

# Physiotherapy management of hip osteoarthritis

Kim Bennell

Centre for Health, Exercise and Sports Medicine, Department of Physiotherapy, The University of Melbourne, Australia

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## Introduction

Hip osteoarthritis is a chronic disease affecting the joint and surrounding musculature resulting in structural and functional failure of the joint and causing pain, disability, and reduced quality of life. This narrative review outlines the prevalence and burden of hip osteoarthritis followed by its natural history and risk factors. Considerations for diagnosis and assessment are then covered. An overview of the principles of hip osteoarthritis management is presented together with specific physiotherapy interventions and evidence for their effectiveness. It is important to note, however, that the bulk of research regarding conservative management relates to osteoarthritis at the knee or mixed osteoarthritis populations rather than hip osteoarthritis specifically, and that results cannot necessarily be generalised from the knee to the hip given differences in biomechanics, presentation, and risk factors. There is also a paucity of research in many areas. The recommendations of clinical guidelines are therefore emphasised. The review concludes with potential directions for research to advance the field.

## Prevalence of hip osteoarthritis

Hip osteoarthritis is a common condition worldwide, particularly in older individuals. The reported prevalence of hip osteoarthritis varies greatly due to differences in the definition of osteoarthritis used (radiographic, symptomatic, or self-reported) and the characteristics of the sample. A 2011 meta-analysis found 27 studies of generally good quality reporting hip osteoarthritis prevalence rates from a range of countries (Pereira et al 2011). The rates varied from 0.9% to 45% with radiographic rates higher than those using self-reported or symptomatic osteoarthritis definitions. Men and women showed similar overall prevalence: 11.5% for men and 11.6% for women. This differs from knee osteoarthritis where the disease is significantly more prevalent in women (Pereira et al 2011). In contrast to prevalence, information on the incidence of hip osteoarthritis is limited, reflecting greater methodological challenges. The meta-analysis reported only four cohort studies from the USA, Netherlands, and Norway, with cumulative incidence rates varying from 3.8% over 10 years to 33% over 8 years (Pereira et al 2011). Despite the variation in reported rates, it is apparent that hip osteoarthritis is a major public health problem, and one that is likely to worsen with the ageing of the population.

## The burden of hip osteoarthritis

Osteoarthritis is a leading cause of musculoskeletal pain and disability. The most recent Global Burden of Diseases study, published in *The Lancet* in 2012, found that, of the musculoskeletal conditions, the burden associated with osteoarthritis is amongst the most rapidly increasing (Vos et al 2012). Hip osteoarthritis is extremely debilitating for affected individuals. Pain is a dominant symptom,

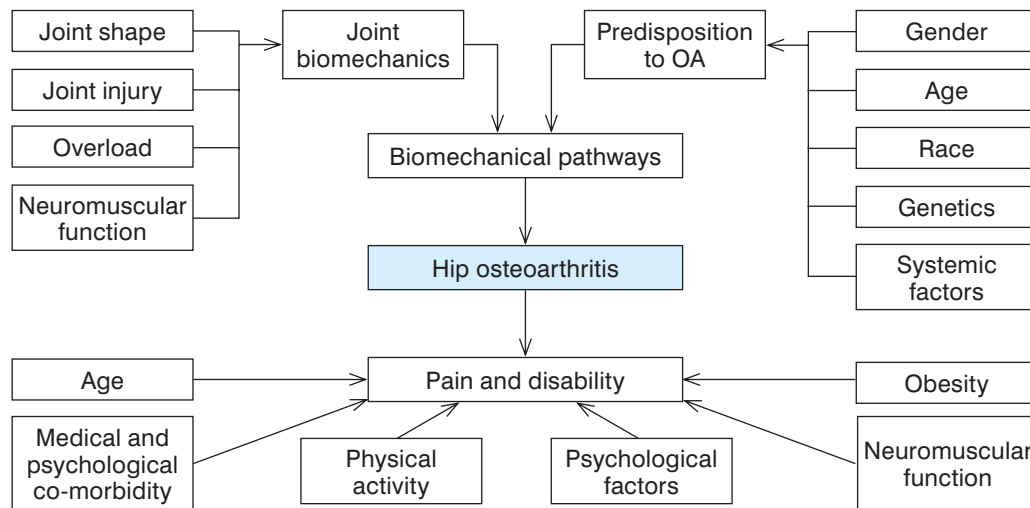
becoming persistent and more limiting as disease progresses. Patients with hip osteoarthritis also report difficulty with functional activities such as walking, driving, stair-climbing, gardening, and housekeeping (Guccione et al 1994) as well as higher levels of anxiety and depression (Murphy et al 2012). Work productivity is affected with greater absenteeism, while fatigue and sleep problems are common (Murphy et al 2011). Furthermore, people with osteoarthritis typically suffer from a range of co-morbid diseases that further increases their likelihood of poor physical function (Guh et al 2009).

Hip osteoarthritis imposes a substantial economic burden, with most costs related to a range of conservative and surgical treatments, lost productivity, and substantial loss of quality of life (Dibonaventura et al 2011). In particular, rates of costly hip joint replacement surgery for advanced disease are increasing including a shift in the demographic of recipients to younger patients (Australian Orthopaedic Association National Joint Replacement Registry 2012, Ravi et al 2012). Clearly hip osteoarthritis is associated with considerable individual and societal burden and, given that there is currently no cure for the disease, treatments that reduce symptoms and slow functional decline are needed.

