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## *Non-Drug Approaches for Managing Osteoarthritis*

### **What is osteoarthritis (OA)?**

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OA, also called degenerative joint disease, is a condition that affects the joints (where two bones meet) in the body. The disease causes the cartilage in a joint to break down, often resulting in pain, swelling and stiffness.

Cartilage is the tissue that cushions the ends of bones and allows joints to move easily. OA also can cause bone spurs to grow around the joints. While it is the leading cause of disability in the U.S., there are different ways to help manage the disease. Getting diagnosed and starting treatment early can help set the stage for living well with OA.

### **How common is osteoarthritis?**

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OA is the most common joint disorder in the body. It affects 30% of people ages 45 to 64, and 68% of those over age 65.

### **What causes OA?**

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The causes of OA are not entirely known. The older you get, the more likely you are to develop OA. But not all older people develop the disease. It is more than “wear and tear” on a joint, as people often think. Many of the joints you use the most are rarely affected by the disease.

Some of the major causes include: 1) disorders in the cells of the cartilage, 2) family history, 3) any force that leads to changes in the cartilage such as injury, overloading the joint, damage to a ligament (tissue that connects bones or cartilage at a joint), muscle wasting, diseases that lead to joint deposits, and 4) inflammation.

OA may be classified as inflammatory or noninflammatory. In noninflammatory OA, patients tend to have pain and difficulty doing

some activities. In inflammatory OA, patients also have a joint that is hot and swollen, nighttime pain, and morning stiffness.

### **Which joints are most affected by osteoarthritis?**

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OA tends to strike the following joints:

- Cervical spine (neck)
- Lumbar spine (lower back)
- Hips
- Knees
- Base of the big toe
- Base of the thumb
- Those closest to the fingertips

### **What is the usual treatment for osteoarthritis?**

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OA is usually treated by managing any troubling symptoms. This is done through medications and changes in lifestyle, such as avoiding further injury to the affected joint and balancing activity with rest. Standard drug treatment includes nonsteroidal anti-inflammatory drugs (NSAIDs) or other pain killers. NSAIDs are more helpful if the OA is inflammatory rather than noninflammatory. If you have inflammation, a combination of acetaminophen and NSAIDs is likely to be helpful.

Viscosupplementation may be used for arthritic knees if other treatments are no longer helpful. It involves injecting a thick fluid into the knee. Newer approaches for OA are geared toward prevention of the disease or removing its underlying causes. Work is underway to develop drugs that can change the course of the disease. At this time there is no way to prevent or cure OA.



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## What can be done to treat osteoarthritis besides drugs?

