

hypomagnesemia is also well supported. Some evidence likewise links CPPD with hemochromatosis. By contrast, although acute CPPD has—until now—been a good excuse to fiscally justify measurement of the thyroid stimulating hormone level in an elderly person, hypothyroidism is among several metabolic syndromes for which the connection to CPPD was deemed too loose; jettisoning such tests from the panel of laboratory values used to evaluate patients for secondary causes of CPPD is timely in this era of cost containment.

### “...microscopic methods used to identify CPP crystals function poorly in the average clinical setting”

The management of CPPD is discussed in the second article of the series,<sup>5</sup> and its scope sadly reflects the woeful absence of good treatment strategies and evidence to support their use. One caveat of the nine treatment-related statements that survived the three anonymous rounds of decision making is manifest by the authors' prudent decision to describe them as 'recommendations' rather than 'guidelines'. They acknowledge that these propositions have a poor evidence basis and should not be blindly accepted as standards of care without further validation. Recommendations for the management of acute CPPD include rest and the local application of heat or cold packs, as well as aspiration of the joint and/or injection of the joint with glucocorticoids. Systemic therapies include the same drugs as are used for acute gout, such as NSAIDs, colchicine and systemic glucocorticoids. Very little evidence supports the utility of these measures. Oral colchicine, for example, has never been studied in acute CPPD. Studies supporting management strategies for chronic CPPD are even sparser than those for acute disease. One small randomized, controlled trial supports the potential efficacy of low dose daily oral colchicine to reduce the number of acute attacks.<sup>8</sup> Small studies, the group found, suggest modest efficacy of methotrexate and hydroxychloroquine in chronic inflammatory arthritis caused by CPP crystals, but we can all agree that there is much to be done in this area. Certainly, the need to study the pathogenesis of CPP crystal formation, highlighted by the EULAR team in their future research agenda, is of paramount importance to the future development of specific and effective therapies for this disease.

The clear and unified voice with which these two-part recommendations are stated is a great starting point for future discussion. Cleaning up the inconsistencies of nomenclature and reinforcing the need for training in methods of crystal identification will, hopefully, set the stage for robust clinical studies in this area. Perhaps most importantly, the work emphasizes what we don't know about this disease, and underscores how our inadequate understanding of its pathogenesis contributes to the paucity of available therapies. As the population ages, and CPPD becomes increasingly common, we enthusiastically agree with our European colleagues that more work on this disease is urgently needed!

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The authors declare no competing interests.

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## OSTEOARTHRITIS

# Best evidence for best therapies in hand osteoarthritis

Krysia S. Dziedzic

**Nonpharmacological therapies are important in the management of hand osteoarthritis, but high quality evidence upon which to base guidelines for their clinical use has been lacking. A systematic review confined to such studies highlights the strengths and gaps in research in this field.**

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A recent systematic review by Ye *et al.*<sup>1</sup> synthesizes, evaluates and presents the best available evidence from high quality trials to describe the effects of rehabilitative interventions on pain, function and physical impairments in people with hand osteoarthritis (OA). The findings will assist with clinical decision making, but they also highlight the dearth of high quality evidence on which to base recommendations for nonpharmacological therapy of hand OA.

As is widely recognized, good clinical practice should be based on high quality evidence, and with this requirement in mind Ye and colleagues conducted a systematic review with several aims. First, they reviewed the quality

of studies of rehabilitation interventions for hand OA in order to identify and assess only high quality evidence. Second, they explored the effects of these rehabilitation treatments in relation to specific outcome measures in adults with hand OA, including hand pain, strength, range of movement, stiffness and function. Third, they sought to provide evidence-based knowledge on the effects of different rehabilitation interventions in order to achieve specific goals.<sup>1</sup> Evidence from studies that compared rehabilitation with a control group, and in which pain, physical function and impairments were assessed, were eligible for appraisal. Of the ten studies selected for inclusion in the review—three

