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THE NATUROPATH'S GUIDE OSTEOARTHRITIS

**A focus on the herbal approach
for managing osteoarthritis**

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WHITE WILLOW
(*Salix alba*)

OSTEOARTHRITIS

This disease is the most prevalent chronic joint condition worldwide. It is also the leading cause of pain, loss of function and disability among the elderly.

The incidence of osteoarthritis (OA) is rising because of the increase in life expectancy, the ageing population and the epidemic of obesity. Pain and loss of function are the main clinical features that lead to treatment which includes nonpharmacological, pharmacological and surgical approaches. This musculoskeletal disorder is complex and multifactorial with genetic, biological, chemical, mechanical, molecular and enzymatic components.

Condition Overview

Sometimes called degenerative joint disease, OA is the degeneration of joint cartilage and the underlying bone. It is characterised by the breakdown of the cartilage that overlies the ends of bones in joints. This results in the bones rubbing together causing pain, swelling and loss of motion. The causes of OA are still unknown and there is much debate in the literature as to the exact sequence of events that trigger the onset of this diverse disease. The initial onset of OA is considered to be due to an imbalance between the cartilage degradation and repair process. Vascular disease is postulated to be relevant in the progression of OA.

OA can broadly be classified in two different forms, primary and secondary. Primary OA is a gene

dependent disease of an unknown origin related to aging. Secondary OA frequently occurs sometime after a traumatic event or is related to another condition such as obesity. Although primary and secondary OA are caused by different factors the resulting pathology is the same: a degenerative phenomenon complicated by inflammatory reactions. OA can be considered the product of an interaction between systemic and local factors. For example a person may have an inherited predisposition to develop OA but may only develop it if an injury to the joint has occurred.

This crippling condition is estimated to affect more than 10% of the population over the age of 60 and one in 11 Australians (9%) which was approximately 2.1 million people in 2014 to 2015. Load bearing and more active joints are more prone to developing OA, especially the knee joint. This location represents 23.9% of all OA pathology but other commonly affected areas include the hips, hands, ankles, spine, neck and lower back.

Although OA was long believed to be caused by the 'wear and tear' of joints over time scientists now view it as a disease of the joint and the causes of OA are now realised to be much more complex. This complication contributes to the broad variation in symptoms and poses a challenge for the development of effective treatment. OA is the most common form of arthritis and is different to osteoporosis. Osteoporosis is a condition where the bones become fragile and brittle causing them

to break more easily. Both OA and osteoporosis are recognized as age related skeletal disorders but it is commonly held that these diagnoses do not often occur together in the same patient. OA is the most common reason for total hip and total knee replacement. This demonstrates the need for preventative medicine. The focus is now shifting to disease prevention and the treatment of early OA which is a difficult task since conventional imaging techniques can detect only quite advanced disease and the relation between pain and structural degeneration is not close.

Common Symptoms

OA symptoms often develop slowly and worsen over time however the damage to the joints usually starts before symptoms arise making it difficult to act early. Symptoms may vary depending on which joints are affected and how severely they are affected. Pain from OA is a key symptom in the decision to seek medical care and is an important precursor to disability. OA is often asymmetric. A patient may have severe, debilitating OA of one knee with almost normal function of the opposite leg. This is the opposite to rheumatoid arthritis which is usually symmetrical.

- Pain: after long periods of inactivity such as first thing in the morning. The pain tends to worsen with overuse and may be relieved by rest.
- Stiffness: after periods of rest. It usually lasts for less than 30 minutes unlike rheumatoid arthritis which causes stiffness for 45 minutes or more. This has been called the gelling phenomenon.
- Swelling: particularly after extended activity.
- Tenderness: when the joint is pressed lightly.
- Loss of flexibility: limited range of motion or stiffness that goes away after movement.
- Grating sensation: there may be a clicking or cracking sound when the joint bends.
- Bone spurs: extra bits of bone, which feel like hard lumps, may form around the affected joint.

Risk Factors

Age

Age is one of the strongest risk factors for OA of all joints. The incidence of OA increases with age and ranges from 11.25% in people aged 45 to 85% in people aged 75. However OA does not affect all aging people so there are other factors at play along with the aging process.

Obesity

One of the most influential and modifiable risk factors is obesity. Being overweight puts additional pressure on hips and knees and can cause the cartilage that cushions joints to break down faster. There is a link between obesity and inflammation. Studies suggest that excess fat tissue produces inflammatory chemicals (cytokines) that can damage the joints.

