# Italian Society for Rheumatology recommendations for the management of hand osteoarthritis

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**SUMMARY**

Hand osteoarthritis (OA) is a common and potentially disabling disease, with different features from hip and knee OA so that a specific therapeutic approach is required. Evidence based recommendations for the management of hand OA were developed by the European League Against Rheumatism (EULAR) in 2006. The Italian Society for Rheumatology (SIR) aimed to update, adapt to national contest and disseminate the EULAR recommendations for the management of hand OA.

The multidisciplinary group of experts included specialists involved in the management of patients with hand OA. In order to maintain consistency with EULAR recommendations, a similar methodology was utilized by the Italian group. The original propositions were reformulated in terms of a search query and for every recommendation a systematic search was conducted updating EULAR recommendations' review. The propositions were translated in Italian and reformulated basing on collected evidences and expert opinion. The strength of recommendation was measured for each proposition with the EULAR ordinal and visual analogue scales.

The original 11 propositions of EULAR recommendations were translated and adapted to Italian context. Further evidences were collected about non-pharmacological therapies, local treatments, intra-articular injection with SYSADOA and corticosteroids, and surgery.

The SIR has developed updated recommendations for the management of hand OA adapted to the Italian healthcare system. Their implementation in clinical practice is expected to improve the management of patients with hand OA.

**Key words:** *Hand osteoarthritis, Treatment, Recommendations.*

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## INTRODUCTION

Hand osteoarthritis (OA) is a common condition (1) with a significant impact on the patient with regards to pain, disability and limitation in activities of daily living (2-4). Some clinical characteristics considerably differentiate OA in the hand from that in other sites, such as the hip and the knee, amongst which are a small correlation between radiological lesions and pain, and a large aesthetic impact (4). Moreover, the specific anatomical, functional and prognostic aspects lead to the postulation that the treatment modalities can themselves have a different impact from that observed in the large joints (5).

In 2006 a European League Against Rheumatism (EULAR) Task Force has issued evidence-based recommendations on hand OA (6). The Italian Society for Rheumatology (SIR), with the aim of facilitating the dissemination of the proposals in the Italian standpoint, has planned to adapt, update and disseminate the 2006 EULAR recommendations for the treatment of hand OA.

## MATERIALS AND METHODS

Italian recommendations for the management of hand OA were developed by a multidisciplinary team of experts including rheumatologists and other specialists involved in the care of patients with hand arthritis, representatives of the Italian Society of Hand Surgery (SICM), the Italian Society of Physical Therapy and Rehabilitation (SIMFER), the Italian Interdisciplinary Society of Primary Care (SIICP), the Scientific Society of General Practitioners - Italian Federation of Family Doctors (Metis-FIMMG), the Italian Society of General Medicine (SIMG), the Italian Medical Association of Hydroclimatology, Talassotherapy and Physical Therapy (AMITTF) and the Italian Society of Orthopaedics and Traumatology (SIOT). The expert panel adhered to the same methodology of the 2006 EULAR recommendations task force in order to guarantee continuity and consistency in content.

The phases of the resolution were: translation of the recommendations, reformulation of propositions as search queries, evidence collection and critical evaluation, and definition of recommendations derived from available evidence and expert advice, adapted to Italian pharmaceutical formulary.

During the first phase, the recommendations were translated from English to Italian and the resulting proposals were evaluated by the internal expert panel. All propositions were rephrased as search queries according to the PICO (*Population-Intervention-Comparator-Outcome*) strategy.

The systematic literature review has been conducted by adhering to the same methodology of the 2006 EULAR guidelines in order to update the previous review in a consistent manner. The same search strategy was utilized for all recommendations by focusing on the keyword *hand arthritis*, as reported in the EULAR recommendations (Appendix 1 of 6). The review search has therefore been conducted to systematically identify all studies on hand OA while studies including patients with OA at other sites were not systematically sought. The search was undertaken on main electronic bibliographic databases (Medline, Embase and Cochrane Library) in a timeframe from 1/1/2006 (final EULAR revision date) to 15/7/2012, and restricting the search to publications in English or Italian and research conducted on human subjects. The search has been enhanced with manual search in the reference lists of the studies included from the electronic search.

Therefore, a specific selection of studies for each recommendation has been performed among studies included in the general literature review. Inclusion criteria have been defined for each query, and subsequently, an *ad hoc* data extraction table has been developed. The article selection for each query has been conducted by a single reviewer (MM, AB, MF and IP).

