Appendix A: Summary of evidence from surveillance

2017 surveillance – Osteoarthritis (2014) NICE guideline CG177

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Summary of evidence from surveillance

Diagnosis

Q – 01 In a person with suspected clinical OA (including knee pain) when would the addition of imaging be indicated to confirm additional or alternative diagnoses (particularly to identify red flags) such as:

- Crystal arthritis (gout or CPPD)
- Inflammatory arthritis (including rheumatoid arthritis, psoriatic arthritis)
- Infection
- Cancer, usually secondary metastases?

Recommendations derived from this review question

1.1.1 Diagnose osteoarthritis clinically without investigations if a person:
- is 45 or over and
- has activity-related joint pain and
- has either no morning joint-related stiffness or morning stiffness that lasts no longer than 30 minutes. [new 2014]

1.1.2 Be aware that atypical features, such as a history of trauma, prolonged morning joint-related stiffness, rapid worsening of symptoms or the presence of a hot swollen joint, may indicate alternative or additional diagnoses. Important differential diagnoses include gout, other inflammatory arthritis (for example, rheumatoid arthritis), septic arthritis and malignancy (bone pain). [new 2014]

Surveillance decision

No new information was identified at any surveillance review.
This review question should not be updated.
Holistic approach to osteoarthritis assessment and management

Holistic assessment of person with OA

Social
- Effect on life
- Lifestyle expectations
- Family duties
- Hobbies

Health beliefs including ideas, concerns, expectations and current knowledge of OA
- Ability to perform job
- Short term
- Long term
- Adjustments to home or workplace
- Screen for depression
- Other current stresses in life

Quality of sleep
- Support network
- Ideas, concerns and expectations of main carer
- How carer is coping
- Isolation
- Evidence of a chronic pain syndrome
- Other treatable source of pain
- Interaction of two or more morbidities
- Falls
- Assessment of most appropriate drug therapy
- Understanding of surgical options
- Fitness for surgery

Attitudes to exercise
- Interaction of two or more morbidities
- Pain assessment
- Self-help strategies
- Drugs, doses, frequency, timing
- Analgesics
- Side effects

Other musculo-skeletal pain

Influence of Comorbidity

NICE guideline CG177
Q – 02  What is known of patient experiences of osteoarthritis and its treatments and how do patient perceptions and beliefs influence their preference and outcome for individual treatments?

Recommendations derived from this review question

1.2.1  Assess the effect of osteoarthritis on the person's function, quality of life, occupation, mood, relationships and leisure activities. Use figure 1 as an aid to prompt questions that should be asked as part of the holistic assessment of a person with osteoarthritis. [2008]

This figure is intended as an ‘aide memoire’ to provide a breakdown of key topics that are of common concern when assessing people with osteoarthritis. For most topics there are a few suggested specific points that are worth assessing. Not every topic will be of concern for everyone with osteoarthritis, and there are other topics that may warrant consideration for particular people.

1.2.2  Agree a plan with the person (and their family members or carers as appropriate) for managing their osteoarthritis. Apply the principles in Patient experience in adult NHS services (NICE clinical guidance 138) in relation to shared decision-making. [new 2014]

1.2.3  Take into account comorbidities that compound the effect of osteoarthritis when formulating the management plan. [2008]

1.2.4  Discuss the risks and benefits of treatment options with the person, taking into account comorbidities. Ensure that the information provided can be understood. [2008]

1.2.5  Offer advice on the following core treatments to all people with clinical osteoarthritis.

- Access to appropriate information (see recommendation 1.3.1).
- Activity and exercise (see recommendation 1.4.1).
- Interventions to achieve weight loss if the person is overweight or obese (see recommendation 1.4.3 and Obesity [NICE clinical guideline 43]). [2008, amended 2014]

Surveillance decision

This review question should not be updated.

An editorial correction is needed to replace the outdated cross reference to the guideline on obesity (NICE CG43) with a cross-reference to the updated guideline (NICE CG189).

Holistic approach

2017 surveillance summary

A systematic review and meta-analysis1 (215 studies, n=41,392) assessed overall effects of treatments for osteoarthritis and the proportion attributable to the non-specific effect from the context in which the treatment is delivered (contextual effect). Only placebo-controlled randomised controlled trials (RCTs) were included. The smallest effect on pain was seen with joint lavage, and the largest was with topical non-steroidal anti-inflammatory drugs. Overall, 75% of pain reduction was attributable to contextual effects (range 47% for intra-articular corticosteroids to 91% for joint lavage). Function and stiffness outcomes showed similar results.

A systematic review and meta-analysis2 (12 studies, n=1,307) assessed psychological interventions in people with osteoarthritis. Psychological interventions significantly reduced pain and fatigue, and improved patients' self-efficacy and pain coping.

An RCT3 (n=111) assessed a 6-week cognitive-behavioural therapy (CBT) group intervention in patients with knee osteoarthritis compared with standard primary care. No significant differences were seen between the intervention and control group for any measures of pain or function.

An RCT4 (n=391) assessed an integrated multidisciplinary outpatient programme compared with usual outpatient care for patients with osteoarthritis. The intervention consisted of a 3.5 hour multidisciplinary group-
based educational program followed by individual consultations. At 4 months, patients who received integrated multidisciplinary care were significantly more satisfied with the health service, and had significantly higher self-efficacy with other symptoms, compared with standard care. However, at 12 months, the multidisciplinary care group had significantly worse pain and fatigue.

A cluster RCT\(^5\) (n=367) assessed CBT for pain and insomnia, compared with CBT for pain coping skills and with an education-only control. CBT for pain and insomnia reduced insomnia severity and increased sleep efficiency significantly more than education only. CBT for pain coping skills did not reduce insomnia severity but significantly improved sleep efficiency compared with education only. No differences were seen in pain severity or arthritis symptoms.

**Topic expert feedback**

Topic experts highlighted the study on the non-specific effect from the context in which the treatment is delivered (contextual effect) of treatment.\(^1\)

**Impact statement**

Evidence identified in surveillance indicates that psychological interventions may have a place in the holistic management of osteoarthritis. NICE plans to develop a guideline on persistent pain, which may consider the role of psychological therapies in chronic painful conditions. Contextual effects may also be important factors in patients’ response to treatment. These findings are consistent with the recommendations to conduct holistic assessment of people with osteoarthritis and to provide advice on risks and benefits of treatments.

New evidence is unlikely to impact on the guideline.

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**Education and self-management**

**Q – 03** In adults with osteoarthritis, what are the relative benefits of different patient information provision and/or education methods

- in relation to each other or
- versus no specific information provision/education, with respect to symptoms, function and quality of life?

**Recommendations derived from this review question**

1.3.1 Offer accurate verbal and written information to all people with osteoarthritis to enhance understanding of the condition and its management, and to counter misconceptions, such as that it inevitably progresses and cannot be treated. Ensure that information sharing is an ongoing, integral part of the management plan rather than a single event at time of presentation. [2008]

**Surveillance decision**

This review question should not be updated.

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**Patient information interventions**

**2017 surveillance summary**

A cluster RCT\(^6\) (10 clusters, n=537) assessed patient and provider intervention compared with patient intervention and with provider intervention and with usual care. The telephone-based patient intervention focused on weight management, physical activity, and
cognitive behavioural pain management. The provider intervention involved delivery of patient-specific osteoarthritis treatment recommendations to primary care providers through the electronic medical record. WOMAC scores showed no significant differences for any of the interventions (patient and provider, patient, or provider) compared with usual care. A cluster RCT7 (30 clusters, n=300) assessed a combined patient and provider intervention for people with hip or knee osteoarthritis. The telephone-based patient intervention focused on weight management, physical activity, and cognitive behavioural pain management. The provider intervention involved delivery of patient-specific osteoarthritis treatment recommendations to primary care providers through the electronic medical record. At 12 months, Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) scores were significantly lower (indicating improvement) in the osteoarthritis intervention group compared with usual care. An RCT8 (n=118) assessed a patient education programme, patient education plus manual therapy, or minimal intervention control in people with osteoarthritis of the hip. Patient education was delivered by a physiotherapist and manual therapy was provided by a chiropractor. Patient education plus manual therapy was associated with significant reductions in pain severity compared with control. Patient education showed no significant difference in pain severity compared with control.

**Topic expert feedback**

No topic expert feedback was relevant to this evidence.

**Impact statement**

Specific interventions incorporating patient education show inconsistent results. Nevertheless, the current recommendation to offer accurate verbal and written information to patients remains integral to patient-centred care.

New evidence is unlikely to impact on the guideline.

**Q – 04 What is the clinical and cost-effectiveness of decision aids for the management of OA?**

**Recommendations derived from this review question**

1.3.2 Agree a plan with the person (and their family members or carers as appropriate) for managing their osteoarthritis. Apply the principles in Patient experience in adult NHS services (NICE clinical guidance 138) in relation to shared decision-making. [new 2014]

**Surveillance decision**

This review question should not be updated.

**Decisions about surgery**

**2017 surveillance summary**

Two studies9,10 assessed the effect of decision aids in increasing uptake of joint replacement surgery in black people with knee osteoarthritis. An RCT9 (n=493) assessed a video decision aid plus brief counselling session compared with educational information on osteoarthritis for black people with knee osteoarthritis. The educational information control did not mention joint replacement. No significant differences were seen between groups in referral for surgery or willingness to consider surgery. An RCT10 (n=336) assessed a video decision aid intervention compared with control in black people with knee osteoarthritis. Significantly more people in the intervention group underwent total knee replacement within 12 months. An RCT11 (n=343) assessed a patient decision aid and report of their treatment preferences for their surgeon compared with usual education in

**Impact statement**

All the identified studies addressed decision aids in terms of deciding to opt for surgery. Decision aids generally did not show effects on rates of referral or completion of surgery. Decision aids aiming to improve access to surgery for black people showed inconsistent results. The current recommendation on planning care and shared decision making remains integral to patient-centred care.

New evidence is unlikely to impact on the guideline.

Q – 05 In adults with osteoarthritis, what are the relative benefits of different patient self-management programmes

- in relation to each other or
- versus no specific self-management programmes, with respect to symptoms, function and quality of life?

**Recommendations derived from this review question**

1.3.2 Agree individualised self-management strategies with the person with osteoarthritis. Ensure that positive behavioural changes, such as exercise, weight loss, use of suitable footwear and pacing, are appropriately targeted. [2008]

1.3.3 Ensure that self-management programmes for people with osteoarthritis, either individually or in groups, emphasise the recommended core treatments (see recommendation 1.2.5), especially exercise. [2008]

**Surveillance decision**

This review question should not be updated.

**Self-management**

2017 surveillance summary

A systematic review [13] (9 studies, n=2,237) assessed self-management programmes in people with osteoarthritis. Self-management interventions showed no significant effects on pain, function, quality of life, depression or satisfaction. Although self-management interventions improved patient's knowledge of the condition, they did not affect analgesic use or use of primary care or physiotherapy services.

An RCT [14] (n=257) assessed approaches to self-management of hand osteoarthritis. Joint protection (education on reducing strain on the joint in activities of daily living) plus hand exercise was compared with joint protection alone, hand exercise alone, or written and verbal advice. Joint protection was associated with significantly greater response rates and improved pain self-efficacy, but no significant effect of hand exercises was seen. An economic analysis of this study [15] suggested that hand exercises were the most cost-effective option in both the base-case and in alternative methodological approaches.
An RCT\(^\text{16}\) (n=147) assessed a 6-week self-management programme with 7 group sessions compared with a 6-week telephone based programme (with 2 group sessions) in people with generalised osteoarthritis. No significant differences were seen in the primary outcome of daily function.