Diet

Dietary factors are the subject of considerable interest in OA however results of studies are conflicting. Nutritional imbalance, combined with endocrine abnormalities, may be involved in the pathogenesis of OA. The onset of OA, as with many other common age-related diseases, seems to be associated with continuous exposure to oxidants so the intake of some substances which have antioxidant properties can reduce the level of reactive oxygen species and, at the same time, the outcome and the development of the disease. Low intake of vitamin D and vitamin C is a possible risk factor for knee OA.

Other Diseases

There is evidence suggesting that type 2 diabetes and elevated glucose concentration are particularly connected with OA development and progression. Recent data suggests that OA shares a similar biochemical and inflammatory profile to metabolic syndrome which may be helpful in detecting OA early before irreversible damage to the joint has occurred. People with rheumatoid arthritis, the second most common type of arthritis, are more likely to develop OA.

Gender and Hormones

Women are not only more likely to have OA than men, they also have more severe OA. The definite increase in OA in women around the time of menopause has led investigations to hypothesise that hormonal factors may play a role in the development of OA. However results on the effect of oestrogen, either endogenous or exogenous, on OA from observational studies have been conflicting.

Race and Ethnicity

The prevalence of OA, and patterns of joints affected by OA, vary among racial and ethnic groups.

Genetics

OA has a strong genetic background with heritability estimations of 39% and 65% for hand and knee OA respectively and 60% for hip OA. Although several genetic chromosomal positions have been associated with OA the underlying genetic variants and genes remain elusive.

Occupation, Joint Injury and Overuse

Repetitive movements or injuries to joints (such as a fracture, surgery or ligament tears) can lead to OA. Some athletes repeatedly damage joints, tendons and ligaments which can speed cartilage breakdown. Certain careers that require standing for long periods of time, repetitive bending, heavy lifting or other movements can also make cartilage wear away more quickly. An imbalance or weakness of the muscles supporting a joint can also lead to altered movement and eventual cartilage breakdown in joints.

Technology

The growing influence of technology in daily life should also be evaluated as a possible risk factor for the onset of secondary OA. The increased use of tablets, smartphones and mobile phones, but also keyboards and mice, can be considered a risk factor for hand and wrist OA.

Congenital/Developmental Conditions

A few congenital or developmental abnormalities (such as congenital dislocation and Legg-Calvé-

Perthes disease, a childhood hip disorder) have been associated with occurrence of hip OA in later life however because these developmental deformities are uncommon they probably only account for a small proportion of hip OA in the general population.

How To Get The Correct Diagnosis

A doctor will collect information on personal and family medical history, perform a physical examination and order diagnostic tests. Plain radiography can be helpful in confirming the diagnosis and ruling out other conditions. Advanced imaging techniques, such as computed tomography or magnetic resonance imaging, are rarely needed unless the diagnosis is in doubt and there is a strong suspicion for another cause such as a meniscal injury.

Conventional Treatment & Prevention

The principles of conventional OA treatment are to alleviate pain and stiffness with minimal adverse effects, maximise and maintain function and improve quality of life. Treatment should be tailored to each individual. Current guidelines recommend the use of a combination of physical therapy with a supervised exercise program, weight loss, analgesia with paracetamol, nonsteroidal anti-inflammatory drugs (NSAIDs), opioids, serotonin norepinephrine reuptake inhibitors (SNRIs), injection with corticosteroids or hyaluronic acid directly into the joint or surgical intervention, such as arthroscopy or joint replacement, where necessary.

Although these drugs may relieve symptoms there is increasing evidence that they inhibit the repair processes, accelerate the progression of joint destruction and actually make the underlying condition worse. In addition, although NSAIDs are generally very good at reducing pain and inflammation they are associated with significant adverse side effects with chronic administration, many of them life threatening. Some examples include cardiovascular problems, bleeding problems, stomach upset, ringing in the ears and liver and kidney damage. Furthermore older people are at the highest risk of complications and this is the

population most commonly afflicted with OA. Some patients report OA pain associated with a persistent pain state that is NSAID resistant, referred to as advanced OA pain.

In recent years several pharmacological therapies have emerged as potential alternatives. Although there are currently no effective treatments or drugs able to prevent or reverse disease progression promising results have been reported in recent trials especially with IL-1 antagonists and antibodies to nerve growth factor. Therapeutic ultrasound, neuromuscular as well as transcutaneous electrostimulation, pulsed magnetic field therapy, low level laser therapy, thermal agents, acupuncture and assistive devices such as insoles, canes and braces can be used additionally in a multimodal therapeutic program.

