Joint pain and Arthritis

A *WellBeing* Special Report
By Karen Bridgman

Contents

According to medical definitions, there are more than 40 conditions that manifest as joint pain. The most likely causes are joint injury, joint strain or sprain, infections, cancer and inflammatory joint disease such as the various types of arthritis. Tendonitis and bursitis can also fit into these categories.

Here, we will concentrate on the inflammatory conditions that cause joint pain, the most common form being the condition we all know as arthritis. The word comes from *arthro* (joint) and *itis* (inflammation) and inflammation is defined as the symptoms of heat, pain, redness and swelling. Sound familiar? Arthritis, however, is a much more complex and diverse condition than you might at first imagine.

ARTHRITIS

Arthritis in its many forms is Australia's major cause of disability and chronic pain. It affects 16.7 per cent of Australians (more than 3.4 million people), of which 60.4 per cent are women. Sixty per cent are between the ages of 15 and 64 (ie of working age). Fifty-four per cent of Australians over 75 have arthritis.

According to Access Economics, the overall financial cost of arthritis to Australia per year is enormous. It totalled $11.2 billion (or 5.3 per cent of total national health expenditure) in 2004. This is equivalent to 1.4 per cent of gross domestic product. Each year, arthritis accounts for 8.5 million GP visits, 2.2 million specialist visits and 1.4 million visits to other health practitioners. Including pain and suffering, total costs amounted to $19.25 billion in 2004. By the year 2020, it's expected that 20 per cent of the population (4.6 million people) will be afflicted.

These costs to the Australian healthcare system are greater than those of diabetes, cancer or asthma. The disability burden is similar to that of dementia and second only to depression.

Musculoskeletal disease is the major cause of disability and handicap in Australia, and arthritis is the most common form.

Arthritis is a general term for many conditions, of differing causes, involving inflamed, thickened and/or painful and stiffened joints. There are at least 100 known types of arthritis, but only five of these account for 90 per cent of cases. The main ones are classified generally into three groups:

- Osteoarthritis (OA).
- The systemic inflammatory forms of arthritis such as rheumatoid arthritis (RA), systemic lupus erythematosus (SLE) and fibromyalgia, which frequently has an infective trigger. These are often autoimmune diseases.
- Gout.

Australians even have their own special form of epidemic polyarthritis — Ross River Fever (and Barmah Forest disease) — which is increasing in incidence thanks to global warming. It is spread by a virus transmitted by various mosquitoes.

OSTEOARTHRITIS

Osteoarthritis is the most common type of arthritis and is a localised disease that involves increasing deterioration of the cartilage in the joints caused by injury, repetitive use or general wear and tear. It typically runs in families and is three times more common in women than in men.

The structure of the joint is composed of hyaluronic acid, proteoglycans attached to glycosaminoglycans. In the joints, cells called chondrocytes make and maintain the integrity of the cartilage. These cells receive nutrients from the synovial fluid, which also removes waste byproducts. The synovial activity is triggered by movement, which compresses and releases the sponge-like cartilage.

Osteoarthritis is characterised by the degeneration, destruction and erosion of the cartilage in the joint, with bony outgrowths (Hebderden's Nodes) often forming at the edges of the joints. The synovial fluid changes and the elasticity of the cartilage degenerates. The joint surfaces become irregular, flattened and poorly adjusted to each other. This causes the joint cavity between adjacent bones to narrow until eventually the cartilage disintegrates and the bones may directly scrape against one another.

Osteoarthritis is more common in weight-bearing joints such as the ankles, knees, elbows, wrists, spine and shoulder (wear and tear) and is commonly one-sided: for example, in the right thumb in right-handed people. Osteoarthritis gradually develops over several years and initially is not always painful, although in the later stages when the cartilage has disintegrated, inflammation sets in and muscle spasms may occur. Many older people have difficulty looking after themselves as their movement is restricted by severe pain and stiffness.

Although the specific triggers for osteoarthritis are unknown, it may be precipitated by excess salt consumption, which affects calcium metabolism, and obesity, which causes greater wear and tear. Because of the joint destruction that occurs, osteoarthritis is better for rest and worse for movement, as movement (particularly weight-bearing) increases the damage. Movement causes the joints to scrape together and increases the inflammation. Despite this, exercise is vital, so non-weight-bearing exercise such as swimming is excellent.

