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Gout is a type of inflammatory arthritis caused by uric acid crystals depositing in the joints, which triggers inflammation. The body’s immune system attacks the crystals, causing pain, redness and swelling in the joint and sometimes in the surrounding tissue. Active periods of gout are known as “attacks” and can vary in severity and length.

High levels of uric acid cause gout but not everyone with high uric acid levels develops gout. Uric acid results when our bodies break down purines — crystalline compounds that occur naturally in our cells and in some high-protein foods. Uric acid is transported by the blood to the kidneys and eliminated in urine. When levels are too high, either because the body can’t excrete uric acid or has conditions that cause high levels of uric acid in the body, the uric acid crystals can form in the joints. These crystals can build up under the skin and form hard bumps called tophi.

Gout can affect the soft tissues (bursa and tendons) around the joints. Affected areas become red, hot and swollen as well as painful. Also unlike other forms of arthritis, gout is characterized by sudden onset but also complete resolution of attacks.
Tophi are bumps that can form when uric acid crystals build up. They are typically small and hard and can form anywhere on the body. Often they form on the toes, knees, heels, fingers, ears, forearms or elbows. Tophi are usually painless; however sometimes they can become inflamed and excrete a thick discharge. Tophi often don’t form until several years after the first gout attack but in some cases they appear in people who have never had a gout attack. Tophi can be irritating and are often surgically removed where possible.

Gout attacks can happen in any joint but often impact those in the lower limbs such as the knees, ankles and feet. Many people experience their first gout attack in the base of the big toe. Initial attacks usually subside after three to 10 days; however, without treatment, attacks can last longer. Some people never experience another attack; however, more than 50 per cent of people will have another attack within a year. Over time, attacks may become more frequent, last longer and impact more joints. Recurring gout attacks can cause permanent joint damage so early diagnosis and treatment are key.

**Early signs of gout**

Gout attacks, particularly early ones, seem to come on suddenly with the fast onset of a red, painful, swollen joint; in reality they take place after uric acid has been building in the system for a period of time. Attacks often happen after something, such as a night of drinking alcohol or a period of dehydration, causes uric acid levels to spike. These occurrences are known as “triggers.”
What is Gout?

Symptoms often appear at night and get worse over the next eight to twelve hours. Although the initial attack often takes place in the base of the big toe, gout can also attack the knee, heel, ankle or instep. Gout pain is persistent and intense and swelling can progress beyond the original joint.

**How is gout diagnosed?**

To diagnose gout, your doctor will ask about recent medications and diet. They will want to know about the onset, length, intensity and joints involved in your attack. A blood test can determine uric acid levels; however, high levels do not necessarily indicate a gout attack since many people with elevated levels of uric acid do not develop gout. Also, for reasons not completely understood, uric acid levels tend to drop during a gout attack! An MRI, X-ray, CT or ultrasound may be done to examine soft tissues and joints. A definitive diagnosis can be made by inserting a needle into the joint and taking a sample of fluid, which, in the case of gout reveals uric acid crystals.

**Why is treatment for gout so important?**

Gout attacks tend to increase in length and frequency without treatment and can even become chronic. The ongoing presence of uric acid crystals in and around the joint can lead to destruction of the joint and soft tissues. After repeated gout attacks, crystals can form in masses called tophi. These most often show up in the fingers, Lifestyle changes are an important part of treatment and can help prevent and manage many conditions associated with gout.
toes or elbow but can appear anywhere in the body. This is called **tophaceous gout**.

Fortunately, with proper medical attention and treatment, few patients progress to this advanced stage. Most people living with chronic gout can control the condition with medication. Lifestyle changes are an important part of treatment and can help prevent and manage many conditions associated with gout. Early diagnosis and treatment reduces the chance of permanent joint damage and can minimize attacks.

**Risk factors**

Since gout is directly related to uric acid levels in the blood, risk factors are primarily associated with the production and excretion of uric acid in the body.