Joint replacement is an effective treatment for symptomatic end stage disease although outcomes can be poor and the lifespan of prostheses is limited. Joint preserving interventions under development include lifestyle modification and pharmaceutical and surgical modalities. Some show potential but few have proven ability to arrest or delay disease progression.

“Ginger has been shown to be as effective as ibuprofen for osteoarthritis.”



Teasel Root
(*Dipsacus asper*)

INTERVENTION	Adaptogens, nervines, anxiolytics, adrenal restoratives	Alteratives, diuretics	Analgesic, anodyne	Anti-inflammatories	Antioxidants, mineral rich	Rubefacient & circulatory stimulant, counter irritant (topical & internal)
Arnica			✓	✓		
Celery		✓		✓	✓	
Devil's Claw			✓	✓	✓	
Garlic		✓		✓	✓	✓
Ginger			✓	✓	✓	✓
Guaiaicum		✓		✓		
Nettle Leaf	✓	✓	✓	✓	✓	✓
Prickly Ash				✓		✓
St John's Wort	✓	✓		✓		
Teasel Root		✓	✓	✓	✓	
Turmeric	✓		✓	✓	✓	
White Willow		✓	✓	✓		

Natural Therapies For Treatment & Prevention

Naturopathic practitioners can consider a wholistic approach to OA treatment with a focus on the promotion of health and general wellbeing. OA is a dynamic process which does include the potential for repair if adverse factors are minimised. Lifestyle, nutritional and herbal intervention each play prominent roles. With a wholistic approach, including staying active, maintaining a healthy weight and complementary treatments, not only can pain and joint function be managed but also progression of the disease can be slowed and, depending on the individual, may even be reversed.

Given the moderate effectiveness, and potential side effects, of conventional treatment both patients and health care professionals are seeking out alternative therapies. Naturopathic treatment offers benefits without the significant risks associated with conventional medical treatments.

There is evidence for naturopathic intervention to reduce inflammation and pain in order to optimise functional capability but as the disease becomes more severe and disabling conventional medical and surgical intervention becomes more likely. The more severe the inflammation and joint degeneration the longer it will take to see a benefit.

The pain, reduced mobility, side effects from medication and other factors associated with OA can lead to negative health effects not directly related to the joint disease. For example knee or hip pain may lead to a sedentary lifestyle that promotes weight gain and possible obesity. This can lead to the development of diabetes, heart disease and high blood pressure. Chronic pain can affect a person's mood, sleep patterns, lifestyle, livelihood and even their ability to live independently. As a result patients with chronic pain are often depressed and anxious. The need for preventative medicine is paramount when it comes to OA so taking care of the body is fundamental.

In traditional herbal medicine OA represented a toxic accumulation in the joint so improving the circulation and reducing the pain using counter irritation by applying heat were the methods used. This could

be done using capsicum poultices or blistering with stinging nettles. This toxic accumulation was seen as a burden on the kidney so diuretics were used to remove the toxic waste through the urine. The focus on the kidney follows through to the widely understood naturopathic principle focusing on the acid/alkaline balance. It is widely understood that the body has to eliminate acid metabolites and that joint problems are a failure of the body to do this. Herbal diuretics can complement a high alkaline diet based on vegetables and fruit in reducing the rate of joint deterioration in many sufferers from OA.

The power of the therapeutic effect of the practitioner and patient relationship must not be forgotten. An important task of the practitioner is to reduce risk factors for OA by promoting self care and empowering the patient to make behavioural changes to their lifestyle. To increase the likelihood of success any changes need to be relevant to that person and to be specific with achievable, measurable goals in both the short and the long term. Devising and sharing the management plan with the patient in partnership allows for the patient's personality, family, daily life, economic circumstances, physical surroundings and social context to be taken into account. This patient centred approach not only increases patient satisfaction but also adherence with the treatment plan. Good communication skills imparting accurate information honestly and sensitively, and in a positive way, greatly enhance the ability of the patient to cope. Treating symptoms often requires the coordination of care with other health care professionals and other modalities such as social services.

The goals in the naturopathic treatment of people with OA are to reduce inflammation, enhance joint integrity and repair damage, improve joint mobility and strength, reduce pain, address oxidation and remove metabolic waste products. It is recommended that an individual strategy be devised for each patient, taking into account their different symptoms and history, however elements of a comprehensive therapeutic approach could include a focus on the following factors:

Weight Loss

Maintain a healthy body weight (see Diet) and implement a weight loss program, if necessary, to take the load off the joints. In patients who are overweight or obese even a small reduction in weight has been shown to create significant improvement in OA symptoms.

