

Musculoskeletal health concerns on the increase

The musculoskeletal system provides the overall framework of the human body; looking after this system, which is so often taken for granted, is paramount to optimum health. With diseases such as osteoporosis and osteoarthritis becoming increasingly more common, it is never too early or too late to start making the necessary changes to ensure long-term musculoskeletal health.

Musculoskeletal physiology –

The musculoskeletal system is made up of the following:

Bones

Joints / connective tissue

Muscles

Problems with joints and muscles frequently cause discomfort and inflammation, and eventually restrict mobility, whilst problems with bone may be less easy to spot; testing may be required in order to establish a problem with the bones.

How does it all work?

Bones

Strong bones depend on proper nourishment, a healthy lifestyle and favourable genetics. In bone, the matrix is about 25% water, 25% protein fibres, and 50% crystallised mineral salts.

The matrix of bone contains abundant inorganic mineral salts which are deposited in the collagen fibre network. These mineral salts crystallise, forming hard tissue.

The hardness of bone depends on the crystallised inorganic mineral salts; its flexibility depends on its collagen fibres. Like reinforcing metal rods in concrete, collagen fibres and other organic molecules provide tensile strength – resistance to being stretched or torn apart.

Bone also has a considerable capacity for growth in the first 2 – 3 decades of life, and for regeneration throughout life. Bone tissue engages in a continuous process of dynamic remodelling - osteoblasts are cells which build new bone and osteoclasts break down bone. Like any other living tissue, bone needs nourishment to stay strong and healthy. Building strong bones throughout life can maximise mobility, appearance and independence.

Bones are too rigid to bend without being damaged. Fortunately, flexible connective tissues form joints that hold bones together, whilst still permitting some degree of movement.

Joints/connective tissue

Joint cartilage matrix consists of cells; chondrocytes and chondroblasts, embedded in a matrix of proteoglycans and fibrous collagen. Proteoglycans are large, complex macromolecules that trap and hold large amounts of water, giving cartilage a resiliency and a resistance to mechanical stress. A combination of the collagen meshwork and proteoglycans provides a wear-resistant, lubricated, low friction surface, both slightly compressible and elastic, which not only allows for ease of movement but the ability to accommodate the enormous forces of compression generated during weight bearing and muscle action.

Muscles

Bones and joints provide leverage and form the framework of the body, but they cannot move body parts by themselves. Motion results from the alternating contraction and relaxation of muscles, which constitute 40 – 50% of total body weight. Muscles rely on the minerals calcium and magnesium for contraction and relaxation.

What happens when things go wrong with our bones?

Osteoporosis

Osteoporosis is a progressive disease affecting bone density which develops when bone breaks down faster than it can be rebuilt. It is often referred to as the "silent disease" because bone loss occurs without symptoms. It increases fracture risk and is a major health problem in industrialised nations.

Postmenopausal women and the elderly are at a higher risk for osteoporosis, as premenopausal women are partially protected against bone loss by the hormone oestrogen. Oestrogen has some control over osteoclasts and aids in decreasing bone loss by slowing resorption (bone break down), but does nothing to build bone. Progesterone stimulates osteoblasts to build bones. In men, testosterone partially protects against bone loss, even after middle age.

In osteopenia, bone density is low, but the mineral content of the bone is not low enough to be considered porous as in osteoporosis.

Conventional treatment

Osteoporosis is conventionally treated with the bisphosphonate class of drugs, commonly named Alendronate or Fosamax. Bisphosphonates decrease osteoclastic bone resorption which results in a small but significant net gain in bone mass in osteoporosis patients. Side effects include nausea, cramping, oesophagus ulceration, eye problems, muscle, joint and bone pain. One serious side effect that can occur with the use of Fosamax is osteonecrosis of the jaw (ONJ).

Clinical Kinesiology diagnosis

A skilled CK practitioner can easily reveal to you the toxicity present in your system, and offer a specific detoxification regime for your needs. This will enable your body to regain it's ability to function, and the automatic healing process will be unimpeded.

Nutritional Support for Bone Health

Dietary factors

Dietary modification is a major factor in the treatment of osteoporosis:

Refined foods, soft drinks, caffeine, excess salt and excess protein all increase the loss of calcium from the bones and should therefore be reduced in the diet.