- **Diet**: Foods rich in purines, such as red meat, and certain seafoods, such as oily fish, raise uric acid levels in the body since purines break down into uric acid. Alcoholic beverages — beer and red wine in particular — are high in purines. Sugar — particularly fructose found in soft drinks — increases uric acid levels.

- **High blood pressure**: High blood pressure increases the risk of gout. Also, those who take diuretic medications to treat high blood pressure are at an increased risk. This is because diuretics taken to lower blood pressure, increase uric acid levels. Taking aspirin at low doses also increases uric acid levels.

- **Obesity**: People with high body weight are more likely to develop gout and at a younger age than those with lower body weight. Over the past twenty years the incidence of gout has nearly doubled.
Many believe this is due to a tendency towards obesity in the general population.

- **Medication**: Some medications block the excretion of uric acid in the kidney. In general, diuretics and medications that repress the immune system can increase risk of gout.
- **Trauma**: Gout can be brought on by surgery, heart attack or other physical and even emotional trauma.
- **Kidney disease**: Even mild kidney disease can result in reduced excretion of uric acid from the body.
- **Heredity**: If someone in your family has gout, you have a higher chance of developing the disease since gout does run in some families. However, many people who develop gout do not have a family history of the disease.
- **Gender**: Up until the age of 60, men are more likely to develop gout than women. Researchers believe that, prior to going through menopause, estrogen shields women from gout.
- **Dehydration**: Dehydration can contribute to gout attacks.
Managing Gout

Given its direct link to uric acid levels, managing gout depends primarily on a strategy for eating well and managing the intake of foods that contribute to increased uric acid levels. Healthy kidney function is important as well since uric acid is excreted by the kidneys. The kidneys rely on the heart to efficiently pump and oxygenate blood which the kidneys then filter. People who are overweight or obese are more prone to heart disease so staying physically active and managing weight assist in controlling gout.

Food choices

Managing gout is as much about what not to eat as it is about what to eat. In general, those suffering from gout need to avoid foods high in purines, as follows:

- Red meat and organ meats (liver, tongue, sweetbreads)
- Shellfish (such as shrimp, lobster, mussels)
- Oily fish (such as herring, sardines, mackerel)
- Sugary beverages (including pop and some juice)
- Excessive alcohol (more than one drink/day for women and more than two drinks/day for men)
- Beer, in particular, has been linked to gout attacks
- Any food, drinks or sauces containing corn syrup

There are some foods that lower uric acid levels and others that are just good for your heart, as follows:

- Skim milk and other low-fat dairy products
- Whole grain foods
- Plant oils (olive, canola, sunflower)
- All vegetables
- Cherries and some other fruits (those that are less sweet)
- Vitamin C supplements (500–1,000 milligrams daily)
- Coffee
- Water

**Eating well to control weight**

Gout is more common in obese and overweight people so losing weight and maintaining a healthy body weight helps manage gout. Losing weight reduces uric acid levels in the blood and for many the more weight they lose, the more their uric acid levels decrease. Maintaining a healthy weight also decreases the risk of heart disease which has been shown to contribute to gout symptoms.

Proper nutrition is vital to controlling body weight. Here are three ways to cut back on excess calories:

- **Reduce fat intake:** A healthy diet should include a small amount of unsaturated fats and limited amounts of saturated and trans fat. Choosing the right amount and types of fats help you achieve and maintain a healthy body weight.
- **Reduce sugar intake:** Sugar contains “empty” calories and has no nutritional value. This includes syrup as well as white, brown, cane and raw sugar. Limit or avoid adding sugar to drinks and cereals. Although artificial sweeteners contain fewer calories, it is best to get used to food being less sweet. Use dried, unsweetened fruit like raisins, cherries or dates to sweeten cereals since they provide vitamins, minerals and fibre.
- **Eat more vegetables and fruit:** Vegetables and fruit should make up the largest component of your diet. Having said that, people suffering from gout need to choose the least
sweet fruits to reduce sugar intake. Try to have at least one vegetable or fruit at every meal and while snacking. Besides being an excellent source of energy, vegetables and fruit boost your fibre intake, which helps with weight management. They are also loaded with antioxidants, which help boost the immune system and may help maintain healthy cartilage.