Diet

OA is like any chronic ongoing health complaint in that it will be aided by superior nutrition. Nutritional factors are very important in the successful treatment of OA and it is important to focus on foods to avoid as they may aggravate OA problems.

- Eliminate inflammatory foods by eating whole foods with an emphasis on an alkaline forming diet. Avoid proinflammatory saturated fats and processed foods as these also contribute to obesity, a risk factor. Omega 3 fatty acids found in oily fish, nuts and seeds have been shown in some studies to reduce proinflammatory mediators and increase joint lubrication. Reduce alcohol and caffeine and increase water intake.
- Consider the integrity of the gut, digestive health and function. Check for inflammatory bowel diseases which may affect nutritional absorption.
- Investigate and correct nutritional intake and deficiencies. Glucosamine and chondroitin are popular supplements for OA and have been shown to exert beneficial effects in some clinical trials.
- Include antioxidant rich foods such as berries: Oxidative stress and free radical activity have a strong contribution to the severity of clinical signs of OA.
- Avoid the Solanaceae family: Avoidance of nightshade foods (potato, tomato, bell pepper, eggplant, tobacco) has been shown to improve OA symptoms in certain people.
- Test for and eliminate allergens, intolerances and sensitivities. Some experts have declared a significant improvement in symptoms of OA in 20% to 30% of patients after the identification and avoidance of allergenic foods such as gluten.

Exercise

Stay active but balance this with rest. Exercise can be difficult with painful joints but it is the most effective nondrug treatment for reducing pain and improving movement in OA. Gentle exercises, such as swimming, walking on flat surfaces or tai chi, are recommended because they are less stressful on the joints. Avoid activities that increase joint pain such as jogging or high impact aerobics. Exercises that strengthen the muscles reduce pain in patients with OA, particularly with OA of the knee.

Reduce Exposure to Toxic Load and Consider Detoxification

There are links between OA and exposure to persistent organic pollutants.

Hormonal Status (especially female patients)

Includes the implications on bone mineralisation. Although the role of hormonal factors in the pathogenesis of OA is complex, research suggests that endogenous hormones and reproductive factors have a role in the pathogenesis of OA, especially knee osteoarthritis, with uncertainty for the effect of exogenous hormones. From the available literature it is difficult to conclude whether this is a direct effect of hormonal factors or whether other factors related to these hormonal factors, such as obesity and inflammation, have a role in this association.

Reduce Pain

Pain is the most common presentation of OA and is a complex phenomenon. It can be episodic, activity related or constant. Address comorbidities of chronic pain such as mood, depression, stress and disturbed sleep. Reducing pain will assist in reducing medication intake and its side effects.

Improve Daily Functioning

Encourage beneficial lifestyle changes such as time out, comfortable footwear, acupuncture, hot and cold packs, mineral baths, physical therapy and massage, including self-massage.

Potential Treatment Plans

Osteoarthritis in an overweight person	Bladderwrack	Celery	Devil's Claw	Ginger	Nettle Leaf	Turmeric
Osteoarthritis of the knee	Celery	Ginger	Nettle Leaf	Teasel Root	Turmeric	White Willow
Pain	Celery	Ginger	Nettle Leaf	Prickly Ash	St John's Wort	White Willow
Osteoarthritis of the hip	Celery	Devil's Claw	Garlic	Ginkgo	Guaiacum	White Willow



Desired Herbal Actions and Potential Herbs Include:

Adaptogen, Nervine, Anxiolytic, Adrenal Restorative

Reduce stress and nourish the nervous system. Herbs include californian poppy, chamomile, gotu kola, lavender, lemon balm, nettle leaf, oats seed, passionflower, St. John's wort, scullcap, teasel root, vervain.

Alterative, Diuretic

Remove metabolic waste products from the body. Traditionally toxicity was seen as contributing to OA so herbs to support the clearance of residual eliminatory wastes are indicated. Herbs include burdock, celery, dandelion leaf, garlic, gotu kola (has shown potential as an adjunctive therapy in the reduction on the severity of joint pain in selected patients with OA), guaiacum, juniper, meadowsweet, nettle leaf, St. John's wort, teasel root, white willow, yellow dock.