High amounts of protein in the diet increase ammonia production in the gut, which prevents the kidneys absorbing calcium, therefore increasing urinary excretion of calcium.

Acid-producing foods (grains, meat and dairy) can actually pull calcium out of the bones.

What happens when things go wrong with our

Connective tissue

Extracellular Matrix and Soft Tissue Injury

Connective tissues such as tendons, joints, ligaments, cartilage and fascia are composed of the extracellular matrix (ECM) - a complex network of

glycosaminoglycans and fibrous proteins – giving strength, support, and protection to other parts of the body, as well as binding body parts together.

The health of the ECM is governed by a family of enzymes called matrix metalloproteinases (MMPs).

In healthy tissue MMPs are beneficial to normal growth, tissue repair, and reproduction, but in higher levels of expression, MMPs have been implicated in numerous inflammatory and degenerative processes. Elevated MMP expression has been associated with tendon pathologies (acute tendon injuries, tendonitis (Riley et al, 2002)), torn rotator cuffs (Lo et al, 2004)), degenerative discs (Le Maitre et al, 2004), and sites of repeated injury or mechanical strain (Arnoczky et al, 2007). MMP enzymes can degrade several different types of collagen, and they have the ability to produce or modulate precursors to proinflammatory cytokines and transcription factors, thereby contributing to inflammation and further MMP expression. Inhibition of signaling pathways, transcription factors, and associated cytokines has therefore been suggested in a growing amount of scientific evidence as a therapeutic approach to conditions associated with MMP overexpression (Functional Medicine Research Centre, 2009).

Conventional treatment

Whilst there are many different types of connective tissue injury (including sprains, strains, tendonitis and many more), many are treated with NSAIDs (non-steroidal anti-inflammatories), which associated with significant side effects.

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Nutritional Factors

Certain dietary nutrients including vitamins, minerals and phytochemicals may specifically target the MMPs that regulate ECM health. A combination of targeted nutrients including phytonutrients from hops, berberine, selenium, zinc, biotin, niacin, folic acid and vitamins B6 and B12 was recently tested in a small open-label clinical trial and observed to improve treatment response to bodywork (Lamb JJ et al, unpublished results).

Useful supplements for connective tissue support include:

MSM Hops & Berberine
Horsetail Selenium, biotin, zinc, niacinamide
Proteolytic enzymes Folic acid and B6 & B12

What happens when things go wrong with our joints?

Osteoarthritis

Osteoarthritis (OA) is the most prevalent form of arthritis, resulting in pain and motion limitation.

Originating in the joint cartilage, the disease is associated with degradation of the cartilage matrix and significant subchondral bone changes, triggering inflammation and pain of the surrounding joint and becoming progressively severe. The joints most often affected in OA are the hands and weight-bearing joints: knees, hips, ankles and spine.

OA is not, as is commonly thought, an inevitable consequence of ageing. Trauma, mechanical stress, or biochemical changes trigger a metabolically active process of remodelling and repair of damaged joint tissue. Ultimately, the balance between joint cartilage synthesis and degradation shifts in balance of degradation. When cartilage in a joint deteriorates, OA develops.

In the early stages of the disease there is a loss of proteoglycans and other cartilage components. In some sufferers, inflammation occurs around the synovium. As the disease progresses and the cartilage volume and integrity deteriorates further, it loses elasticity and becomes increasingly prone to damage due to repetitive use and injury.

Over time, the continued degradation of cartilage results in microfractures and exposure of the subchondral bone, which stimulates the formation of osteophytes within the joint. This ultimately leads to a functional deterioration of the joint, with accompanying pain, stiffness, joint swelling and deformity. The diagnosis of OA is often confirmed with radiological evidence of cartilage destruction (narrowing of the joint space) or if bony projections or erosions are evident

Conventional treatment

OA is typically treated with (non-steroidal anti-inflammatory drugs) NSAIDs. While effective for pain and inflammation, these drugs are known to have a number of adverse side effects including peptic ulcers and damage to the liver or the kidneys. Prolonged use of NSAIDs actually appears to contribute to the progression of OA by encouraging cartilage breakdown directly - a contradiction that is often overlooked. Other popular treatments include analgesics and corticosteroids - the latter occasionally generating devastating side effects. Another problem with the drug-based approach is that it has traditionally limited its focus to symptom relief rather than slowing the progression of the disease.