A quasi-experimental study\(^\text{17}\) (n=195) assessed a web-based self-management intervention in people with hip or knee osteoarthritis. No significant differences in Health Evaluation Impact Questionnaire scores were seen between people who used the website compared with those who did not use the website. However, users of the website had significant improvements in self-management and weight reduction at 12 months.

**Topic expert feedback**
Topic experts highlighted the study of the web-based self-management intervention.\(^\text{17}\)

**Impact statement**
The identified studies do not show compelling evidence for particular self-management strategies for people with osteoarthritis. The current recommendations to agree individualised strategies for self-management, emphasising core treatments, remain integral to patient-centred care.

New evidence is unlikely to impact on the guideline.

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**Q – 06** In adults with osteoarthritis, what are the relative benefits and harms of rest and relaxation/application of pacing techniques versus no treatment or other interventions with respect to symptoms, function, and quality of life?, relaxation and pacing

**Recommendations derived from this review question**
No recommendations were made for this section of the guideline.

**Surveillance decision**
This review question should not be updated.

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**Joint protection**

**2017 surveillance summary**
An RCT\(^\text{14}\) (n=257) assessed approaches to self-management of hand osteoarthritis. Joint protection (education on reducing strain on the joint in activities of daily living) plus hand exercise was compared with joint protection alone, hand exercise alone, or written and verbal advice. Joint protection was associated with significantly greater response rates and improved pain self-efficacy, but no significant effect of hand exercises was seen. An economic analysis of this study\(^\text{15}\) suggested that hand exercises were the most cost-effective option in both the base-case and in alternative methodological approaches.

**Topic expert feedback**
No topic expert feedback was relevant to this evidence.

**Impact statement**
The identified study suggested that joint protection may effective in terms of response rates and improved pain in people with hand osteoarthritis. Pacing is a method used in joint protection, but it was not clear from the abstract what constituted joint protection in this study. Additionally, the related cost-effectiveness study indicated that hand-exercises were the most cost-effective option. Therefore, this evidence is unlikely to be robust enough to develop new recommendations in this area.

New evidence is unlikely to impact on the guideline.
Q – 07  In adults with osteoarthritis, what are the relative benefits and harms of local thermo-therapy (ice, cold, warmth, hot packs, wax baths, contrast baths) versus no treatment or other interventions with respect to symptoms, function, and quality of life?

Recommendations derived from this review question

1.3.4  The use of local heat or cold should be considered as an adjunct to core treatments. [2008]

Surveillance decision

This review question should not be updated.

Thermal therapy

2017 surveillance summary

Evidence on non-pharmacological therapies was identified; it was not always clear from the abstracts whether heat or cold was integral to the interventions. Therefore, these interventions were considered not to be relevant to the guideline at this time, including:

- Spa or bathing therapy
- Mudpack therapy
- Pricking-cupping therapy.

Topic expert feedback

Topic experts indicated that the interventions assessed in these studies are not relevant to clinical practice in the UK.

Impact statement

The identified evidence suggests beneficial effects of heat-based therapies, which supports the current recommendation to consider thermal therapies in addition to core therapies.

Non-pharmacological management

Q – 08  In adults with osteoarthritis, is exercise therapy more effective than

- placebo or no treatment or
- other treatments (e.g. dietary, weight loss, education)?

Subquestions

In adults with osteoarthritis, which type of exercise therapy is the most effective for reducing pain and disability?

Recommendations derived from this review question

1.4.1  Advise people with osteoarthritis to exercise as a core treatment (see recommendation 1.2.5), irrespective of age, comorbidity, pain severity or disability. Exercise should include:

- local muscle strengthening


NICE guideline CG177
• general aerobic fitness.

It has not been specified whether exercise should be provided by the NHS or whether the healthcare professional should provide advice and encouragement to the person to obtain and carry out the intervention themselves. Exercise has been found to be beneficial but the clinician needs to make a judgement in each case on how to effectively ensure participation. This will depend upon the person's individual needs, circumstances and self-motivation, and the availability of local facilities. [2008]

**Surveillance decision**

This review question should not be updated.

**Effects of exercise**

**2017 surveillance summary**

A systematic review29 (60 studies) assessed exercise compared with no exercise control in people with knee and hip osteoarthritis. Trial sequential analysis and Bayesian network meta-analysis were performed. Sequential analysis showed that, as of 2002, sufficient evidence had been accrued to show significant benefit of exercise interventions over no exercise control. Strengthening, flexibility plus strengthening, flexibility plus strengthening plus aerobic, aquatic strengthening, and aquatic strengthening plus flexibility exercises were significantly more effective than no exercise control for pain relief. A combined intervention of strengthening, flexibility, and aerobic exercise was also significantly more effective than no exercise control for improving function.

A Cochrane review30 assessed land-based exercise compared with non-exercise control in people with knee osteoarthritis. The number of participants in the analyses was not reported in the abstract. Exercise reduced pain and improved physical function immediately after treatment compared with control (44 studies), with significant effects still evident 3–6 months after ceasing treatment. A significant effect on quality of life was also seen immediately after treatment (13 studies).

A Cochrane review31 (13 studies, n=1,190) assessed aquatic exercise in people with hip or knee osteoarthritis. In 12 studies (n=1,076) with low or unclear risk of bias, aquatic exercise resulted in a small short-term improvement in pain compared with control. A small improvement in quality of life was also seen (10 studies, n=971). The authors noted that quality of the included studies was moderate. Another systematic review (11 studies, number of participants not reported in the abstract) of aquatic exercise32 found significant effects on pain, function, stiffness and quality of life.

A systematic review33 compared land-based exercise with non-exercise control in people with hip osteoarthritis. Exercise reduced pain and improved physical function immediately after treatment compared with control (9 studies, n=549), with significant effects still evident 2–6 months after ceasing treatment. The authors noted that the evidence for this outcome was high quality. No significant effects were seen on quality of life (3 studies, n=183).

A systematic review34 (9 studies; n=696) assessed isokinetic muscle strengthening in people with knee osteoarthritis. Isokinetic muscle strengthening was associated with improvements in pain, function (Lequesne index), and WOMAC disability. However, the comparator for these analyses was not clear in the abstract. All included studies were assessed by the authors as low or moderate quality.

A systematic review35 (19 studies) assessed exercise or manual therapy, or both, in people with hip osteoarthritis. The number of participants in included studies was not reported in the abstract. Water-based exercise significantly improved WOMAC pain scores in the short term compared with minimal control (4 studies). Land-based exercise significantly improved VAS pain score in the short term compared with minimal control (6 studies). No significant effects or exercise were seen for medium-term effects, long-term effects, or adding manual therapy to exercise, compared with minimal control.

A review of 6 Cochrane reviews36 (54 studies, n=9,806) assessed the effects of exercise or oral analgesics compared with placebo or usual
care control. Exercise and oral analgesics significantly reduced pain compared with control, with no significant difference between the two methods of treatment.

A systematic review\(^3\) (8 studies; n=375) assessed traditional Chinese exercise. The type of control used in included studies was not reported in the abstract. Traditional Chinese exercise had significant short-term effects on pain, function and stiffness. No significant effects were seen for quality of life or mental health.

A systematic review\(^8\) (48 studies, number of participants not reported in the abstract) reported that aerobic, resistance, and performance exercise programmes had similar effectiveness in reducing pain. Single method exercise programmes were significantly more effective than mixed methods exercise programmes. The effects of aerobic exercise increased with the number of supervised sessions. Pain reduction was greater with quadriceps-specific exercise and when supervised exercise was done 3 times a week. No impact of intensity, duration of individual sessions, or patient characteristics was found.

A systematic review\(^9\) (5 studies, n=170) assessed RCTs of whole body vibration. Whole body vibration significantly improved WOMAC function scores, 6-minute walk test, and balance. Another systematic review\(^10\) (5 studies, n=168) of whole-body vibration found significant improvement in functional performance but significant effects were not seen for other measures of function such as the 6-minute walk test. Control interventions were not reported in the abstract of either review.

A systematic review\(^11\) (17 studies, n=1,705) assessed resistance exercise compared with no intervention or psychoeducational intervention in knee osteoarthritis. Significant improvements in pain, stiffness and physical function were seen with resistance exercise. A systematic review\(^12\) assessed physical therapy for improving balance and reducing falls risk in people with knee osteoarthritis. Control interventions were not reported in the abstract. Strength training, Tai chi and aerobic exercise significantly increased balance and reduced falls.

A Cochrane review\(^13\) (7 studies) assessed exercise compared with placebo or no intervention for hand osteoarthritis. Evidence was assessed with GRADE. Low-quality evidence from 5 studies (n=381) found hand exercise significantly reduced hand pain. Hand function and joint stiffness were significantly improved (4 studies, n=369). Low quality evidence suggested that exercise was associated with increased rates of adverse events and withdrawals due to adverse events (increased finger joint inflammation and hand pain), but there was substantial uncertainty in this result (3 studies). Exercise interventions had large variations in dosage, content and number of supervised sessions.

A Cochrane review\(^14\) (6 studies, n=656) assessed high-intensity exercise compared with low-intensity exercise programmes for people with hip or knee osteoarthritis. Evidence was assessed with GRADE. Overall, the evidence was considered to be low or very low quality because of risk of bias and imprecision. Low-quality evidence suggested that high-intensity exercise programmes significantly improved pain and function in the short term, but the effects was unlikely to be clinically significant. There was uncertainty about whether high-intensity exercise increased adverse effects, or whether exercise duration or frequency or level of resistance affected results.

A systematic review\(^15\) (7 studies, n=886) assessed manual therapy or exercise or both in people with hip osteoarthritis. Evidence was assessed with GRADE. Control interventions were not reported in the abstract. High-quality evidence suggested that exercise reduced pain after treatment and at follow-up. Low-quality evidence suggested that manual therapy reduced pain after treatment and follow-up. Low-quality evidence suggested that exercise plus manual therapy reduced pain after treatment but not at follow-up. None of the interventions had a significant effect on quality of life.

A systematic review\(^16\) (8 studies) assessed strengthening and aerobic exercise with more than 3 sessions per week compared with no intervention or psychoeducational control in people with knee osteoarthritis. Overall, exercise reduced pain with a large effect size. Non-weight-bearing strengthening exercise had a larger effect on pain than weight-bearing strengthening exercise or aerobic exercise.

A systematic review\(^17\) (28 studies) assessed the effects of exercise on walking ability in
people compared with no intervention or psychoeducational control in people with knee osteoarthritis. Very low quality evidence suggested that exercise increased 6-minute walk test compared with control. Low or moderate quality evidence suggested that exercise reduced the time taken to walk a specific distance and improved gait velocity.

In addition to the systematic review of exercise therapy, 39 RCTs of exercise interventions were identified, including:

- Adding components to exercise programmes48-56 (for example, manual therapy, booster sessions, or coping skills training)
- Exercise targeting specific anatomy (for example, the quadriceps) or tailored patients’ specific needs57-72
- Specific types of exercise (for example, Nordic walking and yoga).73-86

These studies have not been summarised because of the extensive systematic review evidence showing benefits of exercise. None of these RCTs contradicted this overall finding.