INFLAMMATORY ARTHRITIS

This category covers many forms of arthritis, the best example being rheumatoid arthritis. Rheumatoid arthritis is an autoimmune disorder in which the body attacks itself (similar to psoriatic arthritis, lupus (SLE), juvenile arthritis etc). Inflammation occurs as the body attacks the synovial membranes that secrete the lubricating fluid in the joints, and tissue and cartilage in the joints are gradually destroyed. The damaged tissue is replaced with scar tissue, so eventually the bones fuse together.

Causes of inflammatory arthritis

- High levels of the amino acid homocysteine in the blood (sufferers have 33 per cent higher levels than the general population).
- Oxidation (free radical damage) damaging the connective tissue.

- Immune complexes formed from long-term "allergies" initiating the autoimmune response. Wheat intolerance is a common problem.
- High meat (saturated fat) diets are inflammatory as they trigger the inflammatory response. By contrast, omega-3 fatty acids (from fish and seafood) are believed to trigger an anti-inflammatory response through the prostaglandin pathways.
- Dental problems — periodontal disease, root canals (infected teeth can spread pathogenic bacteria through the bloodstream).
- It has been reported that rheumatoid arthritis sufferers have a significantly higher history of lung diseases than the general population, and low-grade infections remain in the lungs for many years, setting the stage for an immunological cross reactivity.[1]
- There is a strong association between inflammatory arthritis and inflammation of the digestive system (particularly), as well as the urinary tract, the skin and sometimes the eyes.
- In Chinese medicine, the simplest associations are with inflammatory arthritis and:
    - "Damp" conditions — tissue and chronic infection, sluggish digestion (the patient prefers warming [if cold] or bitter [if hot] remedies).
    - "Wind" conditions, with the symptoms having the tendency to move quickly around the body (a hot-cold imbalance).
    - "Heat" conditions — inflammation as a defence that has become "stuck" and is associated with allergies such as sinusitis, hayfever, asthma and digestive disorders ie hypersensitivities (the patient prefers cold).
    - "Cold" with diminished vitality, low energy (the patient prefers heat).

Homocysteine

Homocysteine is an intermediary toxic substance produced in the metabolism of sulphur proteins. Lifestyle choices that increase homocysteine are consumption of coffee and alcohol, and smoking. Low levels of folic acid and vitamins B_{12} and B_6 increase homocysteine levels, as they prevent its metabolism. High levels of homocysteine are also implicated in a range of degenerative diseases including heart disease, atherosclerosis, chronic fatigue and fibromyalgia, kidney stones and neurological disorders such as dementia, Alzheimers disease and depression.

Rheumatoid arthritis afflicts 1-3 per cent of the world's population. It's mainly a disease of younger women between the ages of 20 and 40 and there's a minor hereditary association (rheumatoid factor can be found in the blood). The younger the incidence, the more likely it is to be acute. This means young women are more likely to have severe attacks (and acute onset) than older women. There is also a hormonal connection with rheumatoid arthritis, in that susceptible women have higher levels of circulating oestrogen and lower levels of testosterone. Local levels of hormones such as insulin, aldosterone, and growth hormone are elevated in arthritis, suggesting these hormones also play a pro-inflammatory role.

The symptoms tend to be symmetrical (affecting both sides of the body), associated with stiffness and swelling that is worse for rest. This is because the joints stiffen when not moving, as exercise improves drainage of the inflammatory fluid from the joint. Inflammatory arthritis can also present with shifting pains. It can come on very suddenly after a viral attack, bacterial infection or with severe stress. It's commonly accompanied by malaise and great fatigue.

GOUT

Gout is an acute form of inflammatory arthritis where excess uric acid (in the form of monosodium urate) is present in blood, tissue and urine, causing accumulation of crystals of uric acid (tophi) around the joints. Gout typically attacks the smaller joints of the fingers and toes, especially the right big toe, and deposits of urate crystals in the joints cause swelling, redness and heat along with extreme pain (often early in the morning).

