

# OSTEOARTHRITIS OF HIP

Version 2 Final

## Document control

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### Version history

Version	Date	Comments
2 Final	13 November 2006	Signed off by MSCMT
2d (draft)	23 October 2006	Formatting
2c (draft)	29 September 2006	External review by Dr Simon Thomas
2b (draft)	2 August 2006	Internal QA by Dr A Ferguson and Dr C Traquair
2a (draft)		Initial Draft

### Changes since last version

Highlighted in yellow.

## General Information

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Osteoarthritis of the hip can result in various degrees of disability because of the pain and functional impairment, which results from involvement of a large weight bearing joint. Rather than a single disease entity, osteoarthritis may be regarded as the final common pathway of a variety of processes, which may affect a joint.

### Aetiology

The exact aetiology is unclear, and most cases are idiopathic. The true cause is most likely multi- factorial and many risk factors have been implicated, with varying degrees of strength. Age has the strongest association. White populations are more susceptible than black oriental or Indian ones. [1, 2]. Obesity and male gender, while associated with knee osteoarthritis, are not so clearly implicated in the hip [3]. There seems to be a genetic predisposition [4],

Secondary osteoarthritis may be classified as that having a known predisposing cause, and is often the cause of symptomatic osteoarthritis in younger populations. This includes previous trauma [5], infection, avascular necrosis, and developmental abnormalities. These consist of developmental dysplasia of the hip (incorporating congenital dislocation and acetabular dysplasia), Legg-Calve- Perthes disease, and slipped upper femoral epiphysis. Osteoarthritis can also be a result of inflammatory arthropathies such as rheumatoid and psoriatic arthritis, or ankylosing spondylitis, and some metabolic disorders e.g. Haemachromatosis. [6]

Occupations involving mechanical overloading, particularly heavy physical exercise or workload may contribute to the pathogenesis; however, the evidence is not generally conclusive. The risk for farmers has been shown to be more than double that for other occupations leading to the IIAC recommending hip arthritis in farmers with 10 years employment and confirmed evidence of disease as a prescribed disease PD A13. [7, 8]

In the United States of America osteoarthritis has become the most common indication for elective total hip replacement (THR), which has been shown to improve the quality of life of those patients with advanced disease.

No intervention is known to prevent disease progression and therefore the goals of management of patients with mild to moderate disease are to follow treatment regimens, both pharmacological and non-pharmacological to help relieve pain and maintain or improve function.[6]

### Prevalence

Estimates of both the prevalence and incidence of OA of the hip vary considerably, mostly because of differences in methodology and study design, as well as to a consensus as to a precise definition. European studies have estimated that approximately 7-25% of Caucasians over the age of 55 suffer from OA hip [10].

In general the prevalence of radiographically defined OA of the hip is higher in men than in women (even after the menopause in contrast to OA of knee). [10] It is also higher in caucasians (and highest in white Europeans) than non-caucasians.

Pooled data from three studies covering the years 1956 to 1995 [11] shows the age specific prevalence of OA of the hip to follow an exponential curve with less than 1% of individuals affected below the age of 55 years to 10% in the age group over 85 years of age.

### Assessment of Severity

Algofunctional indices (severity) for hip OA have been used in Europe for over 10 years. The most appropriate to align with disability analysis (although the primary use was to appraise functional severity and as outcome measures in OA treatment trials) being that developed by Lequesne [12] [Appendix 1].

A score above 11-12 points after medical treatment is an indication for surgical intervention. Using these and other indices several trials have shown that, male sex, moderate radiological OA and extra mobility problems are independently positively related to psychosocial disability; however, the chronicity of pain has no significant contribution to the level of physical or psychosocial disability. [13]

The Short-Form-36 (SF-36) Health Survey was developed by Dr John Ware and was derived from the Rand Corporation's Medical Outcomes Study (MOS). It is used as a general survey of health status and an outcome measure in clinical practice. [Appendix 2]

## Diagnosis

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It is essential that the diagnosis of OA of the hip is properly established. The commonest cause of hip/buttock pain in adults is referred pain due to disorders of the spine commonly muscular disorders but also from disc or facet joint disease. True pain from an arthritic hip is most commonly felt in the groin, or radiating to the knee.