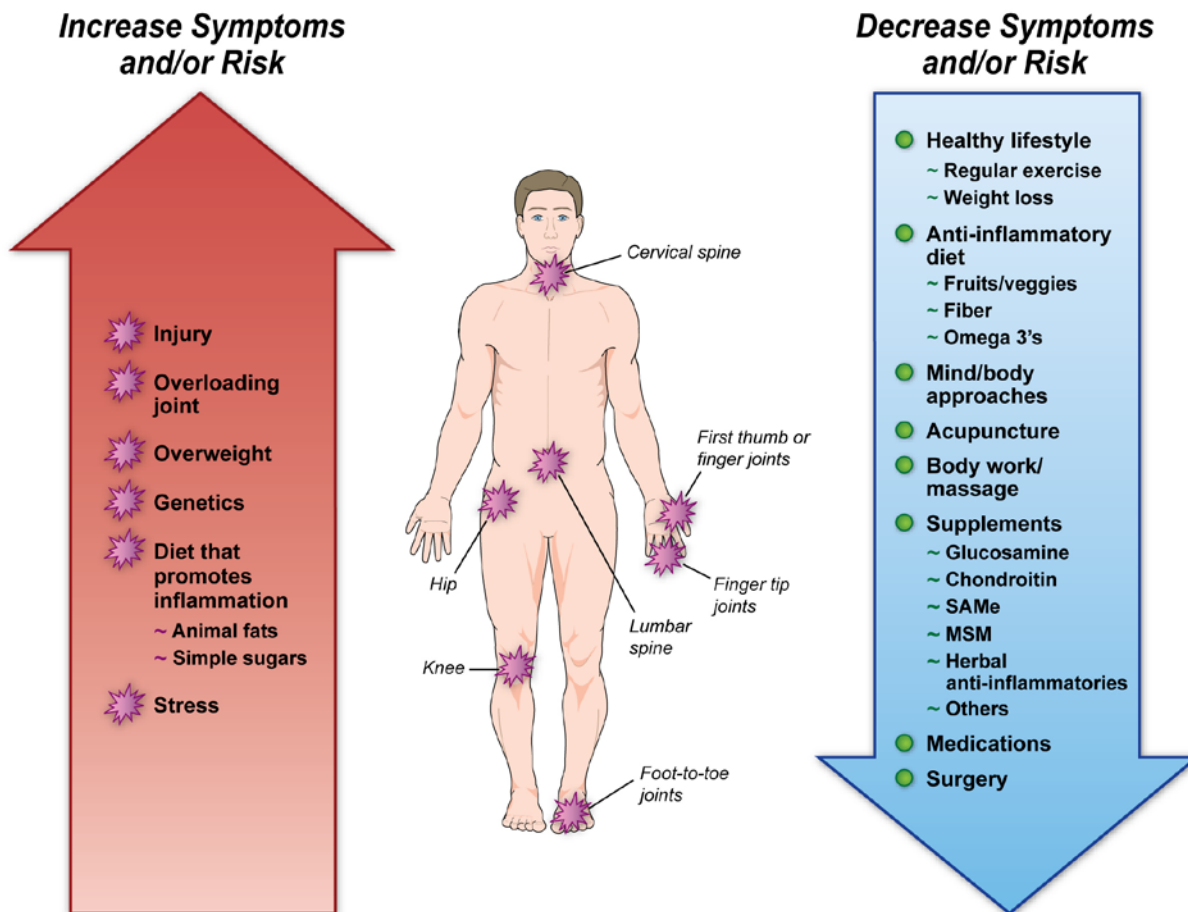
There are a number of different approaches to help you manage the OA. These include: lifestyle changes, nutrition, mind-body approaches, acupuncture, manipulative therapies, and dietary supplements.

## What lifestyle changes might be helpful?

Both exercise and maintaining proper weight can make a difference in how you feel and function.

## Exercise

The Fitness and Arthritis in Seniors Trial (FAST) found that both aerobic and resistance exercise helped patients with OA of the knee. Pool exercises, biking, swimming, and aerobic dance may all be helpful. Strength training can help prevent the muscle wasting that comes when joints and muscles are not used regularly. Flexibility exercises can help increase your range of motion. More information on arthritis and exercise is available through the [Johns Hopkins University Arthritis Center](http://www.jhu.edu/centers/arthritis).





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There is some evidence that tai chi and yoga can be helpful. In one study of 41 adults, those who practiced tai chi reported less pain and more ability to use the joint than those who didn't use tai chi. Other studies have shown similar findings. But you need to keep doing these exercises in order for them to continue to work. A 1994 study indicated that 8 weeks of yoga instruction led to overall improvement in hand pain, strength, joint size, and motion.

### **Weight Loss**

Being overweight can increase your risk of developing OA and disability. For every pound you gain, you add 3 pounds of pressure on your knees and six pounds of pressure on your hips. If you have been diagnosed with OA, losing weight (if needed) may slow down the disease. It can also help you function better.

