

OSTEOPOROSIS

Supporting this diet are research papers that suggest fruits such as dried plum or prunes can be effective in improving bone mineral density in post-menopausal women (Hooshmand et al. 2011) and reports that tomato juice reduces bone resorption (Mackinnon et al. 2010)

This diet can work alongside the orthodox medicine because you can achieve the high calcium intake provided in the orthodox whilst maintaining an alkaline diet.

It is important that within both natural and orthodox medicine, the following interventions should be considered:

Lifestyle intervention

- Dietary calcium intake and vitamin D
- Avoidance of tobacco and alcohol abuse
- Physical activity which can improve the weight bearing capacity of the bone and, through the enhancement of balance reduce the risk of falls

Symptomatic intervention

- Pain relief
- Physiotherapy

Psychological and Social intervention

- Support groups can provide information and practical advice as well as community and social support (Compston, Clifford 2009)

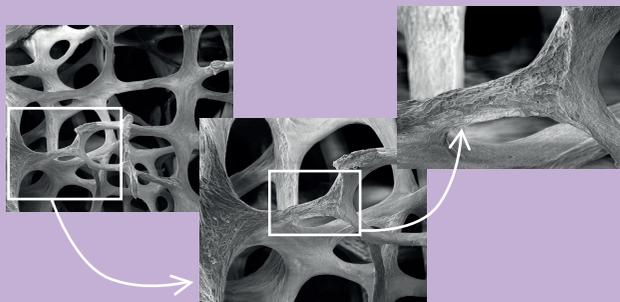
Prognosis

In a normal individual, bone mass will peak in the 20's and begin decreasing from age 40 onwards. In an individual with Osteoporosis, this bone loss starts earlier and/or accelerates faster. If this remains untreated, increasing symptoms caused by bone fractures and deformity over time will occur.

(Compston J 1999)

Hip fractures are the most common form of fragile fracture and most hip fractures require hospitalisation. Of the people hospitalised, about 1/3 die within a year, and 10% within one month. Half of the people with hip fractures end up permanently disabled and only 30% fully recover.

(Sharon Summers-Ma. et al. 2012)



Useful Addresses

International Organisations

International Osteoporosis Foundation
9 rue Juste-Oliver, CH-1260 Nyon
Switzerland
Tel: +41 22 994 0100
info@iofbonehealth.org
www.iofbonehealth.org

National Organisations

National Osteoporosis Society
Manor Farm, Skinners Hill
Camerton, Bath BA2 0PJ
Tel: +44(0)1761 471 771
Helpline: 0845 4500230
(Mon-Fri 9am-5pm)
info@nos.org.uk
www.nos.org.uk

British Association for Nutritional Therapy
27 Old Gloucester Street
London
WC1N 3XX
Tel: 0870 6061284
theadministrator@bant.org.uk
www.bant.org.uk

Self Help Groups

Osteoporosis 2000
Learoyd Way, Hillsborough Barracks, Langsett Road
Sheffield S6 2LR
Helpline: +44(0)114 234 4433
(Mon-Fri 10am-3pm)
osteoporosis2000@btconnect.com
www.osteoporosis2000.org

Women's Health Concern
4-6 Eton Place
Marlow, Bucks SL7 2QA
Tel: +44(0)1628 478 473
www.womens-health-concern.org

Practitioner

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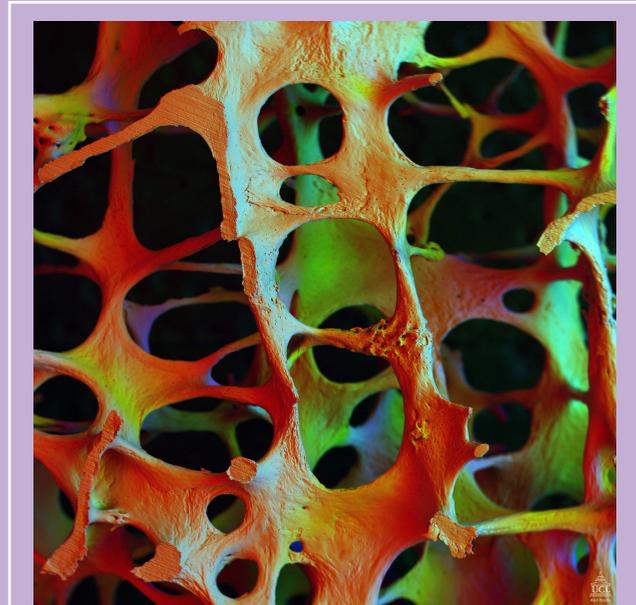
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Images Courtesy of Alan Boyde

What you should know and foods that can help.