Uric acid is the end product of purine (protein) metabolism in the liver. Gout is therefore a problem with digestion of protein and poor liver metabolism. It can be triggered by excess alcohol or a diet high in protein and rich food. Fruit (fructose increases production of uric acid) consumption and excess purines (from protein foods) can be a problem.

Gout afflicts approximately 0.3-0.4 per cent of the population of the Western world and can be hereditary. Ninety-five per cent of gout patients are typically men aged 30 and over. It's 20 times more prevalent in men than in women. Seventy per cent have over-production of uric acid and 30 per cent of sufferers have defective elimination of uric acid. Dehydration (not drinking enough water) can exacerbate the problem.

Pharmaceutical diuretics can also trigger gout (by increasing uric acid production) in those susceptible. Methylxanthines such as caffeine (coffee), nicotine (cigarettes) and theobromine (chocolate) are easily oxidised to uric acid. Lead exposure can also trigger gout in susceptible individuals. The nicotinic acid form of vitamin B_3 can increase production of uric acid.

THE PHARMACEUTICAL APPROACH

Orthodox medicine approaches the treatment of arthritis and joint pain from a palliative perspective. The relief of symptoms is the focus of the approach and the medicines used. Pain relief is critical and is important for quality-of-life issues. Analgesics or anti-inflammatory pharmaceuticals are the initial treatment of choice.

In severe rheumatoid arthritis, methotrexate (a chemotherapeutic drug) is increasingly being prescribed, which can adversely affect the liver and must be taken with folic acid as it is a folic acid antagonist. Immuno-suppressive drugs such as imuran and cyclosporin are also increasingly popular. These are drugs commonly used to reduce the rejection of transplanted organs.

While these medications relieve the pain and inflammation of arthritis, they have significant side-effects and none of them cures the disease. Although they may reduce the symptoms in the short term, they are also known to increase the chronicity and long-term severity of the problem.

With progressive osteoarthritis, badly affected joints can eventually be replaced by artificial joints. In patients with gout, allopurinal (Zyloprim) and colchicine are commonly prescribed and, once again, do help relieve the symptoms but they also have adverse effects on liver and kidney function and may cause bone marrow suppression.

NSAIDs

Non-steroidal anti-inflammatory drugs (NSAIDs) comprise an important class of medications that reduce the signs and symptoms of osteoarthritis and rheumatoid arthritis. They bring relief to millions of people but do not eliminate underlying disease. Disease-modifying anti-

rheumatic drugs also bring relief, but these drugs are often ineffective and not well-tolerated. Failure to provide long-term benefits combined with the high toxicity of most of the disease-modifying agents has prompted a search for more effective treatments. Standard drug therapy (for osteoarthritis) is only of palliative benefit and may exacerbate loss of cartilage.[2]

The COX-1 & COX-2 debate

COX-1 and COX-2 (cyclo-oxygenase 1 and 2) are enzymes that initiate conversion of arachidonic acid into the prostaglandin pathways. Blocking these enzymes reduces the body's ability to produce inflammatory compounds. However, these pathways also have a range of other functions and therein lies the problem.

COX-1 is expressed continually as it is responsible for the constant physiological regulation of day-to-day cellular and metabolic activities, such as maintaining stomach lining integrity, regulating blood flow within the kidneys and balancing platelet function.

COX-2 was discovered in 1991. It's called an "inducible" enzyme in that it is only expressed in response to a variety of inflammatory stimuli. COX-2 is found in the brain, the reproductive organs, the kidneys, the heart, blood vessels and osteoblasts (bone-forming cells). Its normal expression is minimal but, when activated, COX-2 is a key player in diverse inflammatory disorders and tumour genesis. Whether it's protective or harmful depends on the length of time it's present in excess.[3]

NSAIDs are prescribed for pain relief. Generally these are COX-1 inhibitors. The problem is, by inhibiting COX-1 and thereby reducing inflammation and pain, these drugs also inhibit the repair and maintenance of the stomach lining, thus being responsible for gastric ulceration in 30-50 per cent of patients.

The COX-2 inhibitors have significantly less gastro-toxicity but have recently been found to double the risk of heart attack and strokes after taking them for 18 months (compared with placebo). It's believed this is because they also increase clotting of the blood by blocking prostacyclins that are cardioprotective. This increases platelet aggregation and blood vessel constriction, which may also increase blood pressure.[4]

In severe cases of rheumatoid arthritis, corticosteroids are prescribed, although these have well-documented and serious side-effects.

