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Recognizing and managing osteoarthritis

By Helene Harris, MSN, RN, and Ann Crawford, PhD, RN, CNS, CEN

ALSO KNOWN AS degenerative joint disease, osteoarthritis (OA) is a progressive breakdown and loss of articular cartilage in one or more joints caused by continued inflammation and cytokine production.[1] Affecting up to 70% of Americans between ages 55 and 74, it's the most prevalent form of arthritis and is a prominent cause of disability and pain in older adults. As the population ages, the incidence of OA is expected to grow, creating an additional burden on the healthcare system.[2]

This article takes a look at OA and how it's diagnosed and treated, and also reviews appropriate nursing care to help patients manage the disease.

Understanding OA

Articular cartilage is composed of water (65% to 80%), along with a matrix of collagen, chondrocytes (cartilage-producing cells), and proteoglycans (glycoproteins composed of chondroitin, keratan sulfate, and other substances).[2-4] With aging or trauma to the joint, a loss of proteoglycans occurs. In addition, as people age, the synovial fluid that provides lubrication and nutrition to the joints also decreases, leading to OA.

With disease progression, the cartilage and bone beneath the cartilage begin to erode, promoting development of osteocytes (bone spurs), calcifications, fissures, and ulcerations in the joint.[2] The production of inflammatory cytokines such as interleukin-1

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accelerate these destructive forces, overcoming the body's attempt to repair the damage and further exacerbating the thinning and degeneration of the cartilage. Eventually, the cartilage completely breaks down and the joint is left without any cushion to absorb stress and facilitate ease of movement. In addition, loosened fragments of bone and cartilage begin to "float" in the affected joint, causing crepitus, a grating noise/sensation that can be heard and/or palpated when the joint is moved. The degradation process produces pain and stiffness at the joint and may eventually reduce joint range of motion and cause atrophy in muscle tissue that surrounds and supports the joint.[2-4]

OA is classified as primary OA (idiopathic) and secondary OA based on the cause of disease progression. In primary OA, no previous disease or event occurs related to the OA. Cartilage changes in primary OA may develop from genetic and aging changes, as well as from obesity and/or smoking.[2-5] Traumatic joint injury and other musculoskeletal conditions, including rheumatoid arthritis, can facilitate the development of secondary OA.

Although OA has the potential to develop in any joint, certain joints tend to be more prone to the disease. (See *Joints commonly affected by OA*.) Weight-bearing joints, such as the hips, knees, and cervical and lumbar spine, are most commonly involved, possibly due to long-term stress on the body from years of bearing weight and use. The proximal and distal finger joints are also often affected.[2-5]

Who's at risk?

Men are more prone to develop OA at an earlier age than women, though by middle age women have a higher overall incidence of the disease.[5] Obesity exacerbates the mechanical stress of weight bearing, accelerating joint problems, predominantly in the knees. Smoking may also contribute to the degradation of knee cartilage, particularly in those with a family history of OA.[2-5] (See *Risk factors for OA*.)

Risk factors for OA[20]

- age
- female gender
- obesity
- lack of osteoporosis
- occupation
- participation in sports
- previous injury
- muscle weakness
- proprioceptive deficits
- family history of OA
- acromegaly
- calcium crystal deposition.

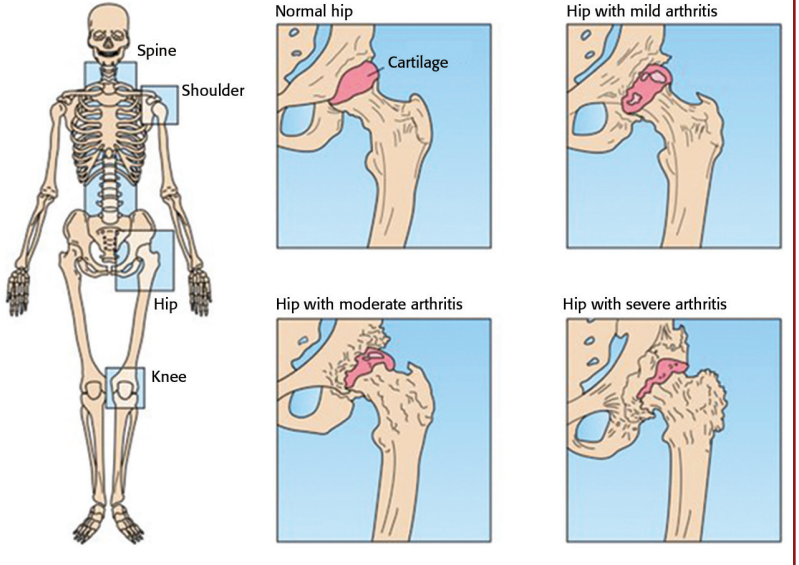
Overuse or abuse of joints may cause tissue injury and/or inflammation, which is exacerbated over time. People working in occupations that include a high level of repetitive joint stress, such as construction, farming/ranching, and other manual labor jobs, tend to be at greater risk for developing secondary OA. Congenital and developmental disorders of the hip, such as congenital subluxation-dislocation of the hip, acetabular dysplasia, and slipped capital femoral epiphysis, predispose an individual to OA of the hip. Individuals with long-term participation in high-intensity sports and activities such as football, running, gymnastics, and weightlifting increase their risk for OA of the hip and knee.[2-4]

