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UPDATE

YOUR BONE STRENGTHENING PROGRAM

⇨*New* therapies for the prevention and treatment of osteoporosis

HEALTHY BONE

Bone is a living dynamic structure which undergoes continual rebuilding and replacement in a process known as 'remodelling'. This involves the breaking down and resorption of old material which is then replaced by the rebuilding of new bone tissue. Ideally the rate of bone formation should equal bone breakdown. An imbalance however, will lead to a net loss of bone mass known as osteoporosis. It is estimated that one in two women in Australia and one in three men over the age of 60 years are now likely to develop osteoporosis.

The balance between bone loss and formation is dependent on the intricate interplay of many factors, including: nutritional, hormonal and lifestyle. We shall discuss how you can use nutritional medicine to promote and strengthen bone.

OSTEOPOROSIS

Literally osteoporosis means 'porous bone'. The primary threat to health is that bones are more liable to fracture even with the slightest trauma or injury or in the case of vertebral fractures may occur spontaneously

From the age of 40, in both men and women, progressive bone loss begins (about 2 per cent loss each year). For women, at menopause, and especially within the first 5-6 years, the rate of bone loss is greater than for men. After the age of 70 years, however, this difference between the sexes is no longer significant. Osteoporosis is not an inevitable consequence of aging, but because it results from the long-term effects of bone loss the end results are generally seen in the elderly. Furthermore contrary to popular belief, it is not just a woman's disease. Men suffer from osteoporosis although the prevalence is lower and fractures occur in women at a younger age.

The causes of osteoporosis are complex and it most certainly is not an 'oestrogen deficiency' disease. To promote oestrogen as the 'most effective' way to prevent osteoporosis is therefore an oversimplification of a complex problem while down playing its potential risks and side effects. As you willl see nutritional factors play a major role in the prevention of osteoporosis and can significantly reduce morbidity and mortality. A comprehensive program for osteoporosis must include the adoption of a lifestyle designed to take nutritional and environmental factors into account.

WHO IS AFFECTED

Osteoporosis involves the deficiency of calcium and other minerals (inorganic) as well as a decline in the non mineral (organic matrix) part of bone. This is the first clue that there is more to osteoporosis than a simple lack of dietary calcium. In fact it is the condition osteomalacia or 'softening of the bone' that is directly due to the lack of vitamin D and thus calcium in adults. Whilst it si important to ensure that calcium intakes are adequate this alone will not precvent osteoporosis. Little attention has been givn to the important role that the organic matrix plays in maintaining bone structure. The more common --Bone loss is typically greatest in the spine (vertebrae), wrist, hip (proximal femur). Vertebral fractures are by far more common in women than in men. Bones of the wrist, spine and jaw are primarily trabecular bone and are particularly sensitive to postmenopausal bone loss. Hip fractures usually occur much later in life (over the age of 75 years) and are the most serious of tneythey result in hospitalisation, permanent disability and may be fatal for 10-20% of cases

THE SYMPTOMS

here are often no signs to indicate that osteoporosis is developing until it is too late as one does not usually experience symptoms until fracture has occurred.

Other related features are: loss of height, periodontal disease, plaque on the teeth, brittle soft finger nails, premature grey hair, lower back pain, neck pain, vertebrae collapse, forward bending of the spine (known as dowager's hump/kyphosis).

RISK FACTORS

Women are more likely to develop osteoporosis than men so let us examine the risk factors that make some women more susceptible than others.

- Family history of osteoporosis
- Small body frame, short stature.
- Premature cessation of menstruation - women who have eating disorders like anorexia or who have low body fat levels due to exercise may experience the cessation of the menstrual period. Surgical removal of the ovaries or the use of drugs to suppress the menstrual cycle also contributes to premature menopause.
- Immobility or bed rest.
- Cigarette smoking
- Excessive intake of alcohol
- Excessive intake of protein (red meat).
- High intakes of caffeine, salt, sugar.
- Inadequate mineral and vitamin intake such as calcium (Ca), phosphorus (P), zinc, magnesium, silica, boron, copper, vitamins B6, C, folic acid, B12
- Poor digestive absorption of nutrients
- The long term use of medications such as corticosteroids, tetracycline antibiotics, thyroid hormones, anticonvulsants, barbiturates, loop diuretics, isoniazid, heparin, aluminium containing antacids
- Disease states such as thyrotoxicosis, Cushing's disease, acromegaly, hepatitis or liver cirrhosis.

WHO IS AFFECTED

Osteoporosis is widespread in the older population, especially in women after menopause. Osteoporosis rarely occurs in women before the age of 40. It is estimated. Bone is a metabolically active tissue and is made of tiny crystals of Ca and P embedded in a matrix of protein fibrcollagen. Ca f collagen. Ca is the most abundant mineral in bone and P comes next. Bone acts as a reservoir for Ca and P in times of need. Three hormones involved in the metabolism of Ca are vitamin D, parathyroid hormone and calcitonin. P also influences Ca absorption, metabolism and utilisation. The average dietary intake of P has increased whilst that of Ca has decreased. This high P level in the blood stream causes Ca is be withdrawn from bone to overcome this imbalance. Other nutrients necessary for optimal bone collagen and mucopolysacharide synthesis are zinc, magnesium, copper, potassium, boron, silica, vitamins C, B6, B12, folic acid. These nutrients play a secondary but important rule. fractures may occur spontaneously.

