

# 2010 Annual Evidence Update on Osteoarthritis

Published 20 September 2010

## Introduction

This is the fourth Annual Evidence Update on osteoarthritis produced by NHS Evidence - musculoskeletal in conjunction with NHS Evidence - trauma and orthopaedics and includes the results of a search for new national guidance and systematic reviews published since August 2009. To accompany this update there are also commentaries discussing the new evidence.

Since our last Annual Evidence Update, NICE has published a guidance leaflet for patients, carers and the public, ['Individually magnetic resonance imaging-designed unicompartmental interpositional implant insertion for osteoarthritis of the knee'](#).

## Acknowledgements

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## Methodology

The Annual Evidence Update (AEU) on osteoarthritis for 2010 was produced by NHS Evidence - musculoskeletal and NHS Evidence - trauma and orthopaedics. The aim was to identify all systematic reviews published in the past year.

## Final results included after appraisal

- Guidance: 4
- Systematic Reviews: 66

The final decision on whether to include a citation as being a valid systematic review was made by Dr Ray Armstrong FRCP, Clinical Lead for NHS Evidence - musculoskeletal and Lead Consultant Rheumatologist, Southampton General Hospital.

## Search period

August 2009 to August 2010 with the final search being conducted on 5 August 2010.

## NHS Databases

(AMED, BNI, CINAHL, EMBASE, MEDLINE, PsychINFO)

- #1 osteoarth\* OR OA (ti/ab)
- #2 systematic review\* (ti/ab)
- #3 "meta-analysis" (pt)
- #4 #2 OR #3
- #5 #1 AND #4

Limited to records published from 2009 - present.  
Total 232 - when duplicates removed 87 records retrieved.

**[PubMed clinical queries systematic review filter](#)**. The library searched "osteoarth\* OR OA" as a free text search term, limiting the search to records published in the last year, human and English language.

112 records retrieved.

**RefMan search using the [MEDLINE search filter](#).**

Search terms "osteoarth\*" OR "osteoarthritis" AND \*systematic" AND "2009" OR "2010".

198 records retrieved.

**Combined searches minus duplicates = 180 records**

**Filtered/sifted results forwarded to clinical lead = 102 records**

**NHS Evidence - musculoskeletal & trauma and orthopaedics**

43 additional records identified

### **Systematic review identification criteria**

Our aim was to identify all systematic reviews published on osteoarthritis for the last year. To achieve this we searched 7 databases and 2 libraries listed above. All citations from database searches were imported into Reference Manager and duplicates removed. The search results were then scanned by the information specialist. This involved scanning the titles, abstracts and full texts where available to identify potential systematic reviews.

To identify systematic reviews the definition used by [Glossary of Cochrane Collaboration Terms](#) was used:

“A review of a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise relevant research, and to collect and analyse data from the studies that are included in the review. Statistical methods (meta-analysis) may or may not be used to analyse and summarise the results of the included studies.”

## **Results**

The results of the osteoarthritis search have been reviewed and grouped into the following topics:

- Guidance (4)
- Risk (11)
- Treatment (2)
- Drugs
  - Intra-articular (2)
  - Oral (5)
- Physical Interventions
  - Orthotics (1)
  - Exercise (5)
  - Ultrasound (2)

- Other (2)
- Other interventions
  - Non-surgical (2)
- Complementary & Alternative Therapies (12)
- Surgery (18)
- Trials and study methodology (4)

**Please note** that the inclusion of citations in this list does not imply endorsements. NHS Evidence - musculoskeletal and NHS Evidence - trauma and orthopaedics do not accept responsibility for the content or quality of the included or excluded studies.

## Reference List

### Guidance

Mini-incision surgery for total knee replacement. *NICE* 26 May 2010

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### Risk

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pathways through receptor-Smads. *Osteoarthritis Cartilage* 2009; 17(12):1539-1545. [ [PubMed](#) ]

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Zammit GV, Menz HB, Munteanu SE. Structural factors associated with hallux limitus/rigidus: a systematic review of case control studies. *J Orthop Sports Phys Ther.* 2009 Oct;39(10):733-42

### **Treatment**

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Van JHP, Poolman RW, Van KA. Isolated patellofemoral osteoarthritis: A systematic review of treatment options using the GRADE approach. *Acta Orthopaedica* 2010; 81(2):199-205

### **Drugs**

#### **Intra-articular**

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#### **Oral**

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### **Physical Interventions**

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### **Ultrasound**

Loyola-Sanchez A, Richardson J, Macintyre NJ. Efficacy of ultrasound therapy for the management of knee osteoarthritis: a systematic review with meta-analysis. *Osteoarthritis Cartilage* 2010; 18(9):1117-26

Rutjes AW, Nuesch E, Sterchi R, Juni P. Therapeutic ultrasound for osteoarthritis of the knee or hip. *Cochrane Database Syst Rev* 2010;(1):CD003132

### **Other**

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### **Trials and study methodology**

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## **Commentary**

This commentary is prepared by Dr Ray Armstrong, Lead Consultant Rheumatologist in Southampton University Hospitals NHS Trust and the Clinical Lead for NHS Evidence - musculoskeletal specialist collection.