### **Can diet help?**

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So far evidence that directly links diet and osteoarthritis is sparse. A recent review of 3 studies found that eating a Mediterranean style diet was linked to reduced prevalence of osteoarthritis and higher quality of life for those living with osteoarthritis<sup>1</sup>. The Mediterranean diet is a primarily plant-based dietary pattern, rich in fresh fruits and vegetables, whole grain cereals, and legumes. It emphasizes nuts, seeds, and olive oil as sources of fat, and includes moderate consumption of fish, shellfish, white meat, eggs, and fermented dairy products. The Mediterranean diet has been extensively studied and may help to lower inflammation. It is just one example of an anti-inflammatory way of eating. For more information about anti-inflammatory diet and lifestyle, see the handout link below. The anti-inflammatory diet and lifestyle is safe, healthy, and likely to help prevent other diseases, so you may want to consider it.

- [For more information see the handout, "The Anti-Inflammatory Lifestyle."](#)

We have learned that omega-3 fatty acids can help a number of disorders, but so far there is no evidence that they are helpful for OA. In a recent animal study, eating high amounts of omega-3 fats was found to be helpful to cartilage. A combination of cod liver oil (not the same as 'fish oil') and NSAIDs did not help patients in a 24-week study. Because there are few risks in taking omega-3 supplements, it is worth considering, though more research regarding its effectiveness for OA is needed.

- [See handout "Omega-3 Fats."](#)



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### **What are mind/body approaches and how can they help?**

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Mind-body approaches make use of the connection between your physical health and your mind or spirit. The power of your mind can help your physical body and vice versa. The Arthritis Self Management Program in the United Kingdom included 6 two-hour courses on topics such as exercise, cognitive symptom management, nutrition, communication, and dealing with depression. Researchers found that people who attended had a decrease in pain, fewer physician visits and greater functioning at both 4 and 12 months following the course. One study showed improvement even 4 years after participation.

Practicing one or more of the following mind/body approaches might help you feel and function better with OA. An added benefit is that they are safe and involve no side effects.

#### ***Biofeedback***

You have more control over your body than you might think. If you want to learn how to reduce muscle tension and increase feelings of relaxation, consider biofeedback. Biofeedback uses a machine to help a person control body functions. The machine measures muscle tension, skin temperature, heart rate, and other body functions. The device's constant feedback can help teach you to gain control over these measurements. You must be willing to practice for biofeedback to be helpful. Over time, you will learn how your body feels when the muscles are relaxed, and you will not need the machine. Your health care practitioner can refer you to a health psychologist for training in biofeedback. Small machines are also available to buy for use at home.

#### ***Cognitive behavioral therapy***

Pain and disability can take a toll. It is not unusual for someone with OA to become

depressed. Depression can make things worse. If you are depressed, you may not be as active as usual. This can lead to further disability from OA. Cognitive behavioral therapy is a type of counseling that has been particularly helpful for depression. It helps you to recognize negative or inaccurate thoughts. Then you learn to replace these thoughts with positive or more accurate ones. It can help you see things more realistically, so your thoughts don't limit you more than the disease does. Talk to your health care practitioner if you are concerned about preventing or treating possible depression. S/he can refer you to a health psychologist or social worker who is experienced with health issues. A benefit of counseling over taking a drug for depression is that you are not adding another drug with possible side effects.

#### ***Guided imagery***

Guided imagery is a process that uses your imagination and all five of your senses. It involves becoming relaxed and imagining a comfortable, safe place. From there you focus on a topic that interests you. Imagery gives you a window to explore your unconscious mind to help you understand an illness or symptom. The understanding you gain through this process can often bring surprising improvement in symptoms. For more information on interactive guided imagery, go to The Academy for Guided Imagery at <http://www.academyforguidedimagery.com/>.

#### ***Self-hypnosis***

Self-hypnosis is a state where you focus your attention internally. In this focused state, you are more open to suggestion. Self-hypnosis is not a loss of control, as people often think. Instead it gives you control to change something in your body or your life. One study compared the effects of relaxation, hypnosis, and no treatment. Patients who practiced relaxation techniques or hypnosis had less pain and used less pain medication than those who had no treatment.



