17. OSTEARTHRITIS TREATMENT

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Several recent reviews provided the core references in developing quality indicators for the evaluation and management of osteoarthritis (OA) (Bálint and Szébenyi, 1996; Dearborn and Jergesen, 1996; Felson, 1996; Oddis, 1996; Puett and Griffin, 1994; Studenski et al., 1996). When these reviews referenced studies supporting individual indicators, we cited the original references.

IMPORTANCE

Osteoarthritis is the most common type of arthritis and the most common rheumatologic disease (Gabriel, 1996). Age is the strongest risk factor for OA. It is difficult to estimate the prevalence of OA because the diagnosis has been based on history, clinical examination, and radiography, alone or in combination. Based on data from the Tecumseh Community Health Study (Mikkelson, 1967), the prevalence of OA for persons aged 60 years or more when diagnosed by history is estimated at 17 percent for men and at 30 percent for women. When diagnosed by physical examination, the prevalence of OA is 20 percent for men and 41 percent for women.

Osteoarthritis causes pain or dysfunction in 20 percent of the elderly (Lawrence et al., 1989). More than 70 percent of hip and knee replacements are for OA. Symptoms most often occur in the weight-bearing joints of the lower extremities. Because there is currently no treatment to stop the degenerative process, therapeutic goals focus on reducing pain and improving function (Puett and Griffin, 1994).

SCREENING

There are no recommendations for screening for OA.
DIAGNOSIS

Clinical Features

Classically, patients with OA are older, deconditioned, and have joint motion restrictions and muscle weakness (Beals et al., 1985; Bunning and Materson, 1991; Minor et al., 1988). Other common complaints are: 1) pain that is worse with weight bearing or activity and relieved by rest; and 2) stiffness that is localized, generally of short duration, and relieved by exercise. The following joints are typically involved: the distal interphalangeal joints, proximal interphalangeal joints, first carpometacarpal joints, the hips, the knees, and the cervical and lumbar spine (Oddis, 1996). Typically, there is little or no joint effusion, but there may be bony swelling, localized tenderness, occasional secondary synovitis, and joint crepitus (Bálint and Szébenyi, 1996; Moskowitz, 1993). Other causes of pain that may be attributed to arthritis include intra-articular disease distinct from OA, periarticular sources of pain (e.g., tendonitis, bursitis, impingement, neoplasm), and referred pain from an adjacent or distant site (e.g., hip OA may refer pain to the knee; thigh or calf pain that is less severe when walking up stairs or inclines may indicate spinal stenosis) (Dearborn and Jergesen, 1996).

Initial evaluation should include a brief history to assess for typical symptoms of OA, presence or absence of limitations in daily activities, and to determine if there is a history or symptoms of a systemic or inflammatory disease (such as fever, malaise, weight loss, or stiffness lasting for more than 60 minutes). It is also important to ask about the effect of treatment modalities such as rest, ice, and nonsteroidal antiinflammatory drugs (NSAID) (Dearborn and Jergesen, 1996) (Indicator 1). A history of previous joint trauma or surgery and an assessment of the severity of pain and the degree of functional impairment should also be elicited (Dearborn and Jergesen, 1996) (Indicator 2).

The physical examination should focus on evidence of OA, including intra-articular pain, bony enlargement around the affected joints, limitation of motion, and presence or absence of effusion (Bálint and
Laboratory Tests

Laboratory findings do not play an important role in the diagnosis of OA (Bálint and Szebenyi, 1996).

Radiography

Characteristic radiographic features of OA include degenerative changes such as marginal osteophyte formation along with sclerosis of the subchondral bone and the presence of subchondral cysts (Oddis, 1996). American College of Rheumatology classification criteria for knee, hip, and hand OA require radiographic evidence of disease for hip OA only (e.g., radiographic osteophytes or joint space narrowing) (Altman et al., 1986; Altman et al., 1990; Altman et al., 1991). An anteroposterior film of the affected hip is recommended for those persons who have a new presumptive diagnosis of OA of the hip (Altman et al., 1991) (Indicator 4). Although many older persons have radiologic features of OA, up to 40 percent of those with radiologically detectable OA have no symptoms (Claessens et al., 1990; Davis et al., 1992; Lawrence et al., 1966).