**Topic expert feedback**
No topic expert feedback was relevant to this evidence.

**Impact statement**
A wealth of evidence supports the recommendation to advise people with osteoarthritis to exercise. Many exercise strategies show benefits, but there is no convincing evidence to recommend a particular type of exercise. Therefore, clinicians should continue to focus on ensuring participation in exercise with consideration of the person’s individual needs, circumstances and self-motivation.

New evidence is unlikely to impact on the guideline.

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**Q – 09**
In adults with osteoarthritis, what are the relative benefits and harms of various manual therapies (massage, trigger point massage, mobilisation, manipulation) versus no treatment or other interventions with respect to symptoms, function, and quality of life?

**Recommendations derived from this review question**

1.4.2 Manipulation and stretching should be considered as an adjunct to core treatments, particularly for osteoarthritis of the hip. [2008]

**Surveillance decision**
This review question should not be updated.

**Manual therapy**

**2017 surveillance summary**
A systematic review67 (6 studies, n=515) assessed manual therapy compared with placebo or minimal intervention control in people with hip osteoarthritis. No significant effects of manual therapy were seen for pain, function, or global perceived effect. An RCT89 (n=320) assessed group physical therapy compared with surgery plus post-surgical rehabilitation. There was no significant difference in WOMAC score between groups at 6 months. Almost all participants (94%) in the surgery plus rehabilitation group, and 30% of the physical therapy group, had undergone surgery. An RCT89 (n=320) assessed group physical therapy compared with individual physical therapy in people with knee osteoarthritis. No significant differences in WOMAC scores were seen at 12 weeks or 24 weeks.
An RCT\(^9\) (n=118) assessed a patient education programme, patient education plus manual therapy, or minimal intervention control in people with osteoarthritis of the hip. Patient education was delivered by a physiotherapist and manual therapy was provided by a chiropractor. Patient education plus manual therapy was associated with significant reductions in pain severity compared with control. Patient education showed no significant difference in pain severity compared with control.

An RCT\(^90\) (n=102) assessed a physical therapy intervention compared with sham treatment for knee osteoarthritis. The physical therapy intervention included 10 sessions of physical therapy plus education and advice, home exercise and gait aid if necessary. Sham treatment included inactive ultrasound and inert gel. No significant differences in pain and function were seen between groups.

An RCT\(^91\) (n=83) assessed manual and manipulation therapy plus rehabilitation compared with rehabilitation alone and with manual and manipulation therapy alone in people with knee osteoarthritis. At 5 weeks, no significant differences in WOMAC scores were seen between groups.

An RCT\(^92\) (n=90) assessed aromatherapy massage with lavender oil compared with massage without lavender oil. No significant difference in pain was seen between groups at 4 weeks.

An RCT\(^93\) (n=75) assessed exercise therapy plus manual therapy, compared with exercise therapy plus booster session plus manual therapy and with exercise plus booster sessions, or exercise alone in people with knee osteoarthritis. Adding manual therapy or booster sessions was associated with improved WOMAC scores compared with exercise alone. However, booster sessions plus manual therapy did not have significant benefits over exercise alone.

An RCT\(^94\) (n=64) assessed Mulligan’s mobilisation with movement compared with passive mobilisation and with physical therapies (heat or cold, transcutaneous electrical nerve stimulation and therapeutic ultrasound). Patient satisfaction was significantly higher with Mulligan’s mobilisation with movement or passive mobilisation compared with physical therapies.

An RCT\(^95\) (n=40) assessed physiotherapy plus non-surgical knee distraction compared with joint distraction alone in people with severe knee osteoarthritis. Joint distraction was associated with significantly greater improvements in pain, function, quality of life, and knee range of motion compared with physiotherapy alone.

A 6-week RCT\(^96\) (n=18) assessed exercise plus massage compared with exercise alone in people with knee osteoarthritis. No significant differences were seen between groups for WOMAC score, pain, or the Get-up-and-go test.

**Topic expert feedback**

No topic expert feedback was relevant to this evidence.

**Impact statement**

Studies of manual therapies investigated various forms of therapy in differing combinations. Results were inconsistent, although a few studies found manipulation to have significant effects on pain, which provides some support for the recommendation to consider manipulation and stretching as an adjunct to core treatments.

New evidence is unlikely to impact on the guideline.
**Q – 10** In adults with osteoarthritis, what are the relative benefits and harms of weight loss versus no weight loss with respect to symptoms, function and quality of life?

**Recommendations derived from this review question**

1.4.3 Offer interventions to achieve weight loss* as a core treatment (see recommendation 1.2.5) for people who are obese or overweight. [2008]

* See Obesity: guidance on the prevention, identification, assessment and management of overweight and obesity in adults and children (NICE clinical guideline 43).

**Surveillance decision**

This review question should not be updated.

An editorial correction is needed to replace the outdated cross reference to the guideline on obesity (NICE CG43) with the updated guideline (NICE CG189).

**Weight management**

**2017 surveillance summary**

An RCT™ (n=192) assessed dietary support compared with exercise and with control in people with knee osteoarthritis and obesity. All participants underwent a 16-week dietary intervention before starting 1 year of maintenance therapy in their randomised groups. The dietary support group maintained a significantly greater weight loss than the exercise group. There was no significant difference in pain reduction between groups, although all groups had significantly lower pain compared with baseline.

**Topic expert feedback**

No topic expert feedback was relevant to this evidence.

**Impact statement**

Evidence from one study suggests that a weight loss intervention may reduce pain in knee osteoarthritis, and that weight loss may be maintained more effectively by dietary support than by exercise. This evidence is consistent with the recommendation to offer interventions to achieve weight loss as a core treatment for people who are obese or overweight.

New evidence is unlikely to impact on the guideline.

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**Q – 11** In adults with osteoarthritis, what are the relative benefits and harms of electrotherapy (ultrasound, laser, transcutaneous electrical nerve stimulation [TENS, TNS, AL-TENS], pulsed shortwave diathermy, interferential therapy) versus no treatment, placebo or other interventions with respect to symptoms, function, and quality of life?

**Recommendations derived from this review question**

1.4.4 Healthcare professionals should consider the use of transcutaneous electrical nerve stimulation (TENS)** as an adjunct to core treatments for pain relief. [2008]
** TENS machines are generally loaned to the person by the NHS for a short period, and if effective the person is advised where they can purchase their own.

**Surveillance decision**

This review question should be updated.

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**Electrotherapies**

**2017 surveillance summary**

**TENS**

A systematic review\^\textsuperscript{97} (18 studies, number of participants not reported in the abstract) assessed TENS in people with knee osteoarthritis. In 14 studies, TENS significantly reduced pain compared with control, but there was no significant difference in WOMAC scores.

A systematic review\^\textsuperscript{98} (10 studies, n=519) assessed high frequency and low frequency TENS in knee osteoarthritis. High-frequency TENS significantly reduced pain compared with control, but no significant differences were seen for low-frequency TENS.

A 6-week RCT\^\textsuperscript{99} (n=224) assessed TENS plus group education and exercise compared with sham TENS plus group education and exercise and compared with education and exercise alone in people with knee osteoarthritis. No differences in WOMAC scores were seen between groups.

**Electrical and magnetic stimulation**

A Cochrane review\^\textsuperscript{100} (9 studies, n=636) assessed electromagnetic field therapy compared with sham in people with knee osteoarthritis. Electromagnetic field therapy was associated with significantly greater pain relief compared with sham, but had no significant effect on function.

A systematic review\^\textsuperscript{101} (6 studies, n=374) assessed static magnet therapy in osteoarthritis. Magnets did not significantly improve pain or function, or reduce analgesic use compared with placebo.

A systematic review\^\textsuperscript{102} (7 studies, n=359) assessed low-frequency pulsed electrical stimulation compared with pulsed electromagnetic stimulation and with sham in people with knee osteoarthritis. Low-frequency pulsed electrical stimulation or pulsed electromagnetic stimulation was associated with improved physical function but did not reduce pain compared with sham. The authors noted the body of evidence was of low and very low quality.

An 8-week RCT\^\textsuperscript{103} (n=100) assessed neuromuscular electrical stimulation plus exercise compared with exercise alone in people with knee osteoarthritis. No significant differences were seen between groups for pain, function or timed up and go test.

An RCT\^\textsuperscript{104} (n=66) assessed a wearable pulsed electromagnetic field device compared with placebo in people with knee osteoarthritis and persistent pain. The pulsed electromagnetic field device was associated with significantly greater reductions in pain and WOMAC score compared with placebo.

An RCT\^\textsuperscript{105} (n=50) assessed electromagnetic therapy compared with sham in people with hand osteoarthritis. Both groups also undertook hand exercises. The electromagnetic therapy group had significantly greater improvements in pain and function compared with the sham group.

**Ultrasound**

A systematic review\^\textsuperscript{106} (6 studies, n=417) assessed ultrasound compared with placebo in people with knee osteoarthritis. Continuous and pulsed ultrasound reduced pain significantly more than sham. No significant differences in WOMAC score were seen. However, another systematic review\^\textsuperscript{107} (10 studies, n=645) found significant effects of ultrasound on both pain and WOMAC score.

A further systematic review\^\textsuperscript{108} (8 studies, number of participants not reported in the abstract) assessed ultrasound in knee osteoarthritis. Ultrasound was associated with significant improvement in pain compared with control.

An RCT\^\textsuperscript{109} (n=90) assessed continuous ultrasound compared with pulsed ultrasound and with sham ultrasound in people with knee osteoarthritis. Both continuous and pulsed ultrasound were associated with significantly greater improvement in pain and function compared with sham ultrasound.
An RCT (n=60) assessed continuous ultrasound compared with pulsed ultrasound and with sham ultrasound. All participants additionally participated in home exercise. WOMAC pain score was significantly lower in the continuous ultrasound group compared with sham ultrasound. However, no other outcomes showed significant differences between groups.

An RCT (n=57) assessed pulsed electromagnetic fields compared with placebo in people with knee osteoarthritis. Pain, stiffness, and disability in daily activities were reduced with pulsed magnetic fields compared with placebo.

An RCT (n=41) assessed phonophoresis of glucosamine sulfate compared with ultrasound and with sham ultrasound in people with knee osteoarthritis. Pain, function, and quality of life outcomes were significantly improved with glucosamine phonophoresis compared with the control groups.

**Laser therapy**

A systematic review (7 studies, n=518) assessed low-level laser therapy compared with sham in people with knee osteoarthritis. No significant differences were seen in pain or WOMAC score between low-level laser therapy and control.

An RCT (n=70) assessed low-level laser therapy plus hyaluronic acid injection every 6 months compared with sham laser plus saline injection control every 6 months in people with osteoarthritis of the knee. Significantly fewer knee replacements were conducted in the active treatment group, although the follow-up time was not reported in the abstract.

**Topic expert feedback**

No topic expert feedback was relevant to this evidence.

**Impact statement**

There was no evidence of an effect of laser therapy, so new recommendations in this area are not necessary.

The various methods of electrotherapy show conflicting results. TENS was found to reduce pain in 2 systematic reviews, which supports the current recommendation to consider this intervention as an adjunct to core treatments.

Several systematic reviews and RCTs found ultrasound to be effective in reducing pain. The guideline previously assessed evidence on ultrasound from only 1 systematic review of 3 studies (n=294).

It is unclear from the abstracts of studies of other methods of electric and magnetic stimulation whether the studies are suitable for consideration together. However, electromagnetic field therapy may reduce pain. An update to this guideline should include a review of electrotherapy.

New evidence identified that may impact on the guideline.