Osteoporosis – Definition

The word Osteoporosis is formed from two Greek words; osteo meaning bone and porosis meaning porous. It is a skeletal disease where the bones, over time, become weak and fragile due to loss in bone tissue and mass. This results in an abnormal structure which leads to weakness and breaks. In particular, this leads to fractures of the spine, hip and wrist from minimal trauma and/or weight bearing activities. (Compston, Clifford 2009)

Epidemiology – Who gets Osteoporosis?

The disease affects a significant portion of the population, primarily women. In 2009, in the UK approximately 250,000, and in the USA 1.5 million fractures were attributed to Osteoporosis. In the world today, over 200 million women alone suffer with Osteoporosis

(Compston, Clifford 2009)

Fractures associated with Osteoporosis in the UK alone, represents around £2 billion in medical and social costs with, as of 2012, an estimated 300,000 patients being hospitalised each year. These costs are expected to rise to £6 billion by 2036.

(Sharon Summers-Ma, et al, 2012)

The likelihood of suffering from Osteoporosis is increased in individuals with the following risk factors:

- Hypogonadism (including premature menopause)
- Glucocorticoid therapy
- Previous fracture, especially after menopause
- Low bodyweight
- Cigarette smoker
- Excess alcohol consumption
- Low dietary calcium intake
- Vitamin D deficiency
- Late puberty
- Physical inactivity
- High caffeine intake
- Maternal history of hip fracture

In addition there are a number of secondary causes of Osteoporosis including:

- Endocrine disorders e.g. Hypogonadism or Cushing's syndrome
- Malignant disease e.g. Lymphoma Mastocytosis
- Connective tissue disorders e.g. Marfan's syndrome or Osteogenesis imperfecta
- Drugs e.g. Herapin or Gonadotropin-releasing hormone
- Gastrectomy
- Chronic liver disease

(Compston, Clifford 2009)

Being aware of and managing these risk factors is fundamental to the prediction, diagnosis and treatment of the disease.

Aetiology and Pathophysiology – Bone Metabolism

Bones are comprised of a hard outer layer called the Periosteum, a layer of dense compact solid bone and a soft interior spongy bone. The soft spongy bone contains the bone marrow. Bone is a living tissue. Old bone is constantly replenished with new in order to maintain its strength. This replenishment is called bone remodelling and is performed by two types of bone loving cells, Osteoclasts, which destroy bone and Osteoblast which form new bone within the bone marrow. As we age it is common to find that Osteoclasts become more active and Osteoblasts less so resulting in a reduction of bone mass. When Osteoporosis occurs, the compact and the spongy bone become thinner than normal and the bone weakens, which increases the risk of fracture. (Glenville 2005)

Clinical Signs and Symptoms

The pain associated with Osteoporosis only starts after fractures and/or deformity has occurred due to the weakening of the bone. There are no clear signs and symptoms associated with Osteoporosis prior to fractures and/or deformity (Cosman, 2003)

Recent research by Stanford Prevention Research centre has shown that the likelihood of developing Osteoporosis is the result of the combined contribution of up to 100 different genes of which 32 have now been clearly identified

(Conger, 2012)

Differential Diagnosis – Diseases that may present in similar ways

There is a large number of differential diagnosis which should be considered when diagnosing Osteoporosis, the most similar of which is Osteomalacia. Osteomalacia is the softening of bones due to poor mineral composition.