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Patients who practiced both relaxation and hypnosis did best.

- [To learn more, see the handout “Self Hypnosis.”](#)

### **Journaling**

Journaling is the process of writing about your experiences, thoughts, and feelings. One way to promote health is to write about a time in your life that was stressful or traumatic. It provides a private way to express thoughts and memories that may have been kept inside worsening physical symptoms. Studies have found that expressing feelings about stressful times in your life can strengthen the immune system, help you relax, and may improve your health.

- [To learn more, see handout “Using Journaling to Aid Health.”](#)

### **Meditation/mindfulness based stress reduction (MBSR)**

Meditation is a practice to relax and calm the mind and body. MBSR is a type of meditation that teaches the art of living in the moment. Several studies have shown that MBSR can be useful in the treatment of pain from different conditions. It also can result in a better quality of life that can increase your long-term health.

- The Center for Mindfulness in Medicine, Health Care, and Society at the University of Massachusetts Medical School keeps a list of MBSR programs across the country. You can access it at the following website: [www.umassmed.edu/cfm/mbsr/](http://www.umassmed.edu/cfm/mbsr/).
- You can also call clinics and hospitals in your area for possible classes.
- Two excellent books by Jon Kabat-Zinn are *Full Catastrophe Living* and *Wherever You Go, There You Are*.

- [To learn more, see handout “Meditation for Health and Happiness.”](#)



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### **How helpful is acupuncture for the treatment of OA?**

Acupuncture is a treatment in which a specialist inserts fine needles into specific places on the body to restore health and well-being. It is a practice that has been used for over 2,500 years in China. Evidence is mounting that acupuncture is helpful for a number of conditions including OA. A 2007 review of 5 studies found that acupuncture was more helpful for the relief of knee pain from OA than a placebo or ‘sham’ acupuncture (placing needles randomly). This was in contrast to an earlier review of 11 trials that reported that acupuncture might not be better than sham acupuncture for OA pain treatment. A 2006 clinical trial involving over 700 patients with knee or hip OA found that the group who received acupuncture had less pain than a control group without treatment. A 2005 study of 294 participants found that after 8 weeks, pain and joint function had improved more with full acupuncture treatments than with little or no treatment. After therapy was stopped, the benefits gained from acupuncture decreased over time.

### **What are manipulative therapies, and how helpful are they for OA?**

Manipulative therapies help your body heal through touch and movement. Examples of manipulative therapies include chiropractic, massage therapy and osteopathy. We’re just starting to see research looking at the effectiveness of manipulative therapies for OA. A 2006 study of Swedish massage in 68 patients with OA of the knee found improvements in pain, range of motion, and function. A study involving 252 patients, who received 20 sessions of chiropractic treatment for OA of the lower back, showed that the treatment worked better than heat alone.

### **Are any dietary supplements helpful for OA?**

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Important supplements to consider are those that may help prevent continuing damage to affected joints. Glucosamine and chondroitin, in particular, have been at the center of a great deal of controversy as far as effectiveness. Both seem to work as painkillers. They may also decrease joint space narrowing, which results in some of the symptoms of OA.

#### **Glucosamine**

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Glucosamine may change the course of OA, so the effects of the disease are lessened. It has been found to be safe in clinical trials lasting from 4 weeks to 3 years. Patients in these studies have had significant improvements in pain and function. Patients taking glucosamine for up to 3 years have less deterioration of the knee joint, less joint narrowing and significant improvements in pain. However, it has been challenging for researchers to learn just how effective this supplement is for a few reasons: 1) Glucosamine hydrochloride has been used in studies. Some believe that this form is not as effective as glucosamine sulfate. 2) Different studies ask patients questions in different ways, so it is hard to compare the results. 3) The results of a study may depend on the brand of supplement a patient takes. The actual ingredient in a product has been found to vary from the description on the label anywhere from 0 to 115%. 4) Finally, studies haven’t been standard in how often a patient takes glucosamine. It may be absorbed better when taken in three divided doses rather than just one large dose per day.