**Table 1** | Evidence-based recommendations for nonpharmacological therapy of hand OA

| Nonpharmacological therapy          | Evidence-based statements by Ye <i>et al.</i> <sup>1</sup> for hand OA*  | Equivalent EULAR proposition for hand OA <sup>7</sup>  | Equivalent NICE recommendation(s) for OA <sup>8</sup>  |
|-------------------------------------|--|--|--|
| Joint protection and hand exercises | “Programs of joint protection, advice and home exercises are effective at improving grip strength and hand function”                             | “Education concerning joint protection (how to avoid adverse mechanical factors) together with an exercise regimen (involving both range of motion and strengthening exercises) are recommended for all patients with hand OA” | “Exercise should be a core treatment for people with OA, irrespective of age, comorbidity, pain severity or disability”<br>“Exercise should include local muscle strengthening and general aerobic fitness”<br>“Assistive devices (for example, walking sticks and tap turners) should be considered as adjuncts to core treatment for people with OA who have specific problems with activities of daily living”<br>“Healthcare professionals may need to seek expert advice in this context (for example, from occupational therapists)” |
| Splinting                           | “Long-term use of a night splint offers significant benefits to improve pain, hand function, strength, and range of motion for patients with OA” | “Splints for thumb base OA and orthoses to prevent/correct lateral angulation and flexion deformity are recommended”   | “People with OA who have biomechanical joint pain or instability should be considered for assessment for bracing/joint supports/insoles as an adjunct to their core treatment”   |
| Electrotherapy and thermotherapy    | “Low level laser therapy is effective at improving range of movement”  | “Local application of heat (for example, paraffin wax, hot pack), especially before exercise, and ultrasound are beneficial treatments”  | “Healthcare professionals should consider the use of TENS as an adjunct to core treatment for pain relief”<br>“The use of local heat or cold should be considered as an adjunct to core treatment”   |

\*Evidence-based statements were made by Ye *et al.* only for therapies where conclusions could be drawn from the quality and/or quantity of available evidence. Abbreviations: EULAR, European League Against Rheumatism; NICE, National Institute for Health and Clinical Excellence; OA, osteoarthritis; TENS, transcutaneous electrical nerve stimulation.

studies on exercise, two each on laser and heat interventions, and one each on splints, massage and acupuncture—six were rated as high quality.

A number of systematic reviews have focused on treatments for hand OA, of which five that focused on conservative treatments were briefly discussed by Ye *et al.*<sup>1</sup> In addition, a 2011 review by Kjekken and colleagues evaluated the design and effects of splints and exercise programs in hand OA.<sup>2</sup> Whilst each systematic review posed slightly different questions, retrieved slightly different studies and used different quality appraisal tools, they broadly agree that there is a paucity of evidence for nonpharmacological therapies for hand OA.

The findings of Ye *et al.*<sup>1</sup> highlight the uncertainty regarding the benefits of exercise. One barrier to comparing the results of the various studies was variation in the content and dosage of the exercise programs; in addition, some studies did not provide precise details regarding the intensity of the programs. Also noted by Ye *et al.*<sup>1</sup> was the fact that among the studies included, exercise programs that incorporated strengthening exercises failed to produce gains in strength but did have positive effects on range of movement, while a program that involved exercises designed to improve range of movement resulted in increased grip strength. They conclude that the intensity of the strengthening exercises might have been insufficient for change to occur, especially given that increases in strength

were not evident. This conclusion is consistent with those of others,<sup>2</sup> and has prompted occupational therapists, through a consensus exercise, to formulate evidence-supported recommendations for exercises in hand OA.<sup>3</sup> These recommendations from occupational therapists now need to be tested in a randomized trial to determine the effective dosages and intensities of hand exercise for OA.

### “Of the ten studies selected for inclusion in the review ... six were rated as high quality”

Another consistent finding from systematic reviews of conservative interventions for hand OA is the importance of combining education about joint protection with exercise. This conclusion is based on the findings of a study by Stamm and colleagues,<sup>4</sup> who reported an improvement in hand function with a program of exercise combined with joint protection education. So what are the independent effects of each of these approaches? Arthritis Research UK, the largest arthritis research charity in the UK, has funded a study of the independent effects of exercise and joint protection education, and of the cost effectiveness of the combination of the two.<sup>5</sup> Findings from this study will be available in 2011, and will be implemented in a second study funded by Arthritis Research UK to assess the clinical effectiveness of adding splinting, and to evaluate the effects of placebo splinting.<sup>6</sup>