Analgesic, Anodyne

Reduce pain. Herbs include arnica (topical), boswellia, Californian poppy, cayenne, ginger, Jamaica dogwood, teasel root, turmeric, white willow.

Anti-inflammatory

Reduce joint pain and inflammation, enhance joint

integrity and repair damage. Herbs which may modify cytokines and other inflammatory processes and nuclear factor kappa B (NF-κB) activation include arnica (topical), boswellia, bupleurum, cat's claw, celery, chamomile, devil's claw, feverfew, garlic, ginger, golden rod, guaiacum, lavender, lemon balm, maritime pine, myrrh, nettle leaf, peppermint, rehmannia, St. John's wort, shatavari, teasel root, turmeric, white willow.

Antioxidant/Mineral Rich

Address oxidative stress. Herbs include bladderwrack, garlic, ginger, green tea, horsetail, maritime pine, nettle leaf, oats green, rose hips, teasel root, turmeric.

Rubefacient and Circulatory Stimulant (topically and internally)

Counter irritation stimulates nerve receptors leading to reflex analgesia. The importance of increasing the circulation to the joints, including those that increase microcirculation, is a traditional belief. Herbs include arnica (topical), bilberry, celery, comfrey (topically has been shown to be effective for patients with OA of the knee. One randomised, double blind, bicentre, placebo controlled clinical trial followed OA patients who used a comfrey cream daily for three weeks. Those using the comfrey cream had significant improvements over those using the placebo. Pain was reduced, mobility of the knee improved and quality of life increased), garlic, ginkgo, maritime pine, muira puama, peppermint, prickly ash, rosemary, rue.



Garlic
(*Allium sativum*)

Herbal Support Could Include:

HERB NAME	DESCRIPTION	ACTIONS
<p>Arnica (<i>Arnica montana</i>)</p> 	<p>This plant has been used for centuries in traditional herbalism as a remedy for injuries, aches and pains. It can be used topically on unbroken skin as a poultice, liniment, compress, oil, cream or salve. It is used to speed healing and relieve pain, inflammation, swelling, and bruising associated with traumatic injuries such as fractures, sprains and contusions. A double-blind study on 204 patients comparing arnica with ibuprofen (an NSAID) in topical applications for hand OA found arnica probably results in similar benefits as treatment with ibuprofen (an NSAID) but with less frequent side effects.</p>	<p>Anti-inflammatory</p> <hr/> <p>Analgesic</p> <hr/> <p>Rubefacient</p> <hr/>
<p>Celery (<i>Apium graveolens</i>)</p> 	<p>This herb is considered to increase the excretion of acidic metabolites in the urine.</p>	<p>Antioxidant</p> <hr/> <p>Anti-inflammatory</p> <hr/> <p>Antirheumatic</p> <hr/> <p>Antispasmodic</p> <hr/> <p>Diuretic</p> <hr/> <p>Digestive Aid</p> <hr/>
<p>Devil's Claw (<i>Harpogophytum procumbens</i>)</p> 	<p>A 'celebrity' among arthritis natural remedies being approved by German Commission E for the treatment of degenerative diseases of the musculoskeletal system. A randomised double blind study compared the effects of treatment with devil's claw 2610mg/day with diacerein (100mg/day), a slow acting drug for OA. The study found that both treatment groups showed similar considerable improvements in symptoms of OA however those receiving devil's claw required fewer rescue analgesics.</p>	<p>Anti-inflammatory</p> <hr/> <p>Analgesic</p> <hr/> <p>Antirheumatic</p> <hr/> <p>Chondroprotective</p> <hr/> <p>Antioxidant</p> <hr/>
<p>Garlic (<i>Allium sativum</i>)</p> 	<p>Improves rehabilitation outcome of knee OA. Participants in a study took 900mg daily (three capsules, each capsule is equivalent to three garlic cloves) with breakfast for eight weeks. There was significant decline in synovial cytokines IL1β, IL6 and TNFα. This was accompanied by more control of knee fluid and pain as well as better muscular strength and quality of life. These results would suggest the beneficial effect of garlic was due to control of inflammation in those people.</p>	<p>Circulatory Stimulant</p> <hr/> <p>Alterative</p> <hr/> <p>Antioxidant</p> <hr/> <p>Anti-inflammatory</p> <hr/> <p>Hypoglycaemic</p> <hr/>

Herbal Support Could Include: (Cont.)