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Nutritional factors

Useful supplements for osteoarthritis include:

Glucosamine sulphate

Chondroitin sulphate

MSM

Vitamin C

Antioxidants

Turmeric, ginger, boswellia

Fish oil.

Rheumatoid arthritis

Rheumatoid arthritis (RA) is characterised by pain, tenderness, swelling and stiffness of the joints, most commonly the smaller joints, especially those of the hands and wrists, although any joint can become affected. The causes of the condition are not well understood in Western medicine, but it is commonly thought to be an autoimmune disorder. All autoimmune disorders are triggered by toxicity stressing the liver, which subsequently over produces pro-inflammatory chemicals, leading to chronic inflammation in the joints. The condition usually starts off as pure

inflammation and as the inflammation continues, joint destruction can gradually occur and the affected joints frequently become visibly deformed.

Inside the affected joints, the earliest change is one of swelling and congestion in the synovial membrane lining of the joint and the overlying connective tissue. Leaking of synovial fluid into the joint space accounts for the swelling of the joint. Later, thickening of the synovial membrane and fibrous adhesions across the joint spaces may occur. Muscles situated around the inflamed joints tend to deteriorate, partly through lack of use and partly because of involvement in the inflammatory process.

Diagnosis of RA is generally confirmed via a blood test.

Conventional Treatment

RA is usually treated with a combination of methotrexate (a disease-modifying anti-rheumatoid drug, DMARD), NSAIDs, COX-2 inhibitors and corticosteroid drugs, the latter three being associated with significant side effects.

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Nutritional factors

Useful supplements for rheumatoid arthritis include:

Plant sterols

Turmeric, ginger, boswellia, rosemary

L-glutamine

Fish oil

Hops and vitamin D

Hops

What happens when things go wrong with our muscles?

Fibromyalgia Syndrome

Fibromyalgia is a chronic condition, the true cause of which is an accumulation of toxicity within the system, stressing the liver, and causing it to over produce pro-inflammatory chemicals, leading to chronic inflammation, pain and disability. It comes under the umbrella of autoimmune disorders, where the immune system is attacking it's own tissues. It is thought to affect around 2% of the population in developed countries, with patients experiencing musculoskeletal pain and fatigue, often to a disabling degree, as well as many other distressing symptoms.

The most common symptoms of FMS are widespread muscle and joint pain accompanied by tender points and stiffness. Patients may also experience excessive fatigue, unrestful sleep, tension headaches/migraines, bladder/bowel problems, anxiety or depression. Most patients with FMS say that they ache all over. Their muscles may feel like they have been pulled or overworked. Sometimes the muscles twitch and at other times they burn.

FMS is 5-10 times more common in women than in men and typically occurs between the ages of 30 to 50 years, although anyone can be afflicted. A patient will often experience periods of relief or significant improvement of symptoms.

The cause of FMS remains elusive, but there are many triggering events thought to precipitate onset, such as infection (viral or bacterial), a car accident or the development of another disorder, such as rheumatoid arthritis, lupus, or hypothyroidism. These triggering events probably don't cause FMS, but rather they may awaken an underlying physiological abnormality that's already present in the form of genetic predisposition.

Theories pertaining to alterations in neurotransmitter regulation (particularly serotonin and noradrenalin, and substance P), immune system function, sleep physiology, and hormonal control (particularly cortisol and growth hormone) are under investigation.

Conventional treatment

As the cause is not understood by Western medicine, symptomatic relief is all that can be offered.

Medicines that boost levels of serotonin and noradrenalin – neurotransmitters that modulate sleep, pain and immune system function – are commonly prescribed. NSAIDs like ibuprofen are also commonly recommended, but are generally found to be unhelpful. Due to a lack of understanding of the condition, a drug-based approach tends to be limited to symptom relief which frequently doesn't work, and therefore many patients seek out alternative treatments to ease their symptoms.

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Physiotherapy carried out by a Chartered Physiotherapist can greatly benefit pain and inflammation symptoms, and skilled guidance and advice can help prevent further damage.

Acupuncture carried out by a TCM acupuncturist can greatly elevate pain, speed up healing, and enhance swift relief.

Nutritional factors

Useful supplements for fibromyalgia include:

- Hops & Vitamin D
- High-strength magnesium
- B vitamins
- 5HTP
- Fish oil
- Malic acid

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