**Q – 12** What is the clinical and cost effectiveness of glucosamine and chondroitin alone or in compound form versus placebo or other treatments in the management of osteoarthritis?

**Recommendations derived from this review question**

1.4.5 Do not offer glucosamine or chondroitin products for the management of osteoarthritis. [2014]

**Surveillance decision**

This review question should not be updated.
Nutritional supplements and herbal remedies

2017 surveillance summary

Glucosamine and chondroitin

A 6-month RCT\(^{115}\) (n=606) assessed glucosamine 500mg plus chondroitin 200 mg three times daily compared with celecoxib 200 mg three times daily in people with knee osteoarthritis. After 6 months, both groups had improved WOMAC pain scores, and the difference between groups met prespecified non-inferiority criteria.

A 2-year RCT\(^{116}\) (n=605) assessed glucosamine 1,500 mg plus chondroitin 800 mg once daily compared with placebo in people with knee osteoarthritis. No significant differences in pain were seen between groups.

An RCT\(^{117}\) (n=164) assessed glucosamine 1,500 mg plus chondroitin 1,200 mg once daily compared with placebo in people with knee osteoarthritis. At 6 months, the glucosamine and chondroitin group’s VAS pain scores had improved significantly less than in the placebo group. No significant differences were seen for WOMAC scores.

An RCT\(^{118}\) (n=147) assessed glucosamine 1,500 mg plus chondroitin 1,200 mg plus methylsulfonylmethane 500 mg once daily compared with glucosamine plus chondroitin and with placebo in people with knee osteoarthritis. At 12 weeks, there was no significant difference between groups in VAS pain score or WOMAC score.

An RCT\(^{119}\) (n=53) assessed a combination of glucosamine plus chondroitin plus curcumin twice daily compared with placebo in people with knee osteoarthritis. Both groups also received 20 sessions of physical therapy. At 12 weeks there was no significant difference between groups in pain at rest.

Chondroitin

A Cochrane review\(^{120}\) (43 studies, n=9,110) assessed chondroitin compared with placebo or other control. Most studies were in knee osteoarthritis. In studies shorter than 6 months, and in studies longer than 6 months, chondroitin was associated with significantly improved pain scores compared with placebo. However, for both duration categories, the evidence quality was rated as low and there was high heterogeneity.

An RCT\(^{121}\) (n=604) assessed chondroitin 800 mg daily compared with celecoxib 200 mg daily and with placebo in people with knee osteoarthritis. Chondroitin and celecoxib both reduced pain significantly more than placebo.

Other nutritional supplements and herbal remedies

A further 33 studies of nutritional supplements and herbal medicines were identified but were thought not to impact on the guideline because RCTs tended to show lack of efficacy or had small sample sizes that would be unlikely to inform recommendations in this area. Systematic reviews tended to show high heterogeneity or low quality of included studies, with authors generally concluding that more rigorous and larger studies were needed.

Interventions included:

- Vitamin supplementation\(^{122-125}\)
- Ginger\(^{126}\)
- Enzyme preparations\(^{127,128}\)
- Traditional Chinese medicine\(^{129-135}\)
- Turmeric extracts\(^{136-138}\)
- Mineral preparations\(^{139}\)
- L-carnitine\(^{140}\)
- Homeopathy\(^{141}\)
- Collagen\(^{142,143}\)
- Krill oil\(^{144}\)
- Other herbal preparations.\(^{145-154}\)

Topic expert feedback

No topic expert feedback was relevant to this evidence.

Impact statement

The guideline currently states ‘do not offer’ glucosamine or chondroitin for osteoarthritis. In developing the guideline, the evidence base for glucosamine and chondroitin was considered to be limited and uncertain. Additionally, the guideline committee ‘felt that the over the counter preparations were not always regulated in terms of their strength and purity and felt strongly that they should make comment only on products whose content is licensed and regulated as outlined in the BNF and on the advice of the Medicines and Healthcare Regulatory Authority (MHRA).’ Three licensed preparations of glucosamine are available in the UK, and many other unlicensed preparations are available as nutritional supplements. It was unclear from the abstracts...
of studies identified in surveillance whether the products assessed are licensed in the UK.

Most of the new RCTs of glucosamine and chondroitin showed no significant differences in pain or function. A systematic review focusing on chondroitin found some evidence of efficacy, but the evidence base was rated by the authors as low quality and had high heterogeneity. Although one new RCT indicated that chondroitin may improve pain, the preparation of chondroitin investigated is not licensed in the UK at this time. Therefore, this study would be unlikely to influence recommendations.

Overall, there is no compelling evidence to initiate an update of this review question at this time.

New evidence is unlikely to impact on the guideline.

Q – 13  What is the clinical and cost-effectiveness of acupuncture versus sham treatment (sham control) and other interventions in the management of osteoarthritis

Recommendations derived from this review question

1.4.6  Do not offer acupuncture for the management of osteoarthritis. [2014]

Surveillance decision

This review question should not be updated.

Acupuncture

2017 surveillance summary

A network meta-analysis\textsuperscript{156} assessed 114 studies (n=9,709) of 22 physical treatments for osteoarthritis of the knee. Overall, 8 non-drug interventions resulted in significant improvements in pain compared with standard care. In 11 studies assessed as satisfactory or good quality, acupuncture and muscle-strengthening exercise were significantly better for pain than standard care. The full text of this study indicated that acupuncture did not differ significantly from sham acupuncture.

A systematic review\textsuperscript{156} (12 studies, n=1,763) assessed acupuncture compared with sham acupuncture, usual care, or no intervention. Acupuncture was associated with significant improvements in pain, function, and quality of life. It was not clear from the abstract whether analyses were comparisons against adequate control (sham acupuncture).

A meta-analysis\textsuperscript{157} (10 studies, number of participants not reported in the abstract) assessed acupuncture compared with sham acupuncture, usual care, or no intervention in people with knee osteoarthritis. Short-term improvements (up to 13 weeks) in pain and function were seen with acupuncture. Acupuncture also improved physical function in the longer term (up to 26 weeks) but did not improve pain. It was not clear from the abstract whether analyses were comparisons against adequate control (sham acupuncture).

An RCT\textsuperscript{158} (n=214) assessed acupuncture compared with non-penetrating acupuncture in people with knee osteoarthritis. Both groups also had exercise-based physical therapy. No significant difference was seen between acupuncture and non-penetrating acupuncture at 12 weeks.

An RCT\textsuperscript{159} (n=190) assessed electrical stimulation of the periosteum facilitated by acupuncture needles compared with sham in people with knee osteoarthritis. No significant differences were seen between groups in pain at 6 weeks or 9 months.

An RCT\textsuperscript{160} (n=60) assessed group acupuncture compared with individual acupuncture and with control in people with knee osteoarthritis. All participants had standard care plus a booklet.
about exercise. Although the abstract omitted results of statistical analysis, the 95% CI for changes from baseline in each group overlapped, suggesting no significant difference between the groups. An RCT (n=50; 100 knees) assessed acupuncture compared with physical therapy in people with knee osteoarthritis. Each participant had acupuncture on one knee and physical therapy on the other. WOMAC pain, stiffness, and physical function scores were significantly improved with acupuncture compared with physical therapy.

**Topic expert feedback**
No topic expert feedback was relevant to this evidence.

**Impact statement**
Although systematic reviews have found acupuncture to be effective in people with osteoarthritis, it was not always clear whether these results were robust when comparisons used an appropriate control. The guideline committee believed ‘that sham is the appropriate comparator to elicit the specific treatment efficacy for acupuncture’.

Additionally, the guideline committee considered adequate blinding to be important in trials of acupuncture. During guideline development, although overall comparisons of acupuncture against sham acupuncture showed benefit, this was not robust when only studies with adequate blinding were analysed. The recommendation not to offer acupuncture was made because benefits of acupuncture were uncertain.

In RCTs of acupuncture compared with sham intervention, no significant differences were seen between groups. Whereas, a significant effect of acupuncture was seen when control was not sham acupuncture. The remaining RCT found no significant benefit of acupuncture compared with standard care.

The full text of the network meta-analysis indicated no significant difference in effect between acupuncture and sham acupuncture. The abstracts of the remaining two systematic reviews did not indicate subgroup analysis of only studies using sham acupuncture control or with adequate blinding.

Therefore, the evidence identified in this surveillance review is unlikely to clarify the uncertainty around the benefits of acupuncture.

New evidence is unlikely to impact on the guideline.

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**Q – 14** In adults with osteoarthritis, which devices (joint brace, taping, strapping, splinting, footwear, insoles, walking aids [cane, crutch, walker, walking stick, frame]) are the most effective when compared with one another or with no intervention/usual care with respect to symptoms, function, and quality of life?

**Recommendations derived from this review question**

1.4.7 Offer advice on appropriate footwear (including shock-absorbing properties) as part of core treatments (see recommendation 1.2.5) for people with lower limb osteoarthritis. [2008]

1.4.8 People with osteoarthritis who have biomechanical joint pain or instability should be considered for assessment for bracing/joint supports/insoles as an adjunct to their core treatments. [2008]

**Surveillance decision**
This review question should not be updated.
Wearable devices for osteoarthritis

2017 surveillance summary

Hand osteoarthritis

A systematic review and meta-analysis (27 studies, number of participants not reported in the abstract) assessed non-drug therapies for trapeziometacarpal osteoarthritis. Prefabricated neoprene and custom-made thermoplastic splints did not significantly differ in pain reduction. Multimodal interventions were significantly more effective than single interventions.

A systematic review\(^{163}\) (4 studies, n=74) assessed compression gloves compared with placebo gloves in people with hand arthritis. Only 1 of the included studies assessed hand osteoarthritis (n=5), and showed no difference from placebo gloves. Therapeutic taping was associated with greater reductions in VAS pain scores than placebo or no tape. There was no significant difference between placebo tape and no tape.

An RCT\(^{14}\) (n=257) assessed approaches to self-management of hand osteoarthritis. Joint protection (education on reducing strain on the joint in activities of daily living) plus hand exercise was compared with joint protection alone, hand exercise alone, or written and verbal advice. Joint protection was associated with significantly greater response rates and improved pain self-efficacy, but no significant effect of hand exercises was seen. An economic analysis of this study\(^{18}\) suggested that hand exercises were the most cost-effective option in both the base-case and in alternative methodological approaches.

An RCT\(^{164}\) (n=25) assessed thumb splinting compared with control in people with carpometacarpal osteoarthritis. VAS pain scores improved to a significantly greater degree in the thumb splinting group.

Knee osteoarthritis

A Cochrane review\(^{165}\) (13 studies, n=1,356) assessed braces and orthoses in knee osteoarthritis. One of four studies of braces showed no significant difference between groups in VAS pain score, but the other 3 studies reported significant improvements in function, stiffness, and health-related quality of life. Lateral wedged insoles significantly reduced pain compared with no insole in 1 study; however, 3 studies of lateral wedged insoles showed no significant differences compared with neutral insole.

A meta-analysis\(^{166}\) (6 studies, the number of participants was not reported in the abstract) assessed braces in medial knee osteoarthritis. Braces were associated with significantly greater improvements in pain and function compared with control. The effect size of braces was moderate in studies using no orthosis in the control group, but was small (but still statistically significant) when the control group used an orthosis.

A meta-analysis\(^{167}\) (12 studies, n=885) assessed lateral wedge insoles compared with neutral or no wedge control in people with knee osteoarthritis. Overall, lateral wedge insoles were associated with significant improvements in pain, but there was substantial heterogeneity. Larger trials with low risk of bias indicated there may be no significant effect.