TREATMENT

Pharmacologic Therapies

NSAIDs are the mainstay of medical management for pain among persons with OA, but their use is associated with risks such as the development of peptic ulcer disease, renal insufficiency, hepatic toxicity, sodium retention, and loss of hypertension control on therapy (Bálint and Szebenyi, 1996; Block and Schnitzer, 1997; Dearborn and Jergesen, 1996; Gabriel et al., 1991; Griffin et al., 1991; Griffin et al., 1995; Oddis, 1996; Perrot and Menkes, 1996; Puett and Griffin, 1994; Sack, 1995; Wollheim, 1996; Studenski et al., 1996).

Acetaminophen appears to have a much lower likelihood than aspirin or other NSAIDs of producing gastrointestinal side effects. In one
randomized controlled trial in persons with symptomatic OA of the knee, acetaminophen was found to improve pain and function as much as ibuprofen (Bradley et al., 1991). Persons who have a new diagnosis of OA who wish to take medication for symptoms should be offered a trial of acetaminophen at approximately 4 g/day (Indicator 5). This regimen can be supplemented with other analgesics and anti-inflammatory agents for severe flares (Studenski et al., 1996). Misoprostol has been shown to reduce the prevalence of symptomatic gastrointestinal bleeding and perforation (Silverstein et al., 1995). This was shown in a multicenter private practice study in which misoprostol or placebo was added to patients’ NSAID preparation. The misoprostol and placebo groups did not differ with regard to NSAID use over a six-month period, but 55 events of bleeding or perforation occurred in the placebo group as compared with 26 in the misoprostol-treated group. However, the cost-effectiveness of misoprostol in persons taking NSAIDs has not been evaluated.

Non-pharmacologic Therapies

Exercise for Knee, Hip and Hand OA

In 1994, Puett and Griffin reviewed all published trials that assigned patients with hip or knee OA to a treatment group of non-medicinal, noninvasive treatment or to a concurrent control group. The trials reviewed also included measures of pain or lower extremity function as outcomes. Exercise had the strongest evidence of benefit. In the three exercise trials with non-exercise controls (Chamberlain et al., 1982; Jan and Lai, 1993; Kovar et al., 1992), patients assigned to the exercise groups had greater pain reduction and more improved function than did the control groups. Exercise programs varied greatly from simple leg lifts done at home (Jan and Lai, 1993) to a sophisticated supervised program that included education, strengthening, and aerobics (Kovar et al., 1992). None of these exercise programs precipitated pain flares. Both studies that included aerobic exercise (Chamberlain et al., 1982; Kovar et al., 1992) showed that patients with moderate-to-severe knee OA can improve their aerobic capacity and exercise tolerance by participating in activities equivalent to 30
minutes of walking or swimming three times a week. The addition of aerobic exercise has been shown to improve the pain associated with OA to a greater degree than that achieved by stretching and strengthening alone; however, only one study specifically addressed this question.

The American College of Rheumatology recommends exercise as one of the mainstays of treatment for knee OA, based on several small, short-term studies that show that both aerobic and resistance exercise reduce pain and disability and improve physical fitness in people with knee OA (Chamberlain et al., 1982; Ettinger and Afable, 1994; Fisher et al., 1991; Fisher et al., 1993; Fisher and P sub>P>ndergast, 1994; Jan and Lai, 1993; Kovar et al., 1992; Minor et al., 1989).

A randomized trial over an 18 month period was conducted to determine the effects of structured exercise programs on self-reported disability in older adults with knee OA (Ettinger et al., 1997). This trial had three arms: 1) an aerobic exercise program, 2) a resistance exercise program, and 3) a health education program. Compared with participants in the health education group, participants in both the aerobic exercise and resistance exercise groups had eight to ten percent lower mean scores on the physical disability scale, eight to twelve percent lower scores on the knee pain scale, and better ratings on a variety of physical performance tests.