This commentary is based upon the results of the literature search and is founded on the systematic review's abstract or other summary, and the inclusion of a study in this update does not imply endorsement. The specialist collections do not accept responsibility for the content or quality of included studies.

## **Risk**

A number of reviews [1, 2, 3, 4, 5] drive home the message about a relationship between obesity/BMI and osteoarthritis. The relationship between hand osteoarthritis and body weight is again noted but the nature of the relationship is obscure and requires further elucidation [4]. There is a suggestion that hand and hip osteoarthritis risk could be associated with the IL-1 region of the genome. However, this is little

more than a suggestion at this stage and more research is necessary to take this forward [6]. Although encouraging obese patients to lose weight can be a rather disappointing activity, there is some evidence to suggest that we should still try [5]. The study in question suggests that at least a 5% reduction in weight within 20 weeks is necessary to produce symptomatic relief. However, the nature of the evidence is such that this conclusion must still be treated with some caution.

### **Drug treatment**

Unsurprisingly, there is little that is new in considering the drug treatment of osteoarthritis symptoms. Injections of corticosteroid, while effective in the short term, seem to be of somewhat doubtful value as judged by the studies published in the last year [7, 8, 9]. Opioid analgesics, while producing some benefit, are not recommended on the basis of the study published here [10] because of the risk of side-effects. A combination of NSAID or COX-II and PPI appears to be cost effective although whether this applies to all individual drug combinations is not clear. [11]

### **Physical treatments**

There are plenty of studies indicating that exercise is beneficial in managing osteoarthritis [12, 13, 14] but the evidence also indicates that GPs have a somewhat ambivalent or contradictory attitude to exercise [15]. While the majority would say that exercise should be used in managing osteoarthritis in weight-bearing joints, their referral rate does not reflect this fully and many GPs also stated that rest was advisable. There is clearly scope for exploring GPs' attitudes and beliefs in greater depth if the potential benefits of exercise are to be fully realised. An attempt to ascertain whether exercise in an individual or group setting was superior was frustrated by a lack of evidence [16]. Although evidence for other physical treatment modalities hints at benefit, the lack of evidence and its often low quality make it difficult to have confidence about effectiveness. [17, 18, 19]

### **Complementary and alternative**

Diacerein is a substance that is used more widely overseas. It would appear that on the basis of the review published here [20] there is limited evidence to support its more widespread use. There is continuing interest in glucosamine and chondroitin. As previously, there is evidence for some limited benefit as regards reducing symptoms [21, 22] and also some evidence to suggest that cartilage may be preserved [23]. There is also a suggestion that not all glucosamine preparations have equal effect [21, 22] and that one particular manufacturer's preparation is superior to others. However, it is important to consider trial methodology in this context and WOMAC outcomes of pain and stiffness and function did not appear to show that there was benefit, whatever the source. What we can say with a fair degree of certainty is that glucosamine is safe. Acupuncture seems to be effective as regards pain relief [24, 25] but the quality of evidence could be better. Other reviews report on a variety of alternative and complementary interventions. In most cases, the evidence is limited in quantity and low in quality.

### **Trial methodology**

As always, conclusions about the results of research must take into account how that research was conducted. It is widely recognised that trials of therapeutic agents are often conducted in patients who are not representative of those who attend our clinics. One study [26] raises concern that elderly patients are considerably under-

represented in clinical trials of osteoarthritis. Small studies tend to report more beneficial treatment effects [27] and this may influence the conclusion of meta analyses. Another study [28] relates benefit effect size to selection and detection bias. These studies remind us to be cautious when utilising health-care resources for patients with osteoarthritis.

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### **Commentary on surgical interventions**

This commentary is prepared by Mr Jeremy Latham, MA MCh FRCS(Orth), Consultant Orthopaedic Surgeon at Southampton University Hospitals Trust. This commentary is based upon the results of the literature search and is founded on the systematic review's abstract or other summary, and the inclusion of a study in this update does not imply endorsement. The specialist collections do not accept responsibility for the content or quality of included studies.