**Physical activity**

Along with eating well, staying physically active helps maintain a healthy weight and healthy joints. Those suffering from gout are encouraged to stay active between attacks. During a gout attack, resting the joint and at most performing light range of motion exercise is recommended; however, once the inflammation is controlled and the symptoms pass, physical activity protects joints by strengthening the muscles around them.

A common misconception is that a painful joint requires rest. On the contrary, not enough exercise can cause worsening joint pain and stiffness and muscle weakness. Strong muscles and tissues support joints that have been weakened or damaged by gout. A physical activity program, designed with advice from a health-care provider, such as a physician, physiotherapist or occupational therapist, allows someone with gout to lead a more productive and enjoyable life by reducing pain and fatigue, improving mobility and overall fitness, and alleviating depression.
Exercise

There are different types of exercises you can do to decrease pain and stiffness:

- **Flexibility** exercises, including stretches and range of motion exercises, improve flexibility and can reduce pain and stiffness and help keep your joints moving. Range of motion refers to the amount your joints can move in certain directions. Stretches elongate muscles and are best done when muscles are already warmed up. Ideally, you should complete range of motion exercises every day even on days when your joints are sore. For some ideas about stretches, visit arthritis.ca/videos and view the “Simple Stretches” video.

- **Strengthening** exercises maintain or increase muscle tone and protect your joints. These exercises include weight training done with “free” weights, your own body weight or weight machines.

- **Endurance** exercises strengthen your heart, give you energy, control your weight and help improve your overall health. These include walking, swimming and cycling including stationary bikes. It is best to avoid high-impact exercises like step aerobics, jogging or kickboxing.

Recreation

There are many low-impact exercise options that can benefit people living with arthritis and gout. Consult your health-care provider to find an exercise(s) that is suitable to you and your particular condition. Examples include:

- **Tai chi**, an ancient Chinese martial art, is a combination of movements performed in a slow, focused manner. Though it has many variations
and styles, tai chi is a low-impact exercise and is reminiscent of both yoga and meditation. Tai chi can improve pain and physical function in some people as well as alleviate depression and contribute to health-related quality of life.

- **Yoga.** Numerous studies have been done about the benefits of yoga in treating stress and anxiety. The practice of breath control, simple meditation and stretching can improve a person's state of mind and help them better manage pain. Regular yoga under the guidance of a certified instructor can boost one's general health and increase energy levels.

**NOTE:** People living with arthritis should avoid strenuous yoga routines, such as Bikram and power yoga.

**Try to avoid triggers**

Gout is often brought on by external stresses so being aware of these and avoiding them where possible can assist in preventing further attacks. These are some of the triggers that can bring on gout attacks.

- Joint injury
- Surgery
- Infection
- Diuretic medications
- Forgetting to take your gout medication
- Crash diets and fasting
- Drinking too much alcohol
- Eating large quantities of foods high in purines
- Dehydration

**Cold therapy and heat**

During a gout attack, as well as taking NSAID medication, using cold can help reduce pain. Cold reduces blood flow to the injury which helps reduce
swelling and inflammation. Cold should not be applied for longer than 20 minutes at a time. As a general rule, 20 minutes on, 20 minutes off, works well. Always use a protective barrier, such as a towel, between any cold pack and the skin.