A randomized trial of yoga and relaxation techniques was conducted for treatment of hand OA over a ten week period (Garfinkel et al., 1994). The yoga class included stretching and strengthening exercises emphasizing extension and alignment, group discussion, supportive encouragement, and a section for general questions and answers. The yoga participants improved significantly more than the control group in pain during activity, tenderness, and finger range of motion. Based on these studies, we recommend as a quality indicator that patients with hip or knee OA be advised to start a regular program of exercise (Indicator 6).

Other Non-Pharmacologic Therapies

Puett and Griffin also reviewed non-exercise therapies for hip and knee OA (Puett and Griffin, 1994). Diathermy (including ultrasound) before exercise is expensive and time consuming, and available evidence
suggests that this treatment provides no benefit in terms of pain reduction or functional improvement when added to an exercise program (Falconer et al., 1992; Jan and Lai, 1993; Svarcova et al., 1987). The data were insufficient to evaluate the efficacy of the other five non-medicinal, non-invasive therapies such as topical irritants (e.g., capsaicin), laser, acupuncture, transcutaneous electrical nerve stimulation, and pulsed electromagnetic fields. A single trial of topically applied capsaicin suggests that it may be useful to reduce pain associated with knee OA (Deal et al., 1991). Since Puett’s review was published, a meta-analysis of placebo-controlled trials of capsaicin gels in OA showed superiority for the active drug, using intention-to-treat analysis (Zhang and Li Wan Po, 1994). In another study, laser treatment was found to be useful reducing the pain and disability associated the knee OA (Stelian et al., 1992).

Other physical modalities that may contribute to pain relief include the application of superficial heat (hot packs, heating pads, hot water bottles, or paraffin) and/or cold (cold packs or ice packs) (Block and Schnitzer, 1997; Studenski et al., 1996). Orthotic devices for shoes and short-term splinting of the hands can provide significant benefits in patients with OA (Block and Schnitzer, 1997; Sasaki and Yasuda, 1987; Studenski et al., 1996; Thompson et al., 1992). A number of assistive devices are available to help the individual with some of the more challenging activities of daily living, including opening jars and reaching for objects. The use of a cane or walker to give the individual more stability and to protect him or her from falling should be encouraged when appropriate (Block and Schnitzer, 1997; Fife, 1994; Perrot and Menkes, 1996; Studenski et al., 1996).

For women, weight accounts for OA more than any other known factor. For men, overweight is second to major knee injury as a preventable cause of knee OA (Anderson and Felson, 1988; Carman et al., 1994; Felson, 1996; Felson et al., 1988; Schouten et al., 1992; Tepper and Hochberg, 1993). In data from the first National Health and Nutrition Examination Survey, obese women -- those with a body mass index (BMI) greater than 30 -- had almost four times the OA risk of women whose BMI was less than 25. For men in the same overweight category, the risk was
increased 4.8-fold (Anderson and Felson, 1988). The mechanism by which overweight causes OA is poorly understood; a contribution from both locally increased force across the joint and systemic factors is likely. Using data from the Framingham Study, Felson et al. (1992) evaluated the effect of weight loss or weight gain on the risk of later symptomatic knee OA. For women whose baseline BMI was 25 or greater, weight loss lowered the risk of knee OA by more than 50 percent for each two units of BMI lost (approximately 11 pounds). Weight gain was associated with a slightly increased rate of later knee OA by more than 25 percent for each two units of BMI gained. Based on these data, we recommend as a quality indicator that persons with knee OA whose BMI is greater than 25 be advised to lose weight (Indicator 6).

**Invasive Therapies**

Intra-articular steroid injections can provide relief in patients with painful flares. Patients who can be expected to have good responses to steroid injections are typically those who have OA flares involving only one or a few joints or pain that are unresponsive to optimal analgesic therapy (Block and Schnitzer, 1997). A given joint should not be injected more than three times a year (Block and Schnitzer, 1997; Fife, 1994).

Arthroscopic lavage with saline for osteoarthritic knees has been shown to alleviate pain and improve function in some patients with moderately severe OA, but the population most likely to benefit has yet to be clearly defined (Block and Schnitzer, 1997).