There are several advantages of taking glucosamine. It has almost no side effects. While it is made from shellfish, it comes from the shell and not the meat. Therefore it is unlikely to trigger a shellfish allergy. It is possible that both glucosamine and chondroitin may increase the



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effects of warfarin, a drug used to thin the blood. There is no evidence that this occurs at standard doses.

A standard dose for glucosamine is 500 mg daily 3 times/day.

### **Chondroitin sulfate**

Chondroitin is found in the cartilage of most mammals. Taken as a supplement, it seems to help prevent further joint deterioration. In 2007 an analysis of the results of 20 clinical trials involving chondroitin for OA of the knee or hip was published. The article reported that chondroitin's usefulness for OA symptoms is "minimal or non-existent." However, it has been argued that the jury is "still out" on this issue. The different studies had mixed results about chondroitin's effectiveness. Many randomized controlled trials (considered to be the gold standard of studies) have indicated some benefit.

Another reason to consider using chondroitin is that there are minimal harms associated with its use. Fortunately safety data about the use of chondroitin are quite good. It has been found to be safe in studies lasting up to 6 years. You will want to be cautious in your use of chondroitin if you have asthma, since it could make the condition worse. Many brands are made from the cartilage of cows. This may be of concern to you if you are vegetarian.

A typical chondroitin dose is 1000-1200 mg per day, taken either as a single dose or divided and taken several times per day.

### **S-adenosyl-l-methionine (SAME)**

This supplement is pronounced "sammy." Its role in the treatment of OA is not fully understood. It is helpful for both pain and inflammation. Multiple studies indicate that SAME is better than a placebo and as effective as many NSAIDs such as ibuprofen, celecoxib

(Celebrex), and indomethacin for the treatment of OA symptoms. It can cause mild nausea or constipation in some people. SAME has also been useful for depression and fibromyalgia. Do not take it if you have bipolar disorder. It can lead to hypomania (mild form of mania) in people with this disorder. Also do not use it if you are taking antidepressant medications.

The usual dose of SAME is 200 mg three times daily for OA. Many people with OA take total doses up to 1600 mg daily.

### **Methyl sulfonyl methane (MSM)**

MSM is often used for OA treatment as well. It comes from various plants. It has been found to stop the joints of animals from deteriorating. Humans have participated in a few small trials. These have had mixed results. MSM has been found to be safe in studies lasting up to 12 weeks. In some patients MSM has led to increased allergy symptoms. Overall it is unlikely to cause adverse reactions at doses of 500-1000 mg two to three times daily.

### **Herbal anti-inflammatories**

There are a number of supplements which might be used in place of drugs for treating arthritis-related inflammation. However, we are still waiting for good data to support this. A list of botanicals (supplements made from plants) which can be used to treat pain and inflammation in a number of different conditions is provided in the table on pages 8-9.



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### Other supplements

Several other supplements have been investigated recently and will likely be receiving more attention in the near future:

- **Vitamin D.** Cartilage cells of people with OA try to pick up more vitamin D (they have more chemical receptors). Vitamin D deficiency is increasingly common in the United States. Taking 1,000-2,000 I.U. daily is frequently recommended.
- **Vitamin C.** Some studies show that the more Vitamin C a person gets through his/her diet, the less cartilage is lost. However, it is unclear if taking additional Vitamin C will be helpful.
- **Vitamin E.** While vitamin E may be helpful with reducing OA symptoms, evidence is limited.
- **Boron.** The femur (long bone in the thigh) in OA patients has less boron. Sodium tetraborate decahydrate has been found in some studies to reduce OA symptoms.
- **Bromelain.** Bromelain is an extract of fruits and stems of pineapple plants. A few studies have investigated it for OA. It has not been effective or well-accepted because of side effects.
- **Rose hips.** Rose hips might be effective, but more studies are needed.
- **Tipi tea (*Petiveria alliacea*).** Tipi tea is used by some people but has not been well-studied.
- **An East Asian cocktail made of three plants (*Clematis mandshurica*, *Trichosantes Kirilowii* and *Prunella vulgaris*).** This combination was found to be moderately effective in two good-quality randomized, controlled trials.
- **Hyperimmune milk or collagen.** There is a lack of scientific evidence for their use.