An RCT\(^{168}\) (n=164) assessed shoes with an insole with variable stiffness of the midsole and mild lateral wedge compared with conventional walking shoes. The intervention shoes did not increase the probability of improvement or influence pain at 6 months compared with conventional shoes.

An RCT\(^{169}\) (n=126) assessed a brace compared with no brace in people with knee osteoarthritis. At 6 weeks, the brace group showed significantly greater improvement in knee pain compared with control.

An RCT\(^{170}\) (n=120) assessed braces compared with lateral wedge insole in people with knee osteoarthritis. Pain severity and walking distance improved significantly more in the braces group compared with wedged insoles.

An RCT\(^{171}\) (n=118) assessed lateral waded insoles compared with neutral insoles in people with knee osteoarthritis. Both groups showed reductions in pain; the p-value for between-group difference was not reported, but the 95% CI for the change in each group did not overlap, suggesting a significant difference.

An RCT\(^{172}\) (n=90) assessed rigid compared with lateral wedge insoles in people with knee osteoarthritis. The soft insole was associated with significant improvements in pain, physical activity, activities of daily living, and quality of life compared with the hard insole.

An RCT\(^{173}\) (n=58) assessed lateral wedge insoles with subtalar strapping compared with a neutral insole with subtalar strapping in people with knee osteoarthritis. At weeks 8 and 24, no significant differences were seen between...
groups in VAS pain score, WOMAC scores or Lequesne score.

An RCT\textsuperscript{174} (n=58) assessed minimal footwear compared with control in people with medial knee osteoarthritis. Minimal footwear was associated with improvements in pain, function and analgesic use.

An RCT\textsuperscript{175} (n=48) assessed wedged insoles compared with no intervention in people with knee osteoarthritis. Knee Injury and Osteoarthritis Outcome Score (KOOS) pain results did not differ significantly between the groups.

An RCT\textsuperscript{176} (n=42) assessed Kinesio taping compared with placebo taping in people with knee osteoarthritis. Kinesio taping significantly reduced night VAS pain scores compared with placebo taping.

An RCT\textsuperscript{177} (n=40) assessed lateral wedge insoles compared with acupuncture in people with knee osteoarthritis. No significant differences in pain or function were seen between groups.

An RCT\textsuperscript{178} (n=30) assessed patellar taping compared with placebo tape or no tape in people with knee osteoarthritis. Therapeutic tape was associated with significant improvements in 6-minute walking distance, stair climbing time and VAS pain compared with placebo tape and no tape.

Foot osteoarthritis

An RCT\textsuperscript{179} (n=102) assessed foot orthoses compared with rocker-sole footwear in people with first metatarsophalangeal joint osteoarthritis. There were no significant differences in Foot Health Status Questionnaire (FHSQ) pain results between the groups at 12 weeks. However, there was significantly lower adherence in the rocker sole footwear groups.

Topic expert feedback

Topic experts highlighted a study\textsuperscript{179} of foot orthoses compared with rocker-sole footwear.

Impact statement

Evidence suggests that wearable devices for support or impact absorption such as braces, insoles are effective in improving pain and function in osteoarthritis.

However, there are a range of effective interventions, and no clear evidence that one method is superior. Therefore, the recommendations to provide advice on footwear and to consider assessment for bracing/joint supports/insoles remain relevant.

New evidence is unlikely to impact on the guideline.

Q – 15 In adults with osteoarthritis, are assistive devices (such as tap turners) more effective than no such devices in improving function and quality of life?

Recommendations derived from this review question

1.4.9 Assistive devices (for example, walking sticks and tap turners) should be considered as adjuncts to core treatments for people with osteoarthritis who have specific problems with activities of daily living. If needed, seek expert advice in this context (for example, from occupational therapists or Disability Equipment Assessment Centres). [2008]

Surveillance decision

No new information was identified at any surveillance review.

This review question should not be updated.
Appendix A: summary of evidence from 2017 surveillance of osteoarthritis (2014) NICE guideline CG176

Q – 16 In adults with osteoarthritis, what are the relative benefits and harms of arthroscopic lavage (with or without debridement) versus

- tidal irrigation
- sham procedure (placebo) with respect to symptoms, function and quality of life?

Recommendations derived from this review question

1.4.10 Do not refer for arthroscopic lavage and debridement† as part of treatment for osteoarthritis, unless the person has knee osteoarthritis with a clear history of mechanical locking (as opposed to morning joint stiffness, 'giving way' or X-ray evidence of loose bodies). [2008, amended 2014]

† This recommendation is a refinement of the indication in Arthroscopic knee washout, with or without debridement, for the treatment of osteoarthritis (NICE interventional procedure guidance 230 [2007]). The clinical and cost-effectiveness evidence for this procedure was reviewed for the original guideline (published in 2008), which led to this more specific recommendation on the indication for which arthroscopic lavage and debridement is judged to be clinically and cost effective.

Surveillance decision

This review question should not be updated.

Cost effectiveness of arthroscopic debridement

2017 surveillance summary

A cost-effectiveness analysis180 was conducted on a cohort of 43 people with radiological knee osteoarthritis and mechanical symptoms who were prospectively followed-up after having arthroscopic debridement. After 1.5 years, 7 people (16%) had undergone knee arthroplasty. Patients who did not have arthroplasty had significant reductions in pain and in Oxford Knee Score. The cost per quality-adjusted life year (QALY) was £2,088.

Topic expert feedback

No topic expert feedback was relevant to this evidence.

Impact statement

The finding of arthroscopic debridement being cost effective in people with knee osteoarthritis with mechanical symptoms is consistent with NICE’s recommendation not to refer patients for this procedure unless they have clear evidence of mechanical locking.

New evidence is unlikely to impact on the guideline.

Pharmacological management

Although the 2014 update of the guideline had initially proposed to review the section on pharmacological management, the update did not proceed as explained in the following advisory note in the guideline:

“NICE intends to undertake a full review of evidence on the pharmacological management of osteoarthritis. This will start after a review by the MHRA (Medicines and Healthcare Products Regulatory Agency) of the safety of over-the-counter analgesics is completed. For more information, see the Introduction.

In the meantime, the original recommendations (from 2008) remain current advice. However, the Guideline Development Group (GDG) would like to draw attention to the
Appendix A: summary of evidence from 2017 surveillance of osteoarthritis (2014) NICE guideline CG176

findings of the evidence review on the effectiveness of paracetamol that was presented in the consultation version of the guideline. That review identified reduced effectiveness of paracetamol in the management of osteoarthritis compared with what was previously thought. The GDG believes that this information should be taken into account in routine prescribing practice until the planned full review of evidence on the pharmacological management of osteoarthritis is published (see the NICE website for further details)."

Q – 17 Oral analgesics

Questions
In adults with osteoarthritis, what are the benefits and harms of paracetamol compared to oral NSAIDs or selective COX-2 inhibitors with respect to pain reduction?
In adults with osteoarthritis, what are the benefits and harms of paracetamol alone compared with
- opioids alone or
- paracetamol-opioid compounds with respect to pain reduction?
In adults with osteoarthritis, what are the benefits and harms of paracetamol-opioid compounds compared to NSAIDs with respect to pain reduction?
In adults with osteoarthritis, what are the benefits and harms of low dose opioids with or without paracetamol versus higher strength opioids with respect to pain reduction?
In adults with osteoarthritis, what are the benefits and harms of paracetamol compared to placebo with respect to pain reduction?
In adults with osteoarthritis, what are the benefits and harms of tricyclics/SSRI/SNRI drugs versus placebo with respect to symptoms, function and quality of life?

Recommendations derived from these review questions
1.5.1 Healthcare professionals should consider offering paracetamol for pain relief in addition to core treatments (see recommendation 1.2.5); regular dosing may be required. Paracetamol and/or topical non-steroidal anti-inflammatory drugs (NSAIDs) should be considered ahead of oral NSAIDs, cyclo-oxygenase 2 (COX-2) inhibitors or opioids. [2008]
1.5.2 If paracetamol or topical NSAIDs are insufficient for pain relief for people with osteoarthritis, then the addition of opioid analgesics should be considered. Risks and benefits should be considered, particularly in older people. [2008]

Surveillance decision
This review question should be updated.

Paracetamol
2017 surveillance summary
A systematic review and network meta-analysis\(^{181}\) (137 studies, n=33,243) assessed the effectiveness of drug treatments for knee osteoarthritis. Included studies assessed two or more of the following: paracetamol, diclofenac, ibuprofen, naproxen, celecoxib, intra-articular corticosteroids, intra-articular hyaluronic acid, oral or intra-articular placebo. All interventions were significantly better for improving pain than oral placebo. The most effective intervention was intra-articular hyaluronic acid, and the least effective intervention was paracetamol. All interventions, apart from intra-articular corticosteroids significantly improved function compared with oral placebo. The authors noted that the limitations of the review were: lack of long-term data, inadequate reporting of safety data, possible publication bias, and few head-to-head comparisons. They also noted that a large placebo response to intra-articular treatments may result in this treatment appearing to be more effective.

Appendix A: summary of evidence from 2017 surveillance of osteoarthritis (2014) NICE guideline CG176
A network meta-analysis\textsuperscript{182} (76 studies, \(n=58,451\)) assessed NSAIDs compared with paracetamol or placebo in people with osteoarthritis. All included studies had at least 100 people per treatment group. Six interventions had at least 95\% probability that the difference from placebo was not clinically important (diclofenac 150 mg/day, etoricoxib 30 mg/day, 60 mg/day, and 90 mg/day, and rofecoxib 25 mg/day and 50 mg/day). Clinically important effects were seen with diclofenac 150 mg/day and etoricoxib 60 mg/day. Treatment effects increased as drug dose increased, a linear dose effect was significant only for naproxen (\(p=0.034\)). Model fit was good, and between-trial heterogeneity and inconsistency were low in all analyses. Sensitivity analyses did not change effect estimates.

A systematic review\textsuperscript{183} (12 studies, number of participants not reported in the abstract) assessed the efficacy of paracetamol in people with spinal pain or knee or hip osteoarthritis. Evidence assessed as high quality suggested that paracetamol has a statistically significant but clinically unimportant effect on pain and disability in knee or hip osteoarthritis. People on paracetamol were significantly more likely to have abnormal results of liver function tests. Paracetamol was not associated with differences in adherence, use of rescue medication, adverse events or withdrawals from studies. NICE has produced a Medicines Evidence Commentary that included this meta-analysis.

Two RCTs\textsuperscript{184,185} assessed formulations of paracetamol (extended-release and dual-release). However, such formulations of paracetamol are not available in the UK.

**Topic expert feedback**

Topic experts highlighted studies of oral analgesics in osteoarthritis that included analysis of paracetamol.\textsuperscript{182,183}

**Impact statement**

During the last update of the guideline in 2014, preliminary work on this section addressing pharmacological agents suggested that paracetamol had lower efficacy than previously thought as well as raising concerns about long-term safety. At the same time, the MHRA was reviewing the safety of over-the-counter analgesics. Therefore, updating this section was postponed until completion of the MHRA review, and the recommendations from 2008 were retained.

The following statement was included in the guideline: 'NICE intends to undertake a full review of evidence on the pharmacological management of osteoarthritis. This will start after a review by the MHRA of the safety of over-the-counter analgesics is completed.' The review from the MHRA has been completed and further new evidence has been identified that may help to inform recommendations. Therefore, the planned full review of oral analgesics should be undertaken in an update to this guideline.