With regards to the study design, systematic reviews and meta-analyses, randomized controlled trials (RCT) and controlled studies were included for queries of efficacy and safety. Conversely, cohort stud-

**Table I -** Level of evidence.

| | |
|---|---|
| Ia | Meta-analysis of randomized controlled trials |
| Ib | Randomized controlled trial |
| IIa | Controlled study without randomization |
| IIb | Quasi-experimental study |
| III | Non-experimental descriptive studies |
| IV | Expert committee reports or opinion or clinical experience of respected authorities, or both |

ies, case control and cross-sectional studies were included for the risk factors queries. Case report, narrative reviews and editorials have been excluded for all queries.

Efficacy and security data on drugs reported in RCTs have been combined in meta-analyses where feasible and presented as standard mean deviations [SMD or effect size (ES)], Number Needed to Treat (NNT) or risk ratio (RR), and relative confidence intervals (CI) at 95%. From the clinical perspective, an ES of 0.20 is considered low, 0.5 as moderate and more than 0.80 as high. The NNT is the number of patients who have to be treated in order to obtain one positive outcome (or prevent one negative outcome), and therefore a lower value corresponds to greater efficacy. On the basis of the study design, the impact of risk factors has been expressed as RR or odds ratio (OR). The ES calculations and the

**Table II -** Propositions and relative strength of recommendation.

| Proposition | VAS (95% IC) | A-B% |
|---|---|---|
| 1. Optimal management of hand OA requires a combination of non- pharmacological and pharmacological treatment modalities individualized to the patient's requirements | 97 (95-99) | 100 |
| 2. Treatment of hand OA should be individualized according to: i) type of OA (nodal, erosive, post-traumatic); ii) risk factors (age, sex, adverse mechanical factors); iii) localization and severity of structural change; iv) presence of inflammation; v) level of pain, disability and restriction of quality of life; vi) comorbidity and co-medication (including OA at other sites); vii) wishes and expectations of the patient | 95 (93-98) | 100 |
| 3. 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 | 80 (73-87) | 65 |
| 4. Thermal therapy, local application of heat (for example, paraffin), especially before exercise, and other physical therapies (for example, laser therapy, magnetotherapy and ultrasound) can be beneficial treatments | 71 (63-80) | 35 |
| 5. Splints for thumb base OA and orthoses to prevent/correct lateral angulation and flexion deformity are recommended | 73 (65-81) | 35 |
| 6. Local pharmacological treatments are preferred over systemic treatments, especially for mild to moderate pain and when only a few joints are affected. Topical NSAIDs and other anti-inflammatory preparations are effective and safe treatments for hand OA | 71 (62-80) | 53 |
| 7. Because of its efficacy and safety paracetamol (up to 3 g/day) is the oral analgesic of first choice and, if successful, is the preferred long term oral analgesic | 79 (68-90) | 76 |
| 8. Oral NSAIDs should be used at the lowest effective dose and for the shortest duration also in patients who respond inadequately to paracetamol. The patient's requirements and response to treatment should be reevaluated periodically. In patients with increased gastrointestinal risk, non-selective NSAIDs plus a gastroprotective agent, or a selective COX-2 inhibitor should be used. In patients with increased cardiovascular risk, coxibs are contraindicated and non-selective NSAIDs should be used with caution. | 86 (82-90) | 88 |
| 9. SYSADOA (for example, glucosamine, chondroitin sulphate, avocado soybean unsaponifiables, diacerhein, intra-articular hyaluronic acid) may give symptomatic benefit with low toxicity, but effect sizes are small, suitable patients are not defined and clinically relevant structure modification, and pharmacoeconomic benefits have not been established | 72 (65-79) | 29 |
| 10. Intra-articular injection of long-acting corticosteroid is effective for painful flares of OA, especially trapeziometacarpal joint OA | 82 (77-88) | 71 |
| 11. Surgery (for example, trapeziectomy, arthroplasty with ligament reconstruction and tendon interposition (LRTI) or arthrodesis) can be an effective treatment for severe thumb base OA and should be considered in patients with marked pain and/or disability when conservative treatments have failed | 85 (78-92) | 88 |

resulting meta-analyses have been created with Review Manager (Version 5.1. Copenhagen: The Nordic Cochrane Centre, The Cochrane Collaboration, 2011).

