## THEORETICAL PART

# Nutritional correction for diseases of the musculoskeletal and urinary system

#### DIET IN DISEASES OF THE MUSCULOSKELETAL SYSTEM

Musculoskeletal disorders are among the most common of human afflictions. They affect all age groups and frequently cause disability, impairments, and handicaps. They consist of a variety of different diseases that cause pain or discomfort in the bones, joints, muscles, or surrounding structures, and they can be acute or chronic, focal, or diffuse. Approximately 33 percent adults are affected by musculoskeletal signs or symptoms, including limitation of motion or pain in a joint or extremity. The prevalence of musculoskeletal disorders generally increases with age, with the majority of persons aged sixty-five and over having some form of musculoskeletal disorder, especially arthritis.

Contained within the broad category of musculoskeletal disorders are a number of specific diseases and causes of pain, several of which affect a large percentage of the population. Musculoskeletal disorders range from back pain to rheumatoid arthritis and gout, and include different types of arthritis, tendinitis, and musculoskeletal pain. The most prevalent disorders are low back pain, osteoarthritis, and so-called soft tissue rheumatism. Even though they afflict millions of persons around the world, several of the common musculoskeletal disorders fall into the category of moderately prevalent, including gout, a form of episodic arthritis; fibromyalgia, a disorder of diffuse muscular pain and a subtype of soft tissue rheumatism; and rheumatoid arthritis, an inflammatory systemic disorder that causes widespread joint pain.

#### Low back pain

Low back pain, one of the most frequent of musculoskeletal disorders, affects up to 80 percent of people sometime in their lives, and in any given month 20 to 30 percent of adults have an episode. Generally, the pain is in the lower back on one or both sides, occasionally extending into the buttocks or thighs. In most persons the cause of back pain is unknown. It may arise from any number of pain-sensitive structures in the lumbar spinal column, including joints, ligaments, muscles, and soft tissues.

Generally, back pain is episodic, with half of the episodes remitting within a week and 90 percent going away within a month. Back pain of long duration, which occurs in only a small minority of patients, accounts for most of the societal cost of low back pain and much of the work loss and disability. Persons at high risk of low back pain include those between age twenty and forty, and those whose jobs involve physical labor — especially lifting, pushing, or pulling heavy objects, or twisting during lifting. Truck drivers are the occupational group who experience the most back pain. Another risk factor for low back pain is cigarette smoking, and poor physical fitness may also contribute to its occurrence. The high rate of back pain in particular occupations has suggested that altering work tasks may be a

successful way to prevent episodes of back pain. Indeed, industry training programs have achieved success in lessening the rate of low back pain in some occupations.

**Osteoarthritis** also known as degenerative arthritis or degenerative joint disease or osteoarthrosis, is a group of mechanical abnormalities involving degradation of joints, including articular cartilage and subchondral bone. Symptoms may include joint pain, tenderness, stiffness, locking, and sometimes an effusion. A variety of causes — hereditary, developmental, metabolic, and mechanical deficits — may initiate processes leading to loss of cartilage. When bone surfaces become less well protected by cartilage, bone may be exposed and damaged. As a result of decreased movement secondary to pain, regional muscles may atrophy, and ligaments may become more lax.

**Rheumatoid arthritis** (RA) is an autoimmune disease in which your body's immune system mistakenly attacks your joints. The abnormal immune response causes inflammation that can damage joints and organs, such as the heart. Early diagnosis and prompt treatment is the key to preventing joint destruction and organ damage.

Nearly three times as many women have the disease as men. In women, RA most commonly begins between ages 30 and 60. In men, it often occurs later in life.

The severity of the disease can vary from person to person. Sudden increases in symptoms and illness are called flares. A flare can last for days or months. Key rheumatoid arthritis symptoms are pain, fatigue and warm, swollen, reddish joints. Long periods of joint stiffness in the morning are common. Inflammation in the small joints of the wrist and hand is typical. If a joint on one side of the body is affected, the same one on the other side is usually affected, too.

