

PAIN MATTERS

Community Information Series
Hunter Integrated Pain Service
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Nutrition and Pain

		Information content Complex
	Contacts for further discussion A dietician, naturopath or your local doctor will be able to discuss nutrition further. Staff from Hunter Integrated Pain Service can also help if you are referred to us.	
	Links and further reading www.mhcs.health.nsw.gov.au Dietary advice <ul style="list-style-type: none">• Fitting more fruit and vegetables into your diet• Good reasons to eat more fish	

The western diet and chronic disease

Australian is currently facing a major health crisis. We are now rated the fattest nation in the world with 26% of the adult population obese (BMI ≥ 30) compared to 25% of Americans¹. In fact over 50% of Australians are overweight (BMI ≥ 25)² and this is just one of the cluster of chronic diseases that have become common place. Chronic diseases now account for two-thirds of Australia's healthcare expenditure³.

Current scientific theory suggests that the typical Western diet causes a low grade systemic inflammation that underlies many chronic diseases including obesity, high blood pressure, high cholesterol, heart disease, diabetes, dementia, depression and cancer^{4,5}.

Diet induced low grade inflammation also has the potential to produce sensitisation of the nervous system or irritation of bodily tissues and hence contribute to persistent pain. Poor nutrition has been linked to many pain conditions including osteoarthritis^{6,7}, inflammatory arthritis⁸, inflammatory bowel disorders⁹ and fibromyalgia¹⁰. Although more research work is required there is very encouraging evidence to suggest that nutritional change can reduce persistent pain.

Evolution and the western diet

For much of history the human race evolved eating a "hunter and gatherer" diet. This was high in vegetables, fruit, nuts and meat. Then around 10,000 years ago the agricultural revolution occurred and we began to eat cereal foods and dairy. In much more recent times the supermarket revolution happened and we became consumers of highly refined and processed foods. Currently the typical Western diet is high in carbohydrate (often high glycaemic index carbohydrate) and dairy with relatively low amounts of vegetables, fruit, protein and omega 3 fatty acids. What we now eat is highly unsuitable given our genetic makeup. Returning to something closer to the so-called "paleolithic" diet of our hunter gatherer ancestors is recommended¹¹.

There is evidence that a single high glycaemic index carbohydrate meal increases levels of inflammatory markers¹². However, on the positive side, a recent study has shown that after only 10 days on a paleolithic diet there were marked improvements in blood pressure, glucose tolerance and cholesterol levels¹³.

Current dietary and lifestyle recommendations have been incorporated into a new “Wellness Lifestyle Pyramid” (Metagenics 2009). The key difference between this and earlier food pyramids is the recommendation to increase protein intake (fish, meat, eggs, nuts, tofu, beans and lentils) and reduce starchy carbohydrates (bread, white rice, pasta, potato and some breakfast cereals).

Wellness Lifestyle Pyramid



The Wellness Lifestyle Diet

1. A hunter gatherer style diet

The diet shown in the Wellness Lifestyle Pyramid represents a shift towards a hunter gatherer diet. The aim is to reduce the inflammation and metabolic problems that can lead to chronic disease and the persistence of pain.

2. Omega 3 essential fatty acids

The western diet is usually deficient in omega 3 fatty acids. These are the healthy fats present in oily fish and some vegetable and nut oils. They include **alpha linolenic acid** present in flaxseed, walnut and fish oils and **eicosapentaenoic acid** (EPA) and **docosahexaenoic acid** (DHA) which are contained only in fish oil. Without enough omega 3 fatty acids cell membranes become brittle and cellular metabolism produces more inflammatory substances.

Studies with omega 3 supplementation in rheumatoid arthritis have shown significant improvement in joint pain along with reduced use of non-steroidal anti-inflammatory drugs^{14,15,16,17}. Studies of human osteoarthritic cartilage have shown that omega 3 treatment lowers levels of aggrecanases and inflammatory chemical mediators^{18,19}. Aggrecanases are enzymes that break down joint cartilage and contribute to osteoarthritis. Fibromyalgia studies have shown that omega 3 improves muscle pain, mood and fatigue²⁰.

Research also points to benefit from omega 3 supplementation in other conditions especially where inflammation is involved. These include Crohn's disease, asthma, psoriasis and heart disease.

3. Antioxidants

Antioxidants are another component that is often lacking in the western diet. Classic antioxidants include vitamin C, vitamin E, beta-carotene and the trace mineral selenium. Fresh fruit and vegetables are good sources along with green tea and red wine.

Antioxidants are part of the body's defence system which "mops up" potentially damaging free radicals. Some free radicals are formed as part of normal metabolic processes, but production is increased by pain, smoking, stress and excessive dietary fat intake. If the system gets out of balance, with too many free radicals and not enough antioxidants, illness can develop. Problems include premature ageing, heart disease and cancer.

Antioxidant treatment shows promise in acute pain²¹. Benefit has also been shown in fibromyalgia²², dysmenorrhoea (period pain)²³, painful diabetic neuropathy²⁴, osteoarthritis²⁵ and recurrent pancreatitis²⁶. Two studies have shown that Vitamin C supplementation in people with wrist fractures significantly reduced development of complex regional pain syndrome^{27,28}.

4. Probiotics

Evolutionary theory suggests that humans developed with certain helpful strains of bacteria in the gastrointestinal tract. However modern diet and lifestyle alters the balance and unhelpful bacteria can grow. Probiotics are live helpful bacteria that are used to restore a healthier intestinal environment.

Part of the link between diet and chronic disease is the initial development of a leaky gut wall. This leak allows substances to cross the gut and get into the bloodstream to cause systemic inflammation. It is thought that helpful bacteria reduce localised

inflammation and leakiness of the gut wall and therefore reduce systemic inflammation²⁹.

Studies show benefit from probiotic therapy in irritable bowel syndrome³⁰ and autoimmune disorders³¹ including inflammatory bowel disease³².

The role of supplements

In the developed world environment it is difficult to get high quality food. Organic produce is desirable but expensive. In addition our modern hi-tech life style exposes us to many chemical and other stressors. Due to problems of access to quality food and also the high stress world we live in a case can be made for nutritional supplementation.

Current guidelines suggest supplementation with:

- a. Omega 3 fatty acids: Take fish or flaxseed oil at a usual dose of 2000mg (2 standard capsules) twice daily.
- b. Vitamins and minerals: Take 1 good quality multivitamin tablet daily. In some situations of high “stress”, such as around the time of surgery, additional supplementation with vitamin C can be used (eg. 1000mg twice daily for 1 month).
- c. Probiotics: Take 1 probiotic capsule daily.

Additional nutritional strategies

1. Glucosamine and chondroitin

Glucosamine and chondroitin occur naturally in the body as components of normal joint cartilage. Glucosamine can be synthesised from glucose (sugar) and an amino acid called glutamine. Alternatively it can be derived from dietary sources such as shellfish. Glucosamine is a building block for mucopolysaccharides that are important for growth of cartilage, bone, ligaments, hair, nails and skin. Chondroitin is available as a supplement derived from the tracheal cartilage of cows. Studies have reported mixed results but overall there appears to be benefit from glucosamine and chondroitin supplementation in osteoarthritis of the hip and knee joints^{33,34}.

2. Appropriate weight loss

Excessive body weight increases strain on the spine and peripheral joints. It can also be part of a more general metabolic syndrome. All these factors predispose to injury and interfere with recovery. Studies have shown that loss of excessive body weight is helpful in reducing pain and improving joint function in osteoarthritis of the knee joint^{35,36}.

In order to lose weight, combining exercise with reduction of calorie intake and a “paleolithic” style diet is recommended.

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