

# Diagnosis and Treatment of Osteoarthritis

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## KEYWORDS

- Osteoarthritis • Joint pain • Joint swelling • Joint inflammation • Osteophytes
- Joint deformity

## KEY POINTS

- Treatment options for osteoarthritis are generally based on symptom severity and duration, with the goals of symptom alleviation and improvement in functional status.
- Nonpharmacologic options include physical activity through land-based or aquatic exercises, acupuncture, transcutaneous electrical nerve stimulation, splints, and braces.
- Pharmacologic options are instituted in a stepwise approach, and include topical capsaicin, acetaminophen, nonsteroidal anti-inflammatories, cyclooxygenase-2 inhibitors, and intra-articular steroid injections.
- A surgical approach to osteoarthritis is reserved for chronic cases when pharmacologic and nonpharmacologic treatment options have already failed. Options include fusion and joint lavage, arthroscopy, and arthroplasty.

## BACKGROUND

Osteoarthritis (OA) refers to a heterogeneous group of conditions that lead to joint symptoms and signs associated with loss of integrity of the articular cartilage, in combination with changes in underlying bone and joint margins.<sup>1</sup> OA affects more than 40 million individuals in the United States alone, and is the leading cause of disability nationwide.<sup>2</sup> It is the most common articular disease worldwide, although frequencies vary by country.<sup>3</sup> The high prevalence of OA makes it one of the principal reasons for office visits in the primary care setting. OA causes with both direct and indirect economic costs to society. Clinician visits, medications, and surgical interventions comprise the direct costs, while comorbidities and time lost from work because of the effects of disability make up the indirect costs.<sup>4</sup> This situation is more evident among the elderly, who may lose their independence and may later need assistance with their daily living activities, thus adding to the economic burden.<sup>5,6</sup>

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OA can be subdivided into primary and secondary forms, with the primary, or idiopathic, form occurring in previously intact joints without any inciting agent.<sup>4</sup> Aging plays an integral part in this form of OA, as the wear and tear on the joints cause damage to the cartilage, leading to an abnormal repair mechanism. Certain diseases including primary generalized OA, erosive OA, and chondromalacia patellae are categorized as subsets of primary OA. The secondary form of OA is caused by an underlying predisposing factor, such as trauma (**Box 1**).

**Box 2** lists some of the risk factors that may predispose persons to develop OA. In general, any breach in the integrity of the chondrocyte matrix has the potential to cause OA.<sup>2</sup> Among these, obesity and joint injury are 2 of the strongest modifiable risk factors.<sup>7</sup> Hip OA has an important correlation with weight, genetic factors, sex, previous traumas, occupational factors, and age, whereas knee OA has a significant correlation with weight, lifestyle, and physical activity.<sup>8</sup>

OA develops by the combination of biochemical, cellular, and mechanical processes.<sup>2</sup> It is thought to start from the breakdown, by proteolysis, of the cartilage matrix. The weak matrix is prone to fibrillation and erosion, and results in the release of proteoglycans and collagen fragments into the synovial fluid. This process induces an inflammatory response in the synovium, which causes further cartilage degradation. As the cartilage becomes weak it begins to thin out, causing the joint space to narrow.<sup>4</sup> Damage to the cartilage also causes new bony outgrowths, or spurs, to form around the joints, which are evident on radiographs. The exact mechanism of pain generation in OA is not well understood, but is possibly related to an interplay of several mechanisms enumerated in **Box 3**.

## DIAGNOSIS

The diagnosis of OA is primarily based on thorough history and physical examination findings, with or without radiographic evidence.<sup>9</sup> Although some patients may be asymptomatic initially, the most common symptom is pain. Primary OA is usually symmetric and tends to initially affect the weight-bearing joints: the knees, hips, and spine. However, it is not uncommon for the joints of the hands and wrists to also become symptomatic. The pain is usually described as intense, deep, and “achy,” worsened by movement or extensive use and relieved by rest and simple analgesics. Later on, as joints become more worn, the pain becomes more noticeable and unresponsive to medications. The pain causes reduction in range of motion and a decrease in

### Box 1

#### Secondary causes of osteoarthritis

- Mechanical stress (obesity)
- Repeated trauma or surgery to the joint structures
- Infection
- Congenital abnormalities (abnormal joints at birth)
- Endocrine and metabolic disorders (diabetes, calcium deposition disorders)
- Other articular diseases (gout and pseudogout, rheumatoid arthritis)

*Data from* Lozada C. Osteoarthritis in Medscape reference. 2012. Available at: <http://emedicine.medscape.com/article/330487-overview>; and Hinton R, Moody RL, Davis AW, et al. Osteoarthritis: diagnosis and therapeutic considerations. *Am Fam Physician* 2002;65(5):841–9.

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