**New evidence identified that may impact on the guideline.**

**Opioids**

**2017 surveillance summary**

A Cochrane review\textsuperscript{186} (22 studies, \(n=8,275\)) assessed oral opioids compared with transdermal opioids in people with knee or hip osteoarthritis. Oral oxycodone was studied in 10 trials, transdermal buprenorphine and oral tapentadol in four, oral codeine in 3, oral morphine and oral oxymorphone in 2, and transdermal fentanyl and oral hydromorphone in 1 trial each. Opioids were associated with significantly greater pain reduction than control. The number needed to treat for 1 additional treatment response was 10. Opioids were also associated with significant improvements in function compared with control, with a number needed to treat of 11 for 1 additional response in function. There were no substantial differences in effects according to type of opioid, potency, route of administration, quality of the trials, or source of funding. Trials of 4 weeks or shorter showed larger effects than longer trials. Funnel plots indicated possible publication bias. Opioids were associated with higher risk of adverse events than controls and participants in opioids arms were more likely to drop out or withdraw from the studies. Oxymorphone is not available in the UK.

A review\textsuperscript{36} of 6 Cochrane reviews assessed the effects of exercise or oral analgesics compared with placebo or usual care control. Exercise
and oral analgesics significantly reduced pain compared with control, with no significant difference between the two methods of treatment. The abstract did not specify the analgesics included in the analysis.

**Topic expert feedback**

No topic expert feedback was relevant to this evidence.

**Impact statement**

Current recommendations to consider adding opioids do not specify the type or potency of opioids to use. Evidence identified in surveillance suggests similar effectiveness of weak opioids and strong opioids.

**NSAIDs**

**2017 surveillance summary**

A network meta-analysis\(^{182}\) (76 studies, n=58,451) assessed NSAIDs compared with paracetamol or placebo in people with osteoarthritis. All included studies had at least 100 people per treatment group. Six interventions had at least 95% probability that the difference from placebo was not clinically important (diclofenac 150 mg/day, etoricoxib 30 mg/day, 60 mg/day, and 90 mg/day, and rofecoxib 25 mg/day and 50 mg/day). Clinically important effects were seen with diclofenac 150 mg/day and etoricoxib 60 mg/day. Treatment effects increased as drug dose increased, a linear dose effect was significant only for naproxen (p=0.034). Model fit was good, and between-trial heterogeneity and inconsistency were low in all analyses. Sensitivity analyses did not change effect estimates.

A network meta-analysis\(^{187}\) (8 studies, n=5,942) assessed etoricoxib 30–60 mg, celecoxib 200–400 mg, and naproxen 1000 mg, based on the number of patient withdrawals in people with osteoarthritis. The proportion of people withdrawing because of lack of efficacy did not differ significantly between the drugs. Etoricoxib had the highest probability of being the best treatment, followed by celecoxib, then naproxen. No significant differences in withdrawals due to adverse events were seen between the drugs.

An RCT\(^{188}\) (n=858) assessed celecoxib 200 mg daily dosed continuously compared with intermittently in people with hip or knee osteoarthritis. The continuous treatment group had significantly greater improvements in WOMAC total score in people younger than 60 years, but no significant difference was seen between groups for people older than 60 years. Significantly more flares were reported in the intermittent group than in the continuous group, in both age groups. A further analysis from this trial was also identified.\(^{189}\)

A 4-week RCT\(^{190}\) (n=125) assessed modified-release acelclofenac compared with immediate release acelclofenac in people with knee osteoarthritis. No significant differences in pain, KOOS and range of motion were seen between groups. Modified-release acelclofenac is not available in the UK.

An RCT\(^{191}\) (n=104) assessed diclofenac compared with paracetamol in people with knee osteoarthritis. No significant differences in pain or function were seen between the groups.

A 3-week RCT\(^{192}\) (n=70) assessed oral NSAIDs compared with intra-articular steroids in people with knee osteoarthritis. Pain intensity and pain on walking were reduced significantly more in the NSAIDs group than in the intra-articular steroids group.

A 12-week RCT\(^{193}\) (number of participants not reported in the abstract) assessed a formulation (Solumatrix) of low-dose meloxicam 5 mg or 10 mg compared with placebo in people with hip or knee osteoarthritis. Both doses of meloxicam were associated with significantly greater improvements in pain compared with placebo. This preparation of meloxicam is not available in the UK.

A 12-week RCT\(^{194}\) (number of participants not reported in the abstract) assessed a formulation (Solumatrix) of low-dose diclofenac...
35 mg twice daily or three times daily compared with placebo in people with osteoarthritis. Reduction in pain did not differ significantly between diclofenac 35 mg twice daily and placebo. However, diclofenac 35 mg three times daily reduced pain to a significantly greater degree than placebo. Both doses of diclofenac were associated with significant improvements in WOMAC total score compared with placebo. This preparation of diclofenac is not available in the UK.

**Topic expert feedback**

No topic expert feedback was relevant to this evidence.

**Impact statement**

Evidence suggests that NSAIDs may be effective in osteoarthritis, but that lower doses may not have significant effects. Etoricoxib may be more effective than celecoxib or naproxen. In developing the guideline, etoricoxib was considered not to be cost effective (dominated by other NSAIDs). However, a generic version has now been licensed in the UK (although it is not yet available), which may materially affect the cost-effectiveness analysis. Additionally, the need to review oral analgesics (see above) is likely to have an impact on this review question.

The MHRA has produced several Drug Safety Updates on NSAIDs:

- Aceclofenac
-Diclofenac
-COX-2 inhibitors
-Etoricoxib
-High-dose ibuprofen

An update of the guideline should consider the efficacy and safety of NSAIDS in osteoarthritis.

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**Duloxetine**

**2017 surveillance summary**

A meta-analysis\(^ {195} \) (3 studies, n=1,011) assessed duloxetine compared with placebo in people with knee osteoarthritis. Duloxetine significantly improved pain intensity, function and patients global assessment compared with placebo. However, duloxetine was also associated with higher rates of adverse events and discontinuing treatment than placebo. Duloxetine is not licensed in the UK for treating osteoarthritis.

An RCT\(^ {196} \) (n=407) assessed duloxetine compared with placebo in people with osteoarthritis. The type of osteoarthritis that participants had was not reported in the abstract. Duloxetine significantly improved pain compared with placebo, but there was no significant difference in discontinuations because of adverse events.

**Topic expert feedback**

No topic expert feedback was relevant to this evidence.

**Impact statement**

Evidence suggests that duloxetine may reduce pain in people with osteoarthritis. The MHRA has produced a Drug Safety Update on duloxetine. In developing the guideline, no recommendations were made on using antidepressants in osteoarthritis because of a lack of suitable evidence.

An update to the guideline should consider whether antidepressants have a role in treating osteoarthritis.

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**Other drug treatments**

**2017 surveillance summary**

In addition to the studies of oral analgesics highlighted above, a further 10 studies of drug treatments were identified. These studies involve agents that are not licensed in the UK for use in osteoarthritis and generally showed no effect or had samples sizes too small to inform recommendations at this time. These studies looked at:

- Methotrexate\(^ {197} \)
- Prednisolone\(^ {198} \)
Appendix A: summary of evidence from 2017 surveillance of osteoarthritis (2014) NICE guideline CG176

- Adalimumab
- Bisphosphonates
  - Alendronate
  - Nерidronate
- Strontium ranelate
- Spironolactone
- Etanercept

Another 14 studies of developmental agents not currently licensed for use in the UK were identified, including:
- Anti-nerve-growth factor antibodies
  - Tanezumab
  - Fasinumab
  - Fulranumab; however development of this drug has been discontinued.
- Diacerein
- Etofenamate
- Pregabalin (plus meloxicam)
- Genetically engineered chondrocytes expressing transforming growth factor beta-1.

**Topic expert feedback**
No topic expert feedback was relevant to this evidence.

**Impact statement**
New evidence on agents that are not licensed in the UK for use in osteoarthritis generally showed no effect or had sample sizes too small to inform recommendations at this time.

\[
\text{New evidence is unlikely to impact on the guideline.}
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**Q – 18** In adults with osteoarthritis, what are the benefits and harms of topical agents (NSAIDs/ capsaicin/ rubefacients) compared to oral NSAIDs or placebo with respect to symptoms, function and quality of life?

**Recommendations derived from this review question**

1.5.3 Consider topical NSAIDs for pain relief in addition to core treatments (see recommendation 1.2.5) for people with knee or hand osteoarthritis. Consider topical NSAIDs and/or paracetamol ahead of oral NSAIDs, COX-2 inhibitors or opioids. [2008]
1.5.4 Topical capsaicin should be considered as an adjunct to core treatments for knee or hand osteoarthritis. [2008]
1.5.5 Do not offer rubefacients for treating osteoarthritis. [2008]

**Surveillance decision**
This review question should be updated.

**Topical therapies**

**2017 surveillance summary**

**NSAIDs**
A meta-analysis (9 studies, number of participants not reported in the abstract) assessed topical diclofenac compared with control in people with osteoarthritis. The type of control interventions was not reported in the abstract. Topical diclofenac was associated with improvements in pain and function compared with control.

A 12-week RCT (n=866) assessed ketoprofen gel 25 mg, 50 mg, or 100 mg compared with vehicle gel in people with osteoarthritis of the knee. Ketoprofen 50 mg and 100 mg reduced pain significantly more than vehicle gel. Only ketoprofen 50 mg improved function significantly more than
vehicle gel. This preparation of ketoprofen is not available in the UK.
A 2-week RCT\textsuperscript{223} (n=633) assessed an S-flurbiprofen patch compared with flurbiprofen patch in people with knee osteoarthritis. Knee pain on rising from a chair was improved to a significantly greater degree with the S-flurbiprofen patch than with the flurbiprofen patch. However significantly more people in the S-flurbiprofen group had drug-related adverse events. No types of flurbiprofen patch are available in the UK.
A 12 week RCT\textsuperscript{224} (n=555) assessed ketoprofen gel in IDEA-033 vehicle compared with TDT-064 vehicle gel in people with knee osteoarthritis. Pain was reduced to a significantly greater extent in the TDT-064 vehicle gel group than in the ketoprofen gel group. The TDT-064 vehicle gel has subsequently been developed as a non-drug treatment (FLEXISEQ). NICE has produced a Medtech Innovation Briefing on FLEXISEQ for osteoarthritis.
A 4-week RCT\textsuperscript{225} (n=260) assessed topical diclofenac compared with vehicle control in people with osteoarthritis of the knee. Topical diclofenac was associated with greater reductions in pain compared with placebo.
A non-inferiority study\textsuperscript{226} (n=169) assessed oral loxoprofen compared with topical loxoprofen in people with knee osteoarthritis. The difference between groups in proportion of patients with an overall improvement of more than 50% was 12.6%, which was greater than the non-inferiority margin of 10%. Loxoprofen is not available in the UK.
A 2-week RCT\textsuperscript{227} (n=64) assessed transdermal ibuprofen compared with placebo in people with osteoarthritis of the knee. WOMAC total score and WOMAC physical functioning were improved significantly more in the ibuprofen group compared with placebo.

