Strong Bones: Strong Foundations

Our bones are the strong and resilient foundations of our bodies, providing the structure that is necessary for everything we do. Unfortunately, they are often taken for granted. We don’t think about them until something goes wrong and, like a building with a crumbling foundation, we can find ourselves, literally, falling down. Without consistent maintenance our bones lose their strength through a condition called osteoporosis. Osteoporosis is most often associated with women and the elderly, but more and more it is recognized that it has a high incidence in men and that the process can begin as early as age 30. Treatment for osteoporosis is available. However, measures for the maintenance of bone health and prevention of the disease that start at an early age have promise for better health in later life.

The physiologic processes that lead to osteoporosis begin early in adulthood. Bone tissue is constantly being renewed as old bone is broken down and replaced by new bone. Until about age 30, more bone is formed than is broken down and the bone becomes dense and strong. After that time, the process is reversed and our skeletons slowly become more porous. Minerals, particularly calcium, also contribute to the strength of our bones. The more calcium available for building bones, the stronger and denser the bones will be, making them more resistant to fractures. Osteoporosis is the result of this reverse process of bone turnover, compounded by deficiency of the mineral calcium.

Osteoporosis is the progressive loss of bone tissue and density over time with the resultant increased risk of fractures, pain and disability. The condition develops gradually over a period of years and often remains undetected until a fracture occurs. While an estimated one in five women over the age of 50 years have osteoporosis, it is also a significant threat to men. One study reported that men over age 50 have just as many osteoporosis related fractures of the spine as women in the same age bracket. Men suffer 30% of hip fractures, and are significantly more likely than women to die following hip fracture. Osteoporosis in women is likely to be the result of age related bone loss which accelerates after menopause. In men it is more often related to secondary causes such as diseases, medications or lifestyle behaviours.

For both men and women, the risk factors for osteoporosis include increasing age; family history of osteoporosis or minimal trauma fractures; calcium and vitamin D deficiency; chronic diseases such as rheumatoid arthritis, chronic kidney disease and eating disorders; smoking; daily alcohol intake of two drinks or more; and low body weight. For men in particular, risk of osteoporosis is related to prior fracture with minimal trauma, and glucocorticoid use. Glucocorticoids such as cortisone or prednisone are medications that are used to treat chronic conditions like rheumatoid arthritis, chronic lung disease, and chronic bowel diseases.

Because the disease has no obvious symptoms in the early stages and may not be recognized until a bone fracture occurs, risk factor assessment could be the first step in identifying that the disease process has started. If you or your doctor recognizes that you have significant risk factors for developing osteoporosis, you can have a Bone Mineral Density (BMD) test. Certainly it is recommended that everyone, men and women, over the age of 65 should be referred for this test. The BMD uses small amounts of x-ray to measure how thick or dense are the bones of the spine and hip. It is safe and painless and may help you to avoid many years of discomfort and disability by recognizing the osteoporotic process before it is too advanced to arrest. Early treatment and life style changes can stop or slow the process and even restore bone density in some cases.

Like most chronic diseases, lifestyle change is a critical factor in the treatment of osteoporosis. Dietary adjustments to increase intake of calcium and vitamin D combined with increasing weight bearing exercises can have a significant impact on the progression of the disease. Efforts to eliminate habits that are detrimental to bone health, such as alcohol and caffeine intake, and smoking have a positive effect, as well.

Calcium is an essential mineral for bone health but it can be difficult to ensure an adequate intake in your daily diet. As well, calcium is less efficiently absorbed from the digestive tract as we age. The recommended daily intake of calcium for adults is 1000 to 1200 milligram. This can be obtained from good sources such as dairy products, salmon, fortified soy products, blackstrap molasses and dark green leafy vegetables like kale and turnip greens. Many people find, however, that they must make a conscious effort to track their calcium intake in order to ensure that they get enough. For instance, one cup (250 mls) of milk provides 300 milligrams of calcium, as does a cup of fortified soy or rice beverage or orange juice, and ¾ cup (185 mls) of yogurt. This means that four or more servings of these foods are needed to provide the required daily amounts of calcium. To complicate matters, many versions of these foods are also high in fat and calories and can contribute to weight gain, not particularly desirable for overall health. Good planning is needed to ensure that you are consuming the right products to provide the best nutrition. As well, careful label reading is necessary particularly if you are substituting soy or rice beverages for milk. Make sure that the beverage product supplies at least 30% of the recommended daily allowance of calcium. However, all the calcium in the world will be of no benefit if you consume insufficient amounts of vitamin D.