Surgical interventions, especially prosthetic joint replacement at the knee and hip, are most appropriate for the person whose symptoms are unrelieved (with consequent functional limitations) by rest or more conservative measures, and who has no other major functional limitations or surgical contraindications, such as severe cardiopulmonary or advanced neurologic disease. The person must also have sufficient cognition to cooperate with a postoperative rehabilitation program (Block and Schnitzer, 1997; Studenski et al., 1996). Given the complexity of structuring indicators to assess the appropriateness of
joint replacement therapy, we are not currently proposing any indicators in this area.

FOLLOW-UP

Patients who are taking NSAIDs chronically should be evaluated regularly for therapeutic response and potential drug toxicity. Monitoring is especially important in patients at higher risk of renal abnormalities, including the elderly, those with hypertension, and those with an elevated baseline serum creatinine level or hepatic abnormalities (e.g., those receiving diclofenac). Evaluations should begin soon after initiation of NSAID therapy (Block and Schnitzer, 1997). All persons with OA should be seen for follow-up at least every six months (Indicator 7).
REFERENCES


Puett DW, and Griffin MR. 1994. Published trials of nonmedicinal and noninvasive therapies of hip and knee osteoarthritis. *Archives of Internal Medicine* 121 (2): 133-140.


## RECOMMENDED QUALITY INDICATORS FOR OSTEOARTHRITIS

The following indicators apply to men and women age 18 and older.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Quality of Evidence</th>
<th>Literature</th>
<th>Benefits</th>
<th>Comments</th>
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<tbody>
<tr>
<td><strong>Diagnosis</strong></td>
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<tr>
<td>1. Providers caring for patients with symptoms of OA(^1) should document all of the following at least once in 2 years:</td>
<td>III</td>
<td>Bálint and Szebenyi, 1996; Block and Schnitzer, 1997; Dearborn and Jergesen, 1996; Griffin, 1994; Griffin et al., 1995; Oddis, 1996; Perrot and Menkes, 1996; Puett and Griffin, 1994; Sack, 1995; Wollheim, 1996</td>
<td>Reduce disability and improve function.</td>
<td>Improves diagnosis and management of OA. Recommended by all articles reviewing this topic.</td>
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<td>a. the location of symptoms;(^2)</td>
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<td>b. the presence or absence of limitations in daily activities;</td>
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<td>c. the presence or absence of a history or symptoms of systemic or inflammatory disease;</td>
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<td>d. the use and effectiveness of treatment modalities.(^3)</td>
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<td>2. Providers caring for patients with incident symptoms of OA(^1) should document at least one of the following:</td>
<td>III</td>
<td>Altman et al., 1986; Altman et al., 1990; Altman et al., 1991; Bálint and Szebenyi, 1996; Block and Schnitzer, 1997; Dearborn and Jergesen, 1996; Griffin, 1994; Griffin et al., 1995; Oddis, 1996; Perrot and Menkes, 1996; Puett and Griffin, 1994; Sack, 1995; Wollheim, 1996</td>
<td>Improve symptoms by making accurate diagnosis.</td>
<td>Improve diagnosis and management of OA. Recommended by all consensus developers and articles reviewing this topic.</td>
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<td>• the presence or absence of a history of any systemic or inflammatory disease that may mimic OA;(^4)</td>
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<td>• the presence or absence of any current symptoms of systemic or inflammatory disease that may mimic OA;(^5)</td>
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<td>• the presence or absence of a history of joint trauma or surgery.</td>
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\(^1\) OA: Osteoarthritis