## Risk factors and natural history

The development of hip osteoarthritis results from a combination of local joint-specific factors that increase load across the joint acting in the context of factors that increase systemic susceptibility (Figure 1). Age is a well-established risk factor for hip osteoarthritis as are developmental disorders such as congenital hip dislocation, slipped capital femoral epiphysis, Perthes disease, and hip dysplasia (Harris-Hayes and Royer 2011). More recently, femoroacetabular impingement, which refers to friction between the proximal femur and acetabular rim due to abnormal hip morphology and is seen in younger active individuals, has been implicated as increasing the risk of hip osteoarthritis (Harris-Hayes and Royer 2011). Caucasians appear to have a higher prevalence of hip osteoarthritis compared to Asian, African, and East Indian populations. Albeit based on limited or inconsistent evidence, hip osteoarthritis also appears to be associated with obesity, occupations involving heavy lifting and farming, high volume and intensity of training particularly in impact sports, and leg length discrepancy (Suri et al 2012).

The natural history of hip osteoarthritis shows that radiographic deterioration over time is common although the rate of progression varies from person to person. Risk factors for disease progression can differ from those of disease onset. A 2009 systematic review summarising the results of 18 prospective cohort studies found strong evidence that age, baseline hip pain, and several radiographic features were predictive of the progression



**Figure 1.** Aetiology of and risk factors for hip osteoarthritis, adapted from Lohmander et al (2007) and Suri et al (2012). Disease initiation and progression are caused by a combination of local factors and systemic factors that vary between individuals.

of hip osteoarthritis, while there was weak evidence of no association with body mass index (Wright et al 2009). The role of modifiable biomechanical and neuromuscular factors such as muscle weakness in predisposing to development of hip osteoarthritis has not been investigated.

A limited number of studies have evaluated the course of functional status over time in people with hip osteoarthritis. For studies with follow-up durations of three years or less, pain and functional status appear to be relatively stable on a population level although considerable individual variation occurs. With follow-up of longer than three years, deterioration has been noted (van Dijk et al 2006, van Dijk et al 2010). There is little research on predictors of functional decline. A longitudinal cohort study of 123 people with hip osteoarthritis found that several factors predicted 3-year worsening of function including range of motion, pain severity, cognitive impairment and co-morbidities (van Dijk et al 2010). Therefore, while progression of hip osteoarthritis can occur, it is not necessarily inevitable and for many people osteoarthritis may remain stable or even improve.

**Box 1.** American College of Rheumatology clinical criteria for the diagnosis of hip osteoarthritis (Altman et al 1991). Either set of criteria can be used. The sensitivity and specificity of these clinical criteria are 86% and 75% with a positive likelihood ratio of 3.44 and a negative likelihood ratio of 0.19.

Clinical Set A	Clinical Set B
<ul style="list-style-type: none"> <li>Age &gt; 50 years</li> <li>Hip pain</li> <li>Hip internal rotation ≥ 15 deg</li> <li>Pain with hip internal rotation</li> <li>Morning stiffness of the hip ≤ 60 min</li> </ul>	<ul style="list-style-type: none"> <li>Age &gt; 50 years</li> <li>Hip pain</li> <li>Hip internal rotation &lt; 15 deg</li> <li>Hip flexion ≤ 115 deg</li> </ul>

### Diagnosis

Hip osteoarthritis can generally be diagnosed by a combination of history and physical examination findings without the need for an X-ray and exposing the patient to unnecessary radiation. The most commonly used clinical criteria for diagnosing hip osteoarthritis are those from the American College of Rheumatology (Altman et al 1991), which include either of two sets of clinical features (Box 1).

Moderate-to-severe hip osteoarthritis can be confirmed on radiographs with findings including joint space narrowing, marginal osteophytes, subchondral sclerosis, and bone cysts. Magnetic resonance imaging is more useful than radiographs in detecting early structural changes such as focal cartilage defects and bone marrow lesions in the subchondral bone. Hip osteoarthritis has different radiological presentations based on the pattern of migration of the femoral head within the acetabulum. Superolateral femoral migration is more common in men while women have more superomedial migration (Ledingham et al 1992). There is strong evidence that greater hip osteoarthritis disease progression is associated with certain structural features on radiographs including joint space narrowing, femoral osteophytes, bony sclerosis, and superolateral femoral migration (Wright et al 2009).

### Assessment

In a subjective assessment, pain is a consistent finding, usually related to a particular movement or sustained position. Stiffness following rest can often be more problematic than pain (Sims 1999). An important part of the subjective assessment is to gain an understanding of the impact of psychosocial factors including mood disorders (eg, depression and anxiety) and sleep, social support, ability to cope, social wellbeing and participation in leisure, relationships, community, and employment. Exploring patient knowledge, expectations, and goals facilitates a patient-centred approach to communication and management.

A key part of the physical examination is to identify what adverse mechanical conditions the hip is being subjected to and what local and global factors are causing the

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