Osteoporosis is not an inevitable consequence of aging, but because it results from the long-term effects of bone loss the end results are generally seen in the elderly. Furthermore contrary to popular belief, it is not just a woman's disease. Men suffer from osteoporosis although the prevalence is lower and fractures occur in women at a younger age. After the age of 40, both men and women begin to progressively lose bone mass. At menopause, and especially within the first 5-6 years, the rate of bone loss in women is greater than for men. After the age of 70 years this difference is no longer significant.

WHOIS AFFECTED

Osteoporosis is widespread in the older population, especially in women after menopause. Osteoporosis rarely occurs in women before the age of 40. It is estimated that 1 in 3 women over the age of 60 will develop an osteoporotic fracture. While osteoporosis is less common in men, (and is virtually unseen before the age of 60), it is estimated that 1 in 6 men over 75 years will be affected. This fact is not commonly mentioned in the popular media. which is unfortunate, as it gives a false view that this condition is a 'women's disease'. It should be noted that conventional treatment with oestrogen, and even vitamin D and will delay but not reverse osteoporosis. Furthermore to be effective, oestrogen must be taken for 10-15 years.

THE SYMPTOMS

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too late as one does not usually experience symptoms until fracture has occurred. Other related features are: loss of height, periodontal disease, plaque on the teeth, brittle soft finger nails, premature grey hair, lower back pain, neck pain, vertebrae collapse, forward bending of the spine (known as dowager's hump/kyphosis). The more common fractures that occur are those of the vertebrae (spine), wrist, hip (proximal femur). Vertebral fractures are by far more common in women than in men. Bones of the wrist, spine and jaw are primarily trabecular bone and are particularly sensitive to postmenopausal bone loss. Falls are an important contributing factor in wrist and hip fractures. Hip fractures occur much later in life (over the age of 75 years) and are the most serious of fractures as they result in hospitalisation, permanent disability and may be fatal for 10-20% of cases.

OSTEOPOROSIS AND NUTRITION

The causes of osteoporosis are multi-factorial. The metabolic complications of bone mineralisation are not always easy to understand. Loss of oestrogen has been highlighted as the major cause of osteoporosis for women but the real story is much more complex than that.

Furthermore, osteoporosis involves more than just a lack of dietary Ca. In fact it is the condition osteomalacia ('softening of the bone') that is directly due to the lack of dietary Ca in the adult. Adequate dietary Ca plays a central role in the prevention of osteoporosis yet other dietary factors also contribute to improved bone mineralisation and should not be overlooked in its prevention and treatment.

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BONE NUTRIENTS

Bone metabolism is dependent on an intricate interplay of many nutritional and lifestyle factors

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YOUR BONE STRENGTHENING PROGRAM

- Have an alkali-diet by avoiding red meat and eating more fruits and vegetables especially green leafy and coloured variety. Use wholegrains and legumes. Include kelp, nori (seaweed), tahini, molasses rosehip and horsetail tea.
- Eat protein and dairy foods in moderation. Cheeses with high salt content may cause Ca loss.
- Increase foods rich in mucopoly-sacharides such as oats, shark cartilage, sea cucumber (bech der mer), green-lip mussel, aloe vera juice.
- Avoid salt, alcohol and caffeinated beverages.
- Eat less refined foods and sugar.
- Fatty foods inhibit calcium absorption, avoid these.
- To strengthen your bones include weight training (with dumbbells or home made weights) - thirty minutes three times per week.
- Do not crash diet.
- Do not use aluminium containing antacids.
- Improve digestion with apple cider vinegar prior to meals.

YOUR SUPPLEMENTATION PLAN

Do not supplement with Ca alone at the exclusion of other nutrients that are required for total bone health. Excess Ca can create a relative Mg imbalance Calcium carbonate salts are the least absorbable. Ca orotate, gluconate or citrate are the preferred forms.

- Take a formulation that includes Ca, Mg, zinc, copper, P, boron, silica

- Take Vitamin C, D, K, B6, folic acid and B12 and bioflavinoids.
- Take an antioxidant of vitamin E, betacarotene
- Take glucosamine and essential fatty acids (Ω3 or flax oil)

References:

Healthy Bones. Nancy Appleton. Avery Publishing Group. 1991.

The role of oestrogen in maintaining healthy bones is not entirely clear.

Oestrogen is thought to have some direct activity on bone with the discovery of oestrogen receptors in bone. It is also postulated that oestrogen may block the bone-dissolving action of PTH so that at menopause the bones become more vulnerable to PTH and undergo increased bone resorption.