**Heat:** Heat should NOT be used DURING a gout attack since applying heat can make symptoms worse. However, between attacks, taking a warm shower and using warm packs (such as hot water bottles or microwavable heating pads) are great ways to help reduce general pain and stiffness. Heat is ideal for:

- relieving pain and stiffness
- relieving muscle spasms and tightness
- enhancing range of motion

**Cold:** Using a commercial cold pack or a homemade one (from crushed ice, ice cubes or a bag of frozen vegetables) can be helpful. Cold is ideal for:

- swelling
- decreasing pain
- constricting blood flow to an inflamed joint

**Relaxation and coping skills**

Developing good relaxation and coping skills can help you maintain balance in your life, giving you a greater feeling of control over your gout and a more positive outlook. Relaxing the muscles around a sore joint can help to reduce pain. Although gout attacks tend to be very painful, there are ways to help you relax. Try deep breathing exercises. Listen to music or relaxation tapes. Imagine or visualize a pleasant activity, such as lying on a beach. Also, visit The Arthritis Society’s free self-management e-learning tools at [arthritis.ca/education](http://arthritis.ca/education).
Treatments for Gout

When having an attack

When suffering a gout attack, take these steps to bring pain and swelling under control:

• Take an anti-inflammatory medication as soon as possible but only on the advice of your doctor
• Ice, elevate and rest the joint
• Drink plenty of fluids — but no alcohol, pop or sugary drinks
• Pay attention to the joint(s) involved, the intensity and changes in pain, the length of the attack
• Call your doctor to set an appointment to be assessed and have blood work done
• Relax — avoid stress since it can aggravate gout

What medications are used to treat gout?

Preventing further gout attacks and the joint damage they can cause is the goal in treating gout. As well as managing diet and weight, several medications effectively prevent pain and swelling in the short term and others lower uric acid levels over the long term. You should discuss short and long term options with your doctor.

Non-Steroidal Anti-Inflammatory Drugs (NSAIDs)

Non-steroidal anti-inflammatory drugs (NSAIDs) are used to treat pain and inflammation. They do not contain steroids so are referred to as “non-steroidal.” NSAIDs are a large, commonly used category of medications. Many can be obtained without a prescription, such as acetylsalicylic acid (ASA) which
has brand names such as Aspirin®, Entrophen®, Novasen®; ibuprofen branded as Motrin® or Advil; and naproxen branded as Aleve®. There are more than 20 NSAIDs currently available.

These medications control the symptoms of gout, but do not alter the course of the disease. Gout medications that reduce swelling are most effective if taken at the first signs of an attack. NSAIDs can be taken as needed as opposed to on an ongoing basis. That being said, some patients may find it helpful to take NSAIDs regularly to control their symptoms. You and your doctor can decide what is suitable for you.

Indigestion, heartburn, stomach cramps and nausea are the most common side effects of NSAIDs. NSAIDs can affect the protective lining of the stomach, making patients more susceptible to ulcers and bleeding. COX-2 inhibitors (COXIBs) are a class of NSAIDs developed to minimize the risk of stomach ulcers; however, they have all the other side effects of NSAIDs. Stomach protective medications such as misoprostol and proton pump inhibitors can minimize the impact NSAIDs have on the stomach. It is also important to maintain good blood pressure control while taking these medications.

Colchicine

For those unable to take NSAIDs, colchicine is an option. Derived from the autumn crocus plant, colchicine has been used to treat gout for more than several medications effectively prevent pain and swelling in the short term and others lower uric acid levels over the long term.
2,000 years, and helps relieve the pain and swelling of acute attacks. Colchicine is most effective if taken at the first signs of a gout attack. A high percentage of patients cannot take colchicine due to its side effects — abdominal pain, nausea and diarrhea. If these symptoms occur, discuss these with your doctor immediately. A good rule of thumb is to then reduce your dose by half.

**Corticosteroids**

For those who cannot take either NSAIDs or colchicine, oral or injected corticosteroids are the best option.

These are given either orally or as injections into the affected joints. Injections tend to work quickly, within a few days or even within a few hours for some patients. Steroid injections are safe for most people; however, steroids do not typically play a significant role in the long-term management of gout. As a general rule, a reasonable approach is to limit the frequency of injections to three or four to each joint per year. Those who have had a serious allergic reaction to steroids, or who have an infection in the joint or in the skin or soft tissue surrounding the joints, should not receive corticosteroid injections.