### **Surgery for osteoarthritis**

Orthopaedic surgery for arthritic conditions is usually offered after conservative methods have failed. The demand for orthopaedic surgery is increasing due to an

ageing population which has high expectations about the outcome and availability of treatment. This comes at a time of unprecedented scrutiny by the commissioners of healthcare who need to ensure the delivery of good value, evidence based treatment. Inevitably, this will lead to demand management for the treatment of some arthritic conditions.

Patients who have to wait for several months for joint replacement surgery might intuitively be thought to suffer increasing pain and deteriorating function. Hoogeboom et al [1] found that waiting up to 180 days for hip or knee replacement did not cause pain and self-reported function to deteriorate, although the evidence was more conflicting in patients with knee osteoarthritis. There was an association between female gender and intensified pain. This is an area worthy of more detailed study as at least anecdotally, the outcome of joint replacement surgery is influenced by gender.

If patients have to wait longer for joint replacement surgery, then it might be necessary to manage their symptoms whilst they are waiting. This will often include treatments such as intra-articular injections, or joint lavage. Intra-articular injection of steroids for painful knee arthritis is a commonly performed outpatient procedure which gives reasonably good short term relief of symptoms. Hyaluronic acid used as a visco-supplement is more expensive but there is evidence that it gives better pain relief at three months compared to steroid alone [2].

More invasive procedures for knee arthritis such as lavage, are usually offered to patients as a prelude to joint replacement. The results of two meta-analyses [3,4] have shown no clear benefits for this procedure, even when done arthroscopically. The procedure is often combined with an intra-articular injection of steroid, but this does not seem to confer any benefit.

### **Complex joint surgery**

This includes osteotomy to treat congenital hip dysplasia and osteoarthritis of the knee. Emerging treatments such as the surgery for femoro-acetabular impingement and minimally invasive knee surgery are becoming increasingly common.

Periacetabular osteotomy of the hip joint is used to treat painful dysplasia. It is a complex procedure, with a rate of major complications up to 37%. Clohisy et al's [5] literature review showed that the operation provides pain relief and improved function in the short to mid-term, but that the clinical outcome did not correlate with the radiographic findings. Not surprisingly, clinical failure was associated with the presence of moderate to severe pre-operative osteoarthritis, implying that patient selection is crucial to the success of the procedure.

Femoro-acetabular impingement of the hip joint is the result of subtle anatomical abnormalities of the femoral head/neck and the acetabulum. It is seen increasingly commonly as a result of improvements in imaging techniques such as MRI arthrography. The surgical treatment can involve arthroscopic and/or open debridement, and is usually associated with short term improvements in pain relief and function. However, the risk of major complication is up to 18% and the risk of conversion to total hip replacement is up to 26% [6]. Longer term studies are needed to determine survivorship and effect on disease progression, and careful patient selection is obviously very important.

In the knee joint, high tibial osteotomy was often used to treat medial compartment osteoarthritis. Unicompartmental knee replacement is an alternative treatment, and the results of a recent meta analysis suggest that the outcome following the latter is better [7].

## **Preventing osteoarthritis**

Joint instability as a result of injury will often result in the onset of post-traumatic osteoarthritis. Gougoulias et al [8] in a meta-analysis of supination-external rotation ankle fractures showed that surgical stabilization reduced the incidence of radiographic osteoarthritis at 5 years from 65.5% to 20.9%, a clear demonstration of the efficacy of surgery in this challenging fracture pattern.

Disruption of the anterior cruciate ligament (ACL) of the knee is usually the result of a significant injury. Instability of the joint and damage to other structures within the knee are common findings. Repair of the ACL restores stability, but in the presence of a meniscal injury, the risk of development of osteoarthritis is significantly increased, and the effect of meniscal repair is inconsistent [9]. Restoring joint stability is clearly important, but in many cases it seems that the outcome of the injury is determined at the time it occurred.

There is increasing interest in trying to encourage cartilage to repair, in the hope that this will delay the onset of significant osteoarthritis. Some controlled trials have been done on the effectiveness of autologous chondrocyte implantation. A recent meta-analysis [10] comparing this treatment with osteochondral grafts showed benefits in clinical outcomes and tissue quality, although there was 'much inconsistency in methodological quality'.