Clinical assessment may confirm pathology in the hip joint but is often non-specific for osteoarthritis. Tenderness in the buttock or over the greater trochanter is not indicative of hip joint pain, and palpation is rarely important in the diagnosis. The patient may walk with an antalgic gait, or in severe cases a Trendelenberg lurch. There may be shortening of the affected leg. Assessment of range of movement is an important part of the examination. Internal rotation is usually the first to be limited, followed by extension (as evaluated by the Thomas test) and abduction. Reproduction of pain at the extremes of these movements, especially if felt in the groin or knee, is strongly supportive of the diagnosis of OA.



Confirming the presence of OA radiologically is not normally a problem but this may not be relevant to the patient's complaints particularly in view of the high prevalence of osteoarthritis in the general public and the poor correlation between early radiological OA and symptoms.

## Differential Diagnosis

### **Extra Articular Causes of Pain:**

Mechanical low back pain

Felt in the buttocks and gluteal region. Specific hip movement does not exacerbate pain.

### **Ankylosing Spondylitis**

Can cause pain referred from the sacro-iliac joints or lumbar spine. Again, hip movement does not exacerbate pain and hip radiographs are usually normal.

### **Psoas abscess**

Infection tracking down from the abdomen, with pain felt in the groin. The patient usually feels more comfortable with the hip flexed (ie. the psoas not stretched) and may be systemically unwell.

## Medical Services

### **Inguinal hernia**

Can cause groin pain, exacerbated by cough. Examination should demonstrate this if present.

### **Malignancy**

Primary tumours are rare but the proximal femur is a common site for metastasis.

### **Trochanteric bursitis**

The patient is tender over the greater trochanter, and hip movement is not painful.

## **Articular causes of pain, which may all eventually result in osteoarthritis:**

### **Inflammatory arthropathy**

e.g. rheumatoid and psoriatic arthritis. These have typical radiographic appearances, and other signs and symptoms should alert the examiner.

### **Avascular necrosis**

Can occur spontaneously in the femoral head. Consider if the patient has ever taken steroids.

### **Labral tears**

Is relatively uncommon, but can produce sharp pain and clicking sensations, often provoked by a reproducible movement.

### **Paget's Disease**

Is usually obvious on x-ray.

An adequate history and physical examination should confirm how much any underlying structural/inflammatory change in the hip is contributing to the patient's symptoms and disability.

## Treatment

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The goals in the management of patients with OA of the hip are to control pain (and any other symptoms), minimise disability and educate the patient about their disease and its therapy (including self – management, exercise and weight loss). [15] There is no evidence that most interventions will halt or delay the progression of hip OA, although osteotomy can in some cases postpone the need for joint replacement. The goals are therefore to control pain.

### Non-pharmacological:

Initial treatment in patients with mild to moderate disease is often non-pharmacological. Patients are encouraged to participate in self-help programmes and are provided with information about the disease process.

They are advised to avoid further trauma to the joint, by modifying lifestyle if necessary, and to lose weight if needed.

They may be 'enrolled' on an exercise programme under the supervision of a physiotherapist/occupational therapist.

They can often be provided with assistive devices (e.g. a cane in the contralateral hand). This reduces the loading forces on the hip which reduces pain and improves function thereby aiding mobility and other aspects of daily living.

Aerobic exercise (walking and hydrotherapy) have been found to be beneficial in some patients. The EULAR report 2004 [9] confirmed that those patients randomised into a treatment plan for 12 weeks showed significant improvement in physical activity. There was also improvement in depression and anxiety compared with a control group who only performed passive exercises.

'Water aerobics' has the advantage of reducing the impact of exercise on affected weight bearing joints.

Aerobic exercises have been shown to improve the overall level of physical activity, reduce pain, and reduce the levels of anxiety and depression which may be associated with osteoarthritis.

## Medical Services

### Pharmacological:

Pain relief is the primary indication for drug therapy and although traditionally non-steroidal anti-inflammatory drugs (NSAIDs) have been used as first line agents, the concerns about side effects (particularly GI bleeding) in the elderly and the adverse effects on the metabolism of articular cartilage have now led to the initial use of simple analgesics. Although paracetamol is inferior to conventional NSAIDs it is safer when taken within the recommended dose range. [9]

If symptom control is poor NSAIDs are indicated in place of, or in addition to, simple analgesics.

All NSAIDs are approximately equal in efficacy, although there is great patient variability in response and the reported incidence of side effects.