\(^2\) Location of symptoms

\(^3\) Use and effectiveness of treatment modalities

\(^4\) History or symptoms of systemic or inflammatory disease

\(^5\) Joint trauma or surgery
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<tr>
<td>3. Providers caring for patients with symptoms of OA(^1) should document</td>
<td>III</td>
<td>Bálint and Szebenyi, 1996; Block and Schnitzer, 1997; Dearborn and Jergesen,</td>
<td>Improve function.</td>
<td>Improve diagnosis and management of OA. Recommended by all consensus developers and articles reviewing this topic.</td>
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<td>the following for any one affected joint at least once in 2 years:</td>
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<td>1996; Griffin, 1994; Griffin et al., 1995; Oddis, 1996; Perrot and Menkes,</td>
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<td>a. the presence or absence of effusion;</td>
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<td>1996; Puett and Griffin, 1994; Sack, 1995; Wollheim, 1996</td>
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<td>b. the presence or absence of bony enlargement;</td>
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<td>c. the presence or absence of tenderness;</td>
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<td>d. the presence or absence of limitations in range of motion.</td>
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<td>4. Patients with incident symptoms of hip OA(^1) should be offered an</td>
<td>III</td>
<td>Altman et al., 1991</td>
<td>Reduce disability.</td>
<td>Improve diagnosis of hip OA. Recommended by the American Rheumatism Association.</td>
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<td>anteroposterior film of the affected hip.</td>
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<td>5. Patients with a new diagnosis of OA who wish to take medication for</td>
<td>I</td>
<td>Bradley et al., 1991</td>
<td>Decrease risk of complications</td>
<td>In a randomized controlled trial involving persons with symptomatic knee OA, acetaminophen (4 g/day) was found to improve pain and function as much as ibuprofen. Acetaminophen will not cause many of the complications that have been associated with the use of NSAIDs such gastrointestinal bleeding, renal insufficiency, sodium retention, and increased blood pressure.</td>
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<tr>
<td>joint symptoms should be offered a trial of acetaminophen.</td>
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<td>associated with NSAIDs.</td>
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### Definitions and Examples

1. Symptoms of osteoarthritis may occur in the hands, hips (manifested by symptoms in the groin, anterior thigh, buttocks, or knees), knees, neck, or lower back. Symptoms may consist of: a) pain that is worse with weight bearing or activity and relieved by rest; b) stiffness that is localized, generally of short duration, and relieved by exercise; and c) restrictions in motion that may interfere with daily activities.

2. Joints commonly involved in osteoarthritis include the distal interphalangeal joints, proximal interphalangeal joints, and first carpometacarpal joints; hips; knees; and cervical and lumbar spine.

3. Treatment modalities for OA include medications such as acetaminophen, NSAIDs, capsaicin, heat and/or ice, exercise, orthotics and splints, canes or walkers, weight loss, intra-articular steroid injections, and joint replacement surgery.

4. Systemic or inflammatory disease that may mimic OA include psoriasis, gout, systemic lupus erythematosus, rheumatoid arthritis, sickle cell disease, and hemophilia.

5. Symptoms of systemic or inflammatory diseases that may mimic OA include fever, malaise, weight loss, and prolonged stiffness (e.g., more than 60 minutes).

6. Body mass index (BMI) = kg/meters²

### Quality of Evidence Codes

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<tr>
<th>Level</th>
<th>Description</th>
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<tbody>
<tr>
<td>I</td>
<td>RCT</td>
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<tr>
<td>II-1</td>
<td>Nonrandomized controlled trials</td>
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<tr>
<td>II-2</td>
<td>Cohort or case analysis</td>
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<tr>
<td>II-3</td>
<td>Multiple time series</td>
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<tr>
<td>III</td>
<td>Opinions or descriptive studies</td>
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<tr>
<th>Indicator</th>
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<th>Literature</th>
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<tr>
<td>Providers caring for patients with symptoms of hip or knee OA¹ should recommend both of the following at least once in 2 years: a. exercise programs for persons with hip or knee OA; b. weight loss among persons with knee OA and a BMI &gt;25. ⁶</td>
<td>I, II, III</td>
<td>Anderson and Felson, 1988; Ettinger, 1997; Felson et al., 1992; Hochberg et al., 1995a; Hochberg et al., 1995b; Puett and Griffin, 1994</td>
<td>Improve symptoms and function.</td>
<td>Multiple trials, some employing randomization of subjects to treatment groups, have demonstrated benefits of exercise programs for hip and knee OA. For women with a BMI &gt;= 25, weight loss has been shown to lower the risk of knee OA by more than 50% for each 2 units of BMI lost.</td>
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Follow-up

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<th>Indicator</th>
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<th>Benefits</th>
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<tr>
<td>Patients receiving care for symptoms of OA¹ should be seen in follow-up at least every 6 months.</td>
<td>III</td>
<td>Block and Schnitzer, 1997</td>
<td>Improve management of OA.</td>
<td>Recommended by all articles reviewing this topic.</td>
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