary and multidisciplinary guidelines to manage hip or knee OA, recommendations do differ to some extent.

- The steering group acknowledged the importance of a patient-centered approach in the management of OA [23–25]. Therefore, the following elements were considered to be important and should be incorporated in the stepped care strategy: mutual goal setting, enhancing communication between health care providers and patient, facilitating an active role of the patient while being realistic about personal limitations as well as the availability of resources.
- The stepped care strategy presents in step 1 those interventions that should be offered (or achieved by self management) to all patients with hip or knee OA. Step 2 or 3 interventions should only be considered for patients with persisting pain or disability despite use of interventions from the lower step or steps.
- The stepped care strategy does not provide explicit statements indicating which specific professional should be involved, as some treatment options can be delivered by several health care providers. For example, education and life style advice can be provided by GPs, nurse practitioners, occupational therapists or physical therapists whereas intra-articular injections can be prescribed and administered by GPs as well as medical specialists.

Discussions and decisions

Comments offered during the different phases of the development process were discussed until consensus was reached.

The major discussions and decisions pertaining to the three phases are described below.

- Some treatment modalities such as occupational therapy or braces are at the moment still commonly prescribed in clinical practice, although they are not recommended in evidence-based clinical guidelines. For that matter, the incorporation of these treatment modalities in the

stepped care strategy was discussed. Nevertheless, it was decided that only treatment modalities that are recommended in evidence-based clinical guideless should be included.

- Contrary to the Dutch multidisciplinary guideline for the diagnosis and management of hip or knee OA, the international Osteoarthritis Research Society International (OARSI) guideline recommends the use of topical non-steroidal anti-inflammatory drugs (NSAIDs) for knee OA based on a recent meta-analysis of randomized controlled trials (highest level of evidence, i.e., level 1a) [3]. Therefore, the stepped care strategy recommends the use of topical NSAIDs as a treatment modality for knee OA.
- The evidence that supports the use of glucosaminesulphate is not conclusive. The Dutch multidisciplinary guideline [1] advises glucosaminesulphate for a trial period, while the Dutch Guideline for General Practitioners [26, 27] clearly does not advise its use. Therefore, the stepped care strategy suggests the possibility of a trial period of 3 months, similar to the Dutch multidisciplinary guideline. The treatment should be discontinued if no response is apparent.
- The stepped care strategy should be concise and straightforward. Therefore, the strategy does not give recommendations concerning the dosage, assessment of contra-indications and prevention of side effects of pharmacological interventions (e.g., of NSAIDs), as well as those concerning the intensity and content of non-pharmacological interventions (e.g., physiotherapy).
- The monodisciplinary guideline of the Royal Dutch Society of Physical Therapy [28] advises restricted use of Transcutaneous Electrical Nerve Stimulation (TENS). So, only if exercise therapy and medication have not resulted in pain reduction, TENS should be recommended.

Content of the stepped care strategy

The final version of BART presents the optimal order of non-surgical treatment options for hip or knee OA in three steps.

Diagnostic procedures and assessment

No definitive test exists to diagnose OA. Therefore, the diagnosis is primarily based on medical history and physical examination. In step 2, the stepped care strategy recommends radiological assessment if there is a discrepancy between the medical history and physical examination.

Prior to mutual goal setting, health care providers are advised to assess the nature and the severity of loss in body functions and body structures as well as reduced activity

and participation resulting from OA. Furthermore, in step 2 behavioural factors that might influence the symptoms and outcomes of treatment should be assessed.

Treatment modalities

The stepped care strategy implies that the more advanced options should only be considered if prior options failed. Therefore, treatment options in step 1, such as education (e.g., about the condition, treatment modalities and timing of care), lifestyle advice (e.g., about exercise, diet, and aids) and an adequate dose of acetaminophen, should be offered to all patients with OA. However, they can also be provided through self-care.

If the treatment options in step 1 are not sufficient, treatment options in step 2 can be considered: e.g., exercise therapy, NSAIDs, and tramadol, either alone or in combination, is recommended. Overweight patients, if motivated to lose weight, should be referred to a dietician.

Treatment options in step 3, should only to be considered if those in the previous steps were ineffective. They comprise the more advanced treatment options, e.g., multidisciplinary care, if available. Intra-articular injections with hyaluronic acid or glucocorticoids or TENS can be considered in patients with knee OA.

Evaluation

To optimize treatment results, mutual goal setting, systematic monitoring, evaluation, and if necessary, adjustment to the previously set goals are advocated.

In step 1, the effectiveness of the treatment should be evaluated after 3 months. Obviously, if the patient has persistent symptoms, evaluation can be performed earlier. In case of partial or non adherence to treatment modalities; patients' personal barriers should be identified, and possibilities to improve adherence should be discussed. In step 2, evaluation should occur after 3–6 months. In step 3, the evaluation moment should be planned with the patient. Depending on the setting, different health care providers such as a nurse practitioner could play an important role in evaluating and monitoring the treatment. A summary of all recommendations are shown in Table 2.

