

## Doctor, it hurts

The Greeks had a word for it, five in fact. Galen and Celsus, two landmark physicians described the reasons most people go to see a doctor - inflammation of one sort and place, or another.

Nearly 2000 years ago they summed up their call for help in five Latin words; -

Dolor – it hurts

Calor - it's hot

Rubor - its red

Tumor – its swollen

Functio Laesa – loss of function, - Its not working properly.

Today, we understand some of the mechanisms behind these symptoms, but they are still primary reasons why we seek medical help. Then, the remedies would have been drawn from natural products and it is interesting that today, more than 20% of the prescription medicines we use have their origin in plants or derivatives from them.

There are many plants which over the course of time have been claimed to have pain relieving, and anti-inflammatory action, but four are outstanding.

**Opium**, was grown more than 3400 years ago in Asia Minor and territories along the silk route, and is still a major crop in those areas, supplying the raw material for manufacture of morphine, codeine and the diamorphine. Opium and its constituent opioids are effective analgesics, elevate mood, and calm the working of the gastrointestinal tract. They act on receptors in the midbrain which control respiration and in the gut. Although useful in controlling cough and stopping diarrhoea these factors are a limiting factor in their use in the most severe pain, if the patients turn blue and are constipated.

**Cannabis** has an even longer history as a medicine.

2637 BC Emperor Shen Nung described its use for treatment of rheumatic pain

700 BC A Shaman's tomb, discovered near to the Silk Road in Western China contained samples of cannabis which analysis has shown to be similar to present-day strains of cannabis, the medicine obviously important enough to be buried with him.

160 A.D. Galen found it useful to relieve acute and chronic pain, soothe inflammation and reduce tumours.

1899 A.D. Merck's Manual describes it as useful for delirium, epilepsy, hysteria, nervous insomnia, migraine, pain, dysmenorrhoea.

At the present day, GW Pharmaceuticals has obtained regulatory approval for a prescription product Sativex<sup>®</sup>, containing, as active ingredient, a carefully defined extract of cannabis for the treatment of spasm and pain in multiple sclerosis and other types of neuropathic pain. GW is also carrying out clinical research on the use of cannabidiol, the non-psychoactive cannabinoid in cannabis for the treatment of the most severe types of epilepsy (Epidiolex<sup>®</sup>), and combined with opioids, for the relief of terminal pain. Cannabinoid receptors are present in many parts of the body, but unlike

morphine, the CB1 receptors for cannabis are principally in the cerebral cortex and consequently do not have an adverse effect on respiration, or the gut.

### **Willow Herb**

3000-1500 BC medical use by Summerians and Egyptians

1763 A.D. Edward Stone published a report on the use of powdered willow bark to reduce fever. This led to the search into the active ingredient and

1828 Buchner extracted the active ingredients Salicin

1874 Hoffman and colleagues at the Bayer company synthesised aspirin

1974 Sir John Vane described new aspects of aspirin's mechanism of action which led to its widespread use for the prevention of stroke.

Aspirin not only reduces inflammation and pain; it also reduces fever and prevents blood clotting. It acts locally, preventing the formation of inflammatory mediators (prostaglandins and thromboxanes) derived from fatty acids.

### **Capsaicin**

Capsaicin, the ingredient which gives chilli peppers their characteristic taste is also useful as a treatment for pain and itch. Capsaicin has a depressant effect in the synthesis, storage, transport, and release of substance P a neuropeptide that acts as a mediator of pain and itching impulses travelling from the periphery to the central nervous system. After initially stimulating these receptors, capsaicin renders them refractory to further stimulation for a while.

There are many different types of pain, and investigation of remedies from nature provides a variety of ways of dealing with it. Investigation of safe ways of using these medicines, and the active principles they contain has provided much of the fuel for the pharmaceutical revolution, and given us many of the analgesics and anti-inflammatory agents which make disease bearable.

## **Suggestions for Healthy Living**

Well-being and health are not merely a matter of having a pill for every ill. Prevention is better than cure, and a balanced diet is something we can all embrace. There is no shortage of dietary advice and trendy diets, in the popular press, and others will provide advice on the importance of exercise, but my dietary recommendations are as follows.

1. **Eat less carbohydrate**, and shift the balance from sugars to sustained-release carbohydrates. This evens out the release of insulin which follows sugar intake.
2. **Eat less food fried in cooking oil**. We need fat as part of a balanced diet; it is a very rich source of energy. However, the body has a problem dealing with certain types of fat. The oil in which most food is fried is rich in omega ( $\Omega$ ) 6 fatty acids which interfere with the body's production of long chain fatty acids such as EPA and DHA and tend to produce inflammatory prostaglandins. DHA is one of the important building materials of brain and retina, and together with EPA is involved in the way they work. EPA also helps to keep blood flowing by making platelets less sticky and, preventing the formation of micro-clots. Humans are not good at making EPA and DHA and most of what we need must come from diet. The richest source of  $\Omega$  3s is from fish or algae, the vegetarian food on which marine creatures feed.

3. **Eat more fish**, particularly deep sea, oily fish such as herring's and salmon. Two meals per week where fish is on the menu provides us with the EPA and DHA we need for healthy living. Recently, it has been found that in the body EPA and DHA form compounds called dissolvins and resolvins which as their name implies, reverse the effects of inflammation. In a balanced diet we should aim to have a ratio of omega 6 to omega 3 fats which is as near to 1:1 as we can manage. In some Western countries where fried food is the order of the day, this ratio is more than 25:1.
4. **Eat more fibre**. In addition to the components of diet which provide protein, fat and carbohydrate, we also need to have less nutritious, even inert 'filler' components that give structure to the food in the gastrointestinal tract. We are all familiar with the five-a-day, or even nine-a-day campaigns to encourage us to eat more fruit and vegetables which are rich in fibre. This is difficult for some people to manage but dietary supplements rich in fibre are available. As well as providing bulk, soluble fibre also provides food for the helpful bacteria which are important for the absorption of vitamins and minerals from our food. Strange as it sounds, a healthy bacterial flora can also improve our mood and mental health.
5. **Drink more water**. Water is essential for life and it is important to get the right amount of fluid to be healthy. Our bodies are nearly two-thirds water and we need to replenish what is lost each day to stay hydrated and healthy. If you don't get enough fluid you may feel tired, get headaches and not perform at your best. Adults should aim for a 'Fluid' intake of 2 L (about eight 200 ml glasses of water or beverage). In addition to the water from the tap or bottle, we also get water from the food we eat – on average, food provides about 20% of the recommended fluid intake. Adequate water intake is important for all, the and particularly for the senior generation.