As in the EULAR guidelines, the level of evidence for efficacy has been assigned via a pre-established hierarchy according to the design of the studies included under each research query (7) (Tab. I). The search results for the clinical queries consisted of the highest level of evidence possible, and, when a systematic review of RCTs was available, the earlier review was updated. Queries on risk factors and adverse events were based both on RCTs and observational studies. Studies with direct evidence were considered first, *i.e.* evidence derived from studies on patients with hand OA about which the literature review has been compiled in a systematic manner; indirect evidence, i.e. evidence from studies conducted on subject with OA at other sites, such as the hip and knee, was only included when direct evidence studies were not available.

The strength of recommendation (SOR) was measured for each proposition by utilizing the EULAR A-E ordinal scale (A=fully recommended; B=strongly recommended; C=moderately recommended; D=weakly recommended; E=not recommended) and a visual analogue scale (VAS) from 0 to 100 mm (8), and by taking into consideration both the evidence (efficacy, safety and cost-effectiveness) and the clinical experience (feasibility, acceptability and tolerance). The results of each proposition were reported as mean of the VAS with 95% CI and as percentage of SOR *A or B* (Tab. II).

## RESULTS

***Recommendation #1***

Optimal management of hand OA requires a combination of non-pharmacological and pharmacological treatment modalities individualized to the patient's requirements.

Level of evidence: IV.

Strength of recommendation (95% CI): 97 (95-99).

This proposition was solely translated to Italian since, via unanimous consensus, it was not deemed worth to be modified. Since there are no studies specifically designed to inform this statement, this statement is supported by expert opinion alone (level IV).

***Recommendation #2***

Treatment of hand OA should be individualized according to:

1) type of OA (nodal, erosive, post-traumatic);
2) risk factors (age, sex, adverse mechanical factors);
3) localization and severity of structural change;
4) presence of inflammation;
5) level of pain, disability and restriction of quality of life;
6) comorbidity and co-medication (including OA at other sites); vii) wishes and expectations of the patient.

Level of evidence: III; IV.

Strength of recommendation (95% CI): 95 (93-98).

This statement includes a number of clinical factors that may be relevant in guiding clinical management. It is known that there are OA subtypes, such as the erosive or inflammatory form, which is related to worse symptoms and outcomes (9). Evidence on the prognostic role of the disease features in hand OA is mainly based on observational studies.

With regards to the type of OA, various studies have evaluated the impact of erosive OA on disease outcomes such as pain, functional disability, radiological progression and aesthetic impact (10-16). These studies suggest that erosive OA is associated with an increased radiological progression at 6 years [RR (95% CI): 1.55 (1.04; 1.88)] (12), higher pain severity [ES (95% CI): 0.42 (0.08; 0.75)], functional disability [ES (95% CI): 0.47 (0.13; 0.81)] and a lower patient satisfaction rate on aesthetic outcomes [ES (95% CI): -0.67 (-1.01; -0.33)] (11).

Similarly, nodal OA seems to be associated with radiological progression at 6 years [RR (95% CI): 1.94 (1.37; 2.48)] (12). Conversely, patient sex does not seem

to significantly influence the outcome of hand OA (13).

The localization of OA can also affect the disease outcome: a cross sectional study on 308 patients with hand OA showed that involvement of both carpometacarpal and proximal interphalangeal joints was associated with higher pain severity [ES (95% CI): 0.67 (0.43; 0.91)] and functional disability [ES (95% CI): 0.60 (0.37; 0.84)] when compared to involvement of proximal interphalangeal joints alone (17); conversely, a prospective study with similar recruitment showed that the involvement of the thumb alone was not associated with a worse disease outcome when compared to involvement of other sites [RR for radiological progression at 6 years (95%CI): 1.16 (0.91; 1.36)] (12). With regards to structural change, higher radiological scores were associated with increased pain severity and functional disability (18).

The literature review did not identify any study which analyzed the impact of clinically-assessed inflammation on disease outcome. Studies utilizing diagnostic ultrasonography have shown an association between detected effusion or synovitis and an increase in severity of both pain and impact on quality of life (19, 20).

Functional disability due to hand OA seems to be associated with a worse quality of life (21), while OA at other sites does not seem to influence the radiological progression at the hand (22).

In conclusion, some clinical factors, such as the presence of the erosive and nodal subtypes, radiological and functional severity, and involvement of multiple joint groups, show an association with a worse outcome of hand OA in observational studies (level III); for other clinical characteristics, this statement is supported by expert opinion alone (level IV).

***Recommendation #3***

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.

Level of evidence: IV.