**Other topical agents**
A systematic review\textsuperscript{228} (5 studies, number of participants not reported in the abstract) assessed topical capsaicin in people with osteoarthritis. Studies evaluated knee, hand or mixed osteoarthritis. Capsaicin moderately reduced pain compared with placebo over 4 weeks.
A further 4 studies were identified that investigated topical application; however, these interventions were not considered to be relevant to the guideline at this time:
- Leech therapy\textsuperscript{229,230}
- Cabbage leaf wraps\textsuperscript{231}
- Chinese herbal patches\textsuperscript{132}

**Topic expert feedback**
No topic expert feedback was relevant to this evidence.

**Impact statement**
New evidence supports the current recommendations to consider topical NSAIDs and capsaicin in addition to other core treatments for osteoarthritis.
However, part of a recommendation in this section states: ‘Consider topical NSAIDs and/or paracetamol ahead of oral NSAIDs, COX-2 inhibitors or opioids.’ Any change to the recommended use of oral analgesics will impact on this recommendation.

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**Q – 19  NSAIDs and highly selective COX-2 inhibitors**

**Questions**
In adults with osteoarthritis, what are the benefits and harms of COX-2 inhibitors compared to:
- nonselective NSAIDs or
- placebo with respect to symptoms, function and quality of life?
In adults with osteoarthritis, what are the relative benefits and harms of
- selective COX-2 inhibitors versus nonselective NSAIDs plus GI protective agents and
• selective COX-2 inhibitors plus GI protective agents versus nonselective NSAIDs plus GI protective agents?

In adults with osteoarthritis taking aspirin what are the relative benefits and harms of selective COX-2 inhibitors versus nonselective NSAIDs versus each of these combined with GI protective agents?

**Recommendations derived from these review questions**

Although NSAIDs and COX-2 inhibitors may be regarded as a single drug class of 'NSAIDs', these recommendations use the two terms for clarity and because of the differences in side-effect profile.

1.5.6 Where paracetamol or topical NSAIDs are ineffective for pain relief for people with osteoarthritis, then substitution with an oral NSAID/COX-2 inhibitor should be considered. [2008]

1.5.7 Where paracetamol or topical NSAIDs provide insufficient pain relief for people with osteoarthritis, then the addition of an oral NSAID/COX-2 inhibitor to paracetamol should be considered. [2008]

1.5.8 Use oral NSAIDs/COX-2 inhibitors at the lowest effective dose for the shortest possible period of time. [2008]

1.5.9 When offering treatment with an oral NSAID/COX-2 inhibitor, the first choice should be either a standard NSAID or a COX-2 inhibitor (other than etoricoxib 60 mg). In either case, co-prescribe with a proton pump inhibitor (PPI), choosing the one with the lowest acquisition cost. [2008]

1.5.10 All oral NSAIDs/COX-2 inhibitors have analgesic effects of a similar magnitude but vary in their potential gastrointestinal, liver and cardio-renal toxicity; therefore, when choosing the agent and dose, take into account individual patient risk factors, including age. When prescribing these drugs, consideration should be given to appropriate assessment and/or ongoing monitoring of these risk factors. [2008]

1.5.11 If a person with osteoarthritis needs to take low-dose aspirin, healthcare professionals should consider other analgesics before substituting or adding an NSAID or COX-2 inhibitor (with a PPI) if pain relief is ineffective or insufficient. [2008]

**Surveillance decision**

This review question should be updated.

All evidence on NSAIDs and highly selective COX-2 inhibitors is discussed in the oral analgesics section above.

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**Q – 20 Intra-articular injections**

**Questions**

In adults with osteoarthritis, what are the relative benefits and harms of intra-articular injection of corticosteroid versus placebo with respect to symptoms, function, and quality of life?

In adults with osteoarthritis, what are the relative benefits and harms of intra-articular injection of hyaluronic acid/hyaluronans versus placebo or steroid injection with respect to symptoms, function, and quality of life?

What is the clinical and cost effectiveness of intra-articular injections of hyaluronic acid/hyaluronans in the management of OA in the knee, hand, ankle, big toe and hip?
Recommendations derived from these review questions

1.5.12 Intra-articular corticosteroid injections should be considered as an adjunct to core treatments for the relief of moderate to severe pain in people with osteoarthritis. [2008]

1.5.13 Do not offer intra-articular hyaluronan injections for the management of osteoarthritis. [2014]

Surveillance decision

This review question should be updated.

Hyaluronic acid and corticosteroids

2017 surveillance summary

A systematic review and network meta-analysis[131] (137 studies, n=33,243) assessed the effectiveness of drug treatments for knee osteoarthritis. Included studies assessed two or more of the following: paracetamol, diclofenac, ibuprofen, naproxen, celecoxib, intra-articular corticosteroids, intra-articular hyaluronic acid, oral or intra-articular placebo. All interventions were significantly better for improving pain than oral placebo. The most effective intervention was intra-articular hyaluronic acid, and the least effective intervention was paracetamol. All interventions, apart from intra-articular corticosteroids significantly improved function compared with oral placebo. The authors noted that the limitations of the review were: lack of long-term data, inadequate reporting of safety data, possible publication bias, and few head-to-head comparisons. They also noted that intra-articular treatments may appear to be more effective because of a large placebo response with intra-articular treatments.

A further 29 studies were identified that assessed intra-articular corticosteroids or hyaluronic acid for osteoarthritis. Hyaluronic acid for knee osteoarthritis was assessed in 7 systematic reviews:

- One review[232] (19 studies, number of participants not reported in the abstract) found high heterogeneity in studies of hyaluronic acid. The overall treatment effect was less than half of the minimal important difference for pain, function, and stiffness. In meta-regression analysis, double-blind sham-controlled trials had lower effect sizes than trials with insufficient blinding. Cross-linked hyaluronic acid preparations had high effect sizes, but these were lower than the minimal important difference for outcomes.
- One review[233] (29 studies, n=4,866) found significant effects on pain and function with no significant difference in adverse events for hyaluronic acid preparations licensed in the USA compared with saline control in knee osteoarthritis.
- One review[234] (18 studies, number of participants not reported) found significant efficacy of hyaluronic acid compared with placebo on function in knee osteoarthritis, with no significant increase in adverse events compared with control.
- One review[235] (6 studies, number of participants not reported in the abstract) found no significant difference for Hylan G-F 20 compared with placebo in knee osteoarthritis.
- One review[236] (5 studies, n=712) found no difference between hyaluronic acid and NSAIDs in pain, function or stiffness in knee osteoarthritis.
- One review[237] (2 studies, n=164) found no effect on pain but significantly better function compared with placebo in thumb osteoarthritis.
- A network meta-analysis[238] (74 studies, n=13,032) found no significant difference between hyaluronic acid and placebo for adverse events.

Hyaluronic acid for knee osteoarthritis was also investigated in 5 RCTs:

- One study[239] (n=391) found no significant difference between hyaluronic acid and corticosteroids.
- One study[240] (n=218) found no significant difference in responder rate (based on pain scores) compared with saline control.
- One study[241] (n=196) found no significant difference in pain on walking 50 m between hyaluronic acid and placebo.
- One study[242] (n=180) found significantly greater effect on pain and function when synovial fluid was aspirated before
administering hyaluronic acid compared with no aspiration.

- One study\(^\text{243}\) (n=200) found hyaluronic acid to be non-inferior to NSAIDs for change in Japanese Knee Osteoarthritis Measure after 5 weeks.

**Corticosteroids**

Intra-articular corticosteroid injections were assessed in 5 systematic reviews:

- A Cochrane review\(^\text{244}\) (27 studies, n=1,767) found a moderate sized significant effect of corticosteroids compared with sham injection that declined over time in knee osteoarthritis. Effect sizes were higher in smaller trials.
- One review\(^\text{245}\) (7 studies, number of participants not reported in the abstract) noted ‘a paucity of data’ comparing different corticosteroids preparations. However, 3 trials indicated that triamcinolone hexacetonide potential benefits on pain outcomes compared with other corticosteroids in knee osteoarthritis.
- One review\(^\text{246}\) (7 studies, n=620) found significantly greater short-term effects on pain in people who had severe pain at baseline compared with people whose pain was less severe.
- One review\(^\text{247}\) (5 studies, number of participants not reported in the abstract) found a moderate-sized significant effect of corticosteroids on pain compared with control in hip osteoarthritis.
- One review\(^\text{248}\) (2 studies, n=164) found no effect on pain or function compared with placebo in thumb osteoarthritis.

Corticosteroids were also investigated in 8 RCTs:

- One study\(^\text{249}\) (n=53) found no significant difference in efficacy of 3 approaches to intra-articular administration of corticosteroids (superolateral, anteromedial, or anterolateral) in knee osteoarthritis.
- One study\(^\text{250}\) (n=228) found an extended-release formulation of triamcinolone acetonide to have significantly greater effects on pain relief in the medium term than an immediate-release preparation in knee osteoarthritis.
- One study\(^\text{251}\) (n=140) found intra-articular triamcinolone resulted in significantly greater cartilage volume loss compared with saline and no significant difference in pain.
- One study\(^\text{252}\) (n=100) found no significant difference in corticosteroid injection before exercise therapy compared with placebo injection before exercise therapy in knee osteoarthritis.
- One study\(^\text{253}\) (n=60) found triamcinolone acetonide plus lidocaine significantly improved pain on movement and swelling compared with lidocaine alone in interphalangeal osteoarthritis.
- One study\(^\text{254}\) (n=100) found no significant differences between triamcinolone hexacetonide and methylprednisolone acetate in knee osteoarthritis.
- One study\(^\text{255}\) (n=60) found dextrose (known as prolotherapy) plus lidocaine to be more effective for pain and function outcomes compared with corticosteroid plus lidocaine in first carpometacarpal osteoarthritis.
- One study\(^\text{256}\) (n=70) assessed oral NSAIDS compared with intra-articular steroids in people with knee osteoarthritis. Pain intensity and pain on walking were reduced significantly more in the NSAIDS group than in the intra-articular steroids group.

**Corticosteroids compared with hyaluronic acid**

Corticosteroids and hyaluronic acid were compared in 3 systematic reviews:

- One review\(^\text{257}\) (12 studies, n=1,794) found corticosteroids improved pain significantly more than hyaluronic acid in the short term (1 month after administration) in knee osteoarthritis. Hyaluronic acid improved pain and function significantly more than corticosteroids in the long term (at 6 months).
- One review\(^\text{258}\) (7 studies, n=583) found no significant difference in pain for corticosteroids compared with hyaluronic acid in knee osteoarthritis.
- One review\(^\text{259}\) (4 studies, n=304) found no significant difference between corticosteroids and hyaluronic acid in the first 12 weeks after administration in thumb osteoarthritis. At 24 weeks, corticosteroids reduced pain significantly compared with hyaluronic acid.

Corticosteroids and hyaluronic acid were also compared in 5 RCTs:

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Impact statement

Evidence for hyaluronic acid is inconsistent in finding statistically significant effects in osteoarthritis. In developing the guideline, the guideline committee recommended that hyaluronic acid products should not be used because, although statistically significant effects were seen, the effects were not considered to be clinically important. Additionally, many studies of preparations licensed in the UK were of low or very low quality.

Findings for intra-articular corticosteroids also showed some inconsistency, although much of the evidence was in favour of corticosteroids. Evidence on intra-articular corticosteroids was not reviewed as part of the 2014 update. However, a review of this section of the guideline is necessary to determine whether the recommendations to consider corticosteroids, but not to use hyaluronic acid, remain relevant.

New evidence identified that may impact on the guideline.