THE COMPLEMENTARY APPROACH

Using nutritional, herbal or homoeopathic remedies, the focus is not simply on the palliation of symptoms. Instead, the health and possible regeneration of the joint are the primary projected outcomes. Joint spaces can be rebuilt given the correct conditions, by supplying the structural components, repairing the joint membrane and by reducing the inflammatory response.

Most herbal and nutritional anti-inflammatories work on both COX-1 and COX-2 pathways, with components such as polyphenols (flavonoids) and salicylates.[5] The disadvantage of herbs is they are slower-acting substances and can take 4-6 weeks for noticeable pain improvement. They do, however, have a longer duration of action and often work for 4–6 weeks after cessation of treatment.

Today, there are traditional alternatives to relieve the pain of arthritis as well as natural products that are becoming well researched. Two substances that have been well researched are the cartilage derivatives: glucosamine and chondroitin.

These are in the category of "chondroprotective" agents, which are defined as compounds that:

1. Support manufacture of joint structures such as collagen and cartilage.
2. Enhance manufacture of joint fluid.
3. Inhibit enzymes that break down tissue or inflammatory mediators in connective tissue.
4. Remove or prevent formation of fibrin, thrombi, plaque in the synovial fluids and/or blood supply, thereby increasing nutrient delivery to cartilage and reducing atherosclerotic formation in the joint.

Glucosamine salts have been shown to exert actions 1 and 2, while chondroitin sulphate exhibits actions 1, 3 and 4.

Glucosamine sulphate

In osteoarthritis, there is a progressive loss of cartilage proteoglycans (glycosaminoglycans, or GAGs) owing to an imbalance between cartilage synthesis and cartilage breakdown (usually reduced synthesis and increased breakdown). Glucosamine is a substance produced in the body that forms part of the structural backbone of the glycosaminoglycans that are components of cartilage. Glucosamine is the primary substrate and stimulant of proteoglycan synthesis and inhibits the degradation of proteoglycans. It also stimulates the production of hyaluronic acid — a compound responsible for the lubricating and shock absorption properties of synovial fluid. Given orally, it assists in the repair of damaged joints.

Glucosamine effectively reduces joint pain and inflammation with remarkable results within four to six weeks of use and this relief increases the longer it's used. The effects continue for up to four weeks after cessation of treatment.[6] Double blind studies demonstrate that, when taken orally, it decreases pain and increases mobility — without side-effects and with a greater than 50 per cent improvement in overall symptoms. Glucosamine has outperformed ibuprofen (brufen, nurofen — NSAIDs) in several clinical trials.

In summary, glucosamine stops or reverses the course of arthritis. It reverses joint tissue damage and restores cartilage lubrication to normal tissue levels. It relieves pain, restores joint flexibility, improves range of motion and walking speed and reduces tenderness — and all with minimal side-effects.

When taken orally, glucosamine is absorbed by the gastrointestinal tract with 26 per cent bioavailability and is incorporated into blood proteins.[7] It has been shown to be safe to use from four weeks to three years with adverse effects comparable to placebo. Short-term adverse effects can be mild digestive symptoms, drowsiness, skin reactions and headaches in a small number of people.

While there are almost no side-effects of glucosamine, here's what you need to know:

- Glucosamine should be safe for someone with an allergy to iodine or shellfish. However, if you notice any reaction, consult your doctor.
- Women who are pregnant and women who could become pregnant should not take these supplements as they have not been studied long enough to determine their effects on a child or on a developing foetus.
- There is some debate as to whether glucosamine may increase the risk of developing insulin resistance. Although glucosamine is classed as a carbohydrate, the body is unable to break it down into glucose, so it does not raise blood sugar. However, many factors can affect insulin secretion and blood glucose levels in diabetic patients.