Strength of recommendation (95% CI): 80 (73-87).

While the 2006 EULAR recommendations supported this proposition on expert opinion alone, the literature review update has included a number of studies which analyzed the efficacy of physical exercise in hand OA; however, the substantial heterogeneity of physical therapy interventions and outcome measures did not permit their combined analysis.



**Table III -** Studies on the efficacy of exercise and joint protection in the treatment of hand osteoarthritis.

| Author (year) | No. | Duration | Design | Intervention | Comparator |
|---|---|---|---|---|---|
| **Exercise and/or joint protection** | | | | | |
| Dziedzic (2012) | 257 | 1 year | RCT | Education + joint protection + exercise | Education |
| Garfinkel (1994) | 27 | 10 weeks | RCT | Yoga | No treatment |
| Lefler (2004) | 19 | 6 weeks | RCT | Exercise | Placebo |
| Rogers (2009) | 76 | 48 weeks | RCT crossover | Exercise | Placebo |
| Stamm (2002) | 40 | 3 months | RCT | Joint protection + exercise | Placebo |
| **Passive mobilization** | | | | | |
| Villafañe (2012) | 60 | 2 months | RCT | Median nerve mobilization | Placebo |
| Villafañe (2012) | 28 | 2 weeks | RCT | Passive mobilization of trapezio-metacarpal joint (Maitland) | Placebo |
| Villafañe (2011) | 29 | 2 weeks | RCT | Passive mobilization of carpo-metacarpal joints (Kalteborn) | Placebo |
| **Splint and exercise** | | | | | |
| Boustedt (2009) | 40 | 1 year | CCT | Joint protection +splint + exercise | Joint protection |
| Stukstette (2011) | 151 | 3 months | RCT | Education +splint + exercise | Education |
| Wajon (2005) | 40 | 6 weeks | RCT | Splint + exercise | Splint + exercise |

RCT, randomized controlled trial; CCT, controlled clinical trial.

The simultaneous evaluation of numerous physical therapy interventions did not permit to identify the specific effect of the various components. Moreover, according to Cochrane criteria, the majority of the studies carried a high risk of bias (23). The included studies were subdivided in three categories according to the evaluated therapy: physical exercise and/or joint protection (24-28), passive mobilization techniques of the joints or of the nerves of the hand (29-31) and combined physical exercise and joint splinting (32-34) (Tab. III).

Among the studies of the first group, in which the employment of physical exercise and/or joint protection were evaluated, a non-randomized controlled trial of 27 patients analyzed a 10-week yoga program and showed a significant reduction in pain severity [ES (95% CI): -1.30 (-2.13;-0.48)] and an increase in range of motion [ES (95% CI): 1.32 (0.49; 2.14)] in the treatment group, although no significant between-group difference in functional improvement and grip strength was found. A 3-month RCT of 40 patients on a combined program of physical exercise and joint protection has shown a significant increase in grip strength in treated patients [ES (95% CI): 4.46 (3.26; 5.66)] while a significant reduction in pain severity and improvement in function did not result (28). Conversely, recent data suggest greater overall improvement, with respect to a decrease in pain severity and functional disability, in patients on a combined program of physical exercise and joint protection when compared to control patients (24). The other studies did not however show a significant effect of physical exercise on the recorded outcomes (26, 27).

In a RCT on 60 patients, Villafane and colleagues have shown a significant decrease in pain severity and an improvement in grip strength secondary to passive mobilization of the radial nerve (29); a significant decrease in pain levels but no improvement in grip strength were shown in 2 RCT utilizing passive mobilization techniques on the trapeziometacarpal (30) and the carpometacarpal (31) joints. These studies however, despite their adequate methodology, have limitations related to sample size, advanced age of the participants and representation of the studied populations.

Lastly, a 1-year non-randomized controlled trial of 40 patients with trapeziometacarpal joint OA compared a combined program of joint protection, physical exercise and joint splintage to joint protection alone (32). A significant reduction in pain severity èES (95% CI): 0.75 (0.06; 1.44)+, improvement in function èES (95% CI): 0.98 (0.27; 1.68)+ and decrease in stiffness èES (95% CI): 0.88 (0.18; 1.58)+ were observed in the combined program group when compared to the control group at long term (even at 1 year) follow-up, while grip strength did not show any significant between-group difference. Conversely, another study did not show significant improvement in pain severity and functional disability in patients who were on a combined program of physical exercise and joint splinting rather than education alone (33); in the same way no significant difference was shown between two exercise regimens which included different types of splints (34). However, the results of the studies included in the last group do not permit to identify the distinct effects of physical exercise and joint splinting, and therefore do not provide direct evidence of the efficacy of one or the other intervention.