Vitamin D is essential for the absorption of calcium from the digestive tract, as well as to support its function of strengthening the bone tissues. The daily recommended intake for adults is 600 to 800 International Units (IU). Vitamin D has a few natural food sources such as cold water fish (salmon and tuna), but our main source is vitamin D fortified milk products. As well, our bodies are able to manufacture vitamin D when skin is exposed to sunlight ultraviolet rays. Overexposure to sunlight can present health risks of its own, but some sources say that as little as 15 minutes of sun exposure daily is adequate for vitamin D production. Many people find that a dietary supplement is essential to ensuring adequate intake of both vitamin D and calcium. Just be sure to consult your doctor or pharmacist before taking supplements, particularly if you are taking other medication. This will help to prevent any potential drug interactions. As well, make sure that you do not exceed recommended dosages as high intake of both vitamin D and calcium can have adverse effects. Adequate intake of calcium and vitamin D provide the building blocks for strong bones, but the stress of weight bearing exercise moves these blocks together and cements them into a strong structure.

Exercise combats osteoporosis in a number of ways: it increases bone strength; it builds strong muscles that support bones and joints; it improves balance and coordination that can prevent falls; and it improves posture, putting less stress on spinal structures. The best exercises for bone health are those where the bones have to carry the body weight. These include aerobic exercise such as brisk walking or hiking, and dancing. Including movements that are different from your daily routine, such as in dancing, have added benefit in including muscle groups and joints that are not usually exercised. Resistance or weight training to target all muscle groups is also beneficial when performed at least 3 times per week. Tai Chi, balance exercise and yoga are all good activities for improving balance, coordination and posture. Be careful, however, to avoid high impact activities like running that could cause injury to bones and joints, and be sure to consult your health care provider before beginning any exercise program. Once you have started a regular exercise program you can reap the benefits of stronger bones and better balance, as well as the side benefit of prevention of falls.

A fall can be devastating to a person with osteoporosis. Fragile bones are more likely to break and beaks result in pain and deformity that may not completely resolve. Hip fractures, in particular, may have severe consequences of loss of independence, admission to long term care, or even death. It is estimated that 1 in 4 women who have a hip fracture die within six months. The statistics for men are even higher. Fractures can be prevented by taking precautions against falling: clear your home of clutter especially around stairs; remove scatter rugs, electrical cords that could trip you, or protruding furniture; wear supportive shoes with a low heel and take care of your feet; keep steps and handrails in good repair; provide good lighting throughout your home; be aware of side effects of medications that may cause dizziness or fainting.

Finally, in recent years, medications have been developed to treat osteoporosis by slowing down the action of the cells responsible for breaking down bone in the bone remodelling process. Called Bisphosphonates, these drugs are likely to be used to treat osteoporosis in both men and women. Some names you might hear are Fosamax, Fosavance, and Actonel. They are usually taken by mouth daily, weekly or monthly and need to be ingested in the morning on an empty stomach with nothing to eat or drink for at least 30 minutes after. It is important that you remain upright (do not lie down) for 30 minutes after taking any of these drugs. These precautions are necessary to prevent the complication of damage or ulceration of the esophagus. In addition, if you are taking any of these drugs, inform your doctor or pharmacist of all other medications that you are taking, including over-the-counter and herbal treatments.

While osteoporosis can be treated and controlled, there is also much that we can do to keep our bones strong and healthy well into old age. Unfortunately, as with most conditions associated with aging, we have to start thinking prevention well before the effects of our actions can be seen. It is never too early to be concerned about bone health. Parents must be vigilant to assure that their children receive enough calcium and vitamin D rich foods well into their teens, and even early adulthood. Children must be encouraged away from their televisions and computer games into the outdoors where they can run, walk, and play. Good diets in addition to lots of weight bearing exercise will build strong bone density to its maximum before the negative effects of bone turnover can begin. It is such a good investment in future health. Buildings cannot stand without strong foundations, and strong bones can keep us moving and functional well into old age.

For more information about osteoporosis and its prevention, management and treatment visit the website of Osteoporosis Canada: www.osteoporosis.ca