Generally the use of NSAIDs is empirical and appears to be determined largely by frequency of dose required and cost. As the intensity of the pain varies from day to day as well as within a day the use of short half-life NSAIDs on a PRN basis is probably preferable providing this regimen gives adequate pain relief.

Although cox 2 inhibitors or the addition of GI protectors can significantly reduce GI bleeding these strategies are more expensive and are only cost effective in patients with greater GI risk.

Injections of hyaluronic acid or orally administered chondroitin sulphate or glucosamine have been advocated by some practitioners, however the evidence for this is sparse, and meta-analyses have failed to show any convincing benefit. [14]

### Surgery :

Patients who fail to respond to simple analgesics/NSAIDs with moderate to severe osteoarthritis causing severe persistent pain and/or disability are referred for surgery - usually total hip replacement (THR).

The decision to perform THR is based largely on the patient's reports of pain and disability and not on radiographic findings - although generally such severe symptoms are associated with radiographic features of moderate to severe OA. [16]





## Medical Services

Although the evidence for osteotomy and joint preserving procedures (including arthroscopic debridement) is sparse it appears to be a useful procedure for younger patients with painful hip dysplasia or deformity for whom THR is not yet justified. [9]

Previously patients between the ages of 60 and 75 years were considered the best candidates for THR. However, over the last 10 - 20 years the age range has been broadened to include more elderly patients, many of whom have other significant medical problems as well as younger patients whose implants will be exposed to greater mechanical stresses over an extended time course.

There are few contraindications to THR other than local or systemic infection and other medical problems which contraindicate surgery and the pre-operative risks.

Although the clinical conditions and other circumstances (disability) leading to THR are broadly defined other issues (potential risk factors, type of prosthesis etc) remain unresolved.

Evaluation of randomised control trials reveals surprisingly few high quality studies comparing prostheses. Of the over 60 implants on the market in the UK, only 3, the Charnley, Exeter and Lubinus have a failure rate of 0.5% per year or less, with over 15 years follow-up.

Many other designs are available, including cemented and uncemented components. These are relatively recent, however, and the evidence for their use over the well established designs is inconclusive. [17] Cemented total hip replacements now seem the most suitable option for patients over the age of 60 with osteoarthritis of the hip because the procedure is reproducible, the quality of arthroplasty is excellent and it is durable lasting up and beyond 15 years in 95% of cases.

Early failure of THR results from infection, recurrent dislocation, or trauma. Aseptic loosening is the cause of eventual failure in the longer term. If the patient is still sufficiently well and active, revision can be performed. There is a poorer outcome following revision, however, with loosening rates up to 26% at 10 years, depending on the cause and severity of the original failure. Revision of failed septic THR gives the worst failure rates.

In younger patients, aseptic loosening occurs at an earlier stage, with 50% failure by 19 years in patients who had THR aged under 50. For this reason, patients under 55 are considered less suitable for THR and are encouraged to persevere with non-operative measures.



## Medical Services

In the last 10 years, however, metal-on-metal hip resurfacing has been suggested as an alternative to total hip replacement in younger patients. As the femoral neck is left intact, in the case of later failure, revision to total replacement is thought to be facilitated by preservation of bone stock. Although evidence so far is encouraging, good quality studies are only available to 8 years post-op [18]. Also, there are concerns about the acetabular component, which may not be so easily revised, and to the effect of plasma concentrations of metal ions, which have been shown to be significantly increased. There is however no evidence of significantly increased rates of cancer in patients who were given metal-on-metal implants in the 1960s- 70s. [19] Currently this is still considered an experimental procedure, albeit of increasing popularity.

### Outcome

Long-term improvement in pain and disability occur in over 95% of patients following THR for OA.

The interference (disability) which OA caused in many areas of daily activity disappears but may take up to one year after THR to reach maximum effect. [20]

## **Main Disabling Effects**

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These are due to pain and stiffness in the hip joint and consequent loss of function.

There is usually mild morning stiffness (lasting less than 30 minutes - average 15 minutes), pain with use, and 'gelling' or stiffness after rest. Prolonged inactivity should be avoided and regular exercise within comfort levels encouraged.

OA of the hip without any underlying cause (primary OA) presents with poorly localised pain in the hip, groin, buttock, trochanter or knee on the affected side and is commonest in people over the age of 55 years.

OA secondary to an underlying cause (developmental dysplasia, Perthe's disease, infections etc.) presents with similar symptoms but usually in a much younger age group.