Individuals with diabetes should check their blood glucose levels frequently when initiating glucosamine into their regimen.[8]

Chondroitin sulphate

Clinical trials with human patients (over six weeks) have shown that when compared with indomethacin and ibuprofen (NSAIDs), chondroitin sulphate is more effective on cellular events of inflammation. It's slower acting but is devoid of any of the dangerous side-effects of these drugs on stomach, platelets and kidneys. Chondroitin sulphate is anti-inflammatory and chondroprotective.[9]

Studies have shown that taken with glucosamine in cases of osteoarthritis of the knee, there is improved joint functionality and the patients in the glucosamine-plus-chondroitin-sulfate group were able to lower their use of pain medication significantly.[10] Chondroitin sulphate is active on leukocyte (white cell) functions and protects cell membranes. Orally administered, it reaches the synovial fluid and cartilage and modifies pharmacological and biochemical markers in patients with osteoarthritis.

The therapeutic activity of chondroitin sulphate is attributed to:

1. Its anti-inflammatory activity on cellular mechanisms.
2. The increase of synthesis of hyaluronate in the synovial fluid.
3. Its direct antidegradative effects — inhibiting the degradative enzymes collagenase, elastase, proteoglycanase, thus decreasing collagen breakdown.
4. Its ability to decrease reactive oxygen species in the joint.
5. It stimulates the formation of new cartilage.[11]

Chondroitin sulphate is well absorbed, with peak concentration in 2–6 hours in plasma after an oral dose. Chondroitin sulphate has a high molecular mass but easily crosses the gastric and intestinal mucosa and shows an affinity for cartilaginous tissues in humans.[12]

Dietary changes

Traditional advice for arthritis has long advocated the need for a diet that limits excess "acid-forming" foods such as grains, dairy and meat in favour of plenty of "alkaline-forming" foods consisting of mostly vegetables and fruit. These should form a major part of the diet. In one study, 145 rheumatoid arthritis patients were compared with 188 subjects who were free of rheumatoid arthritis. People who consumed the most vegetables were found to have a 75 per cent reduction in their risk of developing rheumatoid arthritis.[13]

Vegetable juices, such as carrot and celery, are an excellent alkalising drink. Adding ginger can be warming and can have extra anti-inflammatory benefits. Alfalfa is considered alkalising. Alfalfa (juice) reduces the acidity associated with rheumatoid arthritis and it contains all the minerals essential for correct bone formation. Note: some people with rheumatoid arthritis are intolerant to components of alfalfa, so be careful with initial use.

Avoid sugars, coffee, alcohol and refined flour products (eg white breads, biscuits, rice, pasta etc) as these tend to be more acid-forming. Cut down on saturated fats and red meat and include cold-pressed olive and flaxseed oils and fish in your diet. Reduce (avoid) processed and packaged foods and eat whole fresh foods.

Make sure you have enough fibre, especially soluble fibre such as slippery elm powder. Supplement with lactobacilli either as powders/capsules or as yoghurt.

Arthritis is often associated with poor digestion, so chew carefully and relax when eating. Herbs that help the liver and digestion can be used. Unpasteurised apple cider vinegar in

water, sipped before meals, may help with digestion. Pure water is excellent for detoxifying the liver and removing acidic wastes, so make sure you drink at least two litres per day.

Avoid foods you may have particular sensitivities to such as dairy, wheat or the nightshade family, as these can aggravate arthritic symptoms. The nightshade family includes tomato, potato, eggplant, green and red capsicum, paprika and chilli. Oranges (and orange juice) often need to be avoided as they can irritate the liver and worsen arthritic symptoms.

Supplements

Osteoarthritis

- Vitamin D from exposure to sunlight alleviates osteoarthritis. People with the highest intake of Vitamin D throughout their life have the lowest incidence of osteoarthritis. Vitamin D regulates calcium metabolism, moving it out of tissue and into bone.
- Vitamin C retards the erosion of cartilage and increases the synthesis of the glycosaminoglycans that repair damaged osteoarthritic joints.
- Vitamin E alleviates the pain associated with osteoarthritis (by inhibiting the inflammatory prostaglandins. Essential fatty acids, particularly omega 3 fatty acids, also regulate these prostaglandins and reduce inflammation).
- Vitamin B_6 reduces the size and inflammation of Hebderden's Nodes in osteoarthritis patients.
- Folic acid and vitamin B_{12} have been shown to improve the grip strength of osteoarthritis patients with equal efficacy to NSAIDs.