- **Avocado/soy unsaponifiables (ASU's).** The use of avocado and soy have shown promise in some studies.
- **New Zealand green-lipped mussel extract.** This shellfish has been studied because the Maori people in New Zealand eat a lot of these mussels and have less OA than others. Significant improvements have been found for dogs with OA, and these supplements are safe. However, effectiveness is still in question according to recent reviews.

***The information in this handout is for general education. It is not meant to be used by a patient alone. Please work with your health care practitioner to use this information in the best way possible to promote your health.***

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### NOTES





## Non-Drug Approaches for Managing Osteoarthritis

### Herbal Anti-Inflammatories

Botanical and Dose	Evidence of Effectiveness	Precautions
<b>Boswellia</b> <i>(Boswellia serrata, Indian Frankincense)</i> <u>Extract:</u> 300 mg three times daily. Has been used in much higher doses in some studies	<ul style="list-style-type: none"> <li>- Initial results look promising.</li> </ul>	<ul style="list-style-type: none"> <li>- Safe when used in amounts found in foods.</li> <li>- No data for use beyond 12 weeks.</li> <li>- Rare side effects in the stomach/intestines.</li> </ul>
<b>Cat's Claw</b> <i>(Uncaria guianensis or tomentosa)* Tomentosa</i> most common in U.S. (dosing varies with species) <u>Capsules:</u> 350-500 mg once or twice daily <u>Tincture:</u> 1-2 ml, two or three times daily <u>Freeze dried aqueous extract:</u> 100 mg daily <u>Oxindole alkaloid-free extract:</u> 20 mg three times daily	<ul style="list-style-type: none"> <li>- Freeze dried extract decreased knee pain with activity.</li> <li>- Decreases chemicals in the body that cause inflammation.</li> <li>- May strengthen the immune system.</li> <li>- May work as an antioxidant (promotes health by protecting the body's cells from damage by oxygen).</li> </ul>	<ul style="list-style-type: none"> <li>- May lower blood pressure.</li> <li>- May alter levels of some medications – check with your doctor.</li> <li>- May interfere if you are taking drugs to suppress your immune system.</li> <li>- Avoid in pregnancy.</li> <li>- May increase acne or red blood cell count if you are HIV positive.</li> </ul>
<b>Devil's Claw</b> <i>(Harpagophytum procumbens)</i> <u>Dried root:</u> 0.5-1.5 grams in aqueous solution three times daily <u>Tincture:</u> 0.2-1.0 ml (1:5) in 25% alcohol three times daily	<ul style="list-style-type: none"> <li>- Good evidence for use.</li> <li>- Thought to relieve pain from various sources in majority of patients in various studies, though effectiveness for low back pain uncertain.</li> </ul>	<ul style="list-style-type: none"> <li>- Rated as safer than pain medications.</li> <li>- Rare cases of ringing in the ear, headache, loss of appetite, or diarrhea (8%).</li> <li>- No studies beyond 3-4 months of use.</li> <li>- May change stomach acid levels.</li> </ul>
<b>Ginger</b> <i>(Zingiber officinale)</i> <u>Powdered root:</u> 500 mg to 1 gram twice or three times daily <u>Tincture (1 gram:5ml):</u> 1.25-5 ml, three times daily	<ul style="list-style-type: none"> <li>- Evidence limited – moderate effect on OA of the knee in 247 patients, but mixed results in another smaller study.</li> </ul>	<ul style="list-style-type: none"> <li>- Occasional mild side effects in stomach/intestines.</li> <li>- Eating the whole root may increase the amount of stomach acid.</li> <li>- There is concern that ginger might work as a blood thinner, but there is limited evidence of this in humans.</li> </ul>
<b>Phytodolor</b> A mixture of aspen ( <i>Populus tremula</i> ), common ash ( <i>Fraxinus excelsior</i> ), and goldenrod ( <i>Solidago virgarea</i> ). <u>Tincture:</u> 20-40 drops tincture three times daily in a beverage. Use for 2-4 weeks to reach full therapeutic benefit	<ul style="list-style-type: none"> <li>- Rich in salicylates (similar to the active ingredient in aspirin).</li> <li>- Taking this allowed people to reduce the doses of their anti-inflammatory medication.</li> <li>- Improved grip strength in OA in one study.</li> <li>- As effective as the drug Diclofenac in one OA study.</li> </ul>	<ul style="list-style-type: none"> <li>- No adverse effects noted in studies.</li> <li>- Might have the same side effects as aspirin. Avoid if you are allergic to aspirin.</li> <li>- No drug interactions known.</li> <li>- Avoid during pregnancy.</li> </ul>