*Eating healthily* is essential to provide the right balance of nutrients our bodies need for day-to-day functions.

The most important relationship between diet and arthritis is weight. Excess weight is harmful to joint health and may increase pain, stiffness and swelling in the joints. If you are obese or overweight, try and lose the excess weight. To help lose surplus weight combine healthy eating with regular exercise.

Change the type of fat in your diet. People with RA have a higher risk of developing heart disease than those who don't have RA. The amount and type of fat you eat and use in cooking influences blood cholesterol levels, and might also influence the level of joint pain and inflammation.

Eat iron rich foods regularly: lean red meat, eggs, green leafy vegetables, pulses (peas, beans and lentils), and fortified breakfast cereals. Iron is more easily absorbed by the body if you have it at the same time as vitamin C, so have a portion of fruits or vegetables with your meal.

Eat calcium rich foods. It is important that everyone gets enough calcium in their diet to ensure that their bones stay strong and healthy. This is an even greater consideration when you have RA, as you have a higher risk of developing osteoporosis, so ensuring an adequate calcium intake is important. Good sources of calcium include milk, yogurt cheese and other dairy foods, green leafy vegetables, soya drinks with added calcium, almonds and fish where you eat the bones, such as sardines and pilchards.

Calcium also needs vitamin D to aid its absorption. Most of us get all the vitamin D that we need from sunlight on our skin. However, vitamin D can also be found in oily fish, eggs and fortified breakfast cereals and margarine.

Fasting is an extreme and temporary way of controlling pain and inflammation in RA and is not recommended. A vegetarian diet (more restrictive than a Mediterranean-type diet) may help relieve symptoms for some, but care is needed to ensure it is nutritionally sound.

Some practitioners suggest that a food allergy causes or exacerbates inflammation in RA, but this there is no evidence to support this theory. However, a small number of people with RA may have a genuine intolerance to one or more foodstuffs. Offending foods can be identified through a dietary exclusion programme under the supervision of a dietitian.

There is no scientific evidence to support the use of antioxidant vitamins or mineral supplements in the treatment of RA symptoms. A healthy diet should contain all the nutrients needed by the body. However, if your diet is very restricted or your appetite poor a general multivitamin/mineral supplement may provide useful background fortification.

#### Gout

Gout is a common type of arthritis that occurs when there is too much uric acid in the blood, tissues, and urine. Uric acid is the end product of the metabolism of a class of chemicals known as purines. In people with gout, the body does not produce enough of the digestive enzyme uricase, which oxidizes relatively insoluble uric acid into a highly soluble compound. As a result, uric acid accumulates in the blood and tissues and, ultimately, crystallizes.

When it crystallizes, uric acid takes on a shape like that of a needle and, like a needle, it jabs its way into the joints. It seeins to prefer the joint of the big toe, but other joints can be vulnerable as well, including the mid-foot, ankle, knee, wrist, and even the fingers. Acute pain is usually the first symptom. Then the affected joints become inflamed, almost infected-looking — red, swollen, hot, and extremely sensitive to the touch.

Uric acid is a byproduct of certain foods, so gout isclosely related to diet. Obesity and an improper diet increase the risk of developing gout. Gout has been called the rich man's disease, since it is associated with too much rich food and alcohol. But in fact it affects people from all walks of life, most commonly men between the ages of forty and fifty. It may be inherited or brought on by crash dieting, drinking, certain medications, overeating, stress, surgery, or injury to a joint. Approximately 90 percent of the people who suffer from gout are male. Uric acid kidney stones may be a related problem.

The best way to get a definitive diagnosis of gout is for a physician to insert a needle into the affected joint, remove some fluid, and examine the fluid under a microscope for the characteristic uric acid crystals.

## Herbs

Alfalfa is a good source of minerals and other nutrients that help to

reduce serum uric acid.