Discussion

BART provides a structured approach to achieve implementation of existing guidelines that emphasize self management and creates multidisciplinary support to manage OA. It provides a framework for OA patients and their health care providers to reduce inadequacies in the management of non-surgical treatment options, particularly

Table 2 Summary of the recommendations in each step for the diagnostic procedures and assessment, treatment modalities, and evaluation

	Step 1	Step 2	Step 3
Diagnostic procedures and assessment	<ul style="list-style-type: none"> - Medical history and physical examination - Assessment function and activity limitations - Setting mutual goals 	<ul style="list-style-type: none"> - Radiological assessment^a - Assessment of pain coping and psychosocial factors - Adjust goals 	<ul style="list-style-type: none"> - Consultation specialist - Adjust goals
Treatment modalities	<ul style="list-style-type: none"> - Education - Lifestyle advice - Medication^b <ul style="list-style-type: none"> • Acetaminophen • Glucosaminesulphate 	<ul style="list-style-type: none"> - Exercise therapy - Dietary therapy - Medication^b <ul style="list-style-type: none"> • (Topical) NSAIDs • Tramadol 	<ul style="list-style-type: none"> - Multidisciplinary care - TENS - Medication^b <ul style="list-style-type: none"> • Intra-articular injections
Evaluation	- After 3 months ^c	- After 3–6 months ^c	- Patient sets interval

^a If there is a discrepancy between medical history and physical examination

^b Consult current guidelines for an adequate dose [1, 27]

^c Or earlier, if the symptoms persist or increase

utilization and timing of different options. Moreover, the stepped care strategy endorses quality care as it is built on evidence-based treatment options for patients with hip or knee OA. With this instrument, the different health care providers involved in managing OA and the patients with hip or knee OA can improve their communication with each other.

A possible limitation of our study is that we did not apply a generally accepted consensus technique. However, our consensus procedure resembles the nominal group technique and includes important characteristics of good consensus methods such as face-to-face meetings, balanced group composition, feedback, iteration and involvement of experts [29]. Instead of ranking, all differences in opinions and raised concerns were resolved by discussion in multiple rounds and after multiple consultations of experts and patient representative. In our opinion, the used extensive procedure warrants the quality of content of the proposed stepped care strategy.

Although the stepped care strategy is based on the Dutch multidisciplinary guideline, the approach is likely to be also applicable for other countries, as recommendations in various national and international guidelines are very similar. In case of discrepancies, the proposed stepped care strategy can be easily adjusted. For example, in contrast to the Dutch guideline [1], the National Institute for Health and Clinical Excellence (NICE) guideline [4] recommends braces and capsaicin which could be included in the stepped care strategy.

A possible drawback for such a stepped care approach is that all patients are initially offered treatment options proposed in the first step of the model, while more advanced treatment options, such as joint surgery, may be more appropriate for patients with advanced OA. However, treatment options proposed in later steps could be offered, if considered appropriate. Also, it has been reported that almost half of

the patients referred to secondary care because of OA benefited from a stepped care approach and no predictors for response to non-surgical treatment options could be identified [10]. Therefore, in our opinion, despite the risk for delay of more advanced treatment, the stepped care strategy is a suitable approach for patients with knee or hip OA.

We believe that a successful implementation of the stepped care strategy. BART will improve the outcome and quality of non-surgical care for patients with hip or knee OA substantially. Moreover, it will improve the communication between the patient and the different health care providers. At this moment, we are implementing BART strategy in a region in the Netherlands, and will identify barriers and facilitators for implementing. Therefore, a number of activities will be employed to inform the relevant health care providers about the content of the stepped care strategy, like implementation of a care booklet, newsletters, scientific articles, meetings and (periodical) education. Regional working groups play an important role in contacting and informing their adherents about the stepped care strategy. Most activities will be performed in primary care setting.

To facilitate implementation the booklet “Care for Osteoarthritis” (Zorgwijzer Artrose[®]) is developed. Besides providing a patient-friendly version of the stepped care strategy, this booklet contains concise tools to enhance the patient’s active role and communication between health care providers and the patient, such as leaflets to monitor symptoms, prepare consultations with health care providers, and draw up a comprehensive overview of the treatment options that the patient has already tried.

In summary, we developed a stepped care strategy to optimize the utilization and timing of the non-surgical

treatment options for patients with osteoarthritis of hip or knee. Because osteoarthritis is a heterogeneous and longstanding disease, possible benefits of the proposed model of care will only pay off in the long term. Therefore, long-term prospective studies are needed to evaluate its cost-effectiveness.

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