As people age, cartilage's ability to cushion and protect the joint from the stress of movement and weight bearing diminishes, increasing the likelihood of joint damage. By age 40, 90% of people will develop some degenerative changes, but they may not experience signs and symptoms.[4]

Recognizing OA

The signs and symptoms of OA, which may arise rapidly or slowly,

Joints commonly affected by OA



Souce: Willis MC. *Medical Terminology: A Programmed Learning Approach to the Language of Health Care.* Baltimore, MD: Lippincott Williams & Wilkins; 2002.

include joint pain, stiffness, and impaired function. The pain is caused by synovial inflammation, stretching of the joint capsule, muscle spasm, and nerve irritation. Initially described as aching and diffuse, the pain typically increases with activity and is relieved by rest. With worsening disease, the pain becomes more intense, occurring both during activity and at rest.[2,3]

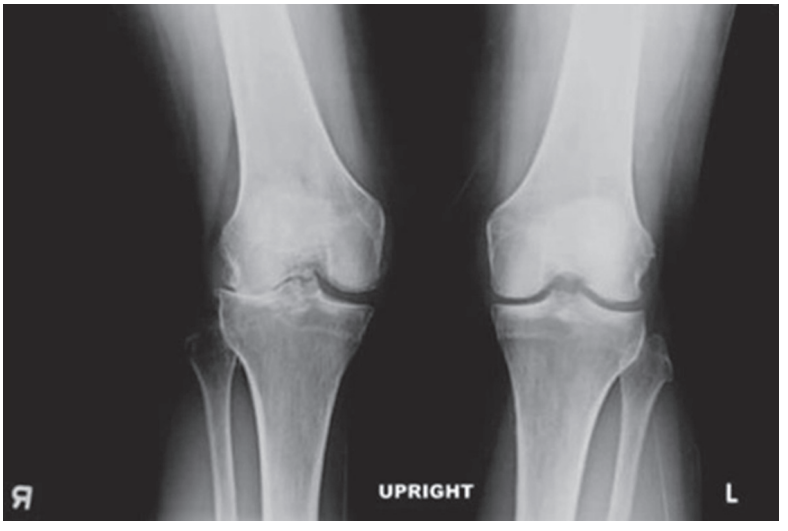
Patients may complain of joint locking or joint instability. Crepitus and grinding of the joints often accompany movement. In severe disease, even minimal activity may elicit pain from decreased range of motion and structural damage. Stiffness often occurs just after awakening in the morning for about 30 to 40 minutes and decreases with movement. Limitations of joint motion and joint instability impair joint function and movement.[4,5]

A diagnosis of OA requires a combination of history and physical assessment findings and radiologic results. Physical assessment will reveal tender and enlarged joints, with complaints of pain with movement. The loss of joint cartilage is visible on X-ray as a narrowing of the joint space. (See *OA of the knee*.) Changes at the joint margins and the presence of osteophytes (spurs) due to incomplete cartilage regeneration may also be visible. Each change individually doesn't specifically indicate OA, but the combination of factors strengthens the suspicion of an OA diagnosis.[4,5] (See *Clinical criteria for OA of the knee*.)

Because OA isn't a systemic disease, blood tests aren't helpful for diagnosis. However, they can help rule out rheumatic disease that may be concurrent with OA. When inflammation is present, OA may cause a slight elevation in white blood cell count and erythrocyte sedimentation rate.[4,5]

OA of the knee

An X-ray of a patient with OA of the right knee, showing marked narrowing of the joint space, increased density of subchondral bone, and osteophyte formation laterally.