- Apply cayenne (capsicum) powder, mixed with enough wintergreen oil to make a paste, to affected areas to relieve inflammation and pain. This may cause a stinging sensation at first, but with repeated use, pain should diminish markedly. Cayenne can also be taken in capsule form.

- Other beneficial herbs include birch, burdock, colchicum tincture, hyssop, and juniper.

#### **Recommendations**

- When an attack of gout strikes, eat only raw fruits and vegetables for two weeks. Juices are best. Frozen or fresh cherry juice is excellent. Also drink celery juice diluted with distilled water — use distilled water only, not tap water. Cherries and strawberries neutralize uric acid, so eat lots of them. Also, include grains, seeds, and nuts in your diet.

- Maintain a diet low in purines at all times. Purines are organic compounds that contribute to uric acid formation. Purine-rich foods to avoid include anchovies, asparagus, consommé, herring, meat gravies and broths, mushroom, mussels, sardines, and sweetbreads.

- Consume plenty of quality water. Fluid intake promotes the excretion of uric acid.

- Eat no meat of any kind, including organ meats. Meat contains extremely high amounts of uric acid.

- Consume no alcohol. Alcohol increases the productif of uric acid and must be eliminated from the diet.

- Do not eat any fried foods, roasted nuts, or any other foods containing (or cooked with) oil that has been subject to heat. When heated, oils become rancid. Rancid fats quick destroy vitamin E, resulting in the release of increased amounts of uric acid.

- Avoid rich foods such as cakes and pies. Leave wheat flour and sugar products out of your diet.

- Avoid the amino acid glycine. Glycine can be convert into uric acid more rapidly in people who suffer from gout.

- Limit your intake of caffeine, cauliflower, dried beans, lentils, fish, eggs, oatmeal, peas, poultry, spinach.

- If you are overweight, lose the excess pounds. Losing weight lowers serum uric acid levels. Avoid very restricted weight loss diets (crash diets), however. Abruptly cutting back on foods or fasting for longer than three days n result in increased uric acid levels.

#### **DIET for DISEASES OF URINARY SYSTEM**

There are a number of different kidney problems that may occur. The kidneys may be damaged by exposure to certain drugs or toxins, including heavy metals, solvents, chemotherapy agents, snake or insect venom, poisonous mush-rooms, and pesticides. Impaired kidney function can also accompany or result

from many other disorders, such as diabetes, lupus, hypertension, and liver disease.

Bright's disease is a kidney disease marked by the presence of blood protein in the urine, along with hypertension and edema (retention of water in the tissues). Glomerulonephritis is an inflammation of the filtering units within the kidney. This may occur as a result of an immunological response to infection, such as a Streptococcus throat infection. Pyelonephritis is a kidney infection. Both glomerulonephritis and pyelonephritis can be chronic or acute, and can be serious. Hydronephrosis is a condition in which the kidney and the renal pelvis (the structure into which urine is discharged from the kidney) become filled with urine due to an obstruction of urinary flow. Kidney stones are mineral accumulations (primarily calcium) in the kidneys. In renal tubular acidosis, the kidneys fail to reabsorb bicarbonate normally, causing impaired ammonia production and acid excretion. Severe dehydration, acidosis, potassium depletion, and bone disorders may result. Nephrotic syndrome is not a disease in itself, but can be a sign of kidney disease. It is marked by edema and excess protein in the urine. It can be caused by lesions of glomeruli (small structures in the kidney made of capillaries) that become inflamed, or by chronic diseases such as diabetes or lupus.

If the kidneys cannot function properly to excrete salt and other wastes, edema results. Toxic wastes may accumulate in the bloodstream due to kidney malfunction, a condition known as *uremia*. Symptoms of kidney problems include chills, fever, urinary urgency, fluid retention (bloating), abdominal pain, appetite loss, back pain, nausea, and vomiting. The urine may be cloudy or bloody. Back pain may be sudden and intense, occurring just above the waist and running down the groin.