#### PATIENT HANDOUT



## Non-Drug Approaches for Managing Osteoarthritis

Botanical and Dose	Evidence of Effectiveness	Precautions
<b>Stinging Nettle</b> <i>(Urtica dioica)</i> <u>Dried extract (7:1):</u> 770 mg twice per day <u>Tincture (1mg:5ml in 25% alcohol):</u> 2-6 ml three times daily	<ul style="list-style-type: none"> <li>- Some limited data indicate pain relief both when taken by mouth and when rubbed on the joint.</li> <li>- Decreases body chemicals that cause inflammation.</li> </ul>	<ul style="list-style-type: none"> <li>- Rarely may cause upset stomach, sweating, skin reactions.</li> <li>- Use caution during pregnancy – increases uterine activity in mice.</li> </ul>
<b>Turmeric</b> <i>(Curcuma longa)</i> <u>Root:</u> 1.5-3 grams daily, divided into several doses (can be made into tea). A heaping teaspoon is 4 grams	<ul style="list-style-type: none"> <li>- Decreases arachidonic acid, a chemical in the body tied to joint swelling and pain.</li> <li>- May not be easy for the intestines to digest.</li> </ul>	<ul style="list-style-type: none"> <li>- Stomach upset at high doses over a long period of time.</li> <li>- Raised liver test values in some animal studies.</li> <li>- May increase bleeding risk.</li> <li>- Seems to protect stomach against NSAIDs.</li> </ul>
<b>Willow Bark</b> <i>(Salicis cortex)</i> <u>Powdered bark:</u> 1-3 grams 3-5 times daily	<ul style="list-style-type: none"> <li>- Studies show helpful for mild pain.</li> <li>- Proved helpful in study of 191 patients with back pain.</li> <li>- Has chemicals similar to aspirin (was the inspiration for the creation of aspirin).</li> </ul>	<ul style="list-style-type: none"> <li>- Could have similar side effects to aspirin, though this has not been found.</li> <li>- Occasional nausea, rash, and wheezing.</li> <li>- Avoid if you have asthma.</li> </ul>

- HIV = human immunodeficiency virus, mg = milligrams, ml = milliliter, OA = osteoarthritis
- Information from Rindfleisch A, Neck Pain. In *Integrative Medicine*, 2<sup>nd</sup> ed. Rakel D (ed). Philadelphia: Saunders, 2007.



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## *Non-Drug Approaches for Managing Osteoarthritis*

### **References**

1. Morales-Ivorra I, Romera-Baures M, Roman-Vinas B, Serra-Majem L. Osteoarthritis and the Mediterranean Diet: A Systematic Review. *Nutrients*. 10(8), 2018.