Source: Strayer DS, Rubin E. *Rubin's Pathology: Clinocopathologic Foundations of Medicine*. 7th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2014.

Treatment strategies

Because OA can't be cured, treatment focuses on alleviating signs and symptoms and slowing disease progression and includes physical rehabilitation, pharmacotherapy, and surgery. Management of both hip and knee OA requires a combination of physical activity and weight management.[6,7]

Although no treatment will stop the degenerative process, some preventive actions may delay progression if initiated early enough. Weight loss, injury prevention, ergonomic adjustments, and perinatal screening for congenital hip problems may help slow the degenerative process.[3-5,8]

Conservative management options include using cold/heat therapy, resting the joint for short periods of time to alleviate pain, avoiding joint overuse, supporting inflamed joints with orthotic devices, and exercise, both aerobic and isometric/postural, to improve flexibility and strengthen muscles that support the affected joints.[3-5,8,9]

Nonpharmacologic interventions for OA involve the application of heat or cold compresses. Heat relaxes the muscle surrounding the affected joint, decreasing pain. Heat treatments include hot baths, showers, heating pads, or compresses, with the water temperature no higher than normal body

Clinical criteria for OA of the knee[21]

The presence of knee pain plus at least three of the following six characteristics indicate OA:

- over age 50
- stiffness of joint in the morning for less than 30 minutes
- crepitus on active motion of the knee
- bony tenderness
- bony enlargement
- no palpable warmth.

temperature (98.6° F [37° C]). Instruct patients and their families about the risk of burns if the water is too hot. Relief from heat treatment is usually achieved within 15 to 20 minutes.[2,10]

Cold therapy may or may not be beneficial. Cold application helps numb the pain, reduce joint swelling, constrict blood vessels, and block nerve impulses to the affected joint. Although it doesn't actually affect the inflammatory process, it may provide symptom relief for some patients. Cold therapy can be administered via cold packs; over-the-counter (OTC) gels/packs that release cold (and heat) may also be used. Caution patients to wrap cold packs in a towel before applying them. Warn them not to apply a cold product directly to the skin, which can cause a skin burn (frostbite). Advise patients of the importance of reading any product's label for correct usage.[2,10]

Physical therapy may be beneficial to patients with OA. Stretching exercises and activities tailored to increase muscle strength may help decrease pain, reduce stiffness, and increase mobility. For some patients, class-based aerobic exercise may be helpful for improving mobility; however, patients with comorbidities should discuss this option with their healthcare provider before initiating any activity.[5,8,10] In addition, a physical therapist can assess the need for assistive devices, such as braces, canes, and shoe insoles. Knee braces may improve mobility, allowing patients to maintain their independence and avoid falling. All of these devices may be beneficial for improved ambulation.[2,5,10]

Soft-tissue massage can be performed by a physical therapist to help relax the muscles surrounding the affected joint.[10] Other treatments, such as yoga and music therapy, while not proven to treat OA, may improve patients' sense of well-being. A combination of exercise and rest periods may allow the patient to maximize mobility and performance of activities of daily living (ADLs).[3,4,8]

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Drug therapy

Pharmacotherapy for OA focuses on relieving pain, reducing inflammation, and restoring function to the affected joint. One class of medications commonly used to treat OA is nonsteroidal anti-inflammatory drugs (NSAIDs) in both OTC forms (such as aspirin and ibuprofen) and prescription-strength versions of OTC drugs (diclofenac, flurbiprofen, tolmetin, ketoprofen, indomethacin, meloxicam). Their analgesic and anti-inflammatory properties make them a good choice for treating OA signs and symptoms.[10,11] Other medications used to treat OA include celecoxib (an NSAID that exhibits anti-inflammatory, analgesic, and antipyretic activities) and tramadol (a centrally acting synthetic opioid analgesic to treat pain).

Topical ointments and gels give some patients temporary relief from pain and inflammation associated with OA. Capsaicin cream, made from peppers, and topical salicylates may be purchased without a prescription, but teach patients to inform their healthcare provider before purchasing or using these medications to avoid potential interactions with other prescribed medications, as well as potentially serious adverse reactions. The American College of Rheumatology (ACR) recommends against using topical capsaicin cream to treat OA of the knee.[12] Topical ointments are available by prescription, including the NSAID diclofenac gel, and the same precautions apply.