In general OA hip results in mild to moderate disability with more severe levels of disability being due to the contribution of concomitant OA knee.

The 'Rotterdam Study' [21] confirmed that radiological osteoarthritis of the hip was a weak independent predictor of locomotor disability, while age, hip pain and morning stiffness were the most important determinants of disability with respect to walking, climbing stairs, rising from a chair, bending and getting in and out of bed.

In severe cases stiffness is associated with external rotation, adduction and shortening of the affected leg.

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## Appendix 1 -

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### Overview :

Lequesne et al developed an index of severity for osteoarthritis for the hip (ISH). This can be used to assess the effectiveness of therapeutic interventions.

Sections for index:

- (1) Pain or discomfort
- (2) Maximum distance walked
- (3) Activities of daily living

#### I Pain or Discomfort

Parameter	Finding	Points
Pain or discomfort during nocturnal bedrest	None	0
	Only on movement or in certain positions	1
	Without movement	2
Duration of morning stiffness or pain after getting up	None	0
	< 15 minutes	1
	>= 15 minutes	2
Remaining standing for 30 minutes increases pain	No	0
	Yes	1
Pain on walking	None	0
	Only after walking some distance	1
	Early after starting	2
Pain or discomfort in sitting position for 2 hours	No	0
	Yes	1

where:

A modification of a 1991 version was to have the duration of morning stiffness scored 0 if it was 1 minute or less and 1 if it was from 1 to less than 15 minutes.

Pain on walking in a 1991 version expanded "early after starting" to "after initial ambulation and increasingly with continued ambulation"

## Medical Services

### II. Maximum Distance Walked

Parameter	Finding	Points
Maximum distance walked	Unlimited	0
	> 1 kilometer but limited	1
	About 1 kilometer (about 15 minutes)	2
	About 500 - 900 meters (about 8-15 minutes)	3
	From 300 - 500 meters	4
	From 100 - 300 meters	5
	< 100 meters	6
Walking aids required	None	0
	1 walking stick or crutch	1
	2 walking sticks or crutches	2

### III. Activities of Daily Living

Parameter	Finding	Points
Can you put on socks by bending forward?	Easily	0
	With mild difficulty	0.5
	With moderate difficulty	1.0
	With marked difficulty	1.5
	Impossible	2.0
Can you pick up an object from the floor?	Easily	0
	With mild difficulty	0.5
	With moderate difficulty	1.0
	With marked difficulty	1.5
	Impossible	2.0
Can you go up and down a standard flight of stairs?	Easily	0
	With mild difficulty	0.5
	With moderate difficulty	1.0
	With marked difficulty	1.5
	Impossible	2.0
Can you get into and out of a car?	Easily	0

## Medical Services

Index of severity =

= SUM (points for all parameters)

Interpretation:

Minimum points for each section: 0

Maximum points for each section: 8

Minimum index score: 0

Maximum index score: 24

Index Score	Handicap
0	None
1 - 4	Mild
5 - 7	Moderate
8 - 10	Severe
11 - 13	Very severe
>= 14	Extremely severe

### Modifications to Index

The index was modified in 1991 (Table 2) by the addition of a question for sexual activity in sexually active women being evaluated for hip prosthesis. This was graded as for the activities of daily living. This results in a maximum index score of 26.

The index was modified in 1997 with some minor changes to morning stiffness and termed the "algofunctional index".

## Medical Services

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### References:

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## Appendix 2 -

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### Overview :

The Short-Form-36 (SF-36) Health Survey was developed by Dr John Ware and was derived from the Rand Corporation's Medical Outcomes Study (MOS). It is used as a general survey of health status and an outcome measure in clinical practice. It can also be used together with disease-specific instruments for patient evaluation. The survey may be self-administered or may be completed by an interviewer.

### Instructions for self-administration:

This survey asks for your views about your health. This information will help keep track of how you feel and how well you are able to do your usual activities. Answer every question by marking the answer as indicated. If you are unsure about how to answer a question, please give the best answer you can.