Other conditions to consider during diagnosis include;

- Tumor
- Osteonecrosis
- Bone infection
- Metastatic bone disease
- Leukeumia
- Lymphoma
- Metastases
- Pathologic fractures secondary to bone Metastases from cancer
- Pediatric Osteogenesis imperfecta
- Renal Osteodystrophy
- Homocystinuria/Homocysteinemia
- Hyperparathyroidism
- Mastoytosis
- Multiple Myeloma
- Renal Osteodystrophy
- Paget Disease
- Scurvy
- Sickle Cell Anaemia

(Jacobs-Kosmin, D, et al. 2012).

Investigation - Tests and Tools

The World Health Organisation has a tool called Frax available at www.shef.ac.uk/FRAX that uses an algorithm that can be applied with or without bone mineral density measurements to estimate Osteoporotic fracture probability

A number of additional techniques are available in order to measure bone mass. These include:

Dual energy X-ray Absorptometry (DEXA)

Dexa is the most valued bone density scan and measures bone density across many parts of the body using calculations from passing a high energy laser through all areas of the bone and a low energy beam through the soft tissue

Quantitative computed Tomography (QCT)

Also known as a cat scan, Tomography scanners provide extremely accurate measurements of bone density. The radiation dose is slightly higher than the DEXA

Quantitative ultrasound (QUS)

Measuring variations in the speed of sound through bone mass measures the broadband attenuation of the bone.

Blood and Urine Tests

Blood and urine tests can be used to measure the amount of bone formation and breakdown (Compston, Clifford 2009)

In addition to the established tests, promising new research involves measuring calcium isotopes in urine samples as a precise detection of bone loss. This, non-invasive and affordable technique will enable both easy early detection of the disease and frequent, accurate assessment of the impact of treatments. (Morgan et al, 2012)

Orthodox Medical Treatment

Bisphosphonates

Bisphosphonates are used by orthodox medicine to inhibit bone resorption and prevent the loss of additional mass. Several of these include:

- Alendronate is an effective anti-resorptive agent which significantly reduces spine and non-vertebral fractures in women with Osteoporosis.
- Risedronate, Ibandronate, Zoledronate are nitrogen containing Bisphosphonate used to treat both men and women with Osteoporosis in Europe and in the USA
- Etridonate Sodium a Bisphosphonate drug used to inhibit bone mineralization.

Possible side effects of Bisphosphonate therapy include Osteonecrosis of the jaw and femoral shaft fractures.

Estrogen Receptor modulators

Raloxifene prevents menopausal bone loss by increasing bone mass by a small amount. This effect is more prominent in the spine and hip, but also occurs throughout the whole of the body.

Hormone Replacement Therapy

Estrogen is an anti-resorptive agent and so hormone replacement therapy can be used to replace Estrogen. However, Estrogen therapy can increase the risk of Endometrial Hyperplasia and cancer so its use as a treatment is often restricted.

Calcitonin

Calcitonin increases calcium excretion in the kidneys and inhibits bone resorption leading to an increase in bone mass density.

Calcium (sometimes combined with Vitamin D)

Calcium suppresses the production of the parathyroid hormone the consequence of which is an anti-resorptive effect. Research from a nursing home suggested that, in elderly individuals, calcium and vitamin D treatment can reduce non vertebral fractures including hip fractures. The benefits of calcium, in relation to bone mass density, has evidence based research for both children and adults.

Strontium Ranelate stimulates bone turnover and bone formation in order to strengthen the bone.

Parathyroid Hormone Peptides stimulates skeletal bone formation. (Compston, Clifford 2009)

Natural Medicine

An effective natural treatment is to focus on increasing the alkaline balance of your diet. When your diet is highly acidic, the body leeches calcium from the bones to naturalize it. Increasing the alkaline balance of your diet means avoiding highly acid foods such as:

- meat
- poultry
- cheese
- soft, fizzy drinks
- alcohol
- tea and coffee
- spinach
- rhubarb

It also means limiting intake of healthy acidic foods to 20-30% of your diet. These include:

- fish and shellfish
- eggs
- nuts and seeds
- grains
- beans

On a low acid diet, the bulk of your food (70-80%) should be non-acidic foods or alkaline foods such as:

- most fruits and vegetables
- buckwheat
- millet
- spouted beans/seeds

(Glenville 2005)