**Medications that reduce uric acid levels:**

Medications that reduce uric acid levels are intended to prevent future gout attacks and keep the condition from becoming chronic. These are sometimes not started until a current attack has ended since they can prolong or worsen gout attacks; however this practice is changing and some patients may be started on allopurinol during an attack. Once you start taking
these drugs, the crystals in your joints may move, triggering another attack; however, staying with the treatment plan is the best way to keep the cycle from starting again. If you suffer a gout attack while on these medications it is important not to stop the medication.

Going on these medications can end up being a lifetime commitment since going on and off medications that control uric acid levels can bring on gout attacks. For this reason, doctors typically wait to see how regular gout attacks are before prescribing such medications. Two to three attacks a year is often the number looked at before prescribing uric acid controlling medications.

**Allopurinol**

Allopurinol reduces uric acid levels no matter whether the root cause is the overproduction of uric acid or inadequate excretion by the kidneys. Allopurinol is often prescribed at a low daily dose initially with the dose increasing over time. Allopurinol is excreted through the kidneys and only low doses can be tolerated by people with kidney disease. Initial use may cause a rash; however, severe allergic reactions are rare. If you develop a rash on allopurinol you should stop it immediately and contact your physician.

**Febuxostat**

Prescribed if you have reaction to allopurinol or if you have kidney disease since it is excreted by the liver. Febuxostat is a daily medication that works by blocking the formation of uric acid in the body. Febuxostat is a brand name drug, known as Uloric, that is more expensive than allopurinol but has a similar impact.

**Probenecid**

Probenecid has been on the market for decades and acts on the kidneys by increasing uric acid excretion. As a result, it can trigger the development of kidney stones so is generally looked at as a third option.
Pegloticase

Used when the drugs mentioned above do not lower uric acid levels, a condition known as refractory or chronic gout.

Surgery

Fortunately, surgery is rarely required for gout. Occasionally surgery must be considered for patients who have suffered from gout over a long period of time. It is used to remove particularly problematic tophi or to repair badly damaged joints. Generally, with proper medication and treatment, these severe situations are avoided.
The Arthritis Society has been setting lives in motion for over 65 years. Dedicated to a vision of living well while creating a future without arthritis, The Society is Canada’s principal health charity providing education, programs and support to the over 4.6 million Canadians living with arthritis. Since its founding in 1948, The Society has been the largest non-government funder of arthritis research in Canada, investing over $190 million in projects that have led to breakthroughs in the diagnosis, treatment and care of people with arthritis.

**Become a Volunteer**

Help others through meaningful work. By volunteering with The Arthritis Society, you can give back to your community, learn new skills, gain work experience and meet new friends. Visit arthritis.ca or call 1.800.321.1433.

**Donate Online**

Donations to The Arthritis Society support vital research and services that help improve the lives of people with arthritis. There are many ways to give, visit arthritis.ca/donate to make a contribution and learn more.
How We Can Help

The Arthritis Society offers free education, programs and support to Canadians living with arthritis.

- **Programs and services:** Join us for adult and child educational sessions, such as the Chronic Pain Management Workshop ([arthritis.ca/cpmw](http://arthritis.ca/cpmw)) and various public forums.

- **Online self-management courses:** Try e-learning programs like *You and Your Health-Care Provider: A Guide for Effective Conversations* and *Overcome Fatigue* ([arthritis.ca/education](http://arthritis.ca/education)).

- **Publications:** We publish several information booklets to help people living with arthritis understand more about their condition and treatment options as well as tips on how to self-manage. For a list of arthritis conditions and related resource materials, including a digital copy of this information, visit [arthritis.ca/publications](http://arthritis.ca/publications).

Learn more and connect with our online community at [arthritis.ca](http://arthritis.ca).

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