Inflammatory arthritis

- **Essential fatty acids (EFAs)** such as evening primrose oil, fish oils, emu oil and flaxseed oil are critical in regulating the inflammatory pathways and in reducing inflammation. As they are slow-acting, significant relief can take 3-6 months. In sufferers with osteoarthritis, increased consumption of omega-3 fatty acids and adequate intake of mono-unsaturated fatty acids such as those found in olive oil (and decreased consumption of omega-6 fatty acids) can improve symptoms and even allow a reduction in the use of NSAIDs.[14] The most effective of the omega-3 fatty acids are oils containing eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), which are found in abundance in coldwater fish.[15] The omega-3 fatty acids reduce the underlying disease progression in rheumatoid arthritis.
- **Antioxidant nutrients**: Researchers have found that patients with rheumatoid arthritis have significantly elevated levels of oxidative products in their blood. Levels of important antioxidants, including vitamin E, glutathione and betacarotene, were all reduced in rheumatoid arthritis.[16] Studies have also documented that adequate intake of antioxidants including vitamin C and vitamin E, as well as the minerals copper and zinc, may help reduce older women's risk of developing rheumatoid arthritis.[17]
- **Zinc** relieves joint swelling and morning stiffness and arthritis sufferers are usually deficient in this important mineral. Zinc activates the essential fatty acid pathways, along with magnesium and vitamin B_6.
- **Quercetin** reduces inflammation by inhibiting the degranulation of mast cells, and bromelain (a sulphur-based proteolytic enzyme extracted from pineapple) minimises the inflammation and improves the digestion of quercetin. Bromelain "digests" the immune complexes that trigger allergies and autoimmune disease.

Herbal treatments

Many herbs considered useful to reduce inflammation have been tested in patients with musculo-skeletal disorders such as arthritis and joint pain. A select few of the most commonly used are listed here.

- **Nettle leaf** (*Urtica dioica*) is useful for the treatment of osteoarthritis and rheumatoid arthritis as it reduces the levels of interleukin 1 and tumour necrosis factor alpha, which are strong factors in the development and progression of both arthritis types when produced in excess. A study investigating the effects of nettle leaf extract found it blocked the chemicals linked to cartilage degradation.[18] Extracts of nettle leaf are well-known for positive effects in the treatment of rheumatic diseases due to its capacity to inhibit inflammatory substances.
- **Gotu kola** or **penny wort** (*Centella asiatica*): Gotu kola has a long history of use for connective tissue repair. In treating arthritis, it has anti-inflammatory capabilities as well as being a general antimicrobial agent against a broad range of micro-organisms. It's also termed an "adaptogen", meaning it generally improves the body's responsiveness to stress, allowing it to adapt more readily. Gotu kola also helps strengthen collagen in the joints and increases the formation of glycosaminoglycans and chondroitin sulphate.[19]
- **Boswellia (***Boswellia serrata*) from India and China is a resin (gum) that can be used as frankincense. It can be taken orally or used as a cream. Boswellia inhibits the lipooxygenase pathway, which is a major mediator of the inflammatory process. Boswellia has been shown to relieve inflammation and to prevent the degradation of connective tissue. It is a slow acting anti-arthritic, but has no ulcerogenic effects on the stomach or digestive system.[20] The dose usually recommended is 200-400mg boswellia extract or 2.4-4.8g resin. Boswellia is an effective herb in conditions where leukotrienes are the main inflammatory mediators, such as inflammatory bowel disease, asthma, rheumatoid arthritis, psoriasis and autoimmune diseases generally. In inflammatory bowel disease, boswellia is as effective as prednisolone and sulphasalazine.
- **Devils claw** (*Harpagophytum procumbens*) in aqueous solutions has been shown to relieve osteoarthritis. It lowers inflammation through the prostaglandin cascade and lowers the matrix degrading enzymes in chondrocytes.[21]
- **Turmeric** (*Curcuma longa*): Curcumin is a component of turmeric and is an anti-inflammatory compound that inhibits both COX-2 and lipoxygenase enzyme activity.[22] A study investigating capsaicin from red pepper and curcumin found these two nutrients decrease the production of inflammatory chemicals. Curcumin and capsaicin also inhibited the breakdown of cartilage that characterises arthritis.[23] To obtain the best effect, and for curcumin to be effectively assimilated into the bloodstream, it must be combined with small amounts of piperine (a component of black pepper). Piperine has been shown to enhance the blood concentration, the bioavailability and the extent of absorption of curcumin in humans, without any adverse effects.
- **Ginger** is an anti-inflammatory and antirheumatic agent used in Ayurvedic medicine. Ginger extract blocks activation of inflammatory mediators such as COX-2 and TNFα, as well as suppressing the inflammatory prostaglandin E2 pathway. In a two-and-a-half-year study that investigated the effects of powdered ginger on people who had either rheumatoid arthritis or osteoarthritis, approximately 75 per cent of the patients