In conclusion, there is no direct evidence of the efficacy of joint protection and physical exercise in the management of hand OA. Data derived from the included studies do not provide comparable results and consequently do not permit the comparison of the effect of the various interventions. Therefore, this proposition is supported by expert opinion alone (level IV).

***Recommendation #4***

Thermal therapy, local application of heat (for example, paraffin), especially before exercise, and other physical therapies (for example, laser therapy, magnetotherapy and ultrasound) can be beneficial treatments.

Level of evidence: Ib; IV.

Strength of recommendation (95% CI): 71 (63-80).

Physical therapies could be of benefit for patients with hand OA. The main objectives to which these modalities should aim are the relief of pain and stiffness and the increase in strength and range of motion.
Seven RCTs from the literature review support this statement; all were conducted on patients with hand OA, were of a duration varying from 3 to 13 weeks, and analyzed the efficacy of various interventions. Of these, 4 RCTs were derived from a 2011 systematic review which evaluated the effect of the various modalities on pain, joint function and overall physical condition of patients with hand OA (35).
Specifically, these studies evaluated the efficacy and safety of the following modalities: acupuncture (36), laser therapy (37, 38), infrared heat (39, 40), paraffin with topical analgesics (41) and magnetotherapy with balneotherapy (42) (Tab. IV). There were no significant results with regards to the considered outcomes (pain, musculoskeletal function, grip strength, range of motion, stiffness) except that for the last two studies.
In the 4-week study of Myrer (41) on 35 patients the efficacy of the paraffin and topical analgesics was compared to that of the paraffin alone and therefore the difference in effect probably represented the effect of topical anaesthetics alone. The study showed a significant decrease in pain severity [ES (95% CI): 0.97 (0.26; 1.67)] and increase in hand function [ES (95% CI): 0.97 (0.26; 1.67)] in the group treated with paraffin and topical anaesthetics when compared to the patients treated with paraffin alone.
On the other hand, the 13-week study of Horvath (42) on 63 patients compared the efficacy of balneotherapy with magnetotherapy to that of magnetotherapy alone: in this case therefore, the difference in effect probably represented the role of balneotherapy. The combination of balneotherapy and magnetotherapy resulted in a greater improvement in pain severity [ES (95% CI) 0.82 (0.18; 1.45)] and grip strength [ES (95% CI): 0.70 (0.07; 1.32)] when compared to the application of magnetotherapy alone.
In conclusion, thermal balneotherapy seems to reduce pain severity and improve grip strength in patients with hand OA (level Ib). The local application of heat and that of other physical modalities are supported by expert opinion alone (level IV).

***Recommendation #5***
Splints for thumb base OA and orthoses to prevent/correct lateral angulation and flexion deformity are recommended.
Level of evidence: Ib; IV.
Strength of recommendation (95% CI): 73 (65-81).
There was no literature on RCTs comparing standard care or placebo to the use of orthoses at the time of publishing of the 2006 EULAR recommendations. The first RCT on trapeziometacarpal joint orthoses was published in 2009 (43) and the literature review update identified another study published in 2010 on a similar intervention (44). Both studies were RCTs in which the use of orthoses in trapeziometacarpal joint OA was compared to standard treatment.



**Table IV -** Studies on the efficacy of physical therapies in the treatment of hand osteoarthritis.

| Author (year) | No. | Duration | Design | Intervention | Comparator |
|---|---|---|---|---|---|
| Basford (1987) | 81 | 3 weeks | RCT | Laser | Placebo |
| Dickens (1989) | 13 | 2 weeks | RCT | Acupuncture | Transcutaneous electrical nerve stimulation (TENS) |
| Favaro (1994) | 48 | Not reported | RCT | Infrared radiation | Placebo |
| Brosseau (2005) | 88 | 6 weeks | RCT | Laser | Placebo |
| Stange-Rezende (2006) | 45 | 3 weeks | RCT Crossover | Infrared radiation | No treatment |
| Myrer (2011) | 35 | 4 weeks | RCT | Paraffin + topical analgesics | Paraffin |
| Horvath (2012) | 63 | 13 weeks | RCT | Magnetotherapy + balneotherapy | Magnetotherapy |

RCT, randomized controlled trial.