## **Joint arthroplasty**

Joint arthroplasty should provide excellent pain relief, good function and a low rate of complications. An updated Cochrane Review on surgery for trapeziometacarpal joint osteoarthritis [11] compared several procedures of varying complexity. It was noted that no one procedure produced greater benefits, but that there was insufficient evidence to be conclusive. Interestingly, trapeziectomy with ligament reconstruction and tendon interposition was associated with a 22% incidence of adverse effects compared to trapeziectomy alone where the incidence was 10%.

Less invasive joint replacement surgery in some circumstances might be associated with better outcomes, but in the knee there is an increased risk of component malalignment and longer operating time [12]. Total shoulder arthroplasty (TSA) compared to hemiarthroplasty is a more complicated procedure, but the outcome in terms of pain relief, function quality of life and lower revision rates suggest that, 'TSA is the preferred treatment for certain populations from both a patient and payer perspective' [13]. Ankle joint replacement clearly provides a considerable challenge to surgeons and patients with residual pain in up to 60% of patients and a failure rate of 10% at 5 years [14].

## **Post operative treatment**

Orthopaedic surgery like many other surgical specialities has a rich tradition with wisdom passed from generation to generation. Some of the received wisdom about post-operative management has been the subject of recent analyses. For example, a systematic review of physiotherapy exercise after hip replacement showed that there was insufficient evidence available to establish its effectiveness [15]. Continuous passive motion is commonly used after knee replacement but a recent Cochrane Review stated that the effects were too small to justify its use [16]. When there is stiffness after total knee replacement surgery, there is good evidence that early intervention can improve the range of motion. A systematic review showed that a simple manipulation under anaesthesia, with or without arthroscopy, was more

effective than an open procedure [17]. Increasing numbers of hip replacements are being done without cement. Some surgeons are concerned that unrestricted weight-bearing after surgery will cause subsidence of the stem and compromise osseointegration; they encourage their patients to use crutches for several weeks after surgery in the hope that these complications will be avoided. There is increasing emphasis on accelerated rehabilitation after hip replacement, and prolonged use of crutches is not compatible with rapid restoration of normal function. Hol et al [18] have reviewed the literature and concluded that immediate unrestricted weight bearing is not associated with stem subsidence.

## Summary

Surgery for arthritic conditions has evolved rapidly since the introduction of total hip replacement, which is one of the most successful operations ever devised. New techniques provide new challenges for orthopaedic surgeons, and it is important that we subject ourselves to the rigorous scrutiny of well conducted research so that we continue to provide safe, effective treatment for our patients.

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## Horizon Scanning

The NHS Evidence - musculoskeletal project team in conjunction with NHS Evidence - trauma and orthopaedics have identified forthcoming guidelines, projects and reviews concerning osteoarthritis. These establish evidence on osteoarthritis which will be published in the future.

### National Institute for Health and Clinical excellence (NICE)

- [Osteoarthritis - diacerein](#)

### The Cochrane Library

- [Chloroquines for the treatment of osteoarthritis](#)
- [Chondroitin for osteoarthritis](#)
- [Homeopathy for osteoarthritis](#)
- [Hormone replacement therapy for osteoarthritis in peri-menopausal and post-menopausal women](#)
- [Isokinetic exercise for improving knee flexor and extensor muscles](#)
- [Post-acute physiotherapy for primary total hip arthroplasty](#)
- [Post-acute physiotherapy for primary total knee arthroplasty](#)
- [Taping for knee osteoarthritis](#)
- [Traction for hip osteoarthritis](#)

### Surgery

- [Cemented versus cementless total hip arthroplasty for osteoarthritis and other non-traumatic diseases](#)
- [Cemented versus cementless surgical approach for total hip arthroplasty revision](#)

- [Computer assisted knee arthroplasty for osteoarthritis and other non-traumatic diseases](#)
- [Cryotherapy following total knee replacement](#)
- [Effects of different bearing surface materials on aseptic loosening of total hip arthroplasty in patients with osteoarthritis and other non-traumatic diseases of the hip](#)
- [Metal versus non-metal backing of the tibial component for total knee replacement for osteoarthritis and/or rheumatoid arthritis](#)
- [Minimally invasive surgical approaches for total hip arthroplasty in adults with osteoarthritis](#)
- [Patella resurfacing in total knee arthroplasty](#)
- [Surgery for shoulder osteoarthritis](#)
- [Surgical approaches in total knee arthroplasty: A systematic review and meta-analysis](#)

### **HTA Research Projects**

- [Total or Partial Knee Arthroplasty Trial \(TOPKAT\)](#)