experienced pain relief and decreased swelling, and there were no reports of adverse effects.[24]

- **Green tea extracts:** There is significant research to suggest that compounds found in green tea, including the polyphenol epigallocatechin gallate (EGCG), can interfere with the progression of osteoarthritis and inflammatory arthritis. Studies have already shown that green tea extracts inhibited the expression of inflammatory substances in arthritic joints. In a study of osteoarthritis, researchers found EGCG was a potent inhibitor of cartilage damage.[25]
- **Brewed apple cider** (two tablespoons in warm water before breakfast) can be effective in helping to relieve arthritic pain, especially from osteoarthritis.

Homoeopathy

While there are useful homoeopathic remedies to relieve inflammation and joint pain in sufferers of arthritis from an acute symptomatic perspective, for classical homoeopathic treatment, the "constitutional" remedies need to be individually prescribed by a qualified homoeopath.[26] However, acute remedies that can be considered and the symptoms they treat are as follows.

- **Aconite:** Rheumatic pain that is worse for exposure to cold air and comes on suddenly.
- **Antimonium crudum** is effective if joint and muscle pain alternates with digestive complaints. This remedy is particularly indicated if the symptoms worsen in sunshine or if overheated.
- **Apis** is frequently used if there is inflamed and painful swelling. Apis patients are worse for warmth and better for fresh air. Apis is indicated for arthritis in the fingers, especially in women who are suffering from menstrual disorders.
- **Bryonia alba** is a principal remedy for acute joint pain, the main symptom being a change for the worse with any movement and therefore better for rest. Bryonia also has associated digestive symptoms. Bryonia can be successfully prescribed when the patient is better for cool weather (worse for heat) and with pressure on the affected area.
- **Rhus toxicodendron** (*Rhus tox*) is regarded as the ideal remedy for patients with the opposite symptoms to Bryonia. Rhus tox would be prescribed if the patient was better for movement. The patient is often anxious and restless, especially at night. They are better with warmth — hot baths, hot drinks, sweating and regular exercise. The patient is worse for cold and damp, at night and if inactive.

Bryonia and Rhus tox are often prescribed at different stages of the condition, with Rhus tox being indicated in the later stages.

One study published in the *British Journal of Clinical Pharmacology* showed that 82 per cent of patients with rheumatoid arthritis experienced some degree of relief after being prescribed an individually chosen homoeopathic medicine. Only 21 per cent of patients given a placebo received a similar degree of relief.[27]

Creams and ointments

- **Glucosamine cream**, when rubbed into the painful area, reduces pain in a short period of time. It would need to be applied regularly for months for significant joint improvement, but for symptomatic relief, it can be very useful.

- **Capsaicin cream** made from hot chillies (*Capsicum annum*) is another useful cream to give relatively speedy pain relief. Chilli has a counter-irritant effect that reduces inflammation.
- **Emu oil** (high in omega-3 fatty acids) applied topically has powerful anti-inflammatory properties and, when rubbed into the joint, relieves pain. As a skin application, emu oil is nearly twice as effective as fish oil in relieving arthritis.[28]

OTHER THERAPIES

Although there is minimal research on whether magnets and copper bracelets can reduce the pain of inflammatory arthritis, there is a long history of use and many anecdotal reports of their efficacy.

Exercise

Exercise is vital for health, but with arthritis, choose your form of exercise carefully. In osteoarthritis, non-weight-bearing exercise is important so that you don't aggravate the joint destruction, particularly when the condition is acute. Exercise such as swimming may be best and there are specific programs for this.

