



Naturopathic Health CARE **Centre for Alternative Medicine Research & Education**

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Osteoporosis

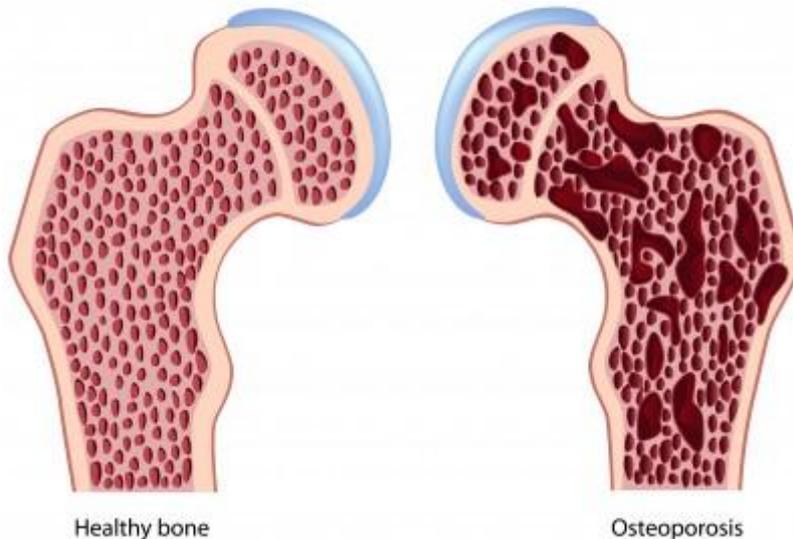
What is Osteoporosis?

Osteoporosis is a growing health problem worldwide. It affects an estimated 75 million people in the United States, Europe and Japan, including a large amount of men.

The enormity of this health problem when considering the increasing population of elderly people in the world is contrasted by the present therapeutic difficulties in significantly adding bone and improving bone strength once it has been lost.

Osteoporosis will become an even more serious public health problem. Osteoporosis related fractures can be expected to double during the next 5 decades. It is also expected that the occurrence of osteoporosis in men will increase.

Osteoporosis



The currently accepted definition of osteoporosis is “systemic skeletal disease characterized by low bone mass and micro architectural deterioration of bone tissue, with a consequent increase in bone fragility and susceptibility to fracture risk”.

Bone mass refers to the amount of bone tissue contained in the skeleton.

Bone mass can be expressed in terms of bone mineral content (the total grams of bone mineral within a given area of bone) or in terms of bone mineral density (the bone mineral content normalized for the projected area).

Bone mineral can be measured with reasonable accuracy and precision. These tests form the basis for diagnosis of osteoporosis and the prediction of fracture risk.

Normally bone density peaks between the ages of 30 to 40 and in subsequent years the bone density decreases. If the decrease is significant enough, the so called “fracture threshold” is reached, and at this level of bone density the patient is at significant risk of fracture. These



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thresholds are reached at different ages and the extent of bone loss varies depending on the peak bone mass and generic and environmental factors, including activity level and diet.

Why do osteoporosis patients often suffer from back pain?

Due to 'brittle' bones: osteoporosis patients often suffer from very painful micro-fractures in the vertebrae of the spine. After just a few weeks of treatments a high level of pain relief is obtained, as a result of these micro-fractures closing.

Will bone density increase?

A study at the Pacific Health Research Institute in Honolulu was designed to provide concrete data on the restoration of bone mass in post-menopausal females. Bone density rose with an average of 5.6%. At the University of Graz in Austria a similar study clearly showed an increase in bone density after one year of around 6%. These results make all the difference in functioning in good health or suffering with an increasing risk for spontaneous fractures. The proportionate increase in fracture risk is directly related to decreased bone density.

Electro-Magnetic Field Treatment for Osteoporosis

Selected low-energy time-varying electromagnetic fields have been used during the past 15 years to treat un-united fractures (non-unions). More than 100,000 patients, mainly in the USA, have been treated. Retrospective studies have substantiated their biological effectiveness in large numbers.

Bone is responsive to the mechanical demands placed on it. When loading diminishes, as it does during bed rest, immobilization and weightlessness, bone mass is lost. On the other hand when loading is increased correctly, bone mass increases.

Results of bio-mechanical and histological investigations prove that electromagnetic fields not only prevent bone loss, but also restore bone mass, once lost.

A program was set up at McGill University of Montreal, where it was found that electromagnetic fields damp bone resorption activity. In addition it was found that selected electro-magnetic fields increase bone formation.

The resorption of bone is lowest and the formation of new bone the greatest when energy of the imposed fields is concentrated in the lower frequency components.

These results are consistent with other studies showing that cells respond to a broad spectrum of frequencies. They appear to be most sensitive to frequencies in the range of those produced endogenously, that is in the range of 1000 Hz or less. Tissue dosimetry studies show that the frequency response of cortical bone over a range of 100 Hz to 20 kHz shows a steep roll off between 100 and 200 Hz.

Electro-magnetic fields at specific frequencies have been shown to produce osteogenic effects in a turkey ulna model. Furthermore low-amplitude signals decrease bone resorption in a canine fibular model.

Lifestyle factors like malnutrition, smoking, excessive use of alcohol and a sedentary lifestyle contribute to, and worsen, osteoporosis. It is not known whether this response derives from decreased osteoblastic activity, increased osteoclastic resorption, or both.

Fractures in elderly people can heal in normal intervals, showing that osteoblasts can be activated by appropriate stimuli.



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A study led by Associate Prof. Dr. W. Passath and Prof. Dr. G. Leb of the Medical Clinic of the Karl Franzen University of Graz in Austria was designed to provide concrete data on the restoration of bone mass in post-menopausal females. A total of 36 female patients between the ages of 46 and 61, all with decreased bone mineral density as defined by a bone densitometer, were treated during a period of 8 to 12 weeks. One year after the study the average bone density had increased by 5.81 percent.

In another study "Prevention of osteoporosis by pulsed electromagnetic fields" by Clinton T. et.al. of the Department of orthopedics, State university of New York, Stony Brook, increased bone mass of 12.3 and 9.7 percent are mentioned.

Electromagnetic fields do modify biological behaviour by inducing electrical changes around and within the cell. The key to rational use of electro-magnetic fields lies in the ability to define the specific treatment parameters (amplitude, frequency, wave form, orientation and timing).

Various studies have clearly shown that bone density does increase in osteoporosis-prone patients exposed to specific pulsed electromagnetic fields. Properly applied pulsed electromagnetic fields, if scaled for whole body use, have clear clinical benefits for treatment of osteoporosis.