#### 1. In general would you say your health is:

Excellent [1]

Very good [2]

Good [3]

Fair [4]

Poor [5]

#### 2. Compared to one year ago, how would you rate your health in general now?

Much better now than one year ago [1]

Somewhat better now than one year ago [2]

About the same now as one year ago [3]

Somewhat worse now than one year ago [4]

Much worse now than one year ago [5]

## Medical Services

3. The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

- a) Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports.
- b) Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf.
- c) Lifting or carrying groceries.
- d) Climbing several flights of stairs.
- e) Climbing one flight of stairs.
- f) Bending, kneeling, or stooping.
- g) Walking more than one mile.
- h) Walking several blocks.
- i) Bathing or dressing yourself.

### Responses

Yes, limited a lot [1]

Yes, limited a little [2]

No, not limited at all [3]

4. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

- a) Cut down on the amount of time you spent on work or other activities.
- b) Accomplished less than you would like.
- c) Were limited in the kind of work or other activities.
- d) Had difficulty performing the work or other activities (for example, it took extra effort).

### Responses

Yes [1]

No [2]

## Medical Services

5. During the past 4 weeks, have you had any of the following problems with your work or other regular activities as a result of any emotional problems (such as feeling depressed or anxious)?

- a) Cut down on the amount of time you spent on work or other activities.
- b) Accomplished less than you would like.
- c) Didn't do work or other activities as carefully as usual.

### Responses

Yes [1]

No [2]

6. During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbours, or groups?

Not at all [1]

Slightly [2]

Moderately [3]

Quite a bit [4]

Extremely [5]

7. How much bodily pain have you had during the past 4 weeks?

None [1]

Very mild [2]

Mild [3]

Moderate [4]

Severe [5]

Very severe [6]

## Medical Services

8. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?

Not at all [1]

A little bit [2]

Moderately [3]

Quite a bit [4]

Extremely [5]

9. These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the past 4 weeks:

- a) Did you feel full of pep?
- b) Have you been a very nervous person?
- c) Have you felt so down in the dumps that nothing could cheer you up?
- d) Have you felt calm and peaceful?
- e) Did you have a lot of energy?
- f) Have you felt downhearted and blue?
- g) Did you feel worn out?
- h) Have you been a happy person?
- i) Did you feel tired?

Responses:

All of the time [1]

Most of the time [2]

A good bit of the time [3]

Some of the time [4]

A little of the time [5]

None of the time [6]

## Medical Services

10. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)?

All of the time [1]

Most of the time [2]

Some of the time [3]

A little of the time [4]

None of the time [5]

11. How TRUE or FALSE is each of the following statements for you?

a) I seem to get sick a little easier than other people.

b) I am as healthy as anybody I know.

c) I expect my health to get worse.

d) My health is excellent.

### Responses

Definitely true [1]

Mostly true [2]

Don't know [3]

Mostly false [4]

Definitely false [5]

## Medical Services

### Interpretation

Responses to 35 of the questions are divided into 8 "dimensions", while the response to question 2 indicates the change in health over the past year. A more favourable response is assigned a higher score.

Dimensions	No.	Items
Physical functioning	10	3a, 3b, 3c, 3d, 3e, 3f, 3g, 3h, 3i, 3j
Role limitations	4	4a, 4b, 4c, 4d
Bodily pain	2	7, 8
Social functioning	2	6, 10
General mental health	5	9b, 9c, 9d, 9f, 9h
Role limitations due to emotional problems	3	5a, 5b, 5c
Vitality, energy or fatigue	4	9a, 9e, 9g, 9i
General health perceptions	5	1, 11a, 11b, 11c, 11d

Rand approach to scoring:

Each response to a question converted to a 0-100 value, with a higher score indicating a more favourable state.

The responses in each dimension are averaged to generate a response from 0 to 100.

3 response scale: 0, 50, 100

5 response scale: 0, 25, 50, 75, 100

6 response scale: 0, 20, 40, 60, 80, 100

If a question is not answered, then it is ignored.

Recommended scoring:

Described in the SF-36 manual

Somewhat complex

Computer-based scoring available from Response Technologies, Inc (see over page)

## Medical Services

### Supplemental Information

Variant forms available:

Acute version referenced to the past week

Knee replacement version

Addresses for additional information:

- (1) Printed forms: The Medical Outcomes Trust, PO Box 1917, Boston, MA. 02205
- (2) Technical information: SF-36 Health Survey, The Health Institute, New England Medical Center Hospitals, Box 345, 750 Washington Street, Boston, MA, 02111
- (3) Computerized scoring system: Response Technologies, Inc., 3399 South County Trail, East Greenwich, RI, 02818

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