In rheumatoid arthritis exercise it's very important to maintain joint function. Gentle rhythmic exercise is good to drain inflammatory products from the joint spaces. Walking, bike riding and even lifting gentle weights can help.

Recommended program for osteoarthritis

Glucosamine: 1500mg/day (preferably as sulphate)
Chondroitin: 1000mg/day
EPA and DHA: 1400mg/day of EPA and 1000mg/day of DHA
Curcumin: 900mg/day, with 5mg of piperine
Ginger: 60mg/day
Bioflavonoids: 300mg/day, including quercetin
Nettle leaf extract: 375-500mg/day
SAMe: 400-1200mg/day, with folic acid, vitamins B_6 and B_{12}
Green tea extract: 725mg/day of green tea yielding at least 246mg of EGCG
Vitamin C: 1-3g/day
Vitamin E: 400IU/day, with 200mg of gamma-tocopherol

Recommended program for rheumatoid arthritis

EPA and DHA: 2100mg/day EPA and 1500mg/day DHA
GLA: 900-1800mg/day (from evening primrose oil)
Boswellic acid: 300mg/day
Curcumin: 900mg/day, with 5mg piperine
Ginger: 60mg/day
Bioflavonoids, including quercetin: 400mg/day
Nettle leaf extract: 375-500mg/day
SAMe: 400-1200mg/day
Glucosamine: 500mg/day
Green tea extract: 725mg/day of green tea powder yielding at least 246mg of EGCG
Vitamin C: 1-3g/day
Vitamin E: 400IU/day, with at least 200mg gamma tocopherol

Dietary changes to relieve gout

To reduce the symptoms of gout, a low-purine diet is essential. Purines are formed by the metabolism of proteins, so a diet with moderate protein, higher carbohydrate and low fat works well. Tofu (soy protein) is the preferable source of protein, as it has been shown to increase uric acid clearance and excretion. Uric acid excretion is reduced by fats and increased by carbohydrates. Excessive dieting will increase the risk of a gout attack. Dieting raises levels of ketones in your body and ketones increase uric acid production. It's important to drink at least two litres of pure water per day, as this increases uric acid excretion.

If you can afford it, and if you can find them, cherries should be a part of every gout sufferer's diet. This is because 250g per day of fresh or canned cherries is particularly effective in lowering uric acid levels. Other red-blue berries prevent joint destruction and are powerful antioxidant and anti-inflammatory foods.

The gout diet

Avoid foods high in purines

Anchovies, brains, meat broths, goose, heart, herring, liver, kidney mackerel, meat extracts, mince, mussels, roe, sardines, scallops, sweetbreads, yeast

Moderate purine foods — eat in moderation

Fish, poultry, meat, asparagus, dried beans, lentils, mushrooms, peas, spinach

Low purine foods — can be consumed regularly

Wholegrain cereals, rice, dairy products such as yoghurt, nuts and seeds, a wide range of vegetables and herbs, olives, oils (olive oil is best)

Supplements to relieve gout

- **Folic acid** lowers uric acid levels in gout sufferers by inhibiting the xanthine oxidase enzyme that catalyses the production of uric acid.
- **Vitamin C** facilitates the excretion of excessive uric acid, but too high a dose may increase uric acid production through oxalic acid.
- **Quercetin** inhibits the xanthine oxidase enzyme, which subsequently causes a reduction in uric acid production (works like the drug allopurinol — Zyloprim, Capurate). Quercetin also reduces the inflammatory response and should be taken with bromelain to improve absorption.
- **Fish oils** reduce the inflammation in inflammatory arthritis (including gout) and should be taken with vitamin E.
- **Celery seeds** alleviate gout by increasing uric acid excretion, thereby assisting in ridding the body of uric acid crystals that can build up in the joints. Their anti-inflammatory effect will also reduce swelling around the joints in other forms of arthritis.
- **Alfalfa** (and celery) are excellent for alkalising the system and so balance the uric acid and increase its excretion.

Dr Karen Bridgman is a naturopath practicing at Pymble Grove Clinic and lectures in the Masters Degree in Herbal Medicine at the University of Sydney.