The following supplements aid in controlling urinary tract infection and help maintain proper kidney function.

#### Herbs

- Buchu tea is good. Do not boil it, however.

- Celery and parsley seeds are natural diuretics. Taken combination, they are especially helpful if high uric acid levels are present in the blood. Eating large amounts animal proteins makes one susceptible to high levels of uric acid. These two herbs help keep them in check.

- Cranberries contain substances that acidify the uri destroy bacteria buildup, and promote healing of the bladder. Use only pure, unsweetened juice.

- Dandelion root extract aids in excretion of the kidney waste products and is very beneficial for nephritis.

- The herbs hydrangea and uva ursi are excellent native diuretics. Uva is also slightly germicidal, so if there are any bacterial present, they will likely be destroyed by it.

Marshmallow tea helps to cleanse the kidneys.

# **Recommendations**

- Consume a diet composed of 75 percent raw food: garlic, potatoes, asparagus, parsley, watercress, celen cumbers, papaya, and bananas. Watermelon and pun seeds are also beneficial.

- Include in the diet legumes, seeds, and soybeans. These foods contain the amino acid arginine, which is benefit for the kidneys.

- Reduce your intake of potassium and phosphate, not use any salt or potassium chloride, a salt substitute.

- Avoid beet greens, chocolate, cocoa, eggs, fish, meat, ach, rhubarb, Swiss chard, and tea.

- If you have symptoms of kidney problems, blood in the urine or severe back pain, consult your care provider promptly. You may need medical treat. Drink 6 to 8 ounces of steam-distilled water every waking hour. Quality water is essential for urinary tract function.

- Reduce your intake of animal protein, or eliminate it altogether. A diet high in animal protein puts stress on the kidneys. Excess accumulation of protein can result in uremia. Protein is easiest to utilize if it has been broken down into free-form amino acids. Other good protein sources include peas, beans, lentils, millet, soybeans, and whole grains.

- Avoid all dairy products except for those that are soured, such as low-fat yogurt, buttermilk, and cottage cheese.

- If you are taking antibiotics for a kidney problem, do not take iron supplements as long as the problem exists.

#### **Kidney stones**

Kidney stones, medically termed *renal calculi*, are accumulations of mineral salts that can lodge anywhere along the course of the urinary tract. Human urine is often saturated to the limit with uric acid, phosphates, and calcium oxalate.

Normally, due to the secretion of various protective compounds and natural mechanisms that control the pH of urine, these substances remain suspended in solution. However, if the protective compounds are overwhelmed or immunity becomes depressed, the substances may crystallize and the crystals may begin to clump together, eventually forming stones large enough to restrict urinary flow. Symptoms of kidney stones include pain radiating from the upper back to the lower abdomen and groin, frequent urination, pus and blood in the urine, absence of urine formation, and sometimes chills and fever.

Stones can range in size from microscopic specks to the size of a fingertip. There are four kinds of kidney stones: *calcium stones* (composed of calcium oxalate); *uric acid stones*; *struvite stones* (composed of magnesium ammonium phosphate); and *cystine stones*.

About 80 percent of all stones are calcium stones. High blood calcium levels lead to *hypercalciuria* — excessive absorption of calcium from the intestine, which increases the level of calcium in the urine. This excess calcium eventually forms a stone. High blood calcium levels can also result from malfunctioning parathyroid glands (tiny glands in the neck that regulate blood calcium levels), vitamin D intoxication, and multiple myeloma. The consumption of refined carbohydrates, especially sugar, can help precipitate kidney stones as well, because the sugar stimulates the pancreas to release insulin, which in turn causes extra calcium to be excreted in the urine. Mild chronic or recurrent dehydration can also be a factor in kidney stones; it concentrates the urine, increasing the likelihood of stone formation.