Although rarely used, opioids are sometimes prescribed for short-term symptom relief if other medications aren't relieving the pain and stiffness. Examples include hydrocodone, fentanyl, oxycodone/aspirin, oxycodone/acetaminophen, and oxymorphone.[5,11,13] Adverse reactions to opioids include central nervous system depression, such as drowsiness, so be sure to institute patient safety measures (such as assisting with ADLs and ambulation) and teach patients to avoid driving and other activities requiring alertness until they determine how the medication affects them.[11,14]

If a patient's pain is poorly controlled by oral medications, corticosteroid injections are an option. Intra-articular injection every few months provides short-term symptom relief. Steroid injections are generally given two to three times a year due to the potential for adverse reactions such as postinjection pain, skin atrophy, fat atrophy, facial

flushing, iatrogenic infection, and tendon rupture.[15] These injections have proven effective in the knee but aren't as effective in the shoulder or hand. The ACR recommends against intra-articular therapies to treat OA of the hand.[12] Some steroids used for intra-articular injection include betamethasone, methylprednisolone, and triamcinolone.[5,11]

Another treatment for OA is hyaluronic acid injection or viscosupplementation. Injected directly into the affected knee or hip joint, hyaluronic acid replaces the natural hyaluronic acid that's been depleted due to inflammation and aging. The most common adverse reactions include pain and edema at the injection site.[11,13,16]

Glucosamine/chondroitin, an OTC herbal medication combination, is promoted with claims that it relieves the pain and inflammation associated with OA by repairing cartilage breakdown; however, the ACR recommends against using it to treat OA.[11,12,17]

Surgical options

For patients with moderate-to-severe OA who continue to experience severe pain and/or loss of function despite conservative treatment, surgery may be appropriate. Commonly used procedures include osteotomy (cutting of either the tibia or femur, which is then reshaped to relieve pressure on the knee joint; this adjusts the distribution of weight within the joint) and arthroplasty, in which unhealthy joint components are replaced with artificial ones.[18] In addition, irrigating the knee joint with saline and then removing the fluid often may provide pain relief for several months.[4,5,8]

Nursing interventions

The Osteoarthritis Research Society International has stated the goals of OA management include pain management and optimal functional

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ability. Toward that end, they've developed guidelines regarding the management of OA of the hip and knee. Nursing interventions based on these guidelines include administering appropriate medication to manage pain as prescribed and facilitating the patient's efforts to maintain optimal mobility and remain independent.[19]

Obtain a baseline health history including all of the patient's prescription, OTC, and herbal and nutritional supplements. A thorough assessment of the patient's physiologic status is required, focusing on the musculoskeletal system. Assess the patient's range of motion, pain intensity level, and ability to perform ADLs. Assess any affected joints for warmth, edema, tenderness, or pain. Help the patient find ways to sleep or relax in positions that enhance comfort; for example, using pillows to prop up the knees or hips may help relax the joint and surrounding muscles. Monitor vital signs regularly and document intake/output, appetite, and food choices. Refer patients with a body mass index over 28 to a dietitian/nutritionist for meal modifications. Encourage patients to work with their healthcare provider to determine the best exercise regimen.[10,19]

Though independence is a goal, be vigilant in monitoring the patient's ability to move and intervene to prevent falls and other injuries. Use appropriate safety measures to protect the patient and assist with ambulation and ADLs as needed. Obtain referrals to physical therapy and/or occupational therapy for assistance with exercise programs or assistive devices for ambulation and other ADL needs.

Because OA is a chronic disease, provide emotional support to patients and their family, and allow time for them to voice any issues or concerns. Provide referrals to appropriate community agencies, such as the National Arthritis Foundation.[2,10,19]

Patient education

Educate patients and their families on the pathophysiology, risk factors, manifestations, and available treatment options. Instruct them to take their medications as prescribed and to keep their healthcare provider informed if the pain is unrelieved or intolerable, or if their range of motion decreases. Make sure patients know the expected actions and possible adverse reactions to their prescribed medications, as well as any contraindications for use.

Because many medications can cause dizziness and drowsiness, advise patients to be cautious about activities requiring alertness when taking them. Encourage overweight or obese patients to participate in a weight-loss/diet modification program.[2,4,10,11]

Improving quality of life

Arthritis and its complications can severely impact an individual's health and quality of life. With thorough assessment, suitable referrals, and appropriate interventions, nurses can help patients with OA lead safe, active, and optimally independent lives. ■

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