Platelet-rich plasma

2017 surveillance summary

Platelet-rich plasma was assessed in 6 systematic reviews:

- One review262 (14 studies, n=1,423) found platelet-rich plasma to significantly improve WOMAC pain, physical function and total scores at 12 months compared with control (saline, hyaluronic acid, corticosteroids or ozone).
- One review263 (10 studies, n=1,069) found platelet-rich plasma to significantly improve pain and function at 12 months compared with hyaluronic acid.
- One review264 (10 studies, number of participants not reported in the abstract) found platelet-rich plasma to improve pain significantly better than hyaluronic acid or placebo.
- One review265 (7 studies, n=722) found platelet-rich plasma to improve WOMAC score significantly more than hyaluronic acid.
- One review266 (6 studies, n=739) found platelet-rich plasma to reduce pain significantly more than hyaluronic acid. This study noted an absence of studies comparing platelet-rich plasma with corticosteroids.
- One review267 (6 studies, n=577) found platelet rich plasma to significantly improve WOMAC scores compared with hyaluronic acid or saline.

Additionally, 13 randomised controlled trials in knee osteoarthritis were identified:

- 6 studies268-273 found significant effects on pain or function compared with hyaluronic acid.
- 1 study274 found no significant effects on pain or function compared with hyaluronic acid.
- 5 studies found significant effects on pain or function compared with other types of control:
  - corticosteroids275
  - saline276,277


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- exercise
- paracetamol.

- 1 study found that a second dose of plasma-rich platelets 1 year after the initial dose improved pain and function significantly more than a single dose

**Topic expert feedback**

No topic expert feedback was relevant to this evidence.

**Impact statement**

Platelet-rich plasma is not currently covered in the guideline. Several studies of platelet-rich plasma were identified, most of which showed significant effects over hyaluronic acid or placebo.

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**Other intra-articular treatments**

**2017 surveillance summary**

Evidence on other intra-articular treatments was identified but these treatments were generally investigational and not licensed in the UK for use in osteoarthritis, including:

- Allogenic human chondrocytes expressing TGF beta
- Botulinium toxin
- Autologous mesenchymal stem cells
- Clodronate
- Bone marrow aspirate
- Dextrose (known as prolotherapy)

Additionally, a systematic review assessed the effects of saline when used as placebo in studies of intra-articular therapy in knee osteoarthritis. Saline significantly reduced pain in the short term (32 studies, n=1,705) and in the long term (19 studies, n=1,445). Another systematic review showed similar results.

**Topic expert feedback**

No topic expert feedback was relevant to this evidence.

**Impact statement**

Additional agents administered intra-articularly were generally investigational and not licensed for this use in the UK. Studies using intra-articular saline in the control group suggest that significant benefits on pain are seen. It is unclear whether saline has an active effect or whether intra-articular administration has a particularly high placebo effect.

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**Referral for consideration of joint surgery**

**Q – 21 Referral criteria for surgery**

**Subquestions**

In adults with osteoarthritis, what are the indications for referring for consideration for total/partial joint replacement therapy?

In adults with osteoarthritis, are there patient centred factors that predict increased benefits or harms from osteoarthritis related surgery?
Recommendations derived from this review question

1.6.1 Clinicians with responsibility for referring a person with osteoarthritis for consideration of joint surgery should ensure that the person has been offered at least the core (non-surgical) treatment options (see recommendation 1.2.5). [2008]

1.6.2 Base decisions on referral thresholds on discussions between patient representatives, referring clinicians and surgeons, rather than using scoring tools for prioritisation. [2008, amended 2014]

1.6.3 Consider referral for joint surgery for people with osteoarthritis who experience joint symptoms (pain, stiffness and reduced function) that have a substantial impact on their quality of life and are refractory to non-surgical treatment. [2008, amended 2014]

1.6.4 Refer for consideration of joint surgery before there is prolonged and established functional limitation and severe pain. [2008, amended 2014]

1.6.5 Patient-specific factors (including age, sex, smoking, obesity and comorbidities) should not be barriers to referral for joint surgery. [2008, amended 2014]

Surveillance decision
No new information was identified at any surveillance review.
This review question should not be updated.

Q – 22 What information should people with OA receive to inform consideration of the appropriate timing of referral for surgery as part of their OA management?

Recommendations derived from this review question

1.6.6 When discussing the possibility of joint surgery, check that the person has been offered at least the core treatments for osteoarthritis (see recommendation 1.2.5), and give them information about:
   • the benefits and risks of surgery and the potential consequences of not having surgery
   • recovery and rehabilitation after surgery
   • how having a prosthesis might affect them
   • how care pathways are organised in their local area. [new 2014]

Surveillance decision
No new information was identified at any surveillance review.
This review question should not be updated.
**Follow-up and review**

Q – 23 What is the clinical and cost effectiveness of regular follow-up or review in reinforcing core treatments (information, education, exercise, weight reduction) care in the management of OA?

**Subquestion**

Which patients with OA will benefit the most from reinforcement of core treatment as part of regular follow-up/review?

**Recommendations derived from this review question**

1.7.1 Offer regular reviews to all people with symptomatic osteoarthritis. Agree the timing of the reviews with the person (see also recommendation 1.7.2). Reviews should include:  
- monitoring the person’s symptoms and the ongoing impact of the condition on their everyday activities and quality of life  
- monitoring the long-term course of the condition  
- discussing the person’s knowledge of the condition, any concerns they have, their personal preferences and their ability to access services  
- reviewing the effectiveness and tolerability of all treatments  
- support for self-management. [new 2014]

1.7.2 Consider an annual review for any person with one or more of the following:  
- troublesome joint pain  
- more than one joint with symptoms  
- more than one comorbidity  
- taking regular medication for their osteoarthritis. [new 2014]

1.7.3 Apply the principles in Patient experience in adult NHS services (NICE clinical guidance 138) with regard to an individualised approach to healthcare services and patient views and preferences. [new 2014]

**Surveillance decision**

No new information was identified at any surveillance review.  
This review question should not be updated.
Editorial and factual corrections

During surveillance of the guideline we identified the following issues with the NICE version of the guideline that should be corrected.

- Recommendations 1.2.5 and 1.4.3 suggest providing advice or interventions for weight loss with a cross reference to the guideline on obesity (NICE CG43). This cross reference is out of date and should be updated to NICE CG189.

Research recommendations

Prioritised research recommendations

At specified surveillance reviews of guidelines published after 2011, we assess progress made against prioritised research recommendations. We may then propose to remove research recommendations from the NICE version of the guideline and the NICE database for research recommendations. The research recommendations will remain in the full versions of the guideline. See NICE’s research recommendations process and methods guide 2015 for more information.

These research recommendations were deemed priority areas for research by the Guideline Committee; therefore, at this surveillance review time point a decision will be taken on whether to retain the research recommendations or stand them down.

We applied the following approach:

- New evidence relevant to the research recommendation was found and an update of the related review question is planned.
  - The research recommendation will be removed from the NICE version of the guideline and the NICE research recommendations database. If needed, a new research recommendation may be made as part of the update process.

- New evidence relevant to the research recommendation was found but an update of the related review question is not planned because the new evidence is insufficient to trigger an update.
  - The research recommendation will be retained because there is evidence of research activity in this area.

- New evidence relevant to the research recommendation was found but an update of the related review question is not planned because evidence supports current recommendations.
  - The research recommendation will be removed from the NICE version of the guideline and the NICE research recommendations database because further research is unlikely to impact on the guideline.

- Ongoing research relevant to the research recommendation was found.
  - The research recommendation will be retained and evidence from the ongoing research will be considered when results are published.

- No new evidence relevant to the research recommendation was found and no ongoing studies were identified.
  - The research recommendation will be removed from the NICE version of guideline and the NICE research recommendations database because there is no evidence of research activity in this area.

- The research recommendation would be answered by a study design that was not included in the search (usually systematic reviews or randomised controlled trials).
  - The research recommendation will be retained in the NICE version of the guideline and the NICE research recommendations database.

- The new research recommendation was made during a recent update of the guideline.
The research recommendation will be retained in the NICE version of the guideline and the NICE research recommendations database.

**RR – 01** What are the short-term and long-term benefits of non-pharmacological and pharmacological treatments for osteoarthritis in very old people (for example, aged 80 years and older)?

The new research recommendation was made during a recent update of the guideline.

**Surveillance decision**

The research recommendation will be retained in the NICE version of the guideline and the NICE research recommendations database.

**RR – 02** What are the benefits of combinations of treatments for osteoarthritis, and how can these be included in clinically useful, cost-effective algorithms for long-term care?

New evidence relevant to the research recommendation was found but an update of the related review question is not planned because the new evidence is insufficient to trigger an update.

Several studies assessed combinations of treatments, but none aimed to develop a treatment algorithm.

**Surveillance decision**

The research recommendation will be retained because there is evidence of research activity in this area.

**RR – 03** What are effective treatments for people with osteoarthritis who have common but poorly researched problems, such as pain in more than one joint or foot osteoarthritis?

The new research recommendation was made during a recent update of the guideline.

**Surveillance decision**

The research recommendation will be retained in the NICE version of the guideline and the NICE research recommendations database.

**RR – 04** Which biomechanical interventions (such as footwear, insoles, braces and splints) are most beneficial in the management of osteoarthritis, and in which subgroups of people with osteoarthritis do they have the greatest benefit?

New evidence relevant to the research recommendation was found but an update of the related review question is not planned because the new evidence is insufficient to trigger an update.

**Surveillance decision**

The research recommendation will be retained because there is evidence of research activity in this area.
RR – 05 In people with osteoarthritis, are there treatments that can modify joint structure, resulting in delayed structural progression and improved outcomes?

The new research recommendation was made during a recent update of the guideline.

**Surveillance decision**

The research recommendation will be retained in the NICE version of the guideline and the NICE research recommendations database.

**Other research recommendations**

The following research recommendations were not deemed as priority areas for research by the guideline committee.

RR – 06 What are the factors influencing, and methods of improving, adherence to osteoarthritis treatments?

No new evidence relevant to the research recommendation was found and no ongoing studies were identified.

**Surveillance decision**

This research recommendation will be considered again at the next surveillance point.

RR – 07 Is it possible to identify predictors of response to individual treatments in people with osteoarthritis?

No new evidence relevant to the research recommendation was found and no ongoing studies were identified.

**Surveillance decision**

This research recommendation will be considered again at the next surveillance point.

RR – 08 What outcome measures are the most effective indicators to identify patient benefits of effective self-management strategies and support for self-management of osteoarthritis?

No new evidence relevant to the research recommendation was found and no ongoing studies were identified.

**Surveillance decision**

This research recommendation will be considered again at the next surveillance point.

RR – 09 For individuals with osteoarthritis, is a patient centred approach to information giving and pain management more effective and cost effective in improving important outcomes compared to group self-management programmes?

No new evidence relevant to the research recommendation was found and no ongoing studies were identified.
**Surveillance decision**

This research recommendation will be considered again at the next surveillance point.

**RR – 10** What is the optimum timing and content of review and follow-up for people with osteoarthritis and how this may relate to structured pathways of care?

No new evidence relevant to the research recommendation was found and no ongoing studies were identified.

**Surveillance decision**

This research recommendation will be considered again at the next surveillance point.

**RR – 11** What is the minimal important difference for the main clinical outcomes in OA?

No new evidence relevant to the research recommendation was found and no ongoing studies were identified.

**Surveillance decision**

This research recommendation will be considered again at the next surveillance point.
References


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