Uric acid stones form when the volume of urine excreted is too low and/or blood levels of uric acid are abnormally high. The latter condition is commonly associated with symptoms of gout. Unlike other types of kidney stones, struvite stones are unrelated to metabolism; these stones are caused by infection. Women often get them with recurrent urinary tract infections. Cystine stones are caused by a condition called cystinuria, a rare congenital defect that can cause stones composed of the amino acid cystine to form in the kidney or bladder.

Calcium stones often run in families because the tendency to absorb too much calcium is hereditary. Also, in people with a family history of kidney stones, there seems to be a stronger than normal correlation between the intake of either vitamin C or oxalic.acid and the urinary excretion of oxalate. Apparently, such individuals either absorb more oxalate from their diets or metabolize greater amounts of oxalate precursors. People who have Crohn's disease or irritable bowel syndrome, or who eat diets high in oxalic acid, may have an increased risk of kidney stones as well, as these factors can cause the excretion of oxalate in the urine to increase. Other risk factors for kidney stones include low urine volume, low bodily pH, and reduced production of natural urinary inhibitors of crystal formation.

#### Herbs

- Aloe vera juice, taken at levels that do not produce a laxative effect, can be useful in preventing stone formation and in reducing the size of a stone during an acute attack.

- Ginkgo biloba and goldenseal, taken in extract form, aid circulation to the kidneys and have anti-inflammatory properties. They are both also powerful antioxidants.

- Marshmallow root tea daily helps to cleanse the kidneys and to expel kidney stones.

Uva ursi helps to relieve pain and bloating.

## **Recommendations**

- For pain relief, drink the juice of half a fresh lemon in 8 ounces of water every half hour until the pain subsides. You can alternate between lemon juice and fresh apple juice.

- To maintain good kidney function, drink plenty of quality water — at least 3 quarts daily. By far the single most important measure one can take to prevent kidney stones from forming is to increase water consumption. Water dilutes urine and helps prevent concentrations of the minerals and salts that can form stones. Also drink unsweetened cranberry juice to help acidify the urine (unless you are prone to uric acid stones). Drinking the juice of a fresh lemon in a glass of warm water first thing each morning can help prevent stones from forming.

- Increase your consumption of foods rich in vitamin A. Vitamin A is beneficial to the urinary tract and helps to discourage the formation of stones. Good sources of vitamin A include alfalfa, apricots, cantaloupes, carrots, pumpkin, sweet potatoes, and squash.

Use distilled water only for drinking and cooking. Add trace mineral

drops to your drinking water.

- Minimize your consumption of animal protein, or eliminate it from your diet altogether. A high-animal-protein diet causes the body to excrete calcium, producing excessive amounts of calcium, phosphorus, and uric acid in the kidneys and often resulting in painful kidney stones.

- Limit your calcium intake and avoid dairy products. Also avoid aluminum compounds and alkalis, such as those in antacids. The consumption of milk and antacids may cause kidney stones in susceptible individuals.

- Reduce your intake of potassium and phosphates. Do not use any salt or potassium chloride, a salt substitute, and avoid carbonated soft drinks.

- Avoid foods that contain or lead to the production of oxalic acid, including asparagus, beets, beet greens, eggs, fish, parsley, rhubarb, sorrel, spinach, Swiss chard, and vegetables of the cabbage family. Also avoid alcohol, caffeine, chocolate, cocoa, dried figs, nuts, pepper, poppy seeds, and black tea.

- Avoid all refined sugar and products that contain it. Sugar stimulates the pancreas to release insulin, which in turn causes extra calcium to be excreted in the urine.

- Stay active. People who are sedentary tend to accumulate high levels of calcium in the bloodstream. Exercise helps pull calcium from the blood into the bones, where it belongs.

- If you have a history of cystine stones, avoid the amino acid Lcystine. If you must take a supplement containing L-cystine, take at least three times as much vitamin C at the same time. Otherwise, cystine can crystallize in the kidneys and form large stones that fill the interior of the kidney.