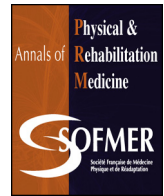




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Original article

## A decision-making tool to prescribe knee orthoses in daily practice for patients with osteoarthritis

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### ABSTRACT

**Objective:** To develop a decision-making tool (DMT) to facilitate the prescription of knee orthoses for Q2 patients with osteoarthritis (OA) in daily practice.

**Methods:** A steering committee gathered a multidisciplinary task force experienced in OA management/clinical research. Two members performed a literature review with qualitative analysis of the highest-quality randomized controlled trials and practice guidelines to confirm evidence concerning knee orthosis for OA. A first DMT draft was presented to the task force in a 1-day meeting in January 2016. The first version of the DMT was criticized and discussed regarding everyday practice issues. Every step was discussed and amended until consensus agreement was achieved within the task force. Then 4 successive consultation rounds occurred by electronic communication, first with primary- and secondary-care physicians, then with international experts. All corrections and suggestions by each member were shared with the rest of the task force and included to reach final consensus. The final version was validated by the steering committee.

**Results:** The definition and indication of several types of knee orthoses (sleeve, patello-femoral, hinged or unicompartamental offloading braces) were detailed. Orthoses may be proposed in addition to first-line non-pharmacological treatment if patient acceptance is considered good. At every step, a specific clinical assessment is needed.

**Discussion/conclusion:** Based on the latest high-level evidence, practice guidelines, and an expert panel, a DMT to facilitate daily practice prescription of knee orthoses for OA patients was designed. An evaluation of DMT implementation in a wide range of health professionals is still needed.

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### 1. Introduction

Because of population ageing, osteoarthritis (OA) has become a major public health problem. OA is one of the 10 most disabling chronic diseases in developed countries. OA affects 9.6% of men

and 18% of women in the world [1]. Lower-limb OA reduces motion 25 for 80% of patients and limits activities of daily living [1], such as 26 walking, climbing stairs, doing household chores or getting up 27 from sitting [2] for 25% of them. Disability is mostly due to knee 28 pain and decreased range of motion [3] and is associated with 29

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reduced health-related quality of life and important psychological distress [4].

International practice guidelines advocate various non-pharmacological treatments, including exercise therapy, information and education, weight loss and active lifestyle as first-line treatments of OA [5–11]. Knee braces are considered second-line non-pharmacological treatments of knee OA and are often presented in an undetailed way as biomechanical interventions [12]. The efficiency of knee orthoses for OA patients is advocated by international practice guidelines and the literature, particularly for knee sleeves [5,13] and unloader knee braces [11].

Knee sleeves are elastic non-adhesive orthoses associated or not with various devices aimed at patellar alignment or frontal tibiofemoral stabilization. Unloading braces consist of external stems, hinges and straps. They aim to decrease compressive loads transmitted to the joint surfaces, in the medial or lateral tibiofemoral compartments, depending on the valgus or varus position of the device (Appendix 1). Unloading braces can be prefabricated or custom-made by healthcare professionals and allows for selecting different angle variations in the varus/valgus position.

A survey of 1800 French general practitioners (GPs), conducted in 2005, indicated that only 10% of them usually prescribe knee orthoses for patients with knee OA [14]. Surveys of rheumatologists and specialists in physical medicine and rehabilitation (PMR) indicate high variability in practice depending on the medical specialty and the type of device [5]. Among splints, tapes, sleeves and unloading knee braces, elastic sleeves are the most frequently prescribed orthoses [5]. On the whole, 25% of PMR physicians and 35% of rheumatologists declared that they often prescribe a knee sleeve, whereas 19% of PMR physicians and 9% of rheumatologists prescribe an unloading knee brace [5]. Altogether, these findings indicate a discrepancy between practice guidelines based on evidence data and expert advice and everyday prescription for OA [15], particularly for knee orthoses. This gap may be explained in part by the variable cost and inconsistent availability of these kinds of devices. One other reason is the lack of user-friendly tools specifically designed to help physicians make decisions in primary and secondary care.

To our knowledge, only one algorithm for knee OA has been proposed by the European Society for Clinical and Economic Aspects of Osteoporosis and OA (ESCEO) [9]. However, this algorithm is too unspecific to be implemented in daily practice to prescribe knee braces because of missing details and specifications of the kind of orthoses.

Closing the gap between international guidelines based on evidence-based data and everyday practice is a real challenge that can improve patient care. The aim of our study was to design a decision-making tool (DMT) to improve the prescription of knee orthoses for patients with knee OA in daily practice, as part of a non-pharmacological management strategy, by using a mixed methodological approach based on both evidence-based data and expert advice [9].

## 2. Methods

In the absence of reference methodology, we built a 6-step methodology (Fig. 1) inspired by that proposed by the ESCEO [9].

### 2.1. Extraction of evidence-based data

Because the aim of our study was not to comprehensively analyze efficacy or safety outcomes of clinical trials, we thought that a systematic literature search of all available electronic databases from their inception would add very little information (Fig. 2). Therefore, we limited our literature search to the 3 most recent systematic reviews with meta-analysis of randomized

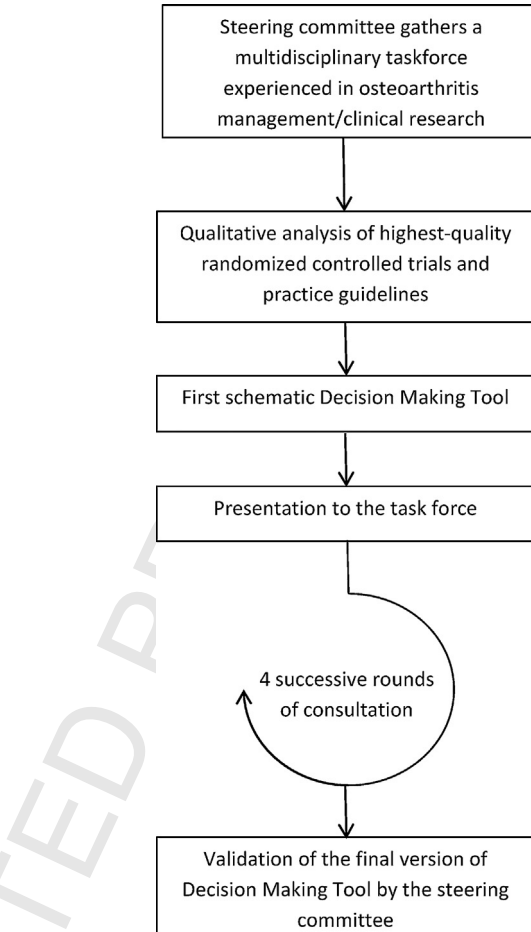


Fig. 1. Successive steps of the decision-making tool (DMT) elaboration.

controlled trials comparing knee orthosis to other interventions or no intervention published up to January 2016 [15–17]. Additional clinical trials published from January 2014 to January 2016 were searched on PubMed by using the keywords (“knee brace” or “knee orthosis” or “knee bracing”) and “osteoarthritis”. The latest French and international practice guidelines from OA Research Society International (OARSI) [11], National Institute for Health and Clinical Excellence (NICE) [10], ESCEO [9], European League Against Rheumatism (EULAR) [7], American Academy of Orthopaedic Surgeons (AAOS) [8], American College of Rheumatology (ACR) [6] and French Society of Physical Medicine and Rehabilitation (SOFMER) [5] were also reviewed. Relevant references were extracted from the 3 sources and assessed independently by 2 reviewers (CN and AC) in an unstandardized qualitative manner. References were eventually considered if they were published, full-length papers of randomized controlled trials or practice guidelines investigating orthotic interventions in patients with knee OA. References were excluded if they were not randomized controlled trials or practice guidelines, if no abstract were available or if they were written in language other than English. Duplicated references were removed after all databases were searched.

### 2.2. Development of the DMT

We used a 6-step methodological approach to design the DMT (Fig. 1). A preliminary version of the DMT using data from the literature was drafted before the first meeting by the principal investigator (EC) and the investigators who reviewed evidence from the literature (CN, AC). The steering committee was composed of 3 clinicians (JB, EC, and FR) who had previously been involved in

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