What do the findings of the Ye *et al.*<sup>1</sup> systematic review add to existing recommendations? Two noteworthy sets of recommendations for people with hand OA, in which I participated, are the 2007 European League Against Rheumatism (EULAR) evidence-based recommendations for the management of hand OA<sup>7</sup> and the 2008 UK National Institute of Health and Clinical Excellence (NICE) guidelines for the care and management of OA in adults.<sup>8</sup> The 11 recommendations of the EULAR Task Force cover 17 pharmacological and non-pharmacological treatments for people with hand OA, including information and advice, exercise, joint injection and surgery.<sup>7</sup> The EULAR guidelines development group was multidisciplinary, comprising 16 rheumatologists, one physiatrist, one orthopedic surgeon, two allied health professionals, and one expert in evidence-based medicine, representing 15 different European countries. The NICE OA guidelines—developed by a group including 18 health care professionals, patients, systematic reviewers, information specialists, health economists and statisticians—cover nonpharmacological and pharmacological treatment, and the advice and support that adults with OA should be offered by their primary health care professional and specialists.<sup>8</sup> The NICE recommendations cover diagnosis, education, exercise, support for self-management, and alternative therapies. Table 1 illustrates the findings of the systematic review by Ye *et al.*<sup>1</sup> in the context

of the equivalent recommendations from EULAR and NICE.<sup>7,8</sup>

Clearly, there is consistent agreement that exercise, joint protection education and splinting have important roles in the non-pharmacological management of hand OA, but advice regarding the use of electrotherapy and thermotherapy is conflicting (Table 1). Of the electrotherapy modalities, Ye *et al.*<sup>1</sup> propose laser therapy, EULAR therapeutic ultrasound<sup>7</sup> and NICE transcutaneous electrical nerve stimulation (TENS).<sup>8</sup> No eligible studies on ultrasound or TENS were identified by Ye and colleagues.<sup>1</sup> Interestingly, the studies of laser therapy identified by Ye *et al.* were available for review by both the EULAR and NICE guideline development groups. So, why the disparity in the conclusions of these groups? In the absence of evidence, the formulation of guidelines relies on consensus methods and expert opinion. The selection of ultrasound by EULAR reflects consensus among experts across 15 European countries, but even so there was limited agreement for recommending ultrasound alone.<sup>7</sup> The selection of TENS by NICE also reflects the target audience for the guidance, namely health care professionals and primary care physicians, and the inclusion of the opinions of patient representatives on the guideline development group.

Despite the high prevalence of OA in the general population and the substantial impact of hand OA on the individual with the condition,<sup>8</sup> few people with hand problems will consult their primary care practitioner, even when they are severely affected, and even fewer are referred for physiotherapy or occupational therapy.<sup>9</sup> People with hand problems consider the diagnosis of 'hand OA' to represent a serious condition, but they often perceive that nothing can be done.<sup>7</sup> The good news is that something can be done, and management should combine pharmacological treatment (for example, topical nonsteroidal anti-inflammatory gels) with nonpharmacological therapies.<sup>7,8</sup> The challenge is implementing such approaches into practice.

Findings from the systematic review of Ye *et al.*<sup>1</sup> add to those of existing reviews and provide evidence-based options for clinical decision making in the therapeutic management of hand OA. Overall, the evidence from a number of systematic reviews of therapies for hand OA is disappointing and there are gaps in the evidence for some modalities.<sup>10</sup> Future research should address these gaps and investigate how joint protection, combined with hand exercises and

splinting, can be implemented into practice to increase the uptake of beneficial therapies for people with hand OA.

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#### RHEUMATOID ARTHRITIS

## Understanding joint damage and physical disability in RA

Yvonne M. R. de Punder and Piet L. C. M. van Riel

**Although, overall, joint damage correlates with physical disability in rheumatoid arthritis, damage to cartilage and to bone might contribute unequally. New data suggest that cartilage damage has the greater influence on disability, but—besides questions about the practical consequences of this finding—further studies are needed to exclude potential confounders.**

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It has been known for several years that in rheumatoid arthritis (RA), disease activity, joint damage and physical disability are interrelated. In patients with early-stage RA, disease activity has a greater impact on physical disability than joint damage does, and the impairment caused by disease activity is reversible. By contrast, in patients with established disease joint damage is a dominant, irreversible contributor to physical disability.<sup>1</sup> Besides joint damage and disease activity, the degree of physical disability in RA is also influenced by age, sex and comorbidities, and is often measured using the disability index of the Health

Assessment Questionnaire (HAQ-DI). Joint damage is frequently assessed using the modified Sharp–van der Heijde score. This latter method combines the two separate components of joint damage—cartilage destruction and bone damage—which are first evaluated separately using scores for radiographic joint-space narrowing (JSN) and erosions, respectively. Accumulating evidence indicates that distinct disease mechanisms influence JSN and erosion scores, but less is known about how the two separate aspects of joint damage that they measure compare in their contribution to physical disability. Publishing in *Annals of*