HERB NAME	DESCRIPTION	ACTIONS
<p>Ginger (<i>Zingiber officinale</i>)</p> 	<p>Ginger has been evaluated in controlled trials for the treatment of OA and has been shown to be as effective as ibuprofen for this condition providing relief from pain and swelling.</p>	<p>Anti-inflammatory Anodyne Analgesic Circulatory Stimulant Antispasmodic Antioxidant</p>
<p>Guaiacum (<i>Guaiacum sanctum</i>)</p> 	<p>Guaiacum is a well known anti-inflammatory herb traditionally used for treating chronic and painful arthritis.</p>	<p>Anti-inflammatory Alterative Diuretic</p>
<p>Nettle Leaf (<i>Urtica dioica</i>)</p> 	<p>Not for the faint of heart, a time honoured remedy used by many cultures for OA is urtication which involves the intentional contact with nettle's stinging hairs either by rubbing up against it or flagellating oneself with nettle plants. Nettle sting causes strong physical stimulation of nerves and joints, activating dormant energies and stimulating circulation, lymphatic flow and cellular metabolism to clear congestion causing wastes. The inflammation caused by the nettle sting will subside in hours to days as will the joint pain and stiffness. Taken internally part of the anti-inflammatory effect of nettle leaf may be due to its inhibitory effect on NF-kappaB activation. Activation of transcription factor NF-kappaB is elevated in chronic inflammatory diseases such as OA.</p>	<p>Anti-inflammatory Nutritive Kidney/Adrenal Trophorestorative Adaptogen Alterative Diuretic Analgesic Antioxidant</p>

Herbal Support Could Include: (Cont.)

HERB NAME	DESCRIPTION	ACTIONS
<p>Prickly Ash (<i>Zanthoxylum clavaherculis</i>)</p> 	<p>This herb has a rich history of use as a herb for aches and pains particularly those that are brought about by aging.</p>	<p>Circulatory Stimulant</p> <p>Antirheumatic</p> <p>Anti-inflammatory</p>
<p>St John's Wort (<i>Hypericum perforatum</i>)</p> 	<p>Used when nerve entrapment is present and it also has a positive effect on the nervous system particularly in depression. May help improve sleep quality affected by pain.</p>	<p>Nervous System Trophorestorative</p> <p>Alterative</p> <p>Relaxing Nervine</p> <p>Anti-inflammatory</p> <p>Antispasmodic</p>
<p>Teasel Root (<i>Dipsacus asper</i>)</p> 	<p>Chondrocytes help maintain joint function and serve an important role in the development of OA. In preclinical studies teasel constituents were used to effectively inhibit the apoptosis of chondrocytes, maintain the function of chondrocytes and suppress the loss of bone mass suggesting that it may have therapeutic potential for OA.</p>	<p>Anti-arthritic</p> <p>Analgesic</p> <p>Anti-inflammatory</p> <p>Antioxidant</p> <p>Diuretic</p>

Herbal Support Could Include: (Cont.)

HERB NAME	DESCRIPTION	ACTIONS
<p>Turmeric (<i>Curcuma longa</i>)</p> 	<p>A randomised, double-blind, placebo-controlled trial in 160 patients with OA of the knee found that on chronic administration turmeric suppresses inflammation, brings about clinical improvement in patients and decreases oxidative stress.</p>	<p>Anti-inflammatory</p> <p>Antioxidant</p> <p>Neuroprotective</p> <p>Immunomodulator</p> <p>Antiarthritic</p> <p>Analgesic</p> <p>Nephroprotective</p> <p>Antidepressant</p>
<p>White Willow (<i>Salix alba</i>)</p> 	<p>The mechanism of action of white willow bark is similar to that of aspirin which is a nonselective inhibitor of COX-1 and COX-2 used to block inflammatory prostaglandins. In an observational study on 436 patients with OA and back pain white willow significantly decreased pain.</p>	<p>Anti-inflammatory</p> <p>Analgesic</p> <p>Diuretic</p>

Conclusion

OA is a chronic degenerative disease of the joints and management should be considered a long term proposition. As for any deteriorating condition OA requires a wholistic approach addressing lifestyle, including weight management, diet and exercise and the combination of an appropriate nutritional and herbal intervention strategy to treat the underlying imbalances. A wholistic assessment of the patient's medical, social and psychological needs enables a tailored approach to treatment options encouraging positive health seeking behaviours that are relevant

to the individual's goals. A therapeutic relationship based on shared decision making endorses the patient's ability to self manage their condition and reduce the reliance on pharmacological therapies